December 5, 2008

Mr. Charles G. Pardee
President and Chief Nuclear Officer (CNO), Exelon Nuclear
Chief Nuclear Officer (CNO), AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville IL 60555

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
NRC COMPONENT DESIGN BASES INSPECTION (CDBI)
INSPECTION REPORT 05000254/2008007; 05000265/2008007(DRS)

Dear Mr. Pardee:

On October 24, 2008, the U. S. Nuclear Regulatory Commission (NRC) completed a component design bases inspection at your Quad Cities Nuclear Power Station, Units 1 and 2. The enclosed report documents the inspection results, which were discussed on October 24, 2008, with you and other members of your staff.

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

Based on the results of this inspection, four NRC-identified findings of very low safety significance were identified. Three of the findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations (NCVs) in accordance with Section VI.A.1 of the NRC Enforcement Policy.

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

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

Sincerely,

/RA/

Ann Marie Stone, Chief
Engineering Branch 2
Division of Reactor Safety

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

Enclosure: Inspection Report 05000254/2008007; 05000265/2008007
(w/Attachment: Supplemental Information)

cc w/encl: Site Vice President - Quad Cities Nuclear Power Station
Plant Manager - Quad Cities Nuclear Power Station
Regulatory Assurance Manager -
Quad Cities Nuclear Power Station
Chief Operating Officer and Senior Vice President
Senior Vice President - Midwest Operations
Senior Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Director Licensing - Licensing and Regulatory Affairs
Manager Licensing - Clinton, Dresden and Quad Cities
Vice President - Law and Regulatory Affairs
D. Tubbs, Manager of Nuclear
Associate General Counsel
Document Control Desk - Licensing
Assistant Attorney General
J. Klinger, State Liaison Officer,
Illinois Emergency Management Agency
M. Rasmusson, State Liaison Officer, State of Iowa
Chairman, Illinois Commerce Commission
Chief Radiological Emergency Preparedness Section,
Dept. Of Homeland Security

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Letter to Mr. Charles Pardee from Ms. A. M. Stone dated December 5, 2008.

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
NRC COMPONENT DESIGN BASES INSPECTION (CDBI) 05000254/2008007;
05000265/2008007(DRS)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-254, 50-265
License Nos:	DPR-29, DPR-30
Report No:	05000254/2008007; and 05000265/2008007(DRS)
Licensee:	Exelon Nuclear
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	Cordova, IL
Dates:	September 22, 2008, through October 24, 2008
Inspectors:	A. Dunlop, Senior Engineering Inspector, Lead S. Sheldon, Senior Engineering Inspector C. Moore, Senior Operations Examiner C. Acosta Acevedo, Engineering Inspector C. Baron, Mechanical Contractor G. Nicely, Electrical Contractor
Approved by:	Ann Marie Stone, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000254/2008007, 05000265/2008007(DRS); 09/22/2008 – 10/24/2008; Quad Cities Nuclear Power Station, Units 1 and 2; Component Design Bases Inspection (CDBI).

The inspection was a three-week onsite baseline inspection that focused on the design of components that are risk significant and have low design margin. The inspection was conducted by regional engineering inspectors and two consultants. Four findings of very low safety significance were identified, three of which were associated Non-Cited Violations (NCVs). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A finding of very low safety significance (Green) involving a NCV of 10 CFR Part 50, Appendix B, Criterion III, Design Control, was identified by the inspectors for the failure to evaluate the effect of lower transient voltages that would exist for safety injection actuated motor-operated valves (MOVs) prior to voltage recovery on the upstream 4Kv buses. Specifically, the licensee used non-conservative inputs and methodologies in calculating terminal voltages to safety-related MOV motors. The licensee entered the issue into their corrective action program and performed an operability review of all safety injection actuated valves to verify they had sufficient margin to operate when considering transient voltage conditions.

  The finding was more than minor because it was similar to IMC 0612, Appendix E, Example 3.j, in that there was a reasonable doubt on the operability of several low pressure coolant injection valves that would have to operate at voltages as low as 60 percent of rating. The inspectors determined the finding was of very low safety significance because it was a design deficiency that did not result in actual loss of safety function. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience because the licensee did not adequately evaluate a similar issue in an NRC Information Notice. (P.2(a)). (Section 1R21.3.b.(1))

- Green. A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to assure that thermal overload relays (TOLs) on safety-related MOV circuits were sized properly and periodically tested. The licensee entered this issue into its corrective action program and was able to demonstrate operability, in that the TOLs would not prevent any MOVs from performing their safety function.

  The finding was more than minor because it was similar to IMC 0612, Appendix E, Example 3.j, in that failing to assure that TOLs on safety-related MOV circuits were sized properly and periodically tested led to there being a reasonable doubt as to the operability of the affected safety-related MOVs. The issue was of very low safety significance because the inspectors determined it was a design deficiency that did not

result in actual loss of safety function. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Self-Assessment because the licensee incorrectly evaluated this issue as not being a concern during a self-assessment. (P.3(a)). (Section 1R21.3.b.(2))

- Green. A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to assure that 250VDC safety-related batteries were installed in accordance with their seismic qualification. The licensee entered this nonconformance into its corrective action program and initiated work orders to replace the intercell spacers with properly sized material. To establish a reasonable assurance of operability, the licensee reviewed seismic experience database reports from the Seismic Qualification Utility Group.

  The finding was determined to be more than minor because the finding was conceptually similar to IMC 0612, Appendix E, Example 3a, in that rework (spacer replacement) was required to restore seismic qualification. The issue was of very low safety significance because the inspectors determined it was a qualification deficiency that did not result in actual loss of safety function. The inspectors determined there was no cross-cutting aspect associated with this finding. (Section 1R21.3.b.(3))

- Green. A finding of very low safety significance was identified by the inspectors for failure to accurately implement the design setpoint for reactor core isolation cooling turbine exhaust pressure switches 1(2)-1360-26A/B. The licensee entered this issue into its corrective action program and was able to demonstrate operability by determining that the setpoints would not be challenged for scenarios where reactor core isolation cooling was credited.

  The finding was determined to be more than minor because the finding was conceptually similar to IMC 0612, Appendix E, Example 3a, in that rework (instrument recalibration) was required to restore conformance with the design. The issue was of very low safety significance because the inspectors determined it was a design deficiency that did not result in actual loss of safety function. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program because the licensee did not adequately evaluate the issue in 2004 such that it was properly classified and prioritized. (P.1(c)) (Section 1R21.3.b.(4))

B. Licensee-Identified Violations

No violations of significance were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Component Design Bases Inspection (CDBI) (71111.21)

.1 Introduction

The objective of the CDBI is to verify that design bases have been correctly implemented for the selected risk significant components and that operating procedures and operator actions are consistent with design and licensing bases. As plants age, their design bases may be difficult to determine and an important design feature may be altered or disabled during a modification. The Probabilistic Risk Assessment (PRA) model assumes the capability of safety systems and components to perform their intended safety function successfully. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for which there are no indicators to measure performance.

Specific documents reviewed during the inspection are listed in the Attachment to the report.

.2 Inspection Sample Selection Process

The inspectors selected risk significant components and operator actions for review using information contained in the licensee's PRA and the Quad Cities Standardized Plant Analysis Risk (SPAR) Model, Revision 3. In general, the selection was based upon the components and operator actions having a risk achievement worth of greater than 1.3 and/or a risk reduction worth greater than 1.005. The operator actions selected for review included actions taken by operators both inside and outside of the control room during postulated accident scenarios. In addition, the inspectors selected operating experience issues associated with the selected components.

The inspectors performed a margin assessment and detailed review of the selected risk-significant components to verify that the design bases have been correctly implemented and maintained. This design margin assessment considered original design reductions caused by design modification, or power up-rates, or reductions due to degraded material condition. Equipment reliability issues were also considered in the selection of components for detailed review. These included items such as performance test results, significant corrective action, repeated maintenance activities, Maintenance Rule (a)(1) status, components requiring an operability evaluation, NRC resident inspector input of problem areas/equipment, and system health reports. Consideration was also given to the uniqueness and complexity of the design, operating experience, and the available defense in depth margins. A summary of the reviews performed and the specific inspection findings identified are included in the following sections of the report.

This inspection constituted 27 samples as defined in Inspection Procedure 71111.21-05.

.3 Component Design

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), design basis documents, drawings, calculations and other available design basis information, to determine the performance requirements of the selected components. The inspectors used applicable industry standards, such as the American Society of Mechanical Engineers (ASME) Code, Institute of Electrical and Electronics Engineers (IEEE) Standards and the National Electric Code, to evaluate acceptability of the systems' design. The NRC also evaluated licensee actions, if any, taken in response to NRC issued operating experience, such as Bulletins, Generic Letters (GLs) Regulatory Issue Summaries (RISs), and Information Notices (INs). The review was to verify that the selected components would function as designed when required and support proper operation of the associated systems. The attributes that were needed for a component to perform its required function included process medium, energy sources, control systems, operator actions, and heat removal. The attributes to verify that the component condition and tested capability was consistent with the design bases and was appropriate may include installed configuration, system operation, detailed design, system testing, equipment and environmental qualification, equipment protection, component inputs and outputs, operating experience, and component degradation.

For each of the components selected, the inspectors reviewed the maintenance history, system health reports, operating experience-related information, and licensee corrective action program documents. Field walkdowns were conducted for all accessible components to assess material condition and to verify that the as-built condition was consistent with the design. Other attributes reviewed are included as part of the scope for each individual component.

The following 17 components were reviewed:

- Emergency Diesel Generator (EDG) 1 (1-6601): The inspectors reviewed the electrical portions of the EDG and associated supply breaker to verify the adequacy of the equipment to respond to design basis events. The inspectors reviewed EDG starting logic and output breaker control logic to verify the appropriate functionality was implemented. The inspectors reviewed the EDG feeder breaker maintenance and control voltage to verify that the components would function when required. The inspectors reviewed protection/coordination and short-circuit calculations to verify the EDG was adequately protected by protective devices during test mode and emergency operation. Completed surveillances were reviewed to verify that the TS requirements were met. Additionally, the inspectors reviewed calculations and technical evaluations to verify that steady-state and transient loading were within design capabilities, adequate voltage would be present to start and operate connected loads, and operation at maximum allowed frequency would be within the design capabilities. The review included determining the bases for brake horsepower loading values, and verifying that design bases and design assumptions had been appropriately translated into the design calculations and procedures. The inspectors reviewed the basis for the EDG load sequence time delay setpoints. The EDG breaker closure and opening control logic diagrams and the 125VDC [Volts Direct Current] voltage calculations were reviewed to ensure adequate voltage would

be available for the control circuit components and the breaker spring charging motors.

- 4160VAC [Volts Alternating Current] Essential Switchgear Bus (14-1): The inspectors reviewed the 4kV essential switchgear to verify it would operate during design basis events. The inspectors reviewed selected calculations for electrical distribution system, including load flow/voltage drop, degraded voltage protection, short-circuit, and electrical protection and coordination. This review was conducted to assess the adequacy and appropriateness of design assumptions, and to verify that bus capacity was not exceeded and bus voltages remained above minimum acceptable values under design basis conditions. Additionally, the switchgear's protective device settings and breaker ratings were reviewed to ensure that selective coordination was adequate for protection of connected equipment during worst-case, short-circuit conditions. The inspectors also reviewed the automatic and manual transfer schemes between alternate offsite sources and the EDG to verify that adequate voltage was maintained for safety-related loads before, and after the transfers. Additionally, bus operating procedures were reviewed to determine if adequate guidance was given to the operators to ensure design basis assumptions were maintained. The inspectors reviewed degraded and loss of voltage relays to verify settings were in accordance with design calculations and associated calibration procedures were consistent with calculation assumptions. To determine if breakers were maintained in accordance with industry and vendor recommendations, the inspectors reviewed the preventive maintenance inspection and testing procedures. The inspectors reviewed breaker opening and closure logic to verify the appropriate functionality was implemented. The 125VDC voltage calculations were reviewed to determine if adequate voltage would be available for the breaker open and close coils and spring charging motors.

- 480VAC Reactor Building Essential Service Motor Control Center (MCC) (19-1): The inspectors reviewed the 480V MCC to verify it would operate during design basis events. The inspectors reviewed selected calculations for electrical distribution system load flow, voltage drop, short-circuit, and electrical protection and coordination. The adequacy and appropriateness of design assumptions and calculations were reviewed to verify that bus capacity was not exceeded and bus voltages remained above minimum acceptable values under design basis conditions. The MCC protective device settings and breaker ratings were reviewed to ensure that selective coordination was adequate for protection of connected equipment during worst-case short-circuit conditions. To ensure that breakers were maintained in accordance with industry and vendor recommendations, the inspectors reviewed the preventive maintenance inspection and testing procedures.

- 208VAC Reactor Building MCC (19-1-1): The inspectors reviewed the 208V MCC to verify it would operate during design basis events. The inspectors reviewed selected calculations for electrical distribution system load flow, voltage drop, short-circuit, and electrical protection and coordination. The adequacy and appropriateness of design assumptions and calculations were reviewed to verify that bus capacity was not exceeded and bus voltages remained above minimum acceptable values under design basis conditions. The MCC protective device settings and breaker ratings were reviewed to ensure that selective

coordination was adequate for protection of connected equipment during worst-case short-circuit conditions. To ensure that breakers were maintained in accordance with industry and vendor recommendations, the inspectors reviewed the preventive maintenance inspection and testing procedures.

- 345/4.28kV Reserve Auxiliary Transformer (T12): The inspectors reviewed the transformer to verify it would respond as described in the UFSAR and the design basis calculations. The inspectors reviewed the system one-line diagrams, nameplate data, electrical load flow calculations, and loading requirements to determine the adequacy of the transformer to supply required power to the associated 4160VAC essential switchgear. The inspectors reviewed the licensing basis for the operation of the automatic load tap changer (LTC) and its role in mitigating a design bases event. The inspectors reviewed the time delay settings and operating speed of the load changer mechanism to verify the ability of the LTC to perform the timing sequence assumed in the design. The inspectors reviewed applicable operating procedures that would be used if the automatic load tap changers or the control power supply were inoperable. To ensure that transformer was maintained in accordance with industry and vendor recommendations, the inspectors reviewed the preventive maintenance inspection and testing procedures.

- 250VDC Battery: The inspectors reviewed electrical calculations for the Unit 2 safety-related 250VDC station battery. These included battery sizing and loading calculations for safety-related DC loads to verify that adequate battery capacity was available during a design bases event and for a station blackout event. The inspectors also reviewed the battery surveillance tests and performance history to verify acceptance criteria were met and performance degradation would be identified. Surveillance procedures were verified to be in accordance with vendor guidance. The minimum and maximum battery room temperatures were reviewed for consistency with design basis requirements. The inspectors reviewed battery charger sizing calculations and verified that battery chargers were periodically tested to ensure proper operation. Operating procedures associated with the battery were also reviewed to ensure they were in accordance with vendor recommendations.

- Division II Reactor Building DC MCC (1B): The inspectors reviewed electrical calculations for the safety-related 250VDC motor control center 1B. These included short circuit, loading, cable sizing and voltage drop calculations for safety-related DC loads to verify that adequate voltage was available at these loads during a design basis event and for a station blackout event. The inspectors reviewed the ratings on fuses and circuit breakers to ensure that they were properly selected for the application.

- Reactor Core Isolation Cooling (RCIC) Turbine/Pump (1/2-1303/1302): The inspectors reviewed the RCIC system to verify that the pump and associated peripherals could meet the design basis requirements. The inspection included a review of calculations including net positive suction head (NPSH) available, vortexing, required flows for design basis accidents, available water inventory, as well as minimum flow provisions. The inspectors reviewed vendor manuals, specifications and pump curves to ensure that these parameters had been correctly translated into calculations. The inspectors also evaluated calculations

and inservice test (IST) data to ensure that TS and design basis requirements were met; and those IST acceptance criteria included instrument uncertainties where appropriate. The inspectors reviewed surveillances conducted on the pump's auxiliaries such as the gland seal condenser, the steam drain pot, and the turbine oil to ensure continued functionality. The inspectors reviewed the pump room heat up calculation as well as the capability of the room coolers to assure a qualified environment. The governor and flow controller tuning procedures and test results were reviewed to verify that they implemented vendor requirements. This included reviewing the automatic initiation logic and the control of the associated automatic injection and minimum flow valves. Finally, the inspectors reviewed RCIC instrumentation surveillances to verify proper instrument setpoints were correct and adequately maintained.

- RCIC Steam Supply Blocking (1-1301-61): The inspectors reviewed motor-operated valve (MOV) calculations and analysis to ensure the valve was capable of functioning under design conditions. This included calculations for required thrust, maximum differential pressure, and valve weak link analysis. In addition, the inspectors reviewed valve DC motor calculations to confirm that the design basis minimum voltage at the motor terminals would be adequate for starting and running, and protective device/thermal overload relay settings provided adequate margin. The inspectors reviewed the control logic diagrams to verify the proper functionality was implemented. Diagnostic and surveillance results were reviewed to verify acceptance criteria were met and performance degradation would be identified.

- Residual Heat Removal Service Water (RHRSW) Pumps (1/2-1001-65A-D): The inspectors reviewed system hydraulics calculations including NPSH available calculations and the adequacy of the differential pressure setpoint across the residual heat removal heat exchanger. The inspectors also reviewed the adequacy of the licensee's calculations and procedures in the event of a loss of normal heat sink. In addition, the inspectors reviewed completed pump surveillances to ensure that actual performance was acceptable and conditions of the test represented, or could be correlated to, conditions during design basis accidents. The inspectors reviewed vendor manuals, specifications, and pump curves to make sure that these parameters had been correctly translated into calculations, as required. In addition, the inspectors reviewed pump motor electrical calculations to confirm that the design basis minimum voltage at the motor terminals would be adequate for starting and running, protective device/thermal overload relay settings to ensure that adequate margin existed, and cable sizing to ensure adequate ampacity.

- High Pressure Coolant Injection (HPCI) Steam Supply Valve (1-2301-3): The inspectors reviewed MOV calculations and analysis to ensure the valve was capable of functioning under design conditions. This included calculations for required thrust, maximum differential pressure, and valve weak link analysis. In addition, the inspectors reviewed valve DC motor calculations to confirm that the design basis minimum voltage at the motor terminals would be adequate for starting and running, and that protective device/thermal overload relay settings were adequate. The inspectors reviewed the control logic diagrams to verify the proper functionality was implemented. Diagnostic and IST results were reviewed

to verify acceptance criteria were met and performance degradation would be identified.

- HPCI Injection Valve (1-2301-8): The inspectors reviewed MOV calculations and analysis to ensure the valve was capable of functioning under design conditions. This included calculations for required thrust, maximum differential pressure, and valve weak link analysis. In addition, the inspectors reviewed valve DC motor calculations to confirm that the design basis minimum voltage at the motor terminals would be adequate for starting and running, and that protective device/thermal overload relay settings were adequate. The inspectors reviewed the control logic diagrams to verify the proper functionality was implemented. Diagnostic and IST results were reviewed to verify acceptance criteria were met and performance degradation would be identified.

- Residual Heat Removal Minimum Flow Valve (1-1001-18B): The inspectors reviewed MOV calculations and analysis to ensure the valve was capable of functioning under design conditions. This included calculations for required thrust, maximum differential pressure, and valve weak link analysis. In addition, the inspectors reviewed valve AC motor calculations to confirm that the design basis minimum voltage at the motor terminals would be adequate for starting, and that protective device/thermal overload relay settings were adequate. The inspectors reviewed the control logic diagrams to verify the proper functionality was implemented. Diagnostic and IST results were reviewed to verify acceptance criteria were met and performance degradation would be identified. Flow instrument surveillances were reviewed to verify proper instrument setpoints were maintained. The inspectors also reviewed a modification that revised the valve's normal position from closed to open.

- Safe Shutdown Makeup Pump (SSMP) (1/2 2901): The inspectors reviewed the SSMP to verify its capability to perform its design function of providing makeup water to the reactor vessel. This was accomplished by reviewing the SSMP hydraulic and NPSH calculations, as well as surveillance test procedures and surveillance test results. The inspectors also reviewed the capability of the alternate SSMP suction supply from the fire protection system. The pump and valve control logic and interlocks, along with the design of the pump power supply interlocks, were reviewed to verify the system would function as designed. In addition, the inspectors reviewed the operating procedures associated with both local and control room pump operation. The inspectors also reviewed MOV calculations to verify the capability of the valves to operate under the most limiting conditions. In addition, the inspectors reviewed pump motor electrical calculations to confirm that the design basis minimum voltage at the motor terminals would be adequate for starting and running, protective device/thermal overload relay settings to ensure that adequate margin existed, and cable sizing to ensure adequate ampacity.

- SSMP Room Cooling Unit (0-5799): The inspectors reviewed the SSMP room cooling unit to verify its capability to perform its design function. The inspectors reviewed design calculations associated with room cooling to ensure the pump and associated components remained within their temperature limits. The inspectors reviewed preventative maintenance procedures to ensure components were being adequately maintained. The inspectors also reviewed

the design of the strainer to verify an adequate service water supply to the room cooling unit would be maintained.

- Diesel Fire Pump (1/2 4101A): The inspectors reviewed the diesel fire pump to verify its capability of providing makeup water to the reactor vessel and of providing an alternate suction supply to the SSMP. The inspection included a review of the calculations and operating procedures related to these functions. This included the automatic and manual pump control logic, the engine starting system, and the engine fuel system to ensure components were being adequately maintained. The inspectors evaluated pump test procedures and test results as well as testing of the engine starting battery system to verify they remained capable of performing their function. In addition, the inspectors reviewed the pump replacement and fuel system modifications.

- Dampers for EDG 1 Room Cooling (1-5772-86A/B, -87, -94, -95, and -96): The inspectors reviewed the air-operated dampers associated with the EDG 1 room ventilation system. The review included the control logic of these dampers, the dampers performance during both EDG operation and fire conditions, and the performance of the backup nitrogen supply associated with the dampers. The inspectors reviewed room ventilation calculations and operability evaluations to ensure the EDG remained within its temperature limits. The inspectors also reviewed testing of the dampers, including testing of the nitrogen backup supply to verify their capability to perform their design functions. The inspectors also evaluated the capability of the EDG ventilation system to withstand postulated depressurization associated with a tornado.

b. Findings

(1) Use of Non-Conservative Inputs and Methodologies in Calculating Terminal Voltages to Safety-Related MOV Motors During Design Basis Events

Introduction: The inspectors identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” in that the licensee had used non-conservative inputs and methodologies in calculating terminal voltages to safety-related MOV motors during design basis events.

Description: The inspectors determined that in the applicable MOV thrust and torque calculations the licensee non-conservatively used steady-state post transient MCC voltages associated with having 3845V at the 4Kv buses. The inspectors determined that the use of steady-state post transient MCC voltages, instead of transient block loading voltages, to evaluate the starting terminal voltages for MOVs required to change state during a safety injection (SI) signal would predict higher terminal voltages than would actually be available. Additionally, the inspectors noted that calculation QDC-6700-E-1503 assumed that SI actuated MOVs stall until adequate bus voltage was available to provide sufficient torque to operate the valves and was assumed to draw locked rotor current for the nominal 7 second time delay of the degraded voltage relay. The licensee had failed to analyze the effect on MOV torque capability during the initial block loading with lower voltages available to the valve motors and had not evaluated the potential for delay in valve movement with respect to safety analysis assumptions for valve stroke timing.

The inspectors also determined that the licensee had not evaluated if the associated thermal overloads (TOLs) for the safety-related valve motors would trip during the time period that the MOVs could be in a stall condition due to the reduced voltage available. Based on the TOL setpoint of 4.5 seconds, the MOVs could have tripped under stall conditions, thus preventing the MOVs from performing their safety function. The licensee performed a review of all SI actuated valves to determine the impact on their margin to operate when considering transient voltage conditions. The inspectors reviewed the licensee's operability determination for low pressure coolant injection (LPCI) valves, which provided reasonable assurance that the MOVs would still function at approximately 60 percent of rated voltage. This issue has been entered into the corrective action program as action request (AR) 823087.

Prior to the inspection, the licensee reviewed approximately 130 findings/violations from the first round of NRC CDBIs as summarized in NRC IN 2008-02, "Findings Identified During Component Design Bases Inspections," for applicability to Quad Cities. The IN identified a similar finding on MOV terminal voltage calculations at Prairie Island, however, the licensee incorrectly concluded that the issue was not applicable and that the associated inputs and methodologies for determining MOV terminal voltages were conservative.

Analysis: The inspectors determined that a performance deficiency existed in that the licensee failed to evaluate the effect of lower transient voltages that would exist for safety injection actuated MOVs prior to voltage recovery on the upstream 4Kv buses. Specifically, the licensee used non-conservative inputs and methodologies in calculating terminal voltages to safety-related MOV motors. The finding was more than minor because it was similar to NRC Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues," Example 3.j, in that there was a reasonable doubt on the operability of several LPCI system valves that would have to operate at voltages as low as 60 percent of rating, thus preventing the MOVs from performing their safety function. The finding was associated with the design control attribute of the mitigating systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Mitigating Systems Cornerstone. The finding screened as "Green" because it was a design deficiency that did not result in actual loss of safety function.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience because the licensee did not adequately evaluate IN 2008-02. Specifically, the IN identified a similar finding on MOV terminal voltage calculations, however, the licensee incorrectly concluded that the issue was not applicable at Quad Cities and that the associated inputs and methodologies for determining MOV terminal voltages were conservative. (P.2(a)).

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," required, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program.

Contrary to the above, as of September 26, 2008, measures had not been established to verify the adequacy of the design minimum voltage levels utilized in SI actuated MOV capability assessments. This resulted in non-conservative voltages being used as design inputs in the analyses of SI actuated MOVs. Because this violation is of very low safety significance and has been entered into the licensee's corrective action program (AR 00823087), this violation is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000254/2008007-01; 05000265/2008007-01).

(2) Inadequate Calculations/Analyses and Testing for Thermal Overload Relays (TOLs) on Safety-Related MOVs

Introduction: A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to assure that TOLs on safety-related MOV circuits were sized properly and periodically tested.

Description: Regulatory Guide 1.106, Revision 1, "Thermal Overload Protection For Electric Motors On Motor-Operated Valves," specified methods acceptable to the NRC staff for complying with Appendix B, Criterion III. The guide allowed the licensee to either bypass the TOL during a design basis event or leave the TOL in the MOV circuit continuously, provided that they were sized properly and periodically tested. These methods would ensure that the TOL devices would not needlessly prevent the motor from performing its safety-related function. The inspectors noted that the licensee was not committed to the Regulatory Guide. Although the licensee chose to leave the TOLs in the MOV circuits during a design basis event, they did not develop acceptable methods to demonstrate that the TOLs were sized properly and to ensure continued functional reliability and the accuracy of the trip point.

A review of calculation 004-E-031, "Thermal Overload Reviews," determined that TOL relays may produce nuisance trips due to stalling of the MOV motor until the MCC voltage increases during the first 8.3 seconds of a design basis accident. In some cases, the TOL relays would trip in approximately 4.5 seconds, prior to the degraded voltage relay time-out (8.3 seconds), rendering that MOV inoperable. The following four LPCI MOVs (two on each unit) were susceptible to this condition: 1-1001-28A, 1-1001-28B, 2-1001-28A, and 2-1001-28B.

The inspectors identified that the licensee had established in 1993 an acceptable criteria, TID E/I&C-C-02, "Thermal Overload Relay Selection of MOVs," for properly sizing TOLs for safety-related MOVs. However, the licensee had not followed through with the required calculations or analyses to assure proper sizing of circuits installed prior to issuance of the criteria were properly sized.

The inspectors also noted that testing of TOLs was a recommendation of the Exelon Performance Centered Maintenance (PCM) template MA-AA-716-210-1001, "Motor Control Centers/Molded Case Circuit Breakers," when performing the cubicle preventive maintenance (PM) inspections at 480VAC and 250VDC MCCs. Procedure QCEPM 0250-11, "480/208 MCC Maintenance and Surveillance," inspected the TOLs and included steps for testing the TOLs, but there was a note indicating that the tests were to be performed only if the overload relays were replaced. Procedure QCEPM 0400-02, "Inspection, Repair, and Maintenance of DC Operated Cutler-Hammer Motor

Controllers," inspected the TOLs, but had no steps to test the TOLs. Therefore, the testing of the TOL relays was not being performed periodically as recommended by the PCM template.

As part of the preparation for this inspection, the licensee performed a self-assessment that reviewed TOL sizing for safety-related MOVs. The review was performed on four safety-related MOVs and concluded that the methodology was in accordance with industry standards and practices, and that the TOLs were selected in accordance with station guidelines and met motor protection acceptance criteria. No issues were identified with TOL sizing for safety-related MOVs. This review provided the licensee with an opportunity to self-identify that TOLs may be incorrectly sized, which could jeopardize the function of safety-related MOVs.

Analysis: The inspectors determined that failing to assure that TOLs on safety-related MOV circuits were sized properly and periodically tested was a performance deficiency warranting a significance evaluation. The finding was more than minor because it was similar to NRC IMC 0612, Appendix E, Example 3.j, in that failing to assure that TOLs on safety-related MOV circuits were sized properly and periodically tested led to there being a reasonable doubt as to the operability of the affected safety-related MOVs. The finding was associated with the design control attribute of the mitigating systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that the failure to assure that TOLs were properly sized and periodically tested could have affected the ability for MOVs to respond to initiating events. By the end of the inspection, the licensee was able to demonstrate operability in that the TOLs would not prevent any MOVs from performing their safety function.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Mitigating Systems Cornerstone. The finding screened as "Green" because it was a design deficiency that did not result in actual loss of safety function.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Self- and Independent Assessments because the licensee did not adequately evaluate the issue in the 2008 self-assessment, which reviewed TOL sizing for safety-related MOVs. Specifically, the licensee reviewed four safety-related MOVs and concluded that the methodology was in accordance with industry standards and practices and that the TOLs were selected in accordance with station guidelines and meet motor protection acceptance criteria. As such, no issues were identified with TOL sizing for safety-related MOVs. (P.3(a)).

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," required in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program.

Contrary to the above, as of September 26, 2008, the licensee failed to ensure design control measures were in place for verifying or checking the adequacy of the design of the TOLs for the safety-related MOVs. Specifically, the licensee failed to properly size

TOLs on safety-related motors to ensure the MOVs would function under degraded voltage conditions. Additionally, the licensee failed to assure the trip setpoint of the TOLs had not changed after being in service by establishing a periodic testing program for the TOLs. The licensee entered this issue into its corrective action program (AR822942 and AR823087). Because this violation was of very low safety significance and was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000254/2008007-02; 05000265/2008007-02).

(3) Seismic Qualification of 250 VDC Batteries

Introduction: A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to assure that 250 VDC safety-related batteries were installed in accordance with their seismic qualification.

Description: During a walkdown of the 250 VDC batteries, the inspectors observed that the ethafoam spacers between individual battery cells did not fill the space between the cells. The batteries have a 0.5 inch space between each cell. The ethafoam in place was nominally 0.25 inches thick, which would allow the battery cells to move in a seismic event. The inspectors reviewed seismic qualification report QDC-8300-S-0673, "Review of Aged Battery Seismic Qualification Report," which established a requirement for 0.5 inch spacers to provide a snug installation.

The licensee entered this nonconformance into its corrective action program as AR822508 and initiated work orders to replace the ethafoam spacers with properly sized material. To establish a reasonable assurance of operability, the licensee reviewed seismic experience database reports from the Seismic Qualification Utility Group (SQUG). Experience from actual seismic events has shown that batteries without spacers or with thinner spacers have survived earthquakes stronger than the Quad Cities design basis earthquake. The inspectors agreed that this SQUG experience provided reasonable assurance of operability.

Analysis: The inspectors determined that the installed configuration of the 250 VDC batteries was contrary to the requirements of the seismic qualification report and was a performance deficiency. The finding was determined to be more than minor because the finding was conceptually similar to IMC 0612, Appendix E, Example 3a, in that rework (spacer replacement) was required to restore seismic qualification. The finding was associated with the design control attribute of the mitigating systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of findings," Table 4a for the mitigation systems cornerstone. The finding screened as "Green" because it was a design/qualification deficiency that did not result in actual loss of safety function.

The inspectors did not identify a cross-cutting aspect associated with this finding.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," required, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, when the 250VDC batteries were replaced in April 2005 and March 2006, the licensee failed to assure that the batteries were installed in accordance with their seismic qualification. Specifically, the licensee installed batteries with inadequate spacers between each cell. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as AR822508, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000254/2008007-03; 05000265/2008007-03).

(4) Inaccurate RCIC Instrument Setpoints

Introduction: A finding of very low safety significance (Green) was identified by the inspectors for failure to accurately implement the design setpoint for RCIC turbine exhaust pressure switches 1(2)-1360-26A/B.

Description: The inspectors reviewed RCIC instrument surveillance records to verify that instruments were properly calibrated and maintained. The RCIC turbine exhaust pressure switches, 1(2)–1360–26A/B, trip the RCIC turbine in the event of blockage in the steam exhaust line. The four switch setpoints varied and included a 2.1 or 3.1 psig [pounds per square inch gage] head correction, which seemed to be inconsistent with the installed configuration. The switches were installed near the bottom of a vertical section of pipe that would be conducive to water accumulation from condensed steam in the exhaust line. The accumulation of water could cause the turbine to trip at exhaust pressures below the design setpoint of 25 psig +/- 1 percent, thus reducing its operating parameter space.

During this inspection, the licensee investigated and found that the Unit 2 instruments were full of water. The Unit 1 instruments were found to have lesser amounts of water because they had been drained during a similar investigation in 2004. Based on the amount of water in the lines, the setpoints should have included approximately 9.0 psig and 3.9 psig head corrections for Unit 1 and Unit 2 respectively.

The licensee entered this nonconformance into its corrective action program as AR829385 and initiated engineering changes EC 372516 and EC 372517 to determine the proper setpoints and implement the required changes. The licensee reviewed operability and determined that the setpoints would not be challenged for scenarios where RCIC was credited.

The inspectors noted that in 2004, the licensee identified a setpoint inconsistency with the instruments that were documented in ACIT 231438, which initiated engineering change (EC) 352843. This change was later closed to EC 359009; however, it was considered an administrative change and did not receive sufficient priority to be resolved prior to this inspection.

Analysis: The inspectors determined that not properly accounting for the head correction due to accumulation of water in the exhaust pressure instruments was contrary to General Electric Design Specification 257HA351AE, "Reactor Core Isolation

Cooling System-Data Sheet," and was a performance deficiency. The finding was determined to be more than minor because the finding was conceptually similar to IMC 0612, Appendix E, Example 3a, in that rework (instrument recalibration) was required to restore conformance with the design. The finding was associated with the design control attribute of the mitigating systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of findings," Table 4a for the mitigation systems cornerstone. The finding screened as "Green" because it was a design deficiency that did not result in actual loss of safety function.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, and in the Corrective Action Program, because the licensee did not adequately evaluate the issue in 2004, such that it was properly classified and prioritized. Specifically, the licensee identified a setpoint inconsistency in 2004 that was documented in ACIT 231438, which initiated EC 352843. This change was later closed to EC 359009, however, it was considered an administrative change, and did not receive sufficient priority to be resolved in a timely manner. As a result, as of September 22, 2008, the licensee failed to accurately implement the design setpoint for RCIC turbine exhaust pressure switches 1(2)-1360-26A/B. (P.1(c)).

Enforcement: No violation of regulatory requirements occurred (FIN 05000254/2008007-04; 05000265/2008007-04).

.4 Operating Experience

a. Inspection Scope

The inspectors reviewed five operating experience issues to ensure that NRC and industry generic concerns had been adequately evaluated and addressed by the licensee. The operating experience issues listed below were reviewed as part of this inspection:

- IN 2007-34, "Operating Experience Regarding Electric Circuit Breakers";
- IN 2006-31, "Inadequate Fault Interrupting Rating of Breakers";
- IN 2008-02, "Findings Identified During Component Design Bases Inspections" (portions associated with thermal overloads);
- AR705189, "NER LI-07-034 Revision 1- HPCI/RCIC Flow Oscillations"; and
- RIS 2006-23, "Post-tornado Operability of Ventilating and Air-conditioning Systems Housed in Emergency Diesel Generator Rooms."

b. Findings

No findings of significance were identified.

.5 Modifications

a. Inspection Scope

The inspectors reviewed four permanent plant modifications related to selected risk significant components to verify that the design bases, licensing bases, and performance capability of the components had not been degraded through modifications. The modifications listed below were reviewed as part of this inspection effort:

- EC 351280, “Replacement Of Reserve Auxiliary Transformer 12”;
- EC 346408, “Fire Pump Replacement”;
- EC 341220, “Diesel Fire Pump Fuel Tank”; and
- DCR 980047, “RHR Min Flow Valve to Normally Open.”

b. Findings

No findings of significance were identified.

.6 Risk Significant Operator Actions

a. Inspection Scope

The inspectors performed a margin assessment and detailed review of five risk significant operator actions. These actions were selected from the licensee’s PRA rankings of human action importance based on risk achievement worth values. Where possible, margins were determined through a review of the assumed design basis, and UFSAR response times and performance times documented by job performance measures results, and by PRA analysis assumed operator response times. For the selected operator actions, the inspectors performed a detailed review and walk through of associated procedures, and observed two operating crews perform several risk significant operator actions during simulator scenarios. The inspectors also performed in plant observations for other important operator actions with a qualified senior reactor operator and an equipment operator to assess licensed operator and non-licensed operator knowledge level, adequacy of plant procedures, and the availability of special equipment required to perform the risk significant operator actions out in the plant.

The following operator actions were reviewed:

- Cross-Tie Emergency AC Buses to Opposite Unit (24-1 to 14-1);
- Cross-Tie Unit 1 and Unit 2 RHRSW Systems;
- Restore Balance of Plant Support Systems Following a Loss of Offsite Power or Dual-Unit Loss of Offsite Power;
- Bypassing HPCI High Room Temperature Trip; and

- Termination of Service Water (SW) Rupture in Reactor Building to Terminate Flooding.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered Into the Corrective Action Program

a. Inspection Scope

The inspectors reviewed a sample of the selected component problems that were identified by the licensee and entered into the corrective action program. The inspectors reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions related to design issues. In addition, corrective action documents written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action program. The specific corrective action documents that were sampled and reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

4OA6 Meeting(s)

.1 Exit Meeting Summary

On October 24, 2008, the inspectors presented the inspection results to Mr. T. Tulon, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. Several documents reviewed by the inspectors were considered proprietary information and were either returned to the licensee or handled in accordance with NRC policy on proprietary information.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Tulon, Site Vice President
R. Gideon, Plant Manager
C. Alguire, Senior Manager Design Engineering
W. Beck, Regulatory Assurance Director
J. Burkhead, Nuclear Oversight Director
D. Collins, Design Engineering
J. Cox, Operations
S. Darin, Senior Manager Plant Engineering
J. Friedrichsen, System Engineering
T. Fuhs, Operations Support Manager
H. Madronero, Engineering Director
R. Merema, Operations
M. Mills, MOV Program Owner
T. Petersen, Regulatory Assurance
B. Strub, Design Engineering
C. Sullivan, PRA Analyst
M. Trivedi, Design Engineering
M. Tucker, Corporate Electrical Engineering
T. Wojcik, Engineering Programs
E. Zhu, System Engineering

Nuclear Regulatory Commission

J. McGhee, Senior Resident Inspector
B. Cushman, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

05000254/265/2008007-01	NCV	Use of Non-Conservative Inputs and Methodologies in Calculating Terminal Voltages to Safety-Related MOV Motors During Design Basis Events. (1R21.3.b.(1))
05000254/265/2008007-02	NCV	Inadequate Calculations/Analyses and Testing for Thermal Overload Relays (TOLs) on Safety-Related MOVs (1R21.3.b.(2))
05000254/265/2008007-03	NCV	Seismic Qualification of 250 VDC Batteries. (1R21.3.b.(3))
05000254/265/2008007-04	FIN	Inaccurate RCIC Instrument Setpoints. (1R21.3.b.(4))

LIST OF DOCUMENTS REVIEWED

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

CALCULATIONS

Number	Description or Title	Revision
004-E-003-1001	MOV Terminal Voltage Calculation	5A
004-E-003-1301	MOV Terminal Voltage Calc	6
004-E-031	Thermal Overload Reviews	1
7923-36-19-1	Calculation For Safe Shutdown AC Systems Coordination For Appendix R	0
8256-56-19-1	250 VDC Short Circuit Calculation	3
8913-67-19-6	Contactor/Auxiliary Relay Coil Voltage at Pickup	1
8913-69-19-4	Justification of the Adequacy of MCC Contactor Circuits fed from Switchgears 19 and 28	1
8913-77-19-1	250 VDC Battery Interconnecting Jumper Ampacity	1
A.3	QC HRA Notebook, Operator Cross-Ties AC Buses to Opposite Unit (or Between 480VAC Divisions)	
A.33	QC HRA Notebook, Operator Cross-Ties Unit 1 and Unit 2 RHRSW	
A.52	QC HRA Notebook, Operator Restores BOP Support Systems Following a LOOP or DLOOP	
A.60	QC HRA Notebook, Operator Terminates SW Rupture to the Reactor Building to Terminate Flooding	
A.66	QC HRA Notebook, Operator Terminates SW Flow to the Turbine Building to Terminate Flooding	
A.67	Operator Bypasses HPCI High Room Temperature Trip	
MAD 91-0037	Instrument Air Capacity Sizing	0
NED-E-MSD-1	AC MOV Test Data Evaluation	0
NED-M-MSD-093	Thrust Seismic Limits of the Quad Cities Mark 1 MOVs	0
PMED-891377-01	Development of a Duty Cycle Based on a More Conservative Application of Coincident Starting Currents for the 250-Vdc Battery System	14
PMED-920001-01	Calc. for Reactor Building Basement Flood Water Height	0
QC-429-M-007	Flow Evaluation for Safe Shutdown Makeup Pump Room Cooler Piping	0
QC-707-E-001	MCC Bus Voltages Based On Second Level UV Relay Setpoint	9
QC-707-E-002	208V Motor Terminal Voltage	2
QDC-0000-E-0206	Motor Terminal Voltage Calc for GL889-10 MOVs	1
QDC-1000-I-0164	Low Pressure Coolant Injection (LPCI) Pump Discharge Minimum Flow Bypass Setpoint Error analysis	0

CALCULATIONS

Number	Description or Title	Revision
QDC-1000-M-0131	NPSH Availability vs. Requirements for DGCW and RHRSW Pumps'	2F
QDC-1000-M-0302	Unit 1 RHR Service Water Supply from the Fire Water Distribution System	0
QDC-1000-M-0485	Determination of Pressure Required at the RHRSW Heat Exchanger Outlet as Measured on Pressure Indicator PI 1(2)-1040-3A/B	1
QDC-1000-M-0627	Safe Shutdown NPSH Evaluation for RCIC and RHR Pumps	000A
QDC-1000-M-0649	Minimum Flow Operation of Residual Heat Removal and Core Spray Pumps	0
QDC-1000-M-0684	Flow Through RHR Minimum Flow Lines During LPCI Operation	0
QDC-1000-M-1318	RHR System Combined DBD and DP Calculation	0
QDC-1300-M-1320	Reactor Core Isolation Main Steam Cooling Combined DBD and DP Calculation	0
QDC-2300-M-1323	High Pressure Coolant Injection System Combined DBD and DP Calculation	000A
QDC-2900-M-0472	Determination of Pressure Required at PI-1/2-2941-8 for Safe Shutdown Makeup Pump System Injection under Safe Shutdown Conditions	1
QDC-2900-M-0721	NPSH Analysis for Safe Shutdown Makeup Pump	0
QDC-3300-M-0489	Useable Water Volume of CCSTs for HPCI and RCIC, Including Vortexing Considerations	3
QDC-3300-M-0542	Determination of Usable Volume in CCSTs or RCIC Following an Appendix R Fire Event	2
QDC-3900-M-0591	Quad Cities Water Volume of the Ultimate Heat Sink After Loss of Normal Heat Sink	0
QDC-3900-M-0692	Ultimate Heat Sink Temperature Effect on Shutdown Capability	0
QDC-4100-M-0537	Design Basis Hydraulic Calculation	10
QDC-5700-H-1567	Diesel Generator Room Ventilation	0
QDC-5700-M-0806	ECCS Room Cooler Performance Calculation Under Design Basis and Degraded Conditions	001A
QDC-6700-E-0935	4kv Degraded Voltage Time Delay Setpoint Error Analysis	0
QDC-6700-E-1498	Second Level Undervoltage Relay Setpoint	1
QDC-6700-E-1503	Auxiliary Power System Analysis	1
QDC-8300-E-1017	Development of a Modified Performance Test Duty Cycle for the Unit 1 250 VDC Battery	0
QDC-8300-E-1227	Development of a Modified Performance Test Duty Cycle for the Unit 2 250 VDC Battery	0A
QDC-8300-S-0673	Review of Aged Battery Seismic Qualification Report	0

CALCULATIONS

Number	Description or Title	Revision
QDC-8350-E-0483	Sizing of the Unit 1 2 and Swing (1/2) 250VDC Battery Chargers	0
QDC-8350-E-0521	Voltages at Loads Fed from the Safety-Related 250VDC Batteries	2
QUA-1-1001-18B	MIDACALC AC Motor Operated Gate Valve Calculation	3
QUA-1-1001-28A	MIDACALC AC Motor Operated Globe Valve Calculation	5
QUA-1-1301-61	MIDACALC DC Motor Operated Globe Valve Calculation	5
QUA-1-2301-3	MIDACALC DC Motor Operated Gate Valve Calculation	5
QUA-1-2301-8	MIDACALC DC Motor Operated Gate Valve Calculation	8

CORRECTIVE ACTION PROGRAM DOCUMENTS

Number	Description or Title	Date
AR221967	RCIC System Engineer To Use Feedback	07/23/04
AR284733	T22 LTC Failed To Operate Automatically	10/19/08
AR485889	NRC Questions Conservatisms of EDG TS Surveillance	05/02/06
AR498484	Effect of Frequency Increase on EDG Loading Calculations	11/17/06
AR591442	Effect of EDG Frequency on Loading and Pump Flows	02/14/07
AR624871	EDG Frequency	09/24/07
AR651966	1A RHRSW Pmp Outboard Seal Gross Leakage	07/19/07
AR705189	NER LI-07-034 Rev 1 – HPCI/RCIC Flow Oscillations	11/29/07
AR744660	EMD EDG Loading Capability Issue	03/04/08
AR753244	RHRSW 2-1001-5B Starting Position Higher Than Expected	03/22/08
AR758971	High Vibration Readings U2 C RHRSW Pumps	04/03/08
AR762327	EDG Cold Deadload Pickup Capability – Industry OPEX	04/11/08
AR775409	Procedure Enhancement T QCOP 2900-02	05/14/08
AR775415	Training Request Needed for a Simulator Scenario	05/14/08
AR780154	SSMP Req'd Discharge Pressure for App. R Event	05/28/08
AR786108	CDBI FASA – Midicalc TOL Reference	06/13/08
AR804738	MOV Midacalc Used Outdated Design Inputs	08/07/08
AR807503	Update Voltage Values In Various MOV Analyses	08/15/08
AR819348	Voltage Drop to ERVs – Drywell Temperature	09/18/08
AR819539	AV Discrepancy Between QCIS 1300-03 & NED-I-EIC-0031	09/18/08
AR821371	U1 HPCI Room Appendix R Extension Ladder Needs Tag	09/23/08
AR821392	U1 RCIC Room Cooler Access Ladder Cage Touches Piping	09/23/08
AR821421	Post Caps For 1/2B Fire Pump Batteries Missing	09/23/08
AR821436	Door To Panel 1B-1 Found Open During Sys Walkdown	09/23/08
AR821439	MCC 1B Compt "W" Panel Door Ajar	09/23/08
AR821449	UFSAR Discrepancy Identified	09/23/08
AR821452	Suppt Corroded/1 Detached 1a RHRSW Rm Clr Vent Line	09/23/08
AR821802	QCOP 2300-14 Procedure Improvements	09/23/08

CORRECTIVE ACTION PROGRAM DOCUMENTS

Number	Description or Title	Date
AR822508	Seismic Issue With 250 Vdc & U2 Alt 125 Vdc Battery	09/25/08
AR822811	Instrument Air Sizing Calculation Not Updated	09/25/08
AR822911	Slice Cable Size Discrepancy For SSMP HVAC 0-5799	09/26/08
AR822942	TOL Relays For MOVS Not Periodically Tested	09/26/08
AR823087	MOV Thermal Overloads Nuisance Trips	09/26/08
AR823279	Damper Thermal Overloads Potential Nuisance Trips	09/27/08
AR824347	IR 822508 EOC Incorrectly Eliminated U1 125vdc Batteries	09/30/08
AR824408	Documentation Errors For A PRA Human Action	09/25/08
AR824945	HPCI Keep Fill Line Touching Mo 1-2301-10	10/01/08
AR825016	Calculations Need To Be Updated To Reflect Higher Dp	09/30/08
AR827157	Data Recorded In The Incorrect Location On Procedure	10/06/08
AR827632	Duplicate Thermal Overload Calculation	10/07/08
AR827870	Battery Tech Spec Surveillance Near Miss	10/07/08
AR827871	Procedure Improvement SSMP Start From Fire System	10/07/08
AR827872	Consider Trending Fire Diesel Battery Capability	10/07/08
AR827873	Proc Imp – Insure SSMP Is Off When Closing Suction	10/07/08
AR828085	RSO Documentation Control	10/08/08
AR828422	QCOP 3900-01 Procedure Improvements	10/07/08
AR828961	EDG Governor Tuning	10/09/08
AR829325	QCOA 6100-13 Procedure Improvements	10/09/08
AR829385	RCIC PS 1(2)-1360-26A/B Head Correction Incorrect	10/10/08
AR830234	4E Drawing Discrepancy For Relay ITE-27N	10/10/08
AR830304	LPCI Min Flow Bypass Setpoint “WC Values Incorrect	10/13/08
AR831352	Outdated RSOs Referenced In Calc	10/15/08
AR832338	Procedure Improvement – RCIC Minimum Flow Protection	10/17/08
AR832876	T22 LTC Failed to Operate Automatically	10/19/08
AR833504	Incorrect Reference In Calc Qdc-1000-I-0164	10/20/08
AR833554	Run PRA Sensitivity For Success Of FP Backup To SSMP	10/20/08
AR833920	Consider Clarifying TS Basis And IST Dbase For RCIC	10/21/08
AR834456	Interlock On SSMP Bus Not Tested Routinely	10/22/08
AT588143-09	Review of NRC IN 2006-31	08/26/07
AT591442-02	Effects of EDG Frequency	07/17/07
AT694690-26	Review of NRC IN 2007-34	11/05/07
AT703499	Review of NRC IN 2007-36	11/26/07
Q1997-04143	Ops Procedures for Transferring 250VDC MCCs	10/29/97

DRAWINGS

Number	Description or Title	Revision
14-1365	Assembly of CSM 40 Single Gland Exhaust Pump With Barometric Condenser	1
4E-1301-1	Single Line Diagram	AM
4E-1301-2	Single Line Diagram	AC
4E-1301-3	Single Line Diagram	AJ
4E-1303	Key Diagram – 4160v SWGR 11,12,13,14	T
4E-1304	Key Diagram – 4160V SWGR 13-1 And 14-1	AD
4E-1306	Key Diagram – 480V SW Groups 18 & 19	Y
4E-1311	Key Diagram – 480V MCC 19-1	BQ
4E-1315	Key Diagram – 208V AC MCC 19-1-1	T
4E-1317 Sh. 1	Key Diagram 250V D.C. Motor Control Centers	AT
4E-1317 Sh. 2	Key Diagram 250V D.C. Motor Control Centers	AK
4E-1317 Sh. 3	Key Diagram 250V D.C. Motor Control Centers	U
4E-1328	Single Line Diagram – Emergency Power System	F
4E-1344 Sh. 1	Schematic Diagram 4160V Buses 13-1 & 14-1 Main Feed Breakers	F
4E-1344 Sh. 6	Schematic Diagram SBO Tie Feed Breaker 4160V SWGR Bus 14-1	B
4E-1346 Sh. 1	Schematic Diagram 4160V Bus 14-1 Standby Diesel 1 Feed and 24-1 Tie Breaker	AT
4E-1346 Sh. 2	Schematic Diagram 4160V Bus 14-1 Standby Diesel 1 Feed and 24-1 Tie Breaker	AX
4E-1346A	Schematic Diagram Safe Shutdown System 4KV ACB 152-3101 & GCB 142-1425	G
4E-1377A	Schematic Diagram – RAT 12	F
4E-1377F, -G	Schematic Diagram – RAT 12	A
4E-1438E	Schematic Diagram RHR System Relay Logic Div II Sht 5	AK
4E-1438L Sh. 2	Schematic Diagram RHR System MOVs Div II	AK
4E-1438Q	Schematic Diagram RHR System Sh 15 Pumps 1002 A,B,C,D 4160V Breaker Control Div I & II	Z
4E-1484A	Schematic Diagram Reactor Core Isolation Cooling System Part 1	AC
4E-1484B	Schematic Diagram Reactor Core Isolation Cooling System Part 2	AV
4E-1484F Sh. 2	Schematic Diagram RCIC System Valves MO 1-1301-26, 61, and 62	AC
4E-1608A	Nameplate – Reserve Auxiliary Transformer 12	B
4E-1608D	Outline – RAT 12	A
4E-2307	Key Diagram – 480V MCC 25-2	AT
E-273023	Series D-100 Valve Assembly with SMB-000 Limitorque Actuator	1
FL-1	Flood Barriers Basement Floor	A

DRAWINGS

Number	Description or Title	Revision
M-27, Sheet 2	Diagram of Fire Protection Piping	WR
M-27, Sheet 3	Diagram of Fire Protection Piping	H
M-27, Sheet 4	Diagram of Fire Protection Piping	O
M-69	Diagram of Service Water Piping	DD
M-70	Diagram of Safe Shutdown Makeup Pump System	Y
M-813, Sheet 1	Diagram of Diesel Generator Room Ventilation	B
M-89	Diagram of Reactor Core Isolation Cooling RCIC Piping	BA
SK-DES-10872-1	4” Class 900 Valve with 3” CAV-B9 Trim	0

10 CFR 50.59 DOCUMENTS (SCREENINGS/SAFETY EVALUATIONS)

Number	Description or Title	Revision
EC 371252/ QCOS 2900-1	SSMP Surveillance Criteria for Tech Spec and Appendix R Compliance	0
QCOP 2900-02	Safe Shutdown Pump System Startup	0
UFSAR-07-R10-010	UFSAR Change for EDG Ventilation Flowrate	0

MISCELLANEOUS

Number	Description or Title	Date or Revision
	Quad Cities FASA for 2008 NRC Component Design Basis Inspection (CDBI)	06/18/08
	Quad Cities Internal Flooding Report Appendix F, Calculations to Determine Times to Flood Individual Compartments	
	Amendment 228/232 to Operating License DPR-30 – Automatic Operation of Load Tap Changers	07/24/06
1(2)-1001-5A(B)	Control Valve Specification Data Sheet	05/09/94
2-1301-060-MO	IST Bases Document – RCIC Minimum Flow Recirc Line Isolation	08/01/05
257HA351AE	Reactor Core Isolation Cooling System – Data Sheet	4
8420-97232	Recommended Spare Parts List – Copes-Vulcan D-300 Valve	02/81
B67	System Health Report – 4KV Bus	09/19/08
D-0259M	Systematic Evaluation Program Applicability Review	06/12/92
EC 366525	Review of the Effects of EDG Frequency on ECCS Systems	0
EC 371252	Revision to QDC-2900-M-0472	0
EC 48811	Battery Frequencies on Surveillances Justification	05/29/98

MISCELLANEOUS

Number	Description or Title	Date or Revision
Letter from Sulzer to Quad Cities	Minimum Flow Questions	06/10/04
LS05-80-12-014	Letter; Dresden 1 and 2 – SEP Topic II-2.A, Severe Weather Phenomena	12/15/80
MCC	System Health Report – 480V Motor Control Center	09/19/08
NDIT QDC-98-092	RHR/CS/RHRSW Pump BHP Input Values for EDG Loading Calculations	03/19/98
P7000	System Health Report – 480V Switchgear	09/19/08
PDG6600	System Health Report – Emergency Diesel Generators	09/22/08
PJC11	Relay Setting Order – Bus 14-1	05/03/85
PJC11	Relay Setting Order – Bus 24-1	05/03/85
PJM Manual 03	Transmission Operations	31
RAT	System Health Report – Reserve Aux Trans 12	09/22/08
RS-06-036	Response to NRC Generic Letter 2006-02, Grid Reliability	04/03/06
RS-07-002	Response to RAI to NRC Generic Letter 2006-02	01/31/07
TID-E/I&C-02	Thermal Overload Relay Selection of MOVs	0
UFSAR-07-R10-10	UFSAR Change Request	10/05/07
White Paper 125	COMED – Installed Motor Capability Evaluation	3

MODIFICATIONS

Number	Description or Title	Date or Revision
DCR 980047	Change MOV 101301-18A/B From Normally Closed to Normally Open	0
EC 341220	Replace of Diesel Engine Driven Fire Pump Oil Storage Tanks	4
EC 346408	Fire Pump Replacement for 1/2-4101-A	3
EC 351280	Replacement Of Reserve Auxiliary Transformer 12	5
EC 363854	Provide Additional Min SWYD Voltage Values To Be Incorporated Into OPS Procedures	8
EC 365446	Evaluate Minimum Control Voltage Available to U1/2 RAT	8
M4-1/2-83-13	Safe Shutdown Makeup Pump System (2900)	03/02/84

OPERABILITY EVALUATIONS

Number	Description or Title	Date or Revision
519119	Tech Spec Testing Of EDG (EC362047)	02/26/08
244267-02	1/2A Diesel Fire Pump (DFP)	3
OP-AA-108-115	EDG Ventilation Fans	3

PROCEDURES

Number	Description or Title	Revision
	Unit 1 Operator Rounds Standard Inspections	
AD-AA-101-1002	Writer's Guide and Process Guide for Procedures and T&RM	12
CC-AA-112	Temporary Configuration Changes	12
CC-AA-309	Control of Design Analyses	8
ER-AA-5400	Buried Piping and Raw Water Corrosion Program (BPRWCP) Guide	1
ER-AA-5400-1001	Raw Water Corrosion Program Guide	0
ER-AA-5400-1002	Buried Piping Examination Guide	1
ER-AA-5400-1003	Buried Pipe and Raw Water Corrosion Program (BPRWCP) Performance Indicators	0
ER-AA-600-1015	FPIE PRA Model Update	9
MA-AA-716-210-1001	MCC/Molded Case Circuit Breakers PCM Template	
MA-AA-716-230-1001	Oil Analysis Interpretation Guideline	6
MA-AA-723-325	Molded Case Circuit Breaker Testing	7
MA-AB-725-110	PM GE Type AK-25 Circuit Breakers	4
MA-AB-725-114	PM on Merlin Gerin G26 SF6 4KV Circuit Breakers	3
MA-QC-773-247	RAT 12 In-Service Test	1
MA-QC-773-523	U1 TS Undervoltage Relay and DV Relay Calibration	7
OA-AA-108-107-1002	Interface Agreement Between Exelon Energy Delivery And Exelon Generation For Switchyard Operations	4
OP-AA-108-107-1001	Station Response to Grid Capacity Conditions	2
QCAN 901(2)-4 E-16	RCIC Pump Low Flow	2
QCAP 0400-17	Station Lubrication Program	31
QCARP 0050-02	SB-1-2 Injection with RCIC and Bringing the Unit to Cold Shutdown	14
QCEMS 0250-11	480/208 MCC Maintenance and Surveillance	49
QCEPM 020-02	Inspection and Maintenance of 480V Switchgear	13
QCEPM 0100-01	Station Battery Systems Preventative Maintenance	32
QCEPM 0200-11	Inspection and Maintenance of Horizontal 4KV Cubicles	23
QCEPM 0200-22	Inspection and Maintenance of Horizontal 4KV Switchgear	7
QCIS 7600-01	Unit 1 Standby Diesel Generator Cardox Fire Protection Functional Test	7
QCMMS 4100-32	1/2-4101A Diesel Driven Fire Pump Annual Capacity Test	22
QCMPM 5700-05	Safe Shutdown Room AHU PM	9
QCOA 0010-14	Lock and Dam #14 Failure	10
QCOA 6000-03	Low Switchyard Voltage	8
QCOA 6100-03	Loss of Offsite Power	20

PROCEDURES

Number	Description or Title	Revision
QCOA 6100-04	Station Blackout	10
QCOA 6100-13	Reserve Auxiliary Transformer 12 (22) Trouble	13, 14
QCOA 6100-14	Reserve Auxiliary Transformer 12 (22) Loss of Cooling	12
QCOA 6900-05	Loss of Safety Related 250VDC Battery Chargers Concurrent with a Design Basis Accident	8
QCOP 1000-15	RHR Service Water Operation Using Loop A Cross-Tie Header	13
QCOP 1000-20	RHR Service Water Operation Using Loop B Cross-Tie Header	15
QCOP 1000-30	Post-Accident RHR Operation	19
QCOP 1300-02	RCIC System Manual Startup (Injection/Pressure Control)	25
QCOP 1300-03	Filling Torus From CCST Through RCIC Minimum Flow Line	8
QCOP 1300-05	RCIC System Shutdown	12
QCOP 1300-09	RCIC Local Manual Operation	22
QCOP 2300-14	Bypassing HPCI Area High Temperature Isolation Signal	3
QCOP 2900-2	Safe Shutdown Makeup Pump System Startup	20
QCOP 2900-4	Safe Shutdown Makeup Pump System Shutdown	9
QCOP 3200-09	Emergency Reactor Vessel Level Control Using Condensate/Feedwater or Standby Coolant Supply	15
QCOP 3900-01	Service Water System Operation	14
QCOP 4100-02	Portable Diesel Pump Operation	8
QCOP 4100-10	Reactor Vessel Level Control using Diesel Fire Pumps via Safe Shutdown Makeup System	5
QCOP 4100-11	Using Diesel Fire Pumps via Safe Shutdown Hose Line for Reactor Vessel Level Control or Flood Emergency Injection Source	13
QCOP 4100-14	CCST Level Restoration using Diesel Fire Pumps via Safe Shutdown Makeup System	2
QCOP 6100-18	Reserve Auxiliary Transformer 12 (22) Operation	10
QCOP 6500-29	Reserve Auxiliary Transformer 12 (22) Load Tap Changer Operation	7
QCOP 6620-13	Energizing Bus 13-1 from SBO DG 1	9
QCOP 6620-17	SBO DG 1(2) Simultaneous Supply to Multiple Unit Buses	7
QCOS 0005-08	U1 Electrical Distribution Breaker & Voltage Verification	24
QCOS 1300-01	Periodic RCIC Pump Operability Test	35
QCOS 2900-09	Cycling of Fire Water Valves to Safe Shutdown Makeup Pump	5

PROCEDURES

Number	Description or Title	Revision
QCOS 4100-18	Quarterly Diesel Fire Pump Battery Test	8
QCOS 6500-06	4160 and 480 V Breaker Local Control Test for App R	16
QCOS 6600-15	Functional Test for Diesel Generator Vent Nitrogen Backup System	7
QCTS 0240-07	Unit 1 (2) 250 VDC Safety Related Battery Testing	3
QGA 100	RPV Control	8, 9
QGA 300	Secondary Containment Control	11
QGA 400	Radioactivity Release Control	5
QOA 6900-01	Safety Related 250VDC Battery and System Failure	16
QOA 900-4 D-18	Annunciator 900-4 D-18 Rx Bld Floor Drain Sump B Hi Level	4
QOA 900-7 G-5	Annunciator 901-7 G-5 Turb Bldg Equip Drain Sump Hi Lvl	3
QOA 900-8 C-2	Annunciator Procedures Reserve Aux Trans 12(22) Trouble	4
QOA 900-8 G-12	Annunciator Procedures	9
QOA-6500-09	4KV Bus 14-1 Voltage Degraded	13
QOP 6700-02	480 Volts Bus Tie Circuit Breakers	25
QOP 6900-01	250 VDC Electrical System	31
QOP 6900-11	Battery Equalizing Charges	17
QOP 6900-S01	Battery Equalize Checklist	13
QOP 6900-T03	Station Battery Equalize Chart	3
QOP 7000-01	Reactor Protection System MG Sets	40
RP-QC-466	Use of Portable Air Moving Equipment in Radiologically Controlled Areas	1

SURVEILLANCES (COMPLETED)

Number	Description or Title	Date
QCOP 2900-1	Safe Shutdown Makeup Pump Flow Rate Test	08/04/08
RBMware	RCIC Turbine Oil Sample Results	10/23/07

TRAINING DOCUMENTS

Number	Description or Title	Date
2006 RAT 22	RAT 22 Modification Changes	04/06
LIC-RISK.doc	PRA and On-Line Maintenance	03/08
LN-6500	4KV / 480 V Lesson Plan	

WORK DOCUMENTS

Number	Description or Title	Date
WO 00351297	Permanent Scaffold Request Form	06/01/07
WO 00447630	Perform Static Diagnostic Testing MOV 1-1001-18B	04/01/04
WO 00634297	250 VDC Battery Charger #2 4 Hr. Load Test per QCTS 0210-02	09/28/05
WO 00642268	Rebuild Actuator and Repack 1-1301-61 Due to Cyclic Load	05/18/06
WO 00827687	A RHR Service Water Pp Performance Test	03/23/07
WO 00836417	RAT Maintenance Inspection	10/24/06
WO 00844340	QCIS 1000-16 LPCI PMP Flow Analog Trip Sys Transmitter	02/20/07
WO 00848442	RCIC Turb Stm Lev Switch Visual Inspection	12/28/06
WO 00849021	Inspect Pmp Internals - Low Press PMP- Degradation Belzona	08/03/07
WO 00859901	ECCS Simulation Auto Actuation & DG Auto-Start Div 2	04/24/07
WO 00898885	Perform U-2 250VDC Safety Related Battery Inspection	01/09/08
WO 00900970	Perform Static Diagnostic Testing MOV 1-2301-3	05/05/07
WO 00909398	250 VDC Battery Charger #2 4 Hr. Load Test per QCTS 0210-02	09/26/07
WO 00922065	Perform Static Diagnostic Testing MOV 1-2301-8	05/08/07
WO 00946196	250 VDC Battery Modified Performance Test	03/25/08
WO 00984324	Perform Inspection of Safe Shutdown Room AHU 0-5799	
WO 00998336	QCIS 1000-16 LPCI PMP Flow Analog Trip Sys Transmitter	07/29/08
WO 01004940	RAT LTC Functional Test	04/03/07
WO 01017740	Bus 14-1 Degraded Voltage Relay Routine Calibration	07/25/08
WO 01024028	Walkdown/Inspect all Accessible Long Term Scaffolds	04/10/08
WO 01097912	250 VDC Station Batteries Quarterly per QCOS 6900-02	04/13/08
WO 01106743	250 VDC Station Batteries Quarterly per QCOS 6900-02	05/08/08
WO 01126962	QCOS 2300-11 CCST/Torus Level Switch Functional	07/18/08
WO 01126967	250 VDC Station Batteries Quarterly per QCOS 6900-02	07/14/08
WO 01129875	QCIS 1000-15 LPCI PMP Flow Analog Trip Sys Cal/Func	07/30/08
WO 01133796	250 VDC Station Batteries Quarterly per QCOS 6900-02	08/07/08
WO 01138674	QCIS 1000-15 LPCI PMP Flow Analog Trip Sys Cal/Func	08/25/08
WO 01138944	RCIC Drain Pot Lvl Switch	08/25/08
WO 01139474	RCIC Pump Operability (IST)	08/26/08
WO 01139852	Perform U2 QCIS 0200-77 Rx Water Level Analog Trip Cal	09/02/08
WO 01140155	Perform U2 QCIS 0200-86 Rx Water Level Analog Trip Cal	09/04/08
WO 01140160	RHR Service Water Pump D Flow (IST)	08/28/08
WO 01150474	RHR Service Water Pump C Flow (IST)	10/01/08
WO 01157972	Switchyard Inspection	08/28/08
WO 01163430	QCOS 6900-01 Station Battery Weekly Surv	09/02/08
WO 01164811	QCOS 6900-01 Station Battery Weekly Surv	09/09/08

LIST OF ACRONYMS USED

AC	Alternating Current
ACIT	Action Item Tracking
ADAMS	Agencywide Documents Access and Management System
AR	Action Request
ASME	American Society of Mechanical Engineers
CDBI	Component Design Basis Inspection
CFR	Code of Federal Regulations
CNO	Chief Nuclear Officer
DC	Direct Current
DRP	Division of Reactor Project
DRS	Division of Reactor Safety
EC	Engineering Change
EDG	Emergency Diesel Generator
FIN	Finding
GL	Generic Letter
HPCI	High Pressure Coolant Injection
IEEE	Institute of Electrical & Electronic Engineers
IMC	Inspection Manual Chapter
IN	Information Notice
IST	Inservice Testing
kV	Kilovolt
LPCI	Low Pressure Coolant Injection
LTC	Load Tap Changer
MOV	Motor-Operated Valve
NCV	Non-Cited Violation
NPSH	Net Positive Suction Head
NRC	U.S. Nuclear Regulatory Commission
PARS	Public Available Records System
PCM	Performance Center Maintenance
PM	Preventative Maintenance
PRA	Probabilistic Risk Assessment
psig	Pounds Per Square Inch Gauge
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RIS	Regulatory Issue Summary
SDP	Significance Determination Process
SI	Safety Injection
SPAR	Standardized Plant Analysis Risk
SQUG	Seismic Qualification Utility Group
SSMP	Safe Shutdown Makeup Pump
SW	Service Water
TOL	Thermal Overload Relay
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VAC	Volts Alternating Current
VDC	Volts Direct Current