January 2, 2004

Mr. John L. Skolds
President and CNO
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION - NUCLEAR REGULATORY COMMISSION INSPECTION REPORT 05000352/2003009, 05000353/2003009

Dear Mr. Skolds:

On November 21, 2003, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station Units 1 and 2. The enclosed report documents the inspection findings which were discussed on November 21, 2003, with Mr. R. DeGregorio and other members of your staff.

This 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.

The report documents one NRC identified finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it has been entered into your corrective action program, the NRC is treating this issue as a Non-Cited Violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest the Non-Cited Violation in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Region I; with copies to the Regional Administrator, Region I; Director of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Limerick facility.

In accordance with 10 CFR 2.790 of the Nuclear Regulatory Commission'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 Nuclear Regulatory Commission Public Document Room or from the Publicly Available Records component of the Nuclear Regulatory Commission's document system. The Agency wide Document Access and Management system is accessible from the Nuclear Regulatory Commission Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Lawrence T. Doerflein, Chief
Systems Branch
Division of Reactor Safety

Docket Nos: 50-352; 50-353
License Nos: NPF-39; NPF-85

Enclosure: Inspection Report No. 05000352/2003009, 05000353/2003009

cc w/encl:
President and CNO, Exelon Nuclear
Chief Operating Officer, Exelon Generation Company, LLC
Site Vice President - Limerick Generating Station
Plant Manager, Limerick Generating Station
Regulatory Assurance Manager - Limerick
Senior Vice President - Nuclear Services
Vice President - Mid-Atlantic Operations
Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Director - Licensing, Exelon Generation Company, LLC
Manager, Licensing - Limerick and Peach Bottom
Vice President, General Counsel and Secretary
Correspondence Control Desk
J. Johnsrud, National Energy Committee
Chief, Division of Nuclear Safety, Pennsylvania Department of
Environmental Resources
Chairman, Board of Supervisors of Limerick Township
D. Allard, Director, Pennsylvania Bureau of Radiation Protection

Distribution w/encl:
H. Miller, RA/J. Wiggins, DRA
M. Shanbaky, DRP
D. Florek, DRP
D. Screnci, ORA
N. Sheehan, ORA
A. Burritt, DRP - Senior Resident Inspector
B. Welling, DRP - Resident Inspector
J. Jolicoeur, RI EDO Coordinator
J. Clifford, NRR
S. Wall, PM, NRR
J. Boska, PM, NRR
Region I Docket Room (with concurrences)
W. Lanning, DRS
R. Crlenjak, DRS
L. Doerflein, DRS
R. Lorson, DRS
M. Modes, DRS

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OFFICE	RI/DRS		RI/DRS		RI/DRP		RI/DRS			
NAME	MModes		WSchmidt		MShanbaky		LDoerflein			
DATE	12/11/03		12/30/03		12/31/03		1/2/04		01/ /04	

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos:	50-352; 50-353
License Nos:	NPF-39, NPF-85
Report No:	05000352/2003009, 05000353/2003009
Licensee:	Exelon Generation Company, LLC
Facility:	Limerick Generating Station, Units 1 & 2
Location:	Evergreen and Sanatoga Roads Sanatoga, PA 19464
Dates:	November 3-7 and November 17-21, 2003
Inspectors:	M. Modes, Team Leader A. Della Greca, Sr Reactor Inspector R. Fuhrmeister, Sr Reactor Inspector G. Bowman, Reactor Inspector S. McCarver, Reactor Inspector F. Baxter, Contractor
Approved by:	Lawrence T. Doerflein, Chief Systems Branch Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000352/2003-009, IR 05000353/2003-009; 11/3-11/7, 11/17-11/21/03; Limerick Generating Station, Units 1 and 2; Safety System Design and Performance Capability.

The inspection was conducted by five region-based inspectors, and one NRC contractor. One Green non-cited violation (NCV) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process". Findings for which the significance determination process does not apply may be "Green" or may be assigned another severity level after Nuclear Regulatory Commission management review. The Nuclear Regulatory Commission'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.

Reactor Safety

A. Nuclear Regulatory Commission-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The team identified a non-cited violation of 10 CFR 50.63, "Loss of All Alternating Current Power," because the licensee's procedures used to cope with a station blackout may not have restored a source of alternating current power to the affected unit within one hour. The restoration of power within one hour is an assumption in the station blackout coping analysis used to demonstrate the plant would be able to manage a station blackout of a specified duration by taking credit for certain safe shutdown equipment such as residual heat removal pumps, air compressors, and battery chargers.

  This finding is greater than minor because the finding affects the Mitigating System Cornerstone objective of ensuring equipment availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Systems used to mitigate the effects of a station blackout could be adversely effected if a source of alternating current power was not restored to the affected unit within one hour. The finding is of very low safety significance (Green) because the finding is not a design or qualification deficiency, does not represent an actual loss of safety function of a train or system, and does not screen as risk significant due to a seismic, fire, flooding, or severe weather initiating event.

B. Licensee-Identified Violations

None

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R21 Safety System Design and Performance Capability (IP 71111.21)

a. Inspection Scope

The inspection team focused primarily on the design and performance capability of Limerick Generating Station's residual heat removal (RHR) and containment venting system as well as some interfacing and supporting systems. Using risk insights derived from the Nuclear Regulatory Commission "Risk Informed Inspection Notebook for Limerick Generating Station," the team structured the inspection around the RHR system's capability to remove decay heat from the reactor coolant system in response to a postulated loss-of-offsite power (LOOP). The team included, in the scope of the inspection, components and procedures used to mitigate the consequences of a loss of offsite power such as emergency diesel generator (EDG) response, and 4KV, 480VAC and 120VAC bus loading.

The RHR system consists of four independent loops, each with a motor-driven pump and associated lines, valves, and instrumentation required to perform the residual heat removal functions. Two of the residual heat removal loops include a heat exchanger, while the other two loops can be aligned to utilize the heat exchangers. The RHR pumps circulate water from the suppression pool into the reactor vessel through four low pressure coolant injection lines. The residual heat removal service water (RHRSW) is used as the cooling medium for the RHR heat exchangers.

The team reviewed a sample of permanent modifications, repairs, and replacements to the selected systems to ensure these activities maintained the design basis of the systems. In addition, the team reviewed preventive and corrective maintenance activities to determine if they were performed as scheduled using controlled procedures. The team evaluated a sample of surveillance and post maintenance test results to verify the system capability was verified and the design basis was being maintained.

The team reviewed the control wiring diagrams of the RHR, RHRSW and emergency service water (ESW) pumps to verify that pump operation, including automatic initiation, conforms with the system operation described in the updated final safety analysis report. The review included control of valves critical to the correct operation of the systems. The team reviewed both alternating and direct current power distribution to ensure that a single failure of an electrical component or source did not impair the ability of the systems to perform their safety function. The review confirmed that sufficient instrumentation was provided to initiate automatic functions and to monitor the operation of the systems during a loss of offsite power.

The team reviewed the Class 1E battery load calculation to verify that required loads

had been correctly identified and to ensure that the batteries were capable of meeting the load requirements under worst-case duty cycles. The team also reviewed the direct current voltage drop calculation and sampled recent battery performance tests to verify that adequate voltage was provided to the safety-related loads during worst-case loading. The team reviewed environmental qualification of motors and valves to verify that the motors and valves would be capable of performing their required safety function.

In addition, the team reviewed:

- the alternating current short circuit calculation to determine if protective devices were adequately rated.

- the procedures in place to restrict 13 KV bus connections to offsite sources.

- the voltage regulation calculation to verify that all equipment would have adequate voltage to start and perform their safety functions with maximum and minimum source voltage under light and full load conditions.

- the calculation for protection of 4 KV motors to assess if the motors had been provided with adequate protection and coordination so that they could perform their safety functions.

- the EDG protective relay set-points comparing them against the electrical relay index.

- the documents relating to EDG fuel capacity.

- the steady state EDG loading calculation to ensure that all required loads had been correctly identified, and the loading was within the capacity and capability of the EDGs.

- the EDG voltage regulation calculation to determine if the emergency diesel generator could start and accept load within the voltage and frequency limits specified in the updated final safety analysis report (UFSAR).

- the EDG ground fault detection and protection scheme to assure satisfactory performance.

- the EDG technical specification (TS) required surveillance requirements to determine if the test frequency and results of tests conducted by the licensee were in accordance with the TS.

The team reviewed the time it takes the RHR pumps to start, in conjunction with a LOOP, in order to assure the start time was within the limits established by the safety analysis. The team reviewed the loss-of-offsite power procedure to determine if the provisions for powering any safeguard bus from any EDG were achievable. The team

reviewed the protection provided Class 1E motor operated valves when the valve's motor controller thermal overload protection was bypassed to ensure that a valve controller experiencing an overload condition would not jeopardize various important components of the circuit, such as the circuit breaker, the contactor, the bypassed overload device, the cable, or the motor. The team reviewed the calculation used to select protective devices required to ensure the integrity of electrical penetrations when circuit overloads or fault conditions were experienced. The team also reviewed the 120 VAC voltage drop calculation to determine if all control circuits had adequate voltage.

The team specifically reviewed procedure E-10/20, Loss-of-Offsite Power, to determine what systems and equipment were utilized to mitigate the consequences of a loss of offsite power. The team reviewed the system operating procedures and piping and instrumentation drawings for the loss of offsite power mitigating systems to determine what equipment was operated, and what special tools were required to perform the alignments of the equipment. The team inventoried the Unit 2 T-200 tool kit to ensure that all the required tools, materials, and jumpers necessary to implement the containment venting procedure were present and that they were dedicated for emergency use only.

The team reviewed licensed operator training materials related to the post-LOOP safe shutdown systems to determine whether abnormal operations due to loss of power were discussed, and whether industry operating experience relating to loss of power events was included. The team reviewed job performance measures relating to post-LOOP recovery actions to verify that local manual actions necessary to achieve safe, stable shutdown conditions were either performed or simulated in the plant.

The team reviewed the results of an eddy current examination conducted on the 2B RHR heat exchanger during the spring 2003 refueling outage. The team verified indications, discovered by the eddy current examination, were appropriately dispositioned to provide assurance that heat exchanger integrity would not be comprised before the next planned inspection. The team also reviewed in-service testing results for pumps and valves in the residual heat removal suppression pool cooling and containment venting flow path to identify any degrading performance. Results of completed technical specification surveillance tests were also reviewed to confirm system and component operability.

The team reviewed several 10 CFR 50.59 screens and evaluations conducted as part of modifications to plant structures, systems, and components. This review included changes made to the allowable fouling factor in the 2B Residual heat removal heat exchanger implemented to compensate for tube plugging and replacement of valve components in the ESW system. The review was conducted to ensure the changes conformed to NRC requirements and that the licensee had properly analyzed the effect of the changes on the plant.

The team reviewed recent maintenance conducted on components used for the suppression pool cooling mode of RHR. This review was conducted to identify adverse trends in equipment performance and ensure the licensee was effectively dealing with

issues identified by maintenance. The team also reviewed calculations for available nominal pump suction head, vortexing limits, pressure drop, and heat exchanger performance data for the residual heat removal system to verify the RHR system can provide containment cooling during a LOOP. The team reviewed in-service testing valve stroke timing data for air and motor operated valves that can be used to vent containment during a LOOP in order to verify the valves stroke in time to meet their safety function.

The team reviewed the Primary Containment Isolation Capability Check Procedure (ST-6-060-460-1) and compared it with the RHR system to verify valves necessary to perform the function were included in the procedure. The team also reviewed design drawings for the eighteen and twenty four inch air and motor operated valves used to vent containment and compared design information to parameters in Primary Containment Control procedure (T-102) to ensure the design of the valves would support containment venting.

The teams conducted walkdowns of the accessible portions of the residual heat removal, residual heat removal service water, and emergency service water systems to assess the material condition of the systems.

b. Findings

Introduction. The team identified a non-cited violation of 10 CFR 50.63, “Loss of All Alternating Current Power,” because the licensee’s procedures used to cope with a station blackout may not have restored a source of alternating current power to the affected unit within one hour. The restoration of power within one hour is an assumption in the station blackout coping analysis used to demonstrate the plant would be able to manage a station blackout of a specified duration by taking credit for certain safe shutdown equipment such as residual heat removal pumps, air compressors, and battery chargers.

Description. In 1988 the Code of Federal Regulations was amended to include section 50.63, “Loss of All Alternating Current Power.” Title 10 Code of Federal Regulations Section 50.63 requires that plant systems be capable of ensuring the core is cooled and containment integrity maintained in the event of a station blackout of a specified duration. The capability to cope with a station blackout is characterized using a station blackout coping analysis.

During a blackout of one Limerick unit, the coping scheme requires alternating current power be sent from the unaffected Limerick unit to the blacked-out unit. Limerick’s station blackout coping analysis assumes the alternate alternating current source from the unaffected unit would be available within one hour from the onset of the station blackout in order to take credit for the availability of the residual heat removal pumps, air compressors, and battery chargers.

Limerick procedure E-1, prescribes actions to mitigate a station blackout, and Limerick procedure E-10/20, prescribes actions for a loss of offsite power. Through interviews with Operations Department staff, the team determined that during a station blackout operators would enter both procedures concurrently. Procedures E-1 and E-10/20

reference cross-connecting alternating current power to the affected unit. Neither procedure highlights, to the operators, the time critical nature of cross-connecting the power sources. The procedures first direct operators to attempt to manually start failed EGDs and locally establish ventilation to high pressure injection sources by opening doors, among other actions, prior to directing the operators to implement cross-connecting emergency power sources.

The team conducted a step-by-step walkdown of the local start procedure, with knowledgeable Limerick operators demonstrating key features of the procedures, for the emergency diesel generators and conducted a similar step-by-step walkdown of the procedure to cross-connect alternating current power. Based on a review of the procedures, the demonstration by knowledgeable operators, and the walkdown, the team concluded there was insufficient evidence the operators would cross-connect alternating power to the affected unit within one hour. Considering the extra-ordinary conditions the operators would experience during a station blackout and the unusual and unfamiliar challenges facing both control room and equipment operators during an event of this nature the team concluded the operators would not succeed in cross-connecting the alternate power source, using the existent procedure, in the required one hour.

Limerick engineering staff recognized the uncertainty in the ability to cross-connect alternate power sources within one hour and took prompt corrective action to enter the issue into their corrective action process and to revise the station blackout procedure. The Limerick engineering staff moved the procedural steps, cross-connecting alternating current power, earlier in the procedural evolution and included a special note to the operators stressing the time critical nature of the step.

Analysis. The licensee's failure to develop a station blackout procedure consistent with their coping analysis is a performance deficiency because the licensee's procedure used to cope with a station blackout may not have restored a source of alternating current power to the affected unit within one hour. The restoration of power within one hour is an assumption used to demonstrate the plant would be able to manage a station blackout of a specified duration by taking credit for certain safe shutdown equipment such as residual heat removal pumps, air compressors, and battery chargers. Assessments were performed to demonstrate the plant can successfully cope for the required four hour period without this equipment.

Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function and was not the result of any willful violation of NRC requirements. This finding is greater than minor because it affected the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding was evaluated by Phase 1 of the Reactor Inspector Findings At Power Situations Significance Determination Process (SDP). The ability to cross-tie the electrical buses in order to make emergency diesel generator power available from one unit to the other unit, either in a station black-out or loss-of-offsite power, is not given credit in the Limerick risk analysis or the NRC's Limerick Phase 2 SDP notebook. The finding was determined to have very low safety significance (Green) because the finding was not a design or qualification deficiency, did

not represent an actual loss of safety function of a train or system, and did not screen as risk significant due to a seismic, fire, flooding, or severe weather initiating events.

Enforcement. 10 CFR 50.63 requires that the capability to cope with a station blackout of specified duration be demonstrated through a coping analysis. Limerick's station blackout coping analysis assumes that an alternate source of power will be available from the unaffected unit within one hour. Contrary to 10 CFR 50.63 and Limerick's station blackout analysis, the licensee's procedures used to cope with a station blackout may not have restored a source of alternating current power to the affected unit within one hour. Because this violation is of very low safety significance and has been entered into the Limerick corrective action program, this violation is being treated as a non-cited violation, consistent with Section VI.A of the Nuclear Regulatory Commission Enforcement Policy: **NCV 05000352; 05000353/2003009-01, Failure to Develop a Station Blackout Procedure Consistent With 10 CFR 50.63 Coping Analysis**.

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a sample of corrective action reports associated with the residual heat removal, emergency diesel generator, residual heat removal service water system, containment venting, and associated systems, as identified in the Documents Reviewed section, to verify that Exelon was identifying issues at an appropriate threshold, entering them in the corrective action program, and taking appropriate corrective actions. Also, the inspectors evaluated corrective actions to confirm that repairs and/or modifications to components had no adverse impact on the system design basis.

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

On November 21, 2003, the NRC team leader presented the inspection results to Mr. DeGregorio and other members of his staff, who acknowledged the findings. The team leader confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

E. Callan, Director - Operations
R. DeGregorio - Vice President
T. Dougherty, Manager - NOS
B. Hanson, Plant Manager
J. Krais, Sr Manager - Design Engineering
S. Minnick, Manager - Mechanical Engineering
C. Mudrick, Director - Engineering
J. Perry, Director - Maintenance
C. Rich, Manager - Operations Training Manager
G. Sosson, Manager - ECCS Systems
T. Wasong, Director - Training
J. Hunter, Shift Manager

NRC Personnel

A. Burritt, Sr Resident Inspector
B. Welling, Resident Inspector
R. Lorson, Chief Performance Evaluation Branch

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NCV 05000352; 353/2003009-01	Failure to Develop a Station Blackout Procedure Consistent With 10 CFR 50.63 Coping Analysis.

Closed

None

Opened and Closed

None

LIST OF DOCUMENTS REVIEWED

Design Basis Documents

L-S-02, Emergency Service Water System, Rev. 13
L-S-01A, Class 1E 125/250Vdc System, Rev. 8
L-S-04, Residual Heat Removal Service Water, Rev. 9
L-S-05, 4KV System, Rev. 9
L-S-07, Diesel Generator and Auxiliary Systems, Rev. 11
L-S-08A, Emergency Switchgear, Battery and Auxiliary Equipment Rooms HVAC, Rev. 6
L-S-08D, Miscellaneous HVAC Systems, Rev. 4
L-S-09, Residual Heat Removal System, Rev. 15
L-S-10, Compressed Air System, Rev. 6
L-S-13, 480V Motor Control Center System, Rev. 8
L-S-14, 480V Load Center System, Rev. 8
L-S-24, 120 VAC System, Rev. 6
L-S-25B, Primary Containment Auxiliary Systems, Rev. 5

Calculations

LE-0052, Class 1E Battery Load Duty Cycle Determination, Rev. 9
LE-0069, Class 1E 125Vdc System Voltage Analysis, Rev. 16A
LGS: M-171, Specification for Environmental Service Conditions, Rev. 16
LM-0036, Evaluation of Heat Transfer Data for Unit 1 and Unit 2 RHR Exchangers
M-51-08, Residual heat removal, LPCI & CS Pressure Drop
M-51-62, Residual heat removal System NPSH
LM-0638, Tube Plugging Limits & Fouling Factors for RHR Exchangers
MEL-0142, Determination of the Vortex Limits for LPCI, HPCI, Core Spray, and RCIC
HN-057-112, AC Motor Operated Butterfly Valve
HV-057-115, AC Motor Operated Butterfly Valve
HV-057-135, AC Motor Operated Butterfly Valve
6300E.19, Short Circuit Calculation for AC Power System, Rev. 9
6300E.20, Voltage Regulation Study, Rev. 11
6380E.07, Diesel Generator Loading (Steady State), Rev. 7
6380E.08, Diesel Generator Voltage Regulation Study, Rev. 4
6900E.02, Sfgd. Aux. Sys. - Phase Overcurrent Relay Sel. & Coord., Rev. 8
6900E.04, Sfgd. Aux. Sys. - Ground Overcurrent Relay Sel. & Coord., Rev. 2
6900E.11, Center Circuit Breakers - Overcurrent Trip Devices, Rev. 8
6900E.14, Selection of Prot. Dev. for Penetration Assy. Conductors, Rev. 10
LE-0068, 120 V AC Safeguard Voltage Drop Calculation, Rev. 5
LM-007, Diesel Fuel Storage Tank, Rev. 0
L-00308, Diesel Fuel Storage Tank Volume Calc, Rev. 0

Drawings

E-1, Sh. 1, Single Line Diagram, Rev. 24
E-15, Unit 1 Single Line Meter & Relay Diagram, 4 kV System, Rev. 26
E-16, Unit 2 Single Line Meter & Relay Diagram, 4 kV System, Rev. 22
E-27, Single Line Meter & Relay Diagram, MCC Lad Tabulation, Rev. 28
E-28, Unit 1 Single Line Dgm. Load Center 440 V, Rev. 18
E-29, Unit 2 Single Line Dgm Load Center 440 V, Rev. 17
E-31, Sh. 1-3, Single Line Diagram – Instrumentation AC System
E-32, Sh. 1-2, Single Line Meter & Relay Diagram – Uninterruptible AC System RPS, UPS and Computer System
E-33, Sh. 1-3, Single Line Meter and Relay Diagram – 125/250VDC System, U1
E-34, Sh. 1-3, Single Line Meter and Relay Diagram – 125/250VDC System, U2
E-162, Schematic Diagram – Safeguard Buses D144 & D244 Safeguard Load Center Transformer Breaker, 4KV, Rev. 13
E-163, Sh. 1-2, Schematic Diagram – Safeguard Buses D114, D124, D134, D214, D224 & D234 Safeguard Load Center Transformer Breaker, 4KV
E-321, Sh. 1-6, Schematic Diagram – Emergency Service Water Pumps – Common
E-322, Sh. 1-2, Schematic Diagram – D-G ESW Inlet and Outlet MOVs
E-324, Sh. 1-3, Schematic Diagram – ESW Discharge to RHR lSW MOVs
E-325, Sh. 1-4, Schematic Diagram – Cooling Water Shutoff Valves to Service Water & ESW
E-342, Schematic Diagram – Drywell and Suppression Pool Purge Line Exhaust Bypass Valve, Rev. 8
E-345, Schematic Diagram – Drywell and Suppression Pool Purge Air Exhaust Isolation Valves, Rev. 13
E-361, Sh. 1-3, Schematic Diagram – RHR Service Water Pumps - Common
E-362, Sh. 1-2, Schematic Diagram – Spray Pond Header Crosstie & Cooling Water Return Crosstie MOVs - Common
E-373, Sh. 1-2, Schematic Diagram – RHR SW/ESW to Cooling Tower Shutoff MOVs
E-374, Sh. 1-2, Schematic Diagram – Clg Tower Return to Spray Pond Shutoff MOVs
E-375, Sh. 1-3, Schematic Diagram – Spray Pond Spray Nozzle Inlet MOVs
E-376, Sh. 1-2, Schematic Diagram – Spray Pond Spray Nozzle Bypass MOVs
E-378, Rev 12, Schematic Diagram – Spray Pond Wetwell Crosstie Motor Operated Gate
E-382, Sh. 1-3, Schematic Diagram – Drywell & Suppression Pool Purge Line Inboard Isolation Valves
E-471, Schematic Diagram – RCIC, HPCI, RHR & Core Spray Rm Unit Coolers, Rev. 14
M-1-E11-1040-E-001, Elementary Diagram - Residual Heat Removal System, Rev. 72
M-1-E11-1040-E-002, Elementary Diagram - Residual Heat Removal System, Sh. 1-2
M-1-E11-1040-E-003, Elementary Diagram - Residual Heat Removal System, Rev. 28
M-1-E11-1040-E-004, Elementary Diagram - Residual Heat Removal System, Rev. 15
M-1-E11-1040-E-005, Elementary Diagram - Residual Heat Removal System, Rev. 25
M-1-E11-1040-E-006, Elementary Diagram - Residual Heat Removal System, Rev. 17
M-1-E11-1040-E-007, Elementary Diagram - Residual Heat Removal System, Rev. 27
M-1-E11-1040-E-008, Elementary Diagram - Residual Heat Removal System, Rev. 29
M-1-E11-1040-E-009, Elementary Diagram - Residual Heat Removal System, Rev. 18
M-1-E11-1040-E-010, Elementary Diagram - Residual Heat Removal System, Rev. 19
M-1-E11-1040-E-011, Elementary Diagram - Residual Heat Removal System, Rev. 32

M-1-E11-1040-E-012, Elementary Diagram - Residual Heat Removal System, Rev. 35
M-1-E11-1040-E-013, Elementary Diagram - Residual Heat Removal System, Rev. 41
M-1-E11-1040-E-014, Elementary Diagram - Residual Heat Removal System, Rev. 30
M-1-E11-1040-E-015, Elementary Diagram - Residual Heat Removal System, Rev. 33
M-1-E11-1040-E-016, Elementary Diagram - Residual Heat Removal System, Rev. 31
M-1-E11-1040-E-017, Elementary Diagram - Residual Heat Removal System, Rev. 28
M-1-E11-1040-E-018, Elementary Diagram - Residual Heat Removal System, Rev. 31
M-1-E11-1040-E-019, Elementary Diagram - Residual Heat Removal System, Rev. 26
M-1-E11-1040-E-020, Elementary Diagram - Residual Heat Removal System, Rev. 22
M-1-E11-1040-E-021, Elementary Diagram - Residual Heat Removal System, Rev. 19
M-1-E11-1040-E-022, Elementary Diagram - Residual Heat Removal System, Rev. 26
M-1-E11-1040-E-023, Elementary Diagram - Residual Heat Removal System, Rev. 27
M-1-E11-1040-E-024, Elementary Diagram - Residual Heat Removal System, Rev. 23
M-1-E11-1040-E-025, Elementary Diagram - Residual Heat Removal System, Rev. 25
P-119-7-10, 18" Butterfly Valve with Cylinder Operator
P-144-17-4, 18" Lugged Wafer Stop Valve
P-144-18-3, 18" Lugged Wafer Stop Valve
P-144-19-6, 24" Lugged Wafer Stop Valve
P-144-20-5, 24" Lugged Wafer Stop Valve
P-144-130-1, 18" Lugged Wafer Stop Valve
P-144-131-1, 18" Lugged Wafer Stop Valve
P-144-132-1, 24" Lugged Wafer Stop Valve
P-144-133-1, 24" Lugged Wafer Stop Valve

Focused Area Self-Assessment Report

C3-UHS FASA, NRC Inspection Procedure 71111.07 Heat Sink Performance
C6-FASA, Review of the System Health Indicator Program
C17-FASA, Limerick Flow Accelerated Corrosion Procedure
In Preparation for NRC Inspection 71111.08

Procedures

GP-8.1, Unit 1 Automatic Actuations by Isolation Signals, Rev. 10
GP-8.2, Unit 1 Manual Isolation, Rev. 4
GP-8.3, Unit 1 Isolation Reset, Rev. 8
GP-8.5, Unit 1 Isolation Bypass of Crucial Systems, Rev. 44
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Miscellaneous

NOSA-LG-03-05, NOS Engineering Design Control Audit Report
Maintenance Rule 2002 Self Assessment (pre (a)(3) assessment)
LM-0036, Evaluation of Heat Transfer Data for Unit 1 & Unit 2 RHR Ht Exchangers
M-51-08, Residual heat removal, LPCI & CS Pressure Drop
M-51-62, Residual heat removal System NPSH
LM-0638, Tube Plugging Limits & Fouling Factors for RHR Heat Exchangers
MEL-0142, Determination of the Vortex Limits for LPCI, HPCI, Core Spray & RCIC
ML-008, LGS 1 and 2 IST Program Specifications, Appendix E, RHR System, Rev. 3
CEQP-001, EQ [Equipment Qualification] Package - GE 4kV Pump Motor, Rev. 7
CEQP-006, EQ Package - Limitorque Motor Operated Valve Actuators, Rev. 2
CEQP-008, EQ Package - ASCO Solenoid Valves, Trip Coils & Pressure Switches, Rev. 3
LGS Maintenance Rule Scope and Performance Monitoring Document
LGS Response to 10 CFR 50.63, "Loss of all Alternating Current Power"
LGS Supplemental Information Regarding 10 CFR 50.63 Analysis

LGS Response to NRC Safety Evaluation Regarding 10 CFR 50.63 Analysis
LGS Response to NRC Concerns Regarding 10 CFR 50.63 Analysis
Battery 1A2D101 Service Test Results, dated March 13, 2002
Selected Component Data Sheets

Engineering Change Requests

LG 94-11555, Delete EQ Data From CRL Component ID's For Valve Operators (IP 711111.02), Rev. 0
LG 00-00887, Replacement of 3 Inch ESW Valves with Stainless Steel, Rev. 2
LG 92-457, Replacement of ESW Valve Wedge and Wedge Guides, Rev. 0
LG 03-00158, 2B RHR Heat Exchanger Nonconformance - Tube Pitting, Rev. 0

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CR-061223	CR-128544	CR-152922	CR-166575	CR-184115	CR-187250*
CR-085823	CR-135950	CR-155442	CR-166876	CR-184919*	CR-1263424
CR-086280	CR-139639	CR-156701	CR-170549	CR-185085*	CR-1382247
CR-096103	CR-142874	CR-156783	CR-172350	CR-185102*	CR-1407103
CR-106060	CR-143141	CR-158552	CR-175377	CR-185353*	
CR-113287	CR-149071	CR-160797	CR-180354	CR-185894*	
CR-119047	CR-149191	CR-162780	CR-183865	CR-186420	

Action Requests

A/R A1442042*, A/R A144204*, A/R A1441590*, A/R A1442596*, A/R A1375748, A/R A1407103, A/R A1263424, A/R A1382247

Note: * indicates Corrective Actions or Action requests issued during or related to this inspection.

LIST OF ACRONYMS

EDG	Emergency Diesel Generator
ESW	Emergency Service Water
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SDP	Significant Determination Process