



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

January 30, 2009

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

**SUBJECT: LIMERICK GENERATING STATION - NRC INTEGRATED  
INSPECTION REPORT 05000352/2008005 AND 05000353/2008005**

Dear Mr. Pardee:

On December 31, 2008, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station Units 1 and 2. The enclosed integrated inspection report documents the inspection results which were discussed on January 9, 2009, with Mr. C. Mudrick 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.

This report documents one NRC-identified finding of very low safety significance (Green). The finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program (CAP), the NRC is treating the finding as a non-cited violation (NCV), consistent with Section VI.A.1. of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administration, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-001; and the NRC Resident Inspector at the Limerick facility.

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Sincerely,

**/RA/**

Paul G. Krohn, Chief  
Projects Branch 4  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000352/2008005 and 05000353/2008005  
w/Attachment: Supplemental Information

cc w/encl:

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NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,  
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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: 05000352/2008005 and 05000353/2008005

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Sanatoga, PA 19464

Dates: October 1, 2008 through December 31, 2008

Inspectors: E. DiPaolo, Senior Resident Inspector  
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Approved by: Paul G. Krohn, Chief  
Projects Branch 4  
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## SUMMARY OF FINDINGS

IR 05000352/2008005, 05000353/2008005; 10/01/2008 - 12/31/2008; Limerick Generating Station, Units 1 and 2; Post-Maintenance Testing.

The report covered a three-month period of inspection by resident inspectors and announced inspections by regional reactor inspectors. One Green finding which was determined to be a non-cited violation (NCV) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. Cross-cutting aspects associated with findings are determined using IMC 0305, "Operating Reactor Assessment Program," dated January 2009. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight," Revision 4, dated December 2006.

### A. NRC-Identified and Self-Revealing Findings

#### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a NCV of Technical Specification 6.8.1, "Administrative Controls-Procedures", because Exelon did not maintain adequate maintenance procedures associated with work performed on the Unit 2 Nuclear Steam Supply Shutoff System (NSSSS). Specifically, the procedures, which performed system relay replacements, did not contain adequate post-maintenance testing (PMT) to demonstrate that the Technical Specification required response times of all circuits affected by the maintenance were satisfied.

The inspectors determined that this finding was more than minor because it was associated with the procedure quality attribute of the Mitigating System cornerstone, and affected the Mitigating System cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. As a result of the inadequate PMT, additional unavailability was accrued, and an engineering evaluation was required to demonstrate satisfactory response times. The finding was determined to be of very low safety significance (Green) because it did not represent a loss of safety function. The inspectors determined this finding had a cross-cutting aspect in Human Performance, Resources, because Exelon did not provide complete and accurate work packages to assure nuclear safety. Specifically, the NSSSS was returned to service without all the required post-maintenance testing being performed to demonstrate operability. [IMC 0305 aspect: H.2(c)] (Section 1R19)

### B. Licensee-Identified Violations

None.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period operating at full rated thermal power (RTP). On December 6, 2008, operators reduced power to approximately 95 percent to facilitate a control rod pattern adjustment. Full RTP was achieved later that day. On December 20, 2008, power was reduced to approximately 94 percent to facilitate main turbine valve testing. Operators returned power to full RTP on December 21, 2008. Unit 1 operated at full RTP for the remainder of the inspection period.

Unit 2 began the inspection period operating at full RTP. On October 18, 2008, operators reduced power to approximately 80 percent to facilitate a control rod pattern adjustment. Full RTP was achieved on October 19, 2008. On October 28, 2008, an unplanned downpower to approximately 25 percent was performed due to drywell temperature exceeding Technical Specification (TS) allowed limits. This was caused by a loss of drywell cooling that resulted when the 2A Drywell Chiller tripped while the 2B Drywell Chiller was out-of-service (OOS) for planned maintenance. Power was returned to full RTP later that day following the restoration of the 2B Drywell Chiller to service, and the subsequent lowering of drywell temperature to below the TS required limit. On November 1, 2008, operators reduced power to approximately 80 percent to facilitate a planned control rod pattern adjustment. Full RTP was reached on November 2, 2008. On December 13, 2008, operators reduced power to approximately 80 percent to facilitate a control rod pattern adjustment, main steam isolation and main turbine valve testing, and main condenser tube and waterbox cleaning. Full RTP was achieved on December 14, 2008. Unit 2 operated at full RTP for the remainder of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

##### 1R01 Adverse Weather Protection

##### .1 System Seasonal (71111.01 - 1 sample)

##### a. Inspection Scope

The inspectors assessed the effectiveness of the licensee's cold weather protection program as it related to ensuring that the facility's emergency diesel generators, standby liquid control system, and condensate storage tank low level switches would remain functional and available in cold weather conditions. In addition to reviewing the licensee's program-related documents and procedures, walkdowns were conducted of the freeze protection equipment (e.g., heat tracing, area space heaters, etc.) associated with the above systems/components. Licensee problem identification and resolution associated with cold weather protections was also assessed. Documents reviewed are listed in the Attachment.

##### b. Findings

No findings of significance were identified.

.2 Site Imminent Weather Conditions (71111.01 - 1 sample)a. Inspection Scope

The inspectors evaluated Exelon's implementation of adverse weather preparation procedures and compensatory measures as a result of a high winds warning that was issued for the site area on December 31, 2008. The inspectors toured risk-significant and susceptible plant areas to verify procedures and compensatory measures were implemented before the onset of the adverse weather conditions. The inspectors reviewed associated issues entered into the CAP to verify that they were properly characterized for resolution. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment AlignmentPartial Walkdown (71111.04Q - 4 samples)a. Inspection Scope

The inspectors performed partial walkdowns of the plant systems listed below to verify their operability when safety-related equipment in the opposite train was either inoperable, undergoing surveillance testing, or potentially degraded. The inspectors used TS, Exelon operating procedures, plant piping and instrumentation drawings (P&IDs), and the Updated Final Safety Analysis Report (UFSAR) as guidance for conducting partial system walkdowns. The inspectors reviewed the alignment of system valves and electrical breakers to ensure proper in-service or standby configurations as described in plant procedures and drawings. During the walkdowns, the inspectors evaluated the material condition and general housekeeping of the systems and adjacent spaces. The documents reviewed are listed in the Attachment. The inspectors performed walkdowns of the following areas:

- D21 Emergency Diesel Generator (EDG) walkdown while D11 EDG was OOS for monthly surveillance test;
- Offsite power and safeguards DC (Direct Current) power while Offsite Bus 10 was for planned maintenance;
- Unit 1 High Pressure Coolant Injection (HPCI) while Unit 1 Reactor Core Isolation Cooling (RCIC) OOS for planned maintenance; and
- Unit 1 'B' Loop of Suppression Pool Cooling while 'A' Loop was OOS for planned maintenance.

b. Findings

No findings of significance were identified.

1R05 Fire Protection.1 Fire Protection - Tours (71111.05Q - 5 samples)a. Inspection Scope

The inspectors conducted a tour of the five areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with Exelon's administrative procedures. Fire detection and suppression equipment was verified to be available for use, and passive fire barriers were verified to be maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for OOS, degraded, or inoperable fire protection equipment in accordance with the station's fire plan. The documents reviewed are listed in the Attachment. The inspectors toured the following areas:

- Unit 1 RCIC Room, Fire Area 33;
- Unit 1 HPCI Room, Fire Area 34;
- Unit 2 RCIC Room, Fire Area 56;
- Unit 2 HPCI Room, Fire Area 57; and
- Unit 2 Control Rod Drive Equipment and Neutron Monitoring Area Room, Fire Area 68.

b. Findings

No findings of significance were identified.

.2 Fire Protection – Drill Observation (71111.05A - 1 sample)

a. Inspection Scope

The inspectors observed one unannounced fire drill conducted near the Unit 1 Hydrogen Seal Oil Skid on December 8, 2008. The inspectors observed the drill to evaluate the readiness of the plant fire brigades to fight fires. The documents reviewed are listed in the Attachment. Specific attributes evaluated were:

- Proper donning of fire fighting turnout gear and self-contained breathing apparatus;
- Proper use and layout of fire hoses;
- Employment of appropriate fire fighting techniques;
- Sufficient fire fighting equipment brought to the scene;
- Effectiveness of fire brigade leader communications, command, and control;
- Search for propagation of fire into other plant areas;
- Utilization of pre-planned strategies;
- Adherence to the pre-planned drill scenario; and
- Licensee self-critique and exercise evaluation.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07A - 2 samples)

a. Inspection Scope

The inspectors reviewed the results of Exelon's thermal performance tests for the safety-related room coolers listed below to assess the capability of the coolers to operate as designed. The inspectors reviewed the UFSAR, supporting design calculations, thermal

performance calculations, and historical trend information to ensure the room coolers were capable of removing the required heat load during accident conditions. The inspectors verified that issues identified during the thermal performance tests were entered into the licensee's CAP for evaluation. The documents reviewed are listed in the Attachment. The inspectors reviewed the results of the following tests:

- 2BV210 Residual Heat Removal (RHR) Room Cooler Air to Water Heat Transfer Test; and
- 1EV211 Core Spray Room Cooler Air to Water Heat Transfer Test.

## 1R11 Licensed Operator Requalification Program

### .1 Quarterly Licensed Operator Requalification Activities (71111.11Q - 1 sample)

On November 4, 2008, the inspectors evaluated the 'A' operating crew licensed operator requalification simulator examination, LSES-2006, "Simulator Evaluation Scenario," Revision 6. The scenario tested the operators' ability to respond to failures of equipment as well as a loss-of-coolant accident with equipment OOS and emergency core cooling system failures. The inspectors observed licensed operator performance including operator critical tasks, which are required to ensure the safe operation of the reactor and protection of the nuclear fuel and primary containment barriers. The inspectors also assessed crew dynamics and supervisory oversight to verify the ability of operators to properly identify and implement appropriate TS actions, regulatory reports, and notifications. The inspectors observed and reviewed the training evaluators' grading and critiques and assessed whether appropriate feedback was provided to the licensed operators.

#### a. Findings

No findings of significance were identified.

### .2 Biennial Requalification Program Review (71111.11 - 1 sample)

#### a. Inspection Scope

The following inspection activities were performed on a sampling basis using NUREG-1021, Revision 9, Supplement 1, "Operator Licensing Examination Standards for Power Reactors," Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program," NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)," and 10 CFR 55.46, "Simulator Rule" as acceptance criteria.

The inspectors reviewed documentation of operating history since the last requalification program inspection. The inspectors also discussed facility operating events with the resident staff. Documents reviewed included NRC inspection reports, and licensee issue reports (IRs) that involved human performance issues for licensed operators to ensure that operational events were not indicative of possible training deficiencies (see document list attached).

The inspectors reviewed three sets each of 2008 simulator scenarios and job performance measures (JPMs) administered during this current exam cycle (i.e., weeks

1, 4, and 5) to ensure the quality of these examinations met or exceeded the criteria established in the Examination Standards and 10 CFR 55.59.

The inspectors observed the administration of operating examinations to Delta operating crew and Staff Crew 1. The operating examinations consisted of two crew simulator scenarios and one set of five JPMs administered to each individual.

#### Conformance with Simulator Requirements Specified in 10 CFR 55.46

For the site specific simulator, the inspectors observed simulator performance during the conduct of the examinations, and discrepancy reports to verify compliance with the requirements of 10 CFR 55.46. The following areas were reviewed:

Reviewed a sample of simulator tests including transients, malfunctions, and core performance tests. Verified that a sample of completed simulator work requests (SWRs) from the past year effectively addressed the described issue. The specific simulator tests reviewed are listed in the Attachment.

Conformance with operator license conditions was verified by reviewing the following records:

- Ten medical records. The inspectors confirmed all records were complete, that restrictions noted by the doctor were reflected on the individual's license and that the physical examinations were given within 24 months;
- Proficiency watch-standing and reactivation records. A sample of one licensed operator reactivation record was reviewed as well as a 100 percent sample of non-shift licensed personnel watch-standing documentation for time on shift to verify currency and conformance with the requirements of 10 CFR 55; and
- Remediation training records. The inspectors reviewed records for five operators from the past year training cycle.

#### Licensee's Feedback System.

The inspectors interviewed instructors, training/operations management personnel, and six licensed operators for feedback regarding the implementation of the licensed operator requalification program to ensure the requalification program was meeting their needs and responsive to their noted deficiencies/recommended changes.

On November 21, 2008, the inspectors conducted an in-office review of licensee requalification examination results. These results included the annual operating tests only. The comprehensive written exams were administered and the results evaluated last year. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The inspectors verified that:

- Crew failure rate on the dynamic simulator was less than 20 percent. (Failure rate was 0.0 percent);
- Individual failure rate on the dynamic simulator test was less than or equal to 20 percent. (Failure rate was 0.0 percent);

- Individual failure rate on the walkthrough test (JPMs) was less than or equal to 20 percent. (Failure rate was 2.0 percent); and
- More than 75 percent of the individuals passed all portions of the examination (100 percent of the individuals passed all portions of the examination).

Note: One licensed operator on short term disability was not able to complete all of his licensed operator requalification training (cycles 0805 and 0806) and his NRC required annual operating examination at this time. He is being administratively restricted from license duties and will not be permitted to resume his license duties until he successfully completes all missed training and successfully passes his annual operating examination (IR 847625).

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12 - 4 samples)

a. Inspection Scope

The inspectors evaluated Exelon's work practices and follow-up corrective actions for structures, systems, and components (SSCs) and identified issues to assess the effectiveness of Exelon's maintenance activities. The inspectors reviewed the performance history of risk significant SSCs and assessed Exelon's extent-of-condition determinations for those issues with potential common cause or generic implications to evaluate the adequacy of the station's corrective actions. The inspectors assessed Exelon's problem identification and resolution actions for these issues to evaluate whether Exelon had appropriately monitored, evaluated, and dispositioned the issues in accordance with Exelon procedures and the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classifications, performance criteria and goals, and Exelon's corrective actions that were taken or planned, to evaluate whether the actions were reasonable and appropriate. The documents reviewed are listed in the Attachment. The inspectors performed the following samples:

- Redundant Reactivity Control System for the period October 2006 – October 2008;
- Control Enclosure Chilled Water for the period December 2006 – December 2008;
- IR 751491, EDG D14 K1 relay contractor failure; and
- IR 760581, Medium voltage cable manhole water intrusion.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 4 samples)

a. Inspection Scope

The inspectors evaluated the effectiveness of Exelon's maintenance risk assessments required by 10 CFR 50.65(a)(4). This inspection included discussion with control room operators and risk analysis personnel regarding the use of Exelon's on-line risk monitoring software. The inspectors reviewed equipment tracking documentation, daily

work schedules, and performed plant tours to gain assurance that the actual plant configuration matched the assessed configuration. Additionally, the inspectors verified that Exelon's risk management actions, for both planned and emergent work, were consistent with those described in Exelon procedure, ER-AA-600-1042, "On-Line Risk Management." The documents reviewed are listed in the Attachment. Inspectors reviewed the following samples:

- IR 826565, Emergent unavailability of 2B Instrument Air Compressor with 20 Start-up Transformer and one 2B RHR room cooler OOS;
- IR 836603, Emergent unavailability of 2A Drywell Chiller with 2B Drywell Chiller OOS;
- IR 839237, Unit 1 HPCI declared inoperable due to flow circuit problems with Offsite Bus 10 OOS for planned maintenance; and
- IR 859270, Emergent unavailability of a Control Enclosure Chiller due to a low freon trip locked in.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 5 samples)

a. Inspection Scope

For the five operability evaluations described below, the inspectors assessed the technical adequacy of the evaluations to ensure that Exelon properly justified TS operability and verified that the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors reviewed the UFSAR to verify that the system or component remained available to perform its intended safety function. In addition, the inspectors reviewed compensatory measures implemented to ensure that the measures worked and were adequately controlled. The inspectors also reviewed a sample of issue reports to verify that Exelon identified and corrected deficiencies associated with operability evaluations. The documents reviewed are listed in the Attachment. The inspectors performed the following evaluations:

- IR 824770, Emergency Service Water (ESW) System flow control valve to 'A' Main Control Room Chiller Condenser, does not fully close;
- IR 831482, Isolation Actuation Instrumentation past operability following system relay replacements;
- IR 836603, Impact of Drywell Temperature on Reactor Vessel Level Indication Operability;
- IR 839237, Flow oscillations on Unit 1 HPCI when shut down; and
- IR 840654, Components missing from containment in-service inspection program.

b. Findings

No findings of significance were identified.

1R18 Plant Modifications

.1 Temporary Modifications (71111.18 - 2 samples)

a. Inspection Scope

The inspectors reviewed two temporary plant modifications, listed below. The inspectors reviewed the design adequacy of the modification for material compatibility which included functional properties, environmental qualification, and seismic evaluation. The inspectors compared the temporary change with the UFSAR and TS to verify that the modification did not affect system operability or availability. The inspectors ensured that station personnel implemented the modification in accordance with the applicable temporary configuration change process. Where applicable, the inspectors verified that modification preparation, staging, and implementation did not impair emergency/abnormal operating procedure actions and key safety functions. Post-modification testing was reviewed to confirm that operability was established, unintended system interactions did not occur, and modification acceptance criteria were met. Documents reviewed are listed in the Attachment. The following temporary modifications were reviewed:

- Temporary Procedure Change to ST-6-011-232-0, 'B' Loop ESW Pump, Valve and Flow Test; and
- Temporary plant modification to add vibration monitoring equipment for HV-51-2F050A (B).

b. Findings

No findings of significance were identified.

.2 Permanent Modifications (71111.18 - 1 sample)

a. Inspection Scope

The inspectors reviewed one permanent plant modification documented in Engineering Change LG 99-00682, Limerick Technical Specification Bases Changes to 3.8.1, Offsite Power. The inspectors reviewed the modification and associated 10 CFR 50.59 evaluation to verify consistency with the Limerick licensing bases. The documents reviewed are listed in the Attachment.

a. Findings

Introduction: The inspectors identified an unresolved item (URI) associated with changes Exelon made to the TS Bases associated with TS 3.8.1, "AC Sources-Operating."

Description: On September 30, 2008, operators racked out one of the two offsite power supply feeder breakers to 4kV Emergency Bus D11 (201-D11) for maintenance. The inspectors noted that although one of the two offsite power sources was not available to 4kV Emergency Bus D11, operators did not declare the associated offsite power circuit (201 Circuit) inoperable and enter into TS Limiting Condition for Operation (LCO) 3.8.1.1, AC Sources – Operating, Action f, which requires, in part, performing Surveillance Requirement (SR) 4.8.1.1.a within one hour and also entails entering a 72 hour LCO shutdown action statement. The inspector noted that TS SR 4.8.1.1.1.b could not be met if one of the two offsite power source breakers was racked out. That SR states "Each of the above required independent circuits between the offsite transmission

network and the onsite Class 1E distribution system shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring, manually and automatically, unit power supply from the normal circuit to the alternate circuit." With an offsite power supply feeder breaker racked out and unavailable to an onsite 4kV emergency bus, manual and automatic transfer was not possible. In addition, TS 4.0.1 states, in part, that, "Failure to meet a Surveillance, whether such failure is experienced during the performance of a Surveillance or between performances of the Surveillance, shall be failure to meet the Limiting Condition for Operation."

The inspectors referenced TS Bases 3/4.8.1, which described that an offsite circuit is considered to be inoperable if it is not capable of supplying at least three, Unit 1 4kV emergency buses. Recognizing that the TS Bases 3/4.8.1 appeared to conflict with the SR, the inspectors questioned the history of the bases. Exelon informed the inspectors that the bases were modified in 2000 to define an operable offsite source as one capable of supplying power to three of the four emergency buses in the unit, through Engineering Change Request (ECR) LGS ECR 99-00682.

The inspectors reviewed LGS ECR 99-00682 and found that Exelon's 10 CFR 50.59 screening for the TS bases change concluded that the change was an enhancement, and, as such, a change to the TS was not required. The ECR described the change as taking advantage of system redundancy similar to the design of the EDGs. Specifically, section 8.3.1.1.2.2 of the UFSAR provides results of a single failure analysis (focused on the EDGs but also applicable to the 4kV emergency buses) that concludes that any combination of three-out-of-four buses could withstand a single failure and still safely shut down the plant. The inspectors reviewed the Limerick licensing basis and found several conflicts with Exelon's conclusion. Namely, the TS bases change:

- Conflicted with the facility as described in the UFSAR Sections 8.2.1, "Offsite Power Sources." Section 8.2.1.1 describes that "Both offsite sources are available continuously to the Class 1E buses"; and
- Conflicted with the description of the onsite emergency power system description as documented in NUREG-0991, "Safety Evaluation Report Related to the Operation of Limerick Generating Station, Units 1 and 2," dated August 1983. Section 8.3.1 of the Safety Evaluation Report stated that "Each 4.16-kV ESF (Engineered Safety Feature) bus is normally connected to two offsite power sources, designated as preferred and alternate power supply..." and,
- Although the ECR described the change as taking advantage of system redundancy similar to the design of the EDGs, the inspector noted that a TS Action is required to be entered for one EDG being inoperable.

The inspectors determined that the modification of the TS bases appeared to be in conflict with the requirements of TS LCO 3.8.1.1 through the application of SR 4.8.1.1.1.b. Therefore, it appeared that the change should have required a change to the TS, which would have required NRC review. Making the TS bases change without changing the TS appeared to be contrary to 10 CFR 50.59 (c)(1)(i) which states that "a licensee may make changes in the facility as described in the final safety analysis report...without obtaining a license amendment pursuant to [paragraph] 50.90 only if a change to the technical specifications incorporated in the license is not required." In addition, the changes made to the TS bases appeared to be contrary to TS 6.8.4.h, "Technical Specification Bases Control Program," which contains similar requirements.

Exelon acknowledged the inspectors observations and agreed to provide additional information to show that the changes made to the TS bases did not require prior NRC approval. Pending the review of the additional information to be provided by Exelon, this issue is unresolved. **(URI 05000352, 353/2008005-01, Changes to Technical Specification 3.8.1 Bases)**

1R19 Post-Maintenance Testing (71111.19 - 6 samples)

a. Inspection Scope

The inspectors reviewed the six post-maintenance tests (PMTs) listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed Exelon's test procedures to verify that the procedures adequately tested the safety functions that may have been affected by the maintenance activity, and that the acceptance criteria in the procedures were consistent with information in the licensing and design basis documents. The inspectors also witnessed the test or reviewed test data to verify that the results adequately demonstrated restoration of the affected safety functions. The documents reviewed are listed in the Attachment. The inspectors performed the following samples:

- C0226609, Replace main steam isolation valve logic relays;
- A1684886, Scram Discharge Volume Drain Primary Containment Isolation Valve actuator leak repair;
- C0226733, Repair Primary Containment Isolation Valve Actuator;
- C0226197, Rebuild Auxiliary Equipment Room Differential Pressure Control Damper;
- C0226274, Replace EDG D13 K1 contactor with new model; and
- R0856209, Unit 1 'A' RHR pump minimum flow valve (HV-051-1F007A), breaker preventive maintenance.

b. Findings

Introduction: The inspectors identified an NCV of Technical Specification 6.8.1, "Administrative Controls-Procedures", because Exelon did not maintain adequate maintenance procedures associated with work performed on the Unit 2 Nuclear Steam Supply Shutoff System (NSSSS).

Description: On October 14, 2008, maintenance personnel performed time response testing of the logic circuitry associated with the IB channel of Unit 2 NSSSS with unsatisfactory results. Technical Specification Limiting Condition for Operation 3.3.2, "Isolation Actuation Instrumentation," requires the isolation system instrumentation response time associated with Main Steam Line Flow-High to be less than or equal to 0.5 seconds. Because the response time for this function was greater than allowed by TS, Exelon replaced several relays in the logic channel per Work Order (WO) C0226609. Post-maintenance surveillance testing was performed on the IB channel per TS SR 4.3.2.3, which verifies time response for the channel is within TS allowed limits. The channel satisfactorily passed the post-maintenance test and was returned to an operable status later that day.

On October 15, 2008, the inspectors reviewed the post-maintenance testing performed for the maintenance. During the review the inspectors noted that one of the replaced relays (B21H-K18D) was common to the IIB channel of the NSSSS. The inspector

questioned whether response time testing the IIB channel was appropriate because the common relay was replaced. Exelon concluded that response time of IIB channel could have been affected by the replacement of relay B21-K18D.

Meanwhile, on October 15, similar maintenance and testing was completed on the Unit 2 IA NSSSS channel per WO C0225812. During the maintenance relay B21-K18A (similar to B21-K18D on the IB channel) was replaced. This relay shared common logic with the IIA channel, but post-maintenance testing was only performed on the IA channel. Operators initially declared the NSSSS system operable upon satisfactory completion of the IA channel post-maintenance test. However, upon notification of the inspectors' questions regarding the adequacy of post-maintenance testing, operators declared the IIA channel inoperable at around 7:00 p.m. Exelon performed the required testing on the IIA channel to demonstrate the response time was within TS allowed limits. The results of the testing were satisfactory and the channel was declared operable on October 16, 2008 at 11:03 a.m.

For the IIB channel, Exelon performed an evaluation of data from past and recent testing. Conservative summation times were used to conclude that TS required response times were met.

The inspectors determined that Exelon's failure to provide complete and accurate work packages (C0226609 and C0225812) to adequately test the response times of the Unit 2 NSSSS logic channels following relay replacements was a performance deficiency.

Analysis: This finding was more than minor because it was associated with the Procedure Quality attribute of the Mitigating System cornerstone, and affected the Mitigating System cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. As a result of the inadequate PMT, additional unavailability was accrued, and an engineering evaluation was required to demonstrate satisfactory response times. The inspector assessed the finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination Process for Reactor Inspection Findings for At-Power Situations" and determined the finding to be of very low safety significance (Green) because it did not represent a loss of safety function.

This finding has a cross-cutting aspect in Human Performance, Resources, because Exelon did not provide complete and accurate work packages to assure nuclear safety (H.2(c)). This resulted in the affected channels of the NSSSS being returned to service without all the required post-maintenance testing being performed to demonstrate operability.

Enforcement: Technical Specification 6.8.1 states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures as recommended in NRC Regulatory Guide (RG) 1.33, Appendix A, February, 1978. NRC Regulatory Guide 1.33, Appendix A, Section 9, requires procedures for the performance of maintenance. Contrary to the above, on October 14 and October 15, 2008, corrective work orders C0226609 and C0225812 were performed on Unit 2 to replace Main Steam Line Flow – High NSSSS logic relays, and did not contain adequate procedural steps to assure all required post-maintenance testing was performed to establish operability. Specifically, although C0226609 and C0225812 replaced relays that could have affected the time responses of the IIB and IIA channels, respectively, the work orders did not include steps to test the channels to assure that the time response remained within

Technical Specification allowed limits. As a result, additional unavailability was accrued, and an engineering evaluation was required to demonstrate satisfactory response times. Corrective actions included testing the missed relays and performing system evaluations. Because the finding is of very low safety significance and has been entered into Exelon's CAP as Issue Report (IR) 831482 and 831567, this violation is being treated as a non-cited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000353/2008005002, Inadequate Post-Maintenance Test following Containment Isolation System Relay Replacement)**

1R22 Surveillance Testing (71111.22 - 5 samples)

a. Inspection Scope

The inspectors either witnessed the performance of, or reviewed test data for, five surveillance tests (STs) associated with risk-significant SSCs. The reviews verified that Exelon personnel followed TS requirements and that acceptance criteria were appropriate. The inspectors also verified that the station established proper test conditions, as specified in the procedures, that no equipment preconditioning activities occurred, and that acceptance criteria were met. The documents reviewed are listed in the Attachment. The inspectors reviewed STs for the following systems and components:

- ST-5-041-800-1, Unit 1 Reactor Coolant System Chemistry Sample, Revision 19;
- ST-6-092-365-0, Inoperable Unit 1 Safeguard Power Supply Actions, Units 1 and 2;
- ST-2-041-911-2, NSSSS Main Steam Line Flow-High; Division 11b Channel D Response Time Test;
- ST-6-011-232-0, 'B' Loop ESW Pump, Valve and Flow Test (In-service test); and
- ST-6-107-596-1(2), Drywell floor drain supply equipment drain tank surveillance.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems and Barrier Integrity Cornerstone PIs

The inspectors sampled Exelon's submittal of the Mitigating Systems and Barrier Integrity cornerstone PIs listed below to verify the accuracy of the data recorded from October 2007 through September 2008. The inspectors utilized performance indicator definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 5, to verify the basis in reporting for each data element. The inspectors reviewed various documents, including portions of the main control room logs, issue reports, power history curves, work orders, and system derivation reports. The inspectors also discussed the method for compiling and reporting performance indicators with cognizant engineering personnel and compared graphical representations from the most recent performance indicator (PI) report to the raw data to verify that the report correctly reflected the data. The documents reviewed are listed in the Attachment.

Cornerstone: Mitigating Systems (71151 - 2 samples)

- Units 1 and 2 MSPI Cooling Water

Cornerstone: Barrier Integrity (71151 - 4 samples)

- Units 1 and 2 Reactor Coolant System Leakage
- Units 1 and 2 Reactor Coolant System Activity

b. Findings

No findings of significance were identified.

.2 Occupational Exposure Control Effectiveness

a. Inspection Scope (71151 - 1 sample)

The inspector reviewed implementation of the licensee's Occupational Exposure Control Effectiveness PI Program for the period September 2007 through September 2008. Specifically, the inspector reviewed electronic dosimetry alarm reports, issue reports, and associated documents, for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators. This inspection activity represents the completion of one (1) sample relative to this inspection area; completing the annual inspection requirement.

b. Findings

No findings of significance were identified.

.3 RETS/ODCM Radiological Effluent Occurrences

a. Inspection Scope (71151 - 1 sample)

The inspector reviewed relevant effluent release condition reports for the period September 2007 through September 2008, for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences that exceed 1.5 mrem/qtr whole body or 5.0 mrem/qtr organ dose for liquid effluents; 5mrads/qtr gamma air dose, 10 mrad/qtr beta air dose, and 7.5 mrads/qtr for organ dose for gaseous effluents. This inspection activity represents the completion of one (1) sample relative to this inspection area; completing the annual inspection requirement.

The inspector reviewed the following documents to ensure the licensee met all requirements of the performance indicator.

- Monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- Quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases; and
- Dose assessment procedures.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (CAP)

.1 Review of Items Entered into the Corrective Action Program

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors screened all items entered into Limerick's corrective action program. The inspectors accomplished this by reviewing each new condition report, attending management review committee meetings, and accessing Exelon's computerized database.

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope (71152 - 1 sample)

As required by inspection procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of Exelon's CAP and associated documents to identify whether trends existed that would indicate a more significant safety issue. The review considered the period of July through December 2008 and was focused on repetitive equipment issues. The results of routine inspector CAP item screening, Exelon's trending efforts, and human performance results were also considered. The inspectors reviewed issues documented outside the normal CAP such as Plant Health Committee reports including the Top Ten Equipment Issues List, the Plant Health Committee Issues List, and the Open Action Items List. The inspectors compared and contrasted their results with the results contained in the Limerick Generating Station Performance Trending reports for the third quarter 2008.

b. Findings and Observations

No findings of significance were identified. The inspectors identified a negative trend in Exelon's maintenance rule program. During the review period the inspectors identified several issues associated with the evaluation of equipment issues which resulted in missed and/or improper functional failure (FF) or maintenance preventable functional failure (MPFF) determinations as follows:

- IR 718479 was written due to an issue with the Redundant Reactivity Control System (RRCS). This issue was reviewed by the Reactor Protection System manager and determined to not be a FF for that system; however the system manager recognized that the issue should be reviewed by the RRCS manager as well. Due to an administrative error, the IR was closed out before the RRCS system manager reviewed the issue. This was later identified by the inspectors, and further review by Exelon determined the failure was a FF for the RRCS system. Exelon placed this issue into the CAP as IR 834878.
- IR 800295 was written due to a failed surveillance related to low frequency associated with EDG D14. Due to an administrative error, the IR was closed to an investigation related to VAR swings associated with the same EDG. The

inspectors identified that, as a result of closing the IR, the low frequency event was never reviewed to determine if it was a FF. Exelon placed this issue into the CAP as IR 821372. Subsequent evaluation determined that the low frequency event was not a FF.

- IR 798687 was written due to an issue related to VAR swings on EDG D14 during surveillance testing. The investigation of the issue determined that the failure was not a FF based on a preliminary investigation determination that the VAR swings would occur only while the EDG is in the test mode. However, further investigation of the issue determined that the VAR swings were caused by erratic operation of the voltage regulator due to vibrations. The inspectors identified that the FF determination was not re-investigated based on the final results of the final apparent cause evaluation. Exelon placed this issue into the CAP as IR 824522. Subsequent evaluation of the issue concluded that the failure was a FF but not a MPFF. However, the inspectors pointed out notable differences between the conclusions of the MPFF determination and the apparent cause evaluation for the failure. Based on the inspector's observation, the erratic operation of the voltage regulator was determined to be a MPFF.
- IR 751491 was written due to an issue associated with the EDG D14 voltage regulator (K1 contactor failure). The issue was determined to not be a FF by the system manager based on the failure occurring when the EDG was not required to be available (i.e., during a refueling outage). The inspectors questioned this determination because the K1 contactor failure could have occurred during a true demand. Exelon placed this issue into the CAP as IR 817091. Subsequent evaluation determined that the failure was a FF.
- IR 801316 was written due to a "B" main control room (MCR) chiller trip in July 2008. The licensee's investigation determined the cause of the trip was a failed capacity control module (CCM). The issue was reviewed by the system manager and determined to be a functional failure, but not a MPFF. The inspectors challenged that the failure should be a MPFF, because there was a previous opportunity to establish preventative maintenance for this component. Specifically, the inspectors identified that a 2A drywell chiller CCM failed in 2005 (IR 348392), and the licensee's extent-of-condition review recognized that the four drywell chillers and two control room chillers all had CCMs that operated similarly to the failed CCM. The licensee established preventive maintenance for the drywell chiller CCMs, but failed to establish a PM for the control enclosure chillers. The system manager agreed to reevaluate IR 801316, and this review is ongoing.

The inspectors determined that each of the individual issues was minor. However, because of the quantity of issues identified during the review period, the issues indicated a negative trend in maintenance rule program function failure determinations. As a result of some of the above issues identified by the inspectors, as well as other issues identified by the site's Nuclear Oversight organization, Exelon wrote IR 840929 to perform a common cause analysis of the collective issues.

### .3 Annual Sample: Valve HV-051-2F024A Internal Failure

- a. Inspection Scope (71152 - 1 sample)

The inspectors reviewed the licensee's corrective actions associated with IR 654041, regarding Unit 2 RHR Suppression Pool Cooling Valve HV-051-2F024A stem-to-disk separation. The inspectors reviewed system operating procedures, applicable technical evaluations, system drawings, work orders, design basis documents, and related internal and external operating experience to ensure that the licensee exercised appropriate actions in accordance with the requirements of their corrective action program.

b. Findings and Observations

No findings of significance were identified. The inspectors confirmed that the valve failure mechanism was unique to the subject valve and did not adversely affect the safety function of the valve. Additionally, the inspectors verified that comparable valves were evaluated by the licensee to ensure that similar failure mechanisms were unlikely and would not adversely affect the safety function of the specific systems. The inspectors also confirmed that the licensee appropriately categorized and prioritized this issue in their corrective action program.

4OA3 Event Follow-up (71153 - 1 sample)

a. Inspection Scope

The inspectors reviewed plant parameters and evaluated performance of plant equipment when Unit 2 performed an unplanned downpower to approximately 25 percent on October 28, 2008. The downpower was required due to the Unit 2 drywell temperature exceeding the TS allowed limit, which was caused by the failure of the 2A Drywell Chiller while the 2B Drywell Chiller was OOS for planned maintenance. Operators returned the plant to full RTP later that day following the restoration of the 2B Drywell Chiller and subsequent lowering of drywell temperature to below the TS allowed limit. The inspectors communicated the event to appropriate regional personnel and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of additional reactive inspection activities. The inspectors verified that Exelon entered the issue into the CAP for resolution.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.2 Implementation of Temporary Instruction (TI) 2515/176 – Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing (TI-2515/176 - 1 sample)

a. Inspection Scope

The objective of TI 2515/176, “Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing,” was to gather information to assess the adequacy of nuclear power plant EDG endurance and margin testing as prescribed in plant-specific TS. The inspectors reviewed emergency diesel generator ratings, design basis event load calculations, surveillance testing requirements, and emergency diesel generator vendor’s specifications and gathered information in accordance with TI 2515/176.

The inspector assessment and information gathered while completing this TI was discussed with licensee personnel. This information was forwarded on to the Office of Nuclear Reactor Regulation for further review and evaluation.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On January 9, 2009, the resident inspectors presented the inspection results to Mr. C. Mudrick and other members of his staff. The inspectors confirmed that proprietary information was not included in the inspection report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT**Exelon Generation Company

C. Mudrick, Site Vice President  
 E. Callan, Plant Manager  
 D. DiCello, Manager, Radiation Protection  
 R. Dickinson, Director, Engineering  
 P. Gardner, Director, Operations  
 R. Kreider, Manager, Regulatory Assurance  
 M. Jesse, Manager, Nuclear Oversight  
 S. Bobbyock, Manager, Plant Engineering  
 D. Palena, Manager, Electrical Engineering Systems  
 E. Dennin, Shift Operations Superintendent  
 C. Gray, Manager, Radiological Engineering  
 R. Harding, Engineer, Regulatory Assurance  
 J. Berg, System Manager, HPCI  
 J. George, System Manager, RHR  
 M. Gift, System Manager, Radiation Monitoring Systems  
 L. Lail, System Manager, EDG  
 R. Gosby, Radiation Protection Technician, Instrumentation  
 D. Malinowski, Simulator Instructor  
 J. Sprucinski, Senior Radiation Protection Technician  
 D. Dicello, Manager Radiation Protection  
 R. Harding, Regulatory Assurance  
 J. Risteter, Radiation Protection Manager  
 D. Wahl, Environmental Scientist  
 C. Rich, Manager of Nuclear Training  
 J. Hunter, Operations Training Manager  
 D. Malinowski, Supervisor Requalification Training  
 W. Ward, Exam Developer  
 D. Monahan, Simulator Operator/Instructor  
 R. Harding, Licensing  
 J. Mihm, Instructor/Evaluator  
 S. Cohen, Instructor/Evaluator

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**Opened

05000352, 353/2008005-01	URI	Changes to Technical Specification 3.8.1 Bases (Section 1R18.2)
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Closed

TI 2515/176	TI	Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing (Section 4OA5.2)
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Opened and Closed

05000353/2008005-02	NCV	Inadequate Post-Maintenance Test following Containment Isolation System Relay Replacement (Section 1R19)
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Discussed

None

**LIST OF DOCUMENTS REVIEWED**

**Section 1R01: Adverse Weather Protection**

Procedures

GP-7, Cold weather preparation and operation, Revision 37  
1S08.8A(COL-2), Lineup for #1 CST and associated pipe freeze protection, Revision 4  
S08.8.A, RWST, #1 and #2 CST Freeze Protection, Revision 10

Issue Reports and Action Requests

IR 835716, Standby liquid control heat trace trouble  
IR 822546, Unit 2 A Standby liquid control pump suction low temperature  
IR 831301, NOS identified weaknesses in winter readiness program

Miscellaneous

Maintenance Manpower Planning System Tier 2 AR's, Winter Readiness  
R1089680, Plant Heating and Auxiliary Steam System

**Section 1R04: Equipment Alignment**

Procedures

HPCI System health Overview (LIM-01) 1555.1.A Equipment Alignment for Automatic Operation of HPCI System, Revision 25  
Technical Specification ¼ 5.1 ECCS Operating, Amendment 192  
UFSAR 6.3.2.2.1., High Pressure Coolant Injection System, Revision 14  
2S92.1.N (COL-1), Equipment Alignment for 2A Diesel Generator operation, Rev. 23

Issue Reports and Action Requests

IR 202873, Update Reference Operability Tech Evaluation for EDG Lube Oil 2592.1N (Col1), Equipment Alignment for 2A Diesel Generator Operation, Revision 23  
IR 837503, Jacket water coolant pump has oil leak

Miscellaneous

M-51, Piping and Instrumentation Drawing RHR System 1 S51.1.A (COL-2), Equipment Alignment for Automatic Orientation of the RHR System in the LPCI mode – B subsystem, Revision 2

**Section 1R05: Fire Protection**

Procedures

Pre-fire Plant F-R-108, Fire Area 33

Pre-fire Plant F-R-109, Fire Area 34  
Pre-fire Plant F-R-179, Fire Area 56  
Pre-fire Plant F-R-180, Fire Area 57  
Pre-fire Plant F-R-475, Fire Area 68

Issue Reports and Action Requests

IR 788507, AG-CG-200 Revision for IN 2007-26  
NRC IN 2007-26, Combustibility of Epoxy Floor Coatings at Nuclear Power Plants

**Section 1R07: Heat Sink Performance**

Procedures

RT-1-011-390-0, EDW Room Cooler Heat Transfer Performance Calculation Test, Revision 005  
RT-2-011-394-1, 1EV211 Core Spray Room Cooler Air to Water Heat Transfer Test, Revision 7  
RT-2-011-391-2, 2BV210 R, RHR Room Cooler Air to Water Heat Transfer Test, Revision 7

Issue Reports

IR 845146, 1E CS Room cooler heat transfer performance  
IR 847711, Core spray unit cooler heat transfer test EOC  
IR 849014, Impact review for CS room heat load change not performed

**Section 1R11: Licensed Operator Requalification Program**

Issue Reports

IR 814656, Level 3 Procedure Non-compliance  
IR 732554, Exceeded TS required Cool down Rate  
IR 750227, SRM Inoperative While CR Moved

Training and Other Procedures

TQA-AA-150, Rev 1, Operator Training Programs  
N-LP-PIMS-LREACTQM, Rev 13, Activation and Reactivation Guide for SRO and RO  
OP-AA-105-102, Rev 9, NRC Active License Maintenance  
HR-AA-07-101, NRC Licensed Operator Medical Examination  
OP-AA-105-101, Administrative Process for NRC License and Medical Requirements

Scenario Tests

LSES-2005, Rev 6                      LSES-2006, Rev. 6  
LSES-3007, Rev 6                      LSES-5002, Rev 3  
LSES-2007, Rev 8                      LSES-5005, Rev 5  
LSES-2004, Rev 6                      LSES-3003, Rev 8

Job Performance Measures

LLOJPM0522              LLOJPM0049              LLOJPM0031  
LLOJPM0107              LLOJPM0129              LLOJPM0525  
LLOJPM0111              LLOJPM0522              LLOJPM0200  
LLOJPM0210              LLOJPM0207              LLOJPM0262  
LLOJPM0261              LLOJPM0211              LLOJPM0097  
LLOJPM0098              LLOJPM0099

Simulator Documents

TQ-AA-302 rev 7 (Simulator Testing and Documentation)

TQ-AA-303 rev 5 (Controlling Simulator Core Updates and Thermal-Hydraulic Model Updates)

Listing of SWRs Generated Since October 2007

Listing of all Simulator Tests Performed in 2007 and 2008

Transient Tests:

Plant Transient Review (PTR) PTR040605 Loss of the 20 Bus (Offsite bus) - compared actual event to simulator

PTR010408 Plant Event Review – Feedwater Heater 6A Removal from Service

PTR091805 Plant Transient Review – Trip of 2C Condensate Pump on 9/18/2005

Transient Test 7.08 Maximum Size Reactor Coolant System Rupture Combined with a Loss of All Offsite Power

Transient Test 7.02 Trip of All Feedwater Pumps

Malfunction/Transient Tests:

5.02A Recirc Loop A Rupture at 100 percent Severity

Core Performance Tests (BOC)

ST-6-107-884-1 Neutron Monitoring System Overlap Verification on Startup

ST-3-107-870-1 Shutdown Margin Determination

ST-3-107-800-1 Control Rod Density Comparison (Reactivity Anomalies)

Other Documents Reviewed

RT-6-000-994-0, Rev 12, Verification of Operator Qualifications

Curriculum Review Committee 4<sup>th</sup> Quarter Meeting Minutes, November 3, 2008

IR 847625

**Section 1R12: Maintenance Effectiveness**

Procedures

EPRI Technical Report 1011218, Basler SER-CB Voltage Regulators for Emergency Diesel Generators, Final Report, December 2005

Issue Reports

IR 829844, A Cont. Encl. Chiller Tripped

IR 348392, 2 A Drywell Chiller Tripping on Low from Temp

IR 755784, High Condenser Trip of B Control Chiller

IR 798868, OA MCR Chiller Tripped on Low Refrigerant Temp

IR 801316, B MCR Chiller Tripping Upon Start-Up

IR 808020, OB-K112 Trips on Low From Temp

IR 829990, Chiller Tripped on Low Refrigerant Temp

IR 844630, PAR Meeting Identifies Trend in Chiller Performance

IR 836393, NRC Concern – Maintenance rule effectiveness for RRCS

IR 834878, A IR was misclassified as not a functional failure

IR 836102, Unit 2, Div 2 RRCS Test Fault

IR 620856, Unit 2 Automatic Scram

IR 792084, Unit 2 Div II RRCS test fault

IR 585323, Received Div 2 RRCS out of service alarm

IR 602178, FHLOI found defective during PM

IR 603069, Defective card found during RRCS card inspection PM

IR 608695, Div II RRCS trouble not resetting  
IR 544186, Div I RRCS out of service alarm Unit 2  
IR 646248, Emergent PRA – U/1 RRCS self test fault and will not reset  
IR 718479, Div I RRCS alarms received in the MCR  
IR 735773, Div II RRCS trouble

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

Technical evaluation 839237-05, Determine Availability of Unit 1 HPCI during Replacement of Square Root Converter  
Operational Technical Decision Making Issue 55-08-001, Unit 1 HPCI Flaw Circuit Repair during Offsite 10 Bus System Outage

**Section 1R18: Plant Modifications**

Procedures

Engineering Change LG-99-00682, Limerick Technical Specification Bases Changes to ¾.8, Offsite Power  
Engineering Change Request LG-06-00227, Vibration Monitoring for HV-51-2F050A(B), Revision 1  
CC-AA-102, Design Input and Configuration for Change Impact Screening, Revision 10  
CC-AA-112, Temporary Configuration Changes, Revision 10  
Tech Spec 3 / 4.5.1 ECCS Operating, Amendment 192

Miscellaneous

Drawing #051-01, Revision 1  
UFSAR Section 6.3, Emergency Core Cooling Systems, Revision 14  
Temporary Change 08-05-71-0 for ST-6-011-232-0

**Section 1R19: Post Maintenance Testing**

Procedures

ST-6-092-933-1, D13 Diesel Generator Governor and Voltage Regulator Post Maintenance Testing, Rev. 6, completed 11-12-08  
AR 1684886, Evaluation 01, Evaluate PMT Requirement for Diaphragm Change Out

**Section 1R22: Surveillance Testing**

Procedures

CY-LG-120-105, Obtaining Samples from and Operation of the Reactor Enclosure Sample Station, Revision 7  
ST-5-041-800-1, Revision 19, Reactor Coolant Chemistry  
ST-6-107-596-2, Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log, Revision 22

Issue Reports and Action Requests

IR 826190, Wrong Flow Rate Listed in ST-6-011-232-0  
IR 834490, ESW flow rates in most recent P,V&F not proven

**Section 40A1: Performance Indicator (PI) Verification**

Procedures

CY-LG-120-105; Obtaining Samples from and Operation of the Reactor Enclosure Sample Station, Revision 7  
 CY-LG-120-110; Chemistry Sampling and Analysis, Revision 9  
 CY-LG-120-601; Determination of Dose Equivalent I-131, Revision 2  
 ER-AB-331-1006; BWR RCS Leakage Monitoring and Action Plan, Revision 1  
 LS-AA-2001; Collecting and Reporting of NRC Performance Indicator Data, Revision 11  
 LS-AA-2100, Monthly Data Elements for NRC Reactor Coolant (RCS) Leakage, Revision 5  
 LS-AA-2200; Mitigating System Performance Index Data Acquisition and Reporting, Revision 2  
 ST-5-041-885-1; Dose Equivalent I-131 Determination, Revision 17  
 ST-5-041-885-2; Dose Equivalent I-131 Determination, Revision 13  
 ST-6-107-596-1, Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1,2,3, Revision 19  
 ST-6-107-596-2, Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1,2,3, Revision 22

Issue Reports and Action Requests

IR 707262, June 2007 ESW MSPI Unavailability Data Incorrect  
 IR 732708, RHRSW System MSPI Data Errors

Miscellaneous

Main Control Room Operator Logs 10/1/2007-10/5/2008  
 NEI 99-02; Regulatory Assessment Performance Indicator Guideline, Revision 5  
 Reactor Oversight Program MSPI Basis Document, Limerick Generating Station, Revision 1  
 U1 MSPI Cooling Water System Unavailability Index, Feb & Aug 2008  
 U2 MSPI Cooling Water System Unavailability Index, Feb & Aug 2008  
 U1 MSPI Cooling Water System Unreliability Index, Feb & Aug 2008  
 U2 MSPI Cooling Water System Unreliability Index, Feb & Aug 2008

Procedures

ST-5-061-810-0, Rev. 22	Batch Liquid Waste Releases Monthly Composite Analysis and Liquid Release Dose Calculations and Setpoint Determination for RISH-063-OK604
ST-5-076-826-0, Rev. 8	Monthly Gaseous Release Dose Calculations
LS-AA-2150, Rev. 5	Monthly Data Elements for RETS/ODCM Radiological Effluent Occurrences
LS-AA-2140, Rev. 4	Monthly Data Elements for NRC Occupational Exposure Control Effectiveness

**Section 40A2: Identification and Resolution of Problems**

Issue Reports and Action Requests

IR 654041, Dual Indication for HV-51-2F024A During Stroke Close  
 IR 771716, HV-51-2F024A Diagnostic Test Rescheduled  
 IR 774661, Inspect Valve Internals No Later Than 1R13  
 IR 774874, Inspect Valve Internals No Later Than 2R11

IR 766331-03, Evaluation of HV-051-2F024A with Degraded Internals  
AR 1625952, 2A RHR PP. Full Flow Test Return Valve.

### LIST OF ACRONYMS

ADAMS	Agencywide Documents Access Management System
AR	action request
CAP	Corrective Action Program
CCM	capacity control module
CFR	Code of Federal Regulations
CNO	Chief Nuclear Officer
ECR	engineering change request
EDG	emergency diesel generator
ESW	emergency service water
FF	functional failure
HPCI	high pressure coolant injection
IMC	Inspection Manual Chapter
IR	issue report
JPM	job performance measure
LCO	limiting condition operation
MCR	main control room
MPFF	maintenance preventable functional failure
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NSSSS	nuclear steam supply shutoff system
OSS	out of service
P&ID	pipng and instrumentation drawing
PARS	Publicly Available Records
PI	performance indicator
PMT	post-maintenance test
RCIC	reactor core isolation cooling
RG	Regulatory Guide
RHR	residual heat removal
RRCS	redundant reactivity control system
RTP	rated thermal power
SDP	significance determination process
SR	surveillance requirement
SSC	structure, system, component
ST	surveillance test
SWR	simulator work requests
TI	temporary instruction
TS	technical specification
UFSAR	updated final safety analysis report
URI	unresolved item
WO	work order