

July 24, 2006

Mr. Christopher M. Crane  
President and CNO  
Exelon Nuclear  
Exelon Generation Company, LLC  
200 Exelon Way  
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION - NRC INTEGRATED INSPECTION  
REPORT 05000352/2006003, 05000353/2006003

Dear Mr. Crane:

On June 30, 2006, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station Units 1 and 2. The enclosed integrated report documents the inspection findings which were discussed on July 14, 2006, with **Mr. C. Mudrick** 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.

This report documents one NRC-identified finding of very low safety significance (Green). This finding was determined to involve a violation of an NRC requirement. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating this violation as a non-cited violation (NCV), in accordance with Section VI.A.1 of the NRC's 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 the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator Region I; the Director, Office 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 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the

C. Crane

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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,

**/RA/**

James M. Trapp, Chief  
Projects Branch 4  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000352/2006003, 05000353/2006003  
w/Attachment: Supplemental Information

cc w/encl:

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U.S. NUCLEAR REGULATORY COMMISSION

REGION 1

Docket Nos: 50-352, 50-353

License Nos: NPF-39, NPF-85

Report No: 05000352/2006003 and 05000353/2006003

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Evergreen and Sanatoga Roads  
Sanatoga, PA 19464

Dates: April 1, 2006 through June 30, 2006

Inspectors: S. Hansell, Senior Resident Inspector  
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Approved by: James M. Trapp, Chief  
Projects Branch 4  
Division of Reactor Projects

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## SUMMARY OF FINDINGS

IR 05000352/2006-003, IR 05000353/2006-003; 04/01/2006 - 06/30/2006; Limerick Generating Station, Units 1 and 2; Licensed Operator Requalification Program

The report covered a 3-month period of inspection by resident inspectors and announced inspections by a health physics inspector, a security inspector, and operations inspectors. Inspectors identified one Green non-cited violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

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

#### **Cornerstone: Barrier Integrity**

Green. The inspectors identified a Green non-cited violation (NCV) of 10CFR55.59 (a)(2)(ii) for an inadequate annual operating test that was administered at Limerick. Exelon procedures and commitments made by the licensee in 1991 require questions on job performance measures (JPMs) to explore the differences, if any, in task performance between Limerick and Peach Bottom. At least three of the five JPMs had significant differences in the way the task is performed at Limerick versus the same task at Peach Bottom. These three JPMs should have had questions to explore these differences, but did not. Exelon has entered this issue into their corrective action program for resolution.

The inspectors determined that the inadequate annual operating test administered at Limerick was more than minor because it was associated with the human performance attribute and affected the barrier integrity cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radio nuclide releases caused by accidents or events. The finding is of very low safety significance (Green) because the inadequate annual operating test did not have an adverse impact on operator actions such that safety related equipment was made inoperable during normal operations or in response to a plant transient. (Section 1R11)

### B. Licensee-Identified Violations.

None.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began this inspection period at full rated thermal power and operated at full power for the entire report period except for a planned maintenance shutdown to repair the 1A recirculation pump seal. The shutdown commenced on May 17, 2006. The unit returned to full power operation on May 22, 2006.

Unit 2 began this inspection period at full rated thermal power and operated at full power for the entire report period except for a planned power reduction to 65 percent on May 26, 2006 for completion of summer readiness activities. Unit 2 returned to 100 percent power on May 28, 2006.

### **1. REACTOR SAFETY**

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01 - 1 sample)

##### a. Inspection Scope

The inspectors reviewed Exelon's overall preparations and protection for summer weather. On June 8, 2006, the inspectors walked down portions of the service water system (including running service water pumps), circulating water pumps, station air compressors, main turbine lube oil cooling system, generator hydrogen cooling system, and the recirculation pump motor generator lube oil cooling system. These systems were selected because they could be affected by warm weather and could affect plant operations as an event initiator. The inspectors conducted a review of GP-7.1, "Summer Weather Preparation of Operation." This inspection satisfied one inspection sample for review of risk significant systems. All documents reviewed for each section of this inspection report are listed in the Attachment.

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment (71111.04)

##### .1 Partial Walkdown (71111.04Q - 3 samples)

##### a. Inspection Scope

The inspectors performed a partial walkdown of the following **three** systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors attempted to identify any discrepancies that could impact the function of the system, or increase risk. The inspectors reviewed applicable operating procedures, walked down control systems components, and verified that

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selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also verified that Exelon had properly identified and resolved equipment mitigation problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program.

- Unit 2 “D2” Core Spray System Room Cooler 2 DV211 During Room Cooler 2HV211 Maintenance
- Unit 2 Drywell Cooling System with Two Fans Out-of-Service
- Unit 1 RCIC System Following Sight Glass Corrective Maintenance

.2 Complete System Walkdown (71111.04A - 1 sample)

a. Inspection Scope

The inspectors completed one complete walkdown of the emergency service water (ESW) system to verify the functional capability of the system. The inspectors used Exelon procedures, drawings, and other documents listed in the Attachment to verify proper system alignment. The inspectors also verified ESW electrical power requirements, operator workarounds, and associated support system status. Operating pumps were examined to ensure that any noticeable vibration was not excessive, bearings were not hot to the touch, and the pumps were properly ventilated. The walkdowns also included evaluation of system piping and supports against the following considerations:

- Piping and supports did not show evidence of water hammer
- Oil reservoir levels appeared normal
- Hangers were functional
- Component foundations were not degraded

The inspectors reviewed outstanding maintenance work orders to verify that the deficiencies did not significantly affect ESW system function. In addition, the inspectors reviewed various issue reports (IRs) related to the ESW system to verify that Exelon identified and appropriately resolved any equipment alignment problems.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Protection - Tours (71111.05Q - 9 samples)

a. Inspection Scope

The inspectors conducted a tour of the nine areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that

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combustibles and ignition sources were controlled in accordance with Exelon's administrative procedures, fire detection and suppression equipment was available for use, and that passive fire barriers were maintained in good material condition. The inspectors also verified that compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with Exelon's fire plan.

- Auxiliary Equipment and Remote Shutdown Panel Rooms
- Unit 2 283' Elevation
- Emergency Service Water and Residual Heat Removal Service Water Spray Pond Pump House
- Unit 1 Drywell During "A" Recirculation Pump Seal Replacement
- Main Control Room and Peripheral Rooms
- Unit 2 217' Elevation
- Unit 2 253' Elevation
- Unit 1 Emergency Diesel Generator Compartments and Corridor
- Unit 2 Emergency Diesel Generator Compartments and Corridor

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspector observed a fire drill on the back shift of June 21, 2006. The inspector evaluated the fire brigade performance during the drill. Specifically, the inspector observed:

- Five fire brigade (FB) members responded to the fire area in the expected time frame
- Each FB member donned the applicable turnout gear
- Self-contained breathing apparatus (SCBAs) were available and properly worn
- FB Leader exhibited command of the fire brigade, had a copy of the pre-fire plan, and utilized pre-fire plan strategies
- FB leader maintained command and control
- FB leader maintained communications with the Main Control Room
- Fire hoses were capable of reaching fire hazard and were laid appropriately
- The fire brigade used the "two person rule"
- FB brought sufficient fire fighting equipment to scene
- FB checked for and retrieved victims
- Drill personnel followed the scenario and all drill objectives were met
- All equipment was returned to the locker
- Exelon performed a post-drill critique

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The inspector completed an independent assessment of the Emergency Action Level (EAL) classification made by the Shift Manager in response to the postulated fire scenario. In addition, the inspector verified that a random sample of SCBA gear used by the Fire Brigade was properly maintained in accordance with Exelon's program.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 2 samples)

.1 External Flooding

a. Inspection Scope

The inspectors reviewed the design, material condition, and procedures for coping with external flooding on June 27 and 28, 2006, after days of heavy rain. The inspectors reviewed the applicable design documents, including applicable sections of the Updated Final Safety Analysis Report (UFSAR), and station procedures, including Exelon procedure SE-4-3, "Flooding External to the Power Block." The inspectors also performed a walkdown of the site perimeter and monitored the Schuylkill River level at the river water intake pump house to ensure the plant operation would not be impacted. The river water level did not reach the pump motor floor level.

b. Findings

No findings of significance were identified.

.2 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected plant design features and Exelon procedures intended to protect the Unit 2 Safeguards Systems Access Room on the 217' elevation from internal flooding events. The inspectors reviewed various design documents, the Updated Final Safety Analysis Report (UFSAR), and abnormal operating procedures. The inspectors conducted various walkdowns of the area and reviewed Exelon drawings to identify areas and equipment that may be affected by internal flooding. In addition, the inspectors reviewed issue reports and corrective actions regarding previous flooding issues to verify the adequacy of the corrective actions.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07A - 1 sample)

a. Inspection Scope

The inspectors reviewed the results of Exelon's inspections of the D23 intercooler water heat exchanger and the jacket water heat exchanger conducted in conjunction with the two-year overhaul of the diesel generator. As both heat exchangers were opened for cleaning and inspection, the inspectors conducted a walk down on June 6, 2006 to verify the cleanliness of the tubes and physical condition of the portions of the heat exchangers that are in contact with emergency service water. The inspectors also reviewed the results of performance and monthly surveillance tests to assess the capability of the heat exchangers to operate as designed. The inspector reviewed Exelon's response to Generic Letter (GL) 89-13 and their implementation of a testing and maintenance program for safety related heat exchangers to meet the requirements of GL 89-13.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program (71111.11 - 1 quarterly sample)

.1 Biennial Review

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, Revision 9, "Operator Licensing Examination Standards for Power Reactors," Inspection Procedure Attachment 71111.11, "Licensed Operator Regualification Program," and NRC Manual Chapter 0609, Appendix I, "Operator Regualification Human Performance Significance Determination Process (SDP)," as acceptance criteria.

The inspectors reviewed documentation of operating history related to fuel handling Limited Senior Reactor Operators (LSROs) since the last regualification program inspection. The inspectors also discussed facility operating events with the resident staff. Documents reviewed included NRC inspection reports and licensee condition reports (CRs) that involved human performance issues for LSROs to ensure that operational events were not indicative of possible training deficiencies.

The inspectors reviewed one set of five job performance measures (JPMs) and the written exam administered during this current LSRO exam cycle, as well as the exams administered the previous cycle to ensure the quality of these exams. Limits on test item repetition did not exceed the criteria established in the Examination Standards and 10 CFR 55.59.

During this inspection, the inspectors observed the administration of operating examinations to all five licensed LSROs on the refueling floor as well as classroom

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JPMs at Limerick. The operating examinations consisted of one set of five JPMs administered to each individual. In addition, inspectors observed the administration of the written exam to the five LSROs. Inspectors reviewed the grading of the JPMs and the written exam on June 1, 2006.

The inspectors interviewed all five LSROs regarding the facility's policies and practices for administering examinations as well as the method and effectiveness of the Licensee Feedback System.

The inspectors reviewed the Exelon's program for maintaining active LSRO licenses and ensuring the medical fitness of its LSROs. Inspectors assessed the facility and operator licensee's compliance with the requirements for maintaining license conditions in accordance with 10 CFR 55.53. Inspectors reviewed medical records for three (of five) of the LSROs as part of this process. In addition, inspectors reviewed reactivation records for all five existing LSROs for conformance with Exelon procedures and 10 CFR 55 requirements.

The inspectors assessed the effectiveness of the facility licensee's process for revising and maintaining its LSRO continuing training.

The inspectors reviewed training records for the 2005 and 2006 LSRO requalification cycles to ensure conformance with licensee procedure and 10 CFR 55 requirements. Since there were no failures on the 2005 LSRO exam, there were no remediation records that needed review.

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 inspector verified that:

- Individual failure rate on the walkthrough test (JPMs) was less than or equal to 20%. (Failure rate was 0.0%)
- Individual failure rate on the written exam was less than or equal to 20%. (Failure rate was 0.0%).
- More than 75% of the individuals passed all portions of the exam (100% of the individuals passed all portions of the exam).

#### b. Findings

##### Inadequate Annual Operating Test Administered at Limerick

Introduction: The inspectors identified a Green non-cited violation (NCV) of 10CFR55.59 (a)(2)(ii) in that Exelon did not include questions on the annual operating tests to explore the differences between JPMs performed at Limerick versus the same tasks at Peach Bottom.

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Description: The NRC clarified the requirement to ask questions on JPMs in a letter from the NRC to Philadelphia Electric Company (PECO) dated December 10, 1991. Since the Senior Reactor Operators - Limited to Fuel Handling (LSROs) are licensed to move fuel at both Limerick and Peach Bottom stations, this letter specifies the following: "Pursuant to 10 CFR 55.59 (a)(2) and 10 CFR 55.59 (c)(4)(I) licensed operators must successfully complete a requalification program that includes an annual operating test. In 10 CFR 55.4, the definition for cases where a license is issued for operation of two or more facilities, facility means all facilities identified in the license. Therefore, an operating test, as described in 10 CFR 55.45, requires that the test be applicable to all of the units for which the LSROs are licensed. The annual operating test Philadelphia Electric Company administers to the LSROs consists of Job Performance Measures (JPMs) tailored to the knowledge, skills and abilities required to perform refueling activities. The operating tests administered to multi-site licensed LSROs will have to include questions associated with each JPM that explore the difference, if any, between the task performed at the facility where the JPM was administered and the same task at the other facility. This will ensure that the operating test suffices as an examination for each facility."

Inspectors observed the 2006 annual operating examination at Limerick. The inspectors noted that no questions were asked at the conclusion of the JPM to explore the differences between performing the task at Limerick and how that same task would have been performed at Peach Bottom. At least three of the five JPMs had significant differences in the way the task was performed at Limerick versus the same task at Peach Bottom. These three JPMs should have had questions to explore these differences, but did not. The failure to ask questions has resulted in an operating test that only suffices as an adequate annual examination for Limerick.

Exelon implemented the commitment to ask followup questions in Exelon procedure TQ-AA-131, "Senior Reactor Operator - Limited Requalification Training." Section 4.10.2 of this procedure states "The annual operating examinations administered to the LSROs will include questions associated with each JPM that explore the differences, if any, between the task performed at the facility where the JPM was administered and the same task at the other similar facilities. This shall be done to ensure that the operating test suffices as an examination for each facility for which the individual holds a license." The 2006 LSRO exam did not satisfy the requirements of this procedure.

Analysis: The inspectors determined that the inadequate annual operating test administered at Limerick was more than minor because it was associated with the human performance attribute and affected the barrier integrity cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radio nuclide releases caused by accidents or events. The finding was evaluated using the Operator Requalification Human Performance SDP (MC 0609 Appendix I). The SDP, Appendix I, Block 10, requires the inspectors to determine if more than 20% of the individual operating test items reviewed by the inspector were unacceptable. In this case, the inspectors determined that at least 3 out of 5 (60%) of the JPMs administered on the examination were unacceptable because they had tasks that were performed

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differently at Peach Bottom and Limerick and no followup questions were asked to explore these differences. This has resulted in an annual operating examination that does not test both facilities. Therefore the answer to Block 10 was affirmative and indicates a finding of very low safety significance (Green).

Enforcement: 10 CFR 55.59 (a)(2)(ii) requires that the operating test as described in 10 CFR 55.45 be applicable to all of the units for which the LSRO's are licensed. Exelon procedure TQ-AA-131, Section 4.10.2, states "The annual operating examinations administered to the LSROs will include questions associated with each JPM that explore the differences, if any, between the task performed at the facility where the JPM was administered and the same task at the other similar facilities. This shall be done to ensure that the operating test suffices as an examination for each facility for which the individual holds a license." Contrary to the above, on May 30, 2006, the inspectors identified that Exelon administered an inadequate annual operating examination to its LSROs because no followup questions were asked to explore differences in how the task that was just performed at Limerick would have been performed differently at Peach Bottom. Because this finding was of very low safety significance and has been entered into the corrective action program under issue report 496375, this violation is being treated as an NCV, consistent with section VI.A.1 of the NRC enforcement policy. **(NCV 05000352, 05000353/2006003-01: Inadequate Annual Operating Test Administered at Limerick)**

## .2 Resident Inspector Quarterly Review

### a. Inspection Scope

On June 27, 2006, the inspectors observed a licensed operator requalification simulator scenario. The scenario included a reactor scram with a failure of control rods to insert and shutdown the reactor, one main steam isolation valve failed closed, the main generator tripped, and a subsequent loss of turbine bypass valve capability. The inspectors assessed the licensed operator performance and the training evaluator's critique. The inspectors discussed the results with operators, operations management, and training instructors. The inspectors also referred to the simulator scenario document and the emergency operating procedures listed in the Attachment.

### b. Findings

No findings of significance were identified.

## 1R12 Maintenance Effectiveness (71111.12 - 3 samples)

### a. Inspection Scope

The inspectors reviewed the three samples listed below for items such as:  
 (1) appropriate work practices; (2) identifying and addressing common cause failures;  
 (3) scoping in accordance with 10 CFR 50.65(b) of the maintenance rule (MR);

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(4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) classification and reclassification in accordance with 10 CFR 50.65 (a)(1) or (a)(2); and (8) appropriateness of performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified as (a)(1). Items reviewed included the following:

- Maintenance Rule Reviews Completed Late, IR 475860
- Inadvertent Half Scram During ST-2-042-645-1, IR 254625
- 2A Primary Containment Instrument Gas Compressor Tripped Due to Low Level, IR 501737

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 6 samples)

a. Inspection Scope

The inspectors reviewed the following six activities to verify that station personnel performed the appropriate risk assessments prior to removing equipment for work. The inspectors verified that Exelon performed risk assessments as required by 10 CFR 50.65 (a)(4), and that the assessments were accurate and complete. When Exelon performed emergent work, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors also verified the appropriate use of Exelon's risk assessment tool and risk categories.

- Unit 2 Drywell Coolers 2DV111, 2DV112, and 2DV212 Inoperable
- Unit 1 Suppression Chamber Air Temperature Reading Low, IR 482059
- Increasing Trend in Unit 1 Reactor Pressure, IR 478119
- Unit 1 Reactor Protection System Half-Scram due to APRM 2 Loss of Power to Voter Module
- Unit 1 'B' Core Spray Injection Line Surge Chamber Low Level Alarm, IR 503311
- '1A' RHR Heat Exchanger Bypass Valve Indication Failed, IR 502769

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 6 samples)

a. Inspection Scope

For the six operability evaluations described in the issue reports listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that Exelon

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properly justified Technical Specification (TS) operability and 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 function. In addition, the inspectors reviewed compensatory measures implemented to ensure that the compensatory measures worked as stated and the measures were adequately controlled. The inspectors also reviewed a sample of issue reports to verify that Exelon was identifying and correcting any deficiencies associated with operability evaluations.

- Unit 1 OPRM Missed Surveillance Test, IR 473549
- Unit 2 Jet Pump Performance Degradation, IR 478379
- HV-051-1F016A Exceeded Max Allowable Stroke Time, A1560534
- ESW Check Valve Has Excessive Leakage, IR 487356
- OPRM Function Not Full Tested During Calibration/Functional Surveillance Test, IR 490107
- Drywell Unit Cooler 202V212 Tripped on Magnetics, IR 473983

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the six post-maintenance tests 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, that the applicable criteria in the procedure were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- ST-2-042-935-1, "RPS and NSSSS Reactor Vessel Water Level-Low Level 3; Division IIB, Channel 'D' Response Time Test"
- ST-6-052-232-1, "B Loop Core Spray Pump, Valve, and Flow Test" Following Core Spray Planned Maintenance Outage
- Post Maintenance Testing Following Hand-Switch Replacement for Unit 2 Standby Liquid Control System Valve 6B
- D14 Initial Start After Diesel Overhaul and Generator Bearing Replacement, RT-6-092-318-1
- ST-6-051-234-2, "D RHR Pump, Valve, and Flow Test" Following Planned Maintenance
- ST-6-049-230-1, "RCIC Pump, Valve, and Flow Test" Following Planned Maintenance

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b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 6 samples)a. Inspection Scope

The inspectors witnessed six surveillance tests and/or reviewed test data of the selected risk-significant structures, systems, and components (SSCs) listed below to assess, as appropriate, whether the SSCs met the requirements of the Technical Specification, the UFSAR, and other design documents and Exelon procedures. The inspectors also determined whether the testing effectively demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions.

- ST-2-074-426-1, "Calibration/Functional Check of Average Power Range Monitor 1"
- ST-2-041-800-1, "RPS Main Steam Line Isolation Valve Closure, Division 1A Channel 1A Response Time Test (HV-41-1F022A,B; HV-41-1F028A,B)"
- ST-6-092-317-1, "D13 Emergency Diesel Generator (Fast Start) Test Run"
- ST-2-074-100-1, "Logic System Functional Test of RPS APRM/OPRM 2-out-of-4 Voter"
- ST-6-055-230-2, "HPCI Pump, Valve and Flow Test," After Maintenance Outage
- ST-2-055-101-1, "Unit 1 HPCI Logic System Functional Isolation Logic Test"

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 3 samples)a. Inspection Scope

The inspectors reviewed the three temporary modifications listed below and the associated 10 CFR 50.59 screening, and compared each against the UFSAR and Technical Specifications to verify that the modification did not affect operability or availability of the affected system. The inspectors ensured that each modification was in accordance with the modification documents and reviewed post-installation and removal testing to verify that Exelon adequately verified the actual impact on permanent systems by the tests.

- ECR 05-00599, Temporary EHC Recorder Installation.
- TC 1-06-263-2, Temporary Change to Daily Surveillance Log Procedure

Enclosure

(ST-6-107-590-2) for Removal of TI-77-201D From Average Drywell  
Temperature Calculation

- ECR 06-00258, U1 'A' & 'C' Phase Main Transformer Sudden Pressure Relays Trip Defeated Due To Ground

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 - 1 sample)

a. Inspection Scope

The inspectors evaluated an emergency preparedness drill on June 6, 2006. The inspectors reviewed the scenario to identify the timing and location of classification, notification, and Protective Action Requirement (PAR) development activities. During the drill, the inspectors observed classification, notification and PAR activities in the Simulator and the Technical Support Center (TSC). The inspectors reviewed checklists and forms used for classification and notification activities, and verified that they adequately supported the activities described Exelon's Standardized Radiological Emergency Plan, EP-AA-1000. The inspectors observed the post-drill critique held in the TSC and found it to be effective in identifying weaknesses and deficiencies observed during the exercise.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Transportation (71122.02 - 6 samples)

a. Inspection Scope

During the period of June 26-30, 2006, the inspector conducted the following activities to verify that Exelon's radioactive material processing and transportation programs complied with the requirements of 10 CFR 20, 61, 71; and Department of Transportation (DOT) regulations 49 CFR 170-189.

### Radioactive Waste Systems Walkdown

The inspector walked down accessible portions of the radioactive liquid processing systems with the Radwaste Systems Engineer and a Radwaste Chemistry Specialist on June 29, 2006. During the tour, the inspector evaluated if the systems and facilities were consistent with the descriptions contained in the Updated Final Safety Analysis Report (UFSAR) and the Process Control Program (PCP), evaluated the general material conditions of the systems and facilities, and identified any changes to the systems. The inspector reviewed the current processes for transferring radioactive resin/sludge to shipping containers, and the subsequent de-watering process.

Also during this tour, the inspector walked down portions of radwaste systems that are no longer in service or abandoned in place, and discussed the status of administrative and physical controls for these systems including components of the radwaste evaporators and centrifuges.

The inspector visually inspected various radioactive material storage locations with the site Shipping Specialist, including areas of the Radwaste Building and yard locations, to evaluate container material conditions and inventories.

### Waste Characterization and Classification

The inspection included a selective review of the waste characterization and classification program for regulatory compliance, including:

- the radio-chemical sample analytical results for various radioactive waste streams
- the development of scaling factors for hard-to-detect radionuclides from radio-chemical data
- the methods and practices to detect changes in waste streams
- the characterization and classification of waste relative to 10 CFR 61.55 and the determination of DOT shipment subtype per 49 CFR 173

### Shipment Preparation

The inspection included a review of radioactive waste program records, shipment preparation procedures, training records, and observations of jobs-in-progress, including:

- reviewing radioactive material shipping logs for calendar years 2004, 2005, and 2006
- verifying that training was provided to appropriate personnel responsible for classifying, handling, and shipping radioactive materials, in accordance with Bulletin 79-19 and 49 CFR 172 Subpart H
- verifying that appropriate NRC (or agreement state) license authorization was current for shipment recipients for recent shipments

Enclosure

- observing technicians performing a waste transfer and de-watering of sludge from the waste sludge tank to a high integrity container (HIC), on June 28, 2006
- verifying compliance with the relevant Certificates-of-Compliance and related procedures for shipping casks

#### Shipment Records

The inspector selected and reviewed records associated with five Type B shipments of radioactive material made since the last inspection of this area. The shipments were Nos. MW-05-011, MW-05-016, MW-05-017, MW-05-018, and MW-05-019.

The inspector reviewed the following aspects of the radioactive waste packaging and shipping activities:

- implementation of applicable shipping requirements including proper completion of manifests
- implementation of specifications in applicable certificates-of-compliance, for the approved shipping casks, including limits on package contents
- verification that dewatering criteria was met
- classification of radioactive materials relative to 10 CFR 61.55 and 49 CFR 173
- labeling of containers relative to package dose rates
- radiation and contamination surveys of the packages
- placarding of transport vehicles
- conduct of vehicle checks
- providing of emergency instructions to the driver
- completion of shipping papers
- notification by the recipient that the radioactive materials have been received

#### b. Findings

No findings of significance were identified.

### **4. OTHER ACTIVITIES**

#### 4OA2 Identification and Resolution of Problems (71152)

##### .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 performed a screening of all items entered into Exelon's corrective action program. Inspectors accomplished this by reviewing the description of each new issue report, attending daily screening meetings, and accessing Exelon's computerized database.

Enclosure

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope

As required by inspection procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of Exelon's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors review was focused on repetitive equipment and human performance issues. The inspectors review of issue reports nominally considered the six-month period of January through June 2006. The review also included issues documented within the Limerick Generating Station Performance Trending report for the first quarter of 2006. Specifically, the Operations and Engineering Focus Areas identified by Exelon along with their applicable action plans, were reviewed and evaluated against the requirements of LS-AA-125, "Corrective Action Program (CAP) Procedure." This review included both issue reports identified and lower level issues which fell below the threshold of those items normally entered into the corrective action system.

b. Assessment and Observations

No findings of significance were identified. The inspector observed that issues selected for review were appropriately categorized and prioritized in accordance with Exelon's corrective action process. Additionally, the Operations and Engineering departments were identifying, trending, and developing appropriate actions with regard to human performance related issues.

.3 Annual Sample: Unit 1 and Unit 2 Main Control Room Annunciator Failures

a. Inspection Scope

The inspectors reviewed Exelon's corrective actions in response to Issue Report (IR) 442990, "Loss of Horn (Audible) for Panels 207 thru 219 in Main Control Room." The inspectors also reviewed Engineering Design Change Packages (ECR 06-00034, Rev. 0 and ECR 05-00340, Rev. 2) including the vendor's recommendation and similar design concern and its adopted resolution at Peach Bottom Atomic station that was implemented to address the repeated loss of the Unit 2 Audible alarms. The inspector verified the wiring and the selected design modification wiring samples in the control room to assure the design change performed consistent with the new design change. The inspector reviewed the Main Control Room alarms' log report after the corrective actions were completed in February 2006 to assure the issue was adequately resolved.

b. Findings and Observations

No findings of significance were identified.

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The inspector noted that the loss of repeated main control room annunciator horn (tone generator) alarm during the troubleshooting efforts was determined to be occasional and with no set frequency. Another condition that Exelon identified included a lock-up of the tone generator, requiring pulling fuses to reset the tone generator. Station personnel found that a transient of the appropriate magnitude and frequency greater than 0.4 MHZ could cause the microprocessor to develop an error while loading up the instructions to annunciate. The original design maintained the alarm relay in normally energized mode. This design change revised the design of this relay to energize upon alarm as consistent with single tone generator application and as recommended by the vendor and as per the existing Peach Bottom Atomic Station preferred method of control design configuration. This method provided the additional benefit of forcing the annunciator horn's internal electronics to reset each time the horn is activated. The forced reset eliminated the issue of the annunciator horn electronics locking up due to high frequency experienced at the switchable input terminals. The review of the Main Control Room alarms' log report indicated no concern after the corrective actions were completed in February 2006. The inspector found that the new design was reasonable and had met the expectations of control room operators and that the corrective actions had appropriately resolved the audible spurious alarm issue.

.4 Annual Sample: Operator Workaround Review

a. Inspection Scope

The inspectors reviewed Exelon's operator workaround program to verify that station personnel are identifying operator workaround problems at an appropriate threshold, have entered them into the corrective action program, and have proposed or implemented appropriate corrective actions. The inspectors observed operators performing routine rounds on both units, reviewed the list of operator workarounds and challenges, reviewed selected items in the Maintenance Manpower Planning System, and reviewed the Shift Turnover Checklists for Equipment Operator positions in Unit 1 and Unit 2.

b. Assessment and Observations

No findings of significance were identified.

Exelon is currently not tracking any operator workarounds for Unit 1 or Unit 2, and the inspectors did not identify any equipment failures that crossed the threshold of an operator workaround.

.5 Radioactive Material Processing and Transportation

a. Inspection Scope

The inspector reviewed the 2005 Annual Radioactive Effluent Release Report, fourteen issue reports, five Nuclear Oversight Quarterly Assessment Reports, a Quality



Assurance Audit, and recent Yard Area Rad Material Inspection reports. Through this review, the inspector assessed Exelon's threshold for identifying problems, and the promptness and effectiveness of the resulting corrective actions. This review was conducted against the criteria contained in 10 CFR 20.11(c), Technical Specifications, and Exelon procedures.

b. Assessment and Observations

No findings of significance were identified.

4OA3 Event Followup (71153)

.1 **(Closed) LER 05000353/01-05-005, Missed Surveillance Resulted in a Condition Prohibited by Technical Specifications**

On November 3, 2005, during review of an offsite circuit calculation, Exelon discovered that the calculation credited a ten second time delay on the automatic voltage controls for the safeguard transformer tap changers to maintain availability of the offsite circuits. Based on this calculation, the associated offsite circuit should have been considered inoperable when the automatic voltage control was operated in the manual mode under certain configurations of the safeguard buses. During the emergency diesel generator monthly and 24-hour endurance runs, the station operated in these configurations and did not take the required Technical Specification actions per TS 3.8.1.1.

Exelon implemented a modification to change the automatic voltage control time delays on the safeguard and station auxiliary transformers such that the offsite circuits will remain operable when the automatic voltage controls are placed in manual mode. The inspectors identified no new findings in their review. This finding constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRCs Enforcement Policy. Exelon documented this issue and its associated corrective actions in IR 394327. This LER is closed.

.2 **(Closed) LER 0500035301-06-001, Loss of One Offsite Circuit Due to Invalid Actuation of Fire Suppression System**

On December 9, 2005, one of two offsite circuits tripped due to a valid actuation of the 10 station auxiliary transformer protective relays. The actuation of the protective relays resulted from a spurious actuation of the fire suppression deluge system. This event caused deenergization of four of eight safeguard buses and subsequent start of four emergency diesel generators and both loops of the emergency service water system, as designed. Additionally, the remaining offsite source automatically reenergized the four safeguard buses, as designed.

Station personnel inspected, cleaned, tested, and returned the 10 station auxiliary transformer to service. Exelon did not identify any equipment damage during the

Enclosure



inspection. The inspectors identified no findings in their review. Exelon documented this issue and its associated corrective actions in IR 432427. This LER is closed.

#### 4OA5 Other

##### 1. Implementation of Temporary Instruction (TI) 2515/165 - Operational Readiness of Offsite Power and Impact on Plant Risk

###### a. Inspection Scope

The objective of TI 2515/165, "Operational Readiness of Offsite Power and Impact on Plant Risk," was to gather information to support the assessment of nuclear power plant operational readiness of offsite power systems and impact on plant risk. The inspectors evaluated Exelon procedures against the specific offsite power, risk assessment and system grid reliability requirements of TI 2515/165. They also discussed the attributes with Exelon personnel.

The information gathered while completing this TI was forwarded to the Office of Nuclear Reactor Regulation for further review and evaluation on April 3, 2006.

###### b. Findings

No findings of significance were identified.

#### 4OA6 Meetings, Including Exit

##### Exit Meeting Summary

On **July 14, 2006** the resident inspectors presented the inspection results to Mr. C. Mudrick and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

## SUPPLEMENTAL INFORMATION

### **KEY POINTS OF CONTACT**

#### Exelon Generation Company

R. DeGregorio, Site Vice President  
C. Mudrick, Plant Manager  
P. Orphanos, Director, Operations  
D. DiCello, Manager, Site Radiation Protection  
T. Basso, Manager, Chemistry and Rad Waste  
W. Harris, Manager, Nuclear Oversight  
J. Hunter, Manager, Operations Training  
P. Chase, Shift Operations Superintendent  
E. Kelly, Engineering Programs Manager  
D. Palena, Supervisor, System Engineering  
J. George, CS System Manager  
D. Hart, Radiation Protection, Technical Support Manager  
R. Monaco, WAC Coordinator  
R. Mandik, Emergency Preparedness  
F. Burzynski, Station Fire Marshall  
M. Kowalski, Maintenance Rule Coordinator  
R. Harding, Regulatory Assurance  
S. Gamble, Regulatory Assurance  
D. Trexler, Site Engineering  
N. Bartle, Site Engineering  
F. Michaels, Site Engineering  
C. Markle, Operations Engineer  
W. Choromanski, Engineering Corrective Action Program Coordinator  
C. Hanson, Equipment Operator  
N. Giasas, Equipment Operator  
J. Schwartz, I&C Technician  
R. Rhode, Instructor/Exam Development  
W. Ward, Exam Development  
L. Parlato, Radwaste Physicist  
E. Purdy, Radwaste Systems Engineer  
C. Smith, RadWaste Specialist, Chemistry  
H. Miller, RadWaste Shipper

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

### **Opened and Closed**

05000352, 05000353/2006003-01    NCV    Inadequate Annual Operating Test Administered at Limerick

### **Open**

05000352/01-06-002                      LER    SRV Position Indication on Remote Shutdown Panel

05000352/01-06-003                      LER    Accident Monitoring Instrument Channel Inoperable

### **Closed**

05000352/01-05-005                      LER    Missed Surveillance Resulted in Condition Prohibited by TS

05000352/01-06-001                      LER    Loss of One Offsite Circuit Due to Invalid Actuation

## **LIST OF DOCUMENTS REVIEWED**

### **Section 1R01: Adverse Weather Protection**

GP-7.1, "Summer Weather Preparation and Operation," Revision 13  
S10.7.C, "Service Water Flow Adjustments," Revision 20  
Work Order R1008045, "Perform GP-7.1", dated June 5, 2006

### **Section 1R04: Equipment Alignment**

#### **Partial Walkdowns**

S49.1.1 (COL-C), "Valve Alignment to Assure Availability of the RCIC System," Revision 16  
S49.3A, "RCIC Fill and Vent," Revision 14  
S49.1.A, "Normal RCIC Line-up for Automatic Operation," Revision 20

#### **Complete Walkdown**

IR 296063, "2<sup>nd</sup> Performance of RT-2-011-393-1 Results Not Within 10%"  
IR 322420, "Valve Did Not Stroke Fully on Pump Start"  
IR 322755, "Potential Need for 50.59/Use of ESW as Compensatory Measure"  
IR 328825, "HV-011-104A Does Not Pass Flow, Plug and Stem Separated"  
IR 345794, "Surveillance Requirement Not Met for HV-011-048"  
IR 487356, "ESW Check Valve Has Excessive Leakage"

IR 487703, "0C ESW Pump Packing Leakoff is Excessive"  
IR 487893, "RHR Heat Exchanger Margin Improvement"  
IR 488630, "Move PM221816 to Open and Inspect Check Valve to 0628"  
A1565145, "ESW Check Valve has Excessive Leakage"  
ST-6-011-231-0, "'A' Loop ESW Pump, Valve, and Flow Test," Revision 53  
ST-6-011-201-0, "ESW Increased Frequency Valve Test," Revision 15  
L-S-02, "ESW Design Basis Document," Revision 13  
P&ID 8031-M-11, Sheet 1, "Emergency Service Water," Revision 66  
P&ID 8031-M-11, Sheet 2, "Emergency Service Water," Revision 70  
SIM-M-0012, Sheet 1, "Emergency Service Water / RHR Service Water Overview," Revision 9  
S10.7.A, "Abnormal Service Water System Operation," Revision 33  
S11.1.A, "ESW System Startup," Revision 28  
Limerick Generating Station UFSAR, Section 9.2.2.3  
Operator Logs Dated May 5, 2006

### **Section 1R05: Fire Protection**

Updated Final Safety Analysis Report, Section 9A  
OP-AA-201-003 Fire Drill Scenario No. 06-02, "F-R-181 U2 'B' Core Spray Pp Rm. Fire Area 58"  
Pre-Fire Plan F-D-313, "Unit 1 Diesel Generator Access Corridor and Condensate Pump Rooms 313 and 314, Fire Area 12," Revision 5  
Pre-Fire Plan F-D-317, "Unit 2 Diesel Generator Access Corridor and Condensate Pump Room, Rooms 317 and 318, Fire Area 125," Revision 3  
Pre-Fire Plan F-R-181, "Unit 2 'B' Core Spray Pump Room, Fire Area 58"  
Pre-Fire Plan F-R-370, "Unit 2 Safeguard System Access Area Room 370, Fire Area 67," Revision 7  
Pre-Fire Plan F-R-475, "Unit 2 CRD Equipment and Neutron Monitoring Areas, Rooms 475, 476, 477, and 479, Fire Area 68," Revision 11  
Pre-Fire Plan F-A-533, "Control Room 533 and Peripheral Rooms 530 to 535, Fire Area 24," Revision 8  
Pre-Fire Plan F-R-574, "Unit 2 Standby Liquid Control and General Equipment Areas, RWCU Compartments, FPCW Area, and Main Steam Tunnel, Rooms 574 through 585, 593, and 594, Fire Area 70," Revision 9  
ST-6-022-551-0, "Fire Drill", Revision 7  
RT-0-111-900-0, "One Hour SCBA Cylinder Inspection and Functional Test", Revision 27  
R1030716 01 "One Hour SCBA Cylinder Inspection and Functional Test", completed June 7, 2006 and June 23, 2006  
IR 507203, "U1 and U2 Diesel Generator Corridor and Pre-Fire Plan"

### **Section 1R06: Flood Protection Measures**

SE-4, "Flood"  
SE-4-3, "Flooding External to the Power Block"  
Limerick Generating Station Updated Final Safety Analysis Report  
IR 348594, "RCIC Flooding - Identify 42" MSO"  
T-103, "Secondary Containment Control - Bases," Revision 20  
SE-4-1, "Reactor Enclosure Flooding," Revision 6

## **Section 1R07: Heat Sink Performance**

M-C-TGSS-05, "Heat Exchanger Maintenance Practices," Revision 1  
M-011-001, "Preventive Maintenance Procedure for Diesel Generator Heat Exchanger Cleaning and Examination Lube Oil Cooler (E506) Jacket Water Heat Exchanger (E507) Intercooler Water Heat Exchanger (E586)," Revision 1  
ST-6-092-313-2 Attachment 1, "D23 Diesel Generator Operability Test Run," Revision 53, Dated April, 10 2006  
ST-6-092-313-2 Attachment 1, "D23 Diesel Generator Operability Test Run," Revision 53, Dated May 10, 2006  
ER-AA-340-1002, "Service Water Heat Exchanger and Component Inspection Guide," Revision 3  
ST-2-011-390-0, "ESW/Diesel Generator Heat Transfer Test," Revision 3  
Limerick Generic Letter 89-13 Program Implementation, Revision 6, December 2005  
Philadelphia Electric Company, Response to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment", dated January 29, 1990  
Philadelphia Electric Company, Supplemental Response to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment", dated January 9, 1991  
Philadelphia Electric Company, Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment" - Implementation of Actions, dated August 5, 1991  
Philadelphia Electric Company, Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment" - Implementation of Actions, dated January 14, 1992  
Philadelphia Electric Company, Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment" - Implementation of Actions, dated October 19, 1992  
Philadelphia Electric Company, Supplemental Response to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment", dated January 9, 1991  
Document, 2C-G501 EDG HX Inspection Report, dated June 5, 2006  
Memo, Limerick D-22 EDG Heat Exchanger Performance Test of August 26, 2003, dated October 23, 2003  
Memo, Limerick D-22 EDG Heat Exchanger Performance Test of July 28, 2004, dated September 10, 2004

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

### **Procedures**

T-101, "RPV Control;"  
T-102, "Primary Containment Control;"  
T-112, "Emergency Blowdown"  
T-117, "Level/ Power Control"  
TQ-AA-131, "Senior Reactor Operator-Limited Requalification Training," Revision 4  
TQ-AA-131, "Senior Reactor Operator – Limited Requalification License Training," Revision 4  
TQ-AA-103-0121, "Lead Regulatory Examination Author Qualification Guide," Revision 0  
TQ-AA-105-102, "NRC Active License Maintenance," Revision 7  
M-041-201, "Reactor Cavity Work Platform (RWCP) Instructions," Revision 0  
S97.0.M, "Refueling Platform Operation," Revision 18

### **Issue Reports and Action Requests**

IR 254722, "LSRO Exam Practice Position Paper"

IR 498411, "LSRO 71111.11B Inspection Comment"  
IR 495748, "TQ-AA-131 requires revision"  
IR 495724, "Delays encountered in starting the LSRO JPMs"  
IR 496375, "2006 LSRO NRC 71111.11B Inspection Results"

#### JPMs

JPM-2041, "Loss of Secondary Containment (Limerick)," Revision 3  
NLSRO2036, "Response to a Dropped Irradiated Fuel Assembly," Revision 2  
NLSRO2023, "Dummy Bundle Movement Within the Spent Fuel Pool (LSRO performs as RPO)"  
JPM-3050, "CRB/FSP Replacement Using Combined Grapple (Alternate Path Due to Gross Undervessel Leakage)"  
NLSROJPM2051, "Manual Operation of the Refuel Platform (LGS)"

#### 2005 Operating Exam

JPM 3005, "Refuel Platform C.O.L., Main Hoist Grapple Checks"  
JPM 3025, "Response to an Unanticipated Spent Fuel Pool Hi Radiation Alarm During Fuel Handling in the Spent Fuel Pool"  
JPM 3035, "Actual Dummy Fuel Movement in the Spent Fuel Pool"  
JPM 3051, "Control Rod Removal Using Combined Grapple"  
JPM 3053, "Fuel Handling Director Shift Turnover Checklist"

#### Biennial Written Exams

2004 NRC Written Examination (PBAPS)  
2005 NRC Written Exam (PBAPS)  
2006 NRC Written Examination (Limerick)

#### Miscellaneous

UFSAR Section 15.7.4, "Fuel Handling Accident"  
2006 LSRO Operating Exam Sample Plan  
LSRO Requalification Cycle 0501 Schedule  
LSRO Approved Task List  
NUREG 1021, Rev. 9  
LSRO CRC Meeting Minutes for LGS 1R11  
Limerick Top 30 Cut sets for Operator actions

### **Section 1R12: Maintenance Effectiveness**

#### Issue Reports and Action Requests

IR 201983, "Unplanned LCO on Core Spray - Engineering Weaknesses"  
IR 199961, "Unplanned LCO on Core Spray"  
IR 475860, "Six Functional Failure Reviews Not Completed Within 30 Days"  
IR 254625, "Inadvertent Half Scram During ST-2-042-645-1"  
IR 501737, "2A PCIG Compressor Tripped Due to Low Oil Level"

#### Miscellaneous

Expert Panel Meeting Minutes 0409 (dated 11/18/04)  
Maintenance Rule Database: Reactor Protection System

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

#### Issue Reports and Action Requests

IR 473612, "Unable to Maintain 3455 to 3457.5 MWT on Unit 1"  
IR 478119, "Increasing Trend Noted in Unit 1 Reactor Pressure"  
IR 482059, "Unit 1 Suppression Chamber Air Temperature Reading Low"  
IR 502769, "'1A' RHR HTX Bypass Valve Indication ZI-051-148A-1 Failed"  
IR 503311, "Increasing Trend in Unit 1 Reactor Pressure"  
IR 503311, "Unexpected Alarm During ST-6-052-760-1, Unit 1 Core Spray Loop Low Level"  
A1436929, "1ARHR HX Bypass Indication 5% With Valve Closed"  
A1484052, "CN 114-85315 - Transmitter, Position, Signal Converter Obsolete"  
A1561985, "Increasing Trend Noted in Unit 1 Reactor Pressure"  
A1573067, "1A RHR HX Bypass Valve indication ZI-051-148A-1 Failed"

#### Miscellaneous

Limerick Generating Station Updated Final Safety Analysis Report, Section 5.4.5  
Operator Logs, dated 6/25/06  
ST-6-052-760-1, "Safeguard Piping Fill Quarterly Valve Test"  
Prompt Investigation IR 482059, "Unit 1 Failed Suppression Chamber Air Temperature Recorder Point"  
RT-1-100-640-1, "Monitoring for Trends in Thermal Power Calculation Inputs," Revision 3, Completed April 20, 2006  
GP-5, "Steady State Plant Operations," Revision 121  
Operator Logs Dated May 4, 2006  
C0217868, "ZI-051-148A-1 Failed Valve Position Indication"  
Operator Logs Dated June 23, 2006  
ST-2-088-413-1, "Remote Shutdown System - RHR Heat Exchanger Bypass Valve Position Indication Calibration," Revision 7

### **Section 1R15: Operability**

#### Issue Reports and Action Requests

IR 388966, "2D1V212 D/W Unit Cooler Found Tripped on Thermals"  
IR 473549, "Unit 1 OPRM Missed Surveillance Test"  
IR 473983, "D/W Unit Cooler 2D2V212 Tripped on Magnetics"  
IR 478379, "Unit 2 Jet Pump Performance Degradation"  
IR 480610, "TI-77-201D Point Should Be Removed From Drywell Volumetric"  
IR 483585, "Local Drywell Temperatures at Elev 320' Have Increased to 200 Deg F"  
IR 490107, "OPRM Function Not Full Tested During Cal/Functional ST"  
A1431792, "Margin Improvement for RHR Drywell Spray Valves"  
A1559865, "D/W Unit Cooler 2D2V212 Tripped on Magnetics"  
A1560534, "HV-051-1F016A Exceeded Max Allowable Stroke Time"

#### Miscellaneous

Operator Logs Dated April 5, 2006  
Prompt Investigation Report, "Unit 1 OPRM Missed Surveillance Test"



Maintenance Rule Database: Residual Heat Removal System  
ST-6-051-231-1, "A' RHR Pump, Valve, and Flow Test," Revision 55, Completed April 5, 2006  
ECR 04-00250, "Margin Improvement for RHR Drywell Spray Valves"  
ECR 99-01338, "P00224, Reactor Stability/PRNMS - MAT Criteria, Unit 1"  
ST-2-074-100-1, "Logic System Functional Test of RPS APRM/OPRM 2-Out-of-4 Voter,"  
Revision 4, Completed May 18, 2006.  
Temporary Change 1-06-263-2 to ST-6-107-590-2, "Daily Surveillance Log," Revision 102  
Design Basis Document L-S-08F, "Drywell HVAC System," Revision 4  
PORC Meeting Minutes 06-010  
Maintenance Rule Database: Drywell HVAC

### **Section 1R19: Post Maintenance Testing**

GP-7, "Cold Weather Preparation and Operation," Revision 28  
Commitment Number T02470  
M1562821, "SLCS Injection Pump Isolation Outboard Valve Control Switch"  
ST-6-048-450-2, "SLC Lineup Verification," Revision 3, Completed April 27, 2006  
ST-6-107-200-0, "IST Valve Stroke Surveillance Log," Revision 19  
ST-6-049-200-1, "RCIC Valve Test," Revision 40  
S49.9.A, "Routine Inspection of the RCIC System," Revision 23

### **Section 1R22: Surveillance Testing**

#### **Procedures**

S55.9.A, "Routine Inspection of HPCI System," Revision 34  
ST-2-055-100-1, "HPCI Logic System Functional: Simulated Automatic Actuation," Revision 10  
ST-2-055-101-1, "HPCI Logic System Functional: Isolation Logic Test," Revision 6, performed  
on 06/21/2006  
ST-4-055-303-2, "HPCI Pump Suction From CST, Pump Suction From Supp. Pool and Pump  
Min. Flow Auto Closure Seal-In Contact Test," Revision 1  
ST-6-055-230-2, "HPCI Pump, Valve and Flow Test," Revision 52, performed on 06/20/2006  
Updated Final Safety Analysis Report Section 6.3, "HPCI"  
Technical Specification 3.5.1, "ECCS Operating"  
S55.9.A, "Routine Inspection of HPCI"

#### **Issue Reports and Action Requests**

IR 437418, "HPCI Procedure Enhancements"  
IR 435459, "HPCI Suction Swap During Pump Valve and Flow"  
IR 472049, "HPCI Temperature Switch has History of Being Damaged"  
IR 457546, "Grease Leak on Valve"  
IR 463273, "HV-055-1F002 has 40 DPM Packing Leak"  
IR 484935, "HV-055-2F054 has Packing Leak"  
IR 490107, "OPRM Function Not Full Tested During Cal/Functional ST"  
IR 491531, "Unanticipated Alarms During ST-2-074-100-1"

#### **Miscellaneous**

M-55, P&ID, "High Pressure Coolant Injection," Sheet 1, Revision 5  
M-55, P&ID, "High Pressure Coolant Injection," Sheet 2, Revision 2  
Specification ML-008, "IST Pumps Unit 2," Revision 7



Specification ML-008, "Specification Cover Sheet," Revision 7  
Technical Specifications 3/4.5, "Emergency Core Cooling Systems"  
UFSAR Section 6.3, "Emergency Core Cooling Systems"

### **Section 1R23: Temporary Plant Modifications**

#### Issue Reports and Action Requests

A1569417, "A' Phase Transformer"  
A1523835, "Drywell Ambient Air Temperature"  
A1535568, "Evaluate Install of Recorder in 20-C663"  
IR 480610, "Perform Tech Eval Supporting Removal Of TI-77-201D From Daily ST"  
IR 480610, "TI-77-201D Point Should Be Removed From Drywell Volumetric"

#### Procedures

CC-MA-112-1001, "Temporary Configuration Change Packages (TCCP)," Revision 1  
SA-AA-129-2118, "Management and Control of Temporary Power," Revision 2

#### Miscellaneous

E-10, "Single Line Meter & Relay Diagram 1 Generator, Transformer & 11 Unit Aux Trans."  
E-140, Sheet 2 of 2, "Schematic Diagram Unit Protection Relaying Groups A&B- 1 Unit," Rev.10  
ECR-03-00544, "U1 Main Transformer & Unit Aux. Sudden Pressure Relay Mod"  
ECR-06-00258, "U1 'A' & 'C' Phase Main XTMR SPR Trip Defeated Due To Ground"  
ST-6-107-590-2, "Daily Surveillance LOG/OPCONS 1,2,3," Revision 102  
TC-1-06-263-2, "Temporary Change Removed TI-77-201D from Ave Temp Calculation"  
R004384, Activity 3, "Preventive Maintenance Library Work Order"  
ECR 05-00599, "TCCP for Documentation of Temporary Recorder Installation"  
50.59 Review for TCCP for the Installation of a Recorder in Unit 2 EHC Panel 20-C663

### **Section 1EP6: Drill Evaluation**

EP-AA-114, "Notifications," Revision 6  
EP-MA-114-100, "Mid-Atlantic State/Local Notifications," Revision 8  
EP-MA-114-100-F-01, "State/Local Event Notification Form," Revision C  
EP-AA-111-F-08, "Emergency Classification and Protective Action Recommendations,"  
Revision D  
EP-AA-1000, "Standardized Radiological Emergency Plan," Revision 16  
EP-AA-1000-AA-125-1002, "Emergency Response Organization (ERO) Performance -  
Performance Indicator Guidance," Revision 3

### **Section 2PS2: Radioactive Material Processing and Transportation**

#### Procedures

RW-AA-100, "Process Control Program for Radioactive Wastes," Revision 3  
RP-AA-600, "RADIOACTIVE Material/Waste Shipments," Revision 10  
RP-AA-605, "10CFR 61 PROGRAM," Revision 0  
RP-LG-6050, "10CFR61 Waste Stream Sampling and Analysis," Revision 2  
RP-AA-600-1001, "Exclusive Use and Emergency Response Information," Revision 3  
RP-AA-600-1002, "Highway Route Controlled Quantity Advance Notification for  
Radioactive/Waste Shipments," Revision 2

RP-AA-600-1003, "Radioactive Waste Shipments to BARNWELL and the DEFENSE CONSOLIDATION FACILITY," Revision 3  
RP-AA-600-1004, "Radioactive Waste Shipments to ENVIROCARE," Revision 5  
RP-AA-600-1005, "Radioactive Material and Non-Disposal Site Waste Shipments," Revision 7  
RP-AA-600-1006, "Notification Requirements for Radioactive Waste Shipments Greater Than Ten Times the Minimum Quantity of Concern," Revision 2  
RP-AA-601, "Surveying Radioactive Material Shipments," Revision 6  
RP-LG-601, "Surveying Radioactive Material Shipments at LIMERICK," Revision 7  
RP-AA-602, "Packaging of Radioactive Material Shipments," Revision 11  
RP-AA-602-1001, "Packaging of Radioactive Material/Waste Shipments," Revision 6  
RP-AA-603, "Inspection and Loading of Radioactive Material Shipments," Revision 3  
RP-AA-603-1001, "Inspection and Loading of Radioactive Material/Waste Shipments," Revision 1  
TQ-AA-126, "Radioactive Material Shipping Training," Revision 3  
RW-226, "Radwaste and Radioactive Material Inspection & Loading Operations," Revision 13  
M-053-003, "3-55 Transport Cask Handling," Revision 9  
M-053-004, "8-120B Transport Cask Operations," Revision 6

#### Nuclear Oversight Audits

Nuclear Oversight Quarterly Assessment Reports:06-1Q, 05-4Q, 05-3Q, 05-2Q, 05-1Q for Chemistry, RadWaste, and Process Control Programs  
Audit No. NOSA-LIM-06-04 (AR 4575 12-04), Chemistry, RadWaste and Process Control Program

#### Shipping Manifests

Shipment No. MW-05-011, Dewatered Mechanical Filters, Type B  
Shipment No. MW-05-016, Irradiated Hardware, Type B  
Shipment No. MW-05-017, Irradiated Hardware, Type B  
Shipment No. MW-05-018, Dewatered Mechanical Filters, Type B  
Shipment No. MW-05-019, Irradiated Hardware, Type B

#### Issue Reports

484101, 399484, 334529, 252988, 269092, 501621, 492844, 483920, 486274, 483895, 467336, 464043, 456036, 451828

#### Miscellaneous

Shipping Logs for 2004, 2005, and 2006  
2005 Limerick Annual Radioactive Effluent Release Report  
Radwaste/Transportation Training Records for selected personnel  
Small Article Monitor Calibration Records  
2006 Isotopic Mix  
High Level Storage Vault Inventory

#### **Section 4OA2: Other**

##### Issue Reports and Action Requests

A1568626, "FC-C-046-1F002B CRD Flow Controller Hunting"  
A1543259, "RCIC Flow Controller Drifting Upward in Manual Control"  
IR 498409, "Lack of Vigor Demonstrated in Resolving MCRD's"

A1564079, "PD-C-078-054-OP Control Room Delta Pressure Not Maintained"  
IR 438697, "Perform Common Cause Analysis On Fundamental Indicator Of Procedure Compliance"  
A0443722, "2A CRD Pump visual Debris Observed In Oil Sample"  
A0443710, "1D Circ. Pump Visual Debris Observed In Oil Sample"  
A0481248, "Visible Particulates Observed in 1C Cond. Upper Motor Sample"  
A0309113, "U2 HPCI Turbine Shaft Out Of Tolerance"  
A0462370, "HV-049-1F007 Failed Closed"  
A0358569, "Change Oil 2A Stator Coolant Pump Inboard Bearing"  
IR 396823, "Engineering CAP Corrective Action Closure Issues Identified"  
IR 438697, "Engineering Low Level Procedure Compliance Observations"  
IR 481132, "Operations Implementation Of Work Weeks"  
IR 481337, "Review Backlog Increase For Potential Learning and CA's"

#### Procedures

OP-AA-102-103, "Operator Work-Around Procedure", Revision 1  
S15.1.B, "Normal Starting of Instrument Air, Service Air or Backup Service Air Compressors"  
LS-AA-125-1005, "Coding And Analysis Manual," Revision 5

#### Drawings

8031-M-14, "P&ID Turbine Enclosure Cooling Water (Unit 1)," Revision 29  
E-600, Sh. 3, "Schematic Diagram Main Control Room Annunciator Audible Alarms and control circuits 1 & 2 Units," Revision 8  
E-620, Sh. 1, "Schematic Diagram Main Control Room Annunciator panel ACBO3.Reactor Control-1 & 2 Units," Revision 1  
E-620, Sh. 2, "Schematic Diagram Main Control Room Annunciator panel BCBO3.Reactor Control-1 & 2 Units," Revision 31  
E-8005, Sh. 1, "Internal Wiring Diagram Annunciator Terminal Cabinet 2AC893," Revision 11  
E-8005, Sh. 2, "Internal Wiring Diagram Annunciator Terminal Cabinet 2BC893," Revision 8  
E-8005, Sh. 3, "Internal Wiring Diagram Annunciator Terminal Cabinet 2CC893," Revision 10  
E-8005, Sh. 4, "Internal Wiring Diagram Annunciator Terminal Cabinet 20C893," Revision 8

#### Engineering Change Requests

ECR 06-00034, Revision 0, Unit 2 Annunciator Horn Spurious Operation Eng. Change  
ECR 05-00340, Revision 2, ECP to Eliminate LGS U2 Annunciator Horn Spurious Operation

### **Section 4OA3: Event Followup**

#### Issue Reports and Action Requests

IR 394327, "Limerick Offsite Voltage Regulation Study Calc 6300E.20"  
IR 432427, "10 Startup Bus Deenergized Due to Fault at 10 Startup Transformer"  
A1421718, "Spurious Actuation of Deluge System - 10 S/U Transformer"

### **Section 4OA5: Other**

E-5, "Grid Emergency," Revision 4  
PJM Manual M-3, "Transmission Operations," Revision 20  
WC-AA-101, "On-Line Work Control Procedure," Revision 11  
OP-AA-108-107-1001, "Station Response to Grid Capacity Conditions," Revision 1

### **LIST OF ACRONYMS**

ADAMS	Agencywide Documents Access Management System
APRM	Average Power Range Monitor
AR	Action Request
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
DOT	Department of Transportation
EAL	Emergency Action Level
ECR	Engineering Change Request
EDG	Emergency Diesel Generator
EHC	Electrohydraulic Control System
EP	Emergency Preparedness
ESW	Emergency Service Water
FB	Fire Brigade
HIC	High Integrity Container
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IR	Issue Report
JPM	Job Performance Measure
LER	Licensee Event Report
LSRO	Senior Reactor Operators - Limited to Fuel Handling
MR	Maintenance Rule
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NSSSS	Nuclear Steam Supply Shutoff System
OPRM	Oscillation Power Range Monitoring System
PAR	Protective Action Recommendation
PCP	Process Control Program
P&ID	Piping and Instrumentation Diagram
RCIC	Reactor Core Isolation Cooling System
RHR	Residual Heat Removal
RPS	Reactor Protection System
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SSC	Structure, System, or Component
TI	Temporary Instruction
TS	Technical Specification
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report