August 9, 2004

Mr. Christopher M. Crane
President and CNO
Exelon Nuclear
Exelon Generation Company, LLC
200 Exelon Way KSA 3-E
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION - NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000352/2004006, 05000353/2004006

Dear Mr. Crane:

On June 25, 2004, the US Nuclear Regulatory Commission (NRC) completed a team inspection at your Limerick Generating Station Units 1 and 2. The enclosed inspection report presents the results of that inspection, which was discussed with Mr. Bryan Hanson and other members of your staff on June 25, 2004.

This inspection was an examination of activities conducted under your license as they relate to the identification and resolution of problems, and compliance with the Commission's rules and regulations and the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel.

On the basis of the samples selected for review, the team concluded that in general, problems were properly identified, evaluated, and corrected. There were two Green findings identified during this inspection associated with the corrective actions for a potential fuel channel bow condition and for an age-related degradation of moisture elements in the control room emergency fresh air supply system. These findings were determined to be violations of NRC requirements. However, because of the very low safety significance and because they have been entered into your corrective action program, the NRC is treating these findings as non-cited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny any of these non-cited violations, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Limerick Generating Station.

In addition, some examples of minor problems were identified by the team that your staff entered into the corrective action program. Some of these items involved corrective actions that were ineffectively tracked or had not been implemented. None of these minor deficiencies resulted in a challenge to system operability or reliability.

In accordance with 10CFR2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publically Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

If you have any questions, please contact me at 610-337-5282.

Sincerely,

/RA/

Raymond K. Lorson, Chief
Performance Evaluation Branch
Division of Reactor Safety

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

Enclosure: Inspection Report No. 05000352/2004006 and 05000353/2004006
w/Attachment: Supplemental Information

cc w/encl:
Chief Operating Officer, Exelon Generation Company, LLC
Site Vice President - Limerick Generating Station
Plant Manager, Limerick Generating Station
Regulatory Assurance Manager - Limerick
Senior Vice President - Nuclear Services
Vice President - Mid-Atlantic Operations
Vice President - Operations Support
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Director - Licensing and Regulatory Affairs, Exelon Generation Company, LLC
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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:	05000352/2004006 and 05000353/2004006
Licensee:	Exelon Generation Company, LLC
Facility:	Limerick Generating Station, Units 1 & 2
Location:	Evergreen and Sanatoga Roads Sanatoga, PA 19464
Dates:	June 7 through June 25, 2004
Inspectors:	J. Schoppy, DRS, Senior Reactor Inspector (Team Leader) G. Bowman, DRS, Reactor Inspector M. Marshfield, DRP, Ginna Resident Inspector B. Welling, DRS, Senior Reactor Inspector
Approved by:	Raymond K. Lorson, Chief Performance Evaluation Branch Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000352/2004006, IR 05000353/2004006; 06/07/2004-06/25/2004; Limerick Generating Station, Units 1 and 2; biennial baseline inspection of the identification and resolution of problems. Two findings were identified in the area of corrective actions.

This inspection was conducted by three regional inspectors and one resident inspector. Two findings of very low safety significance (Green) were identified during this inspection and were classified as non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process (SDP)." Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

Identification and Resolution of Problems

The team determined that, in general, Limerick Generating Station properly identified, evaluated and corrected problems. The team identified two findings that indicated deficiencies with the identification and evaluation of issues. Limerick was generally effective at identifying problems and placing them in the corrective action program (CAP). These items were screened and prioritized using established criteria. Corrective actions were implemented in a timely manner, however, some actions were not completed in a comprehensive manner or were not tracked appropriately. The team determined that, in general, workers used the CAP to identify problems. The team found that Exelon self-assessments and audits were self-critical and consistent with the team's observations.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Barrier Integrity

- Green. The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because Exelon did not implement prompt corrective actions for an age-related degradation of a moisture element in the 'B' train of the control room emergency fresh air supply (CREFAS) system.

  This finding is greater than minor because it affected the Barrier Integrity Cornerstone objective of maintaining the availability and reliability of systems used to maintain control room habitability following a reactor accident. This finding is of very low safety significance because it represented a degradation in the radiological barrier function provided for the main control room. (Section 4OA2.b.2.1)

Cornerstone: Mitigating Systems

- Green. The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because Exelon did not identify and promptly correct a condition adverse to quality associated with four Unit 2 control rods

that were not properly surveillance tested when they were susceptible to friction caused by fuel channel bow.

This finding is more than minor because if left uncorrected, it would become a more significant safety concern. Specifically, there was a potential for the channel bow degradation to go undetected because the affected control rods were not being tested. The failure to enter this condition adverse to quality in the CAP, for several months, potentially affected the reactor shutdown function of the rod control mitigating system because the operability and reliability of four control rods were not demonstrated by the surveillance testing. The finding was determined to be of very low safety significance, because the control rods passed channel bow surveillance tests in April 2004. (Section 4OA2.a.2.2)

B. Licensee-Identified Violations

None.

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution

a. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors reviewed the procedures describing the corrective action program (CAP) at Exelon's Limerick Generating Station (LGS). Exelon identifies problems by initiating condition reports (CRs) for conditions adverse to quality, plant equipment deficiencies, industrial or radiological safety concerns, or other significant issues. Exelon documents plant equipment deficiencies as action requests (ARs), and also initiates CRs for some of these deficiencies. Condition reports are subsequently screened for operability, categorized by significance level (1 through 5) and evaluation type (e.g., root cause, apparent cause), and assigned to personnel for evaluation and resolution. The inspectors observed daily Management Review Committee (MRC) meetings in which Exelon managers reviewed incoming CRs and recently completed corrective action evaluations.

The inspectors reviewed items selected across the seven cornerstones of safety in the NRC Reactor Oversight Program to determine if problems were being properly identified, characterized, and entered into the CAP for evaluation and resolution. The inspectors selected a risk-informed sample of CRs that had been issued since the last NRC Problem Identification and Resolution inspection, completed in June 2002. The inspectors reviewed Exelon audits and self-assessments, including a recently issued CAP audit. The inspectors evaluated the effectiveness of these audits and assessments by comparing the audit and assessment results against self-revealing and NRC-identified findings.

For selected risk significant systems, the inspectors reviewed applicable system health reports, work requests, engineering documents, plant log entries, and results from surveillance tests and maintenance tasks. For these selected systems, the inspectors also interviewed the cognizant station personnel and walked down portions of these systems.

The inspectors reviewed operator logs, control room deficiencies, operator work-arounds, and procedures. In addition, the inspectors interviewed plant staff and management to determine their understanding of and involvement with the CAP. The inspectors also reviewed selected issues and conducted interviews at the Exelon corporate office in Kennett Square, PA. These activities were related to items described in Limerick CRs and other documents. The specific documents reviewed and referenced during the inspection are listed in the attachment to this report.

(2) Assessment

The inspectors concluded that the station was generally effective at problem identification. Based on interviews, document reviews and plant walkdowns, the inspectors determined that station staff were generally familiar with and utilized the CAP to identify problems. There were relatively few deficiencies identified by the team that had not been previously identified by Exelon. Station staff promptly initiated CRs, as appropriate, in response to inspection team identified deficiencies or issues. The CRs that were generated in response to the inspectors' activities are listed in the attachment to this report.

Examples of minor deficiencies identified by the team included:

- Scaffolding poles stored in the immediate vicinity of the recirculation pump trip breaker cabinets created an unnecessary risk for an plant transient. Limerick initiated CR 227129 to resolve this condition.

- The number four cylinder air start check valve retaining collar nuts on the D12 emergency diesel generator (EDG) did not meet the minimum thread engagement (i.e., 3 threads were not engaged) specified in engineering calculation OPE-04-002. Engineering subsequently revised this calculation and determined that the existing "as found" condition was acceptable (CR 227894).

The inspectors noted that some station groups did not appear to fully engage the Exelon corrective action process. Specifically, on several occasions Exelon Nuclear Fuels (NF) failed to initiate CRs in a timely manner (CRs 190861, 231428). Additionally, Exelon CAP assessments identified several radiation protection and maintenance issues where CRs were not generated as expected.

The team found that Exelon self-assessments and audits were self-critical and consistent with the team's observations.

.1 Peak Pellet Exposure Calculations

The inspectors identified an unresolved item (URI) related to CR 190531, which questioned the differences between three NRC-licensed computer codes for calculating peak pellet exposure. Two of the more advanced codes, which were not currently licensed codes for Limerick, indicated that peak pellet exposure limits would be exceeded during Unit 1 Cycle 10.

The inspectors noted that NF did not promptly initiate a CR when the problem was first identified in early 2003. Ten months later in December 2003, Limerick Nuclear Oversight (NOS) prompted NF to write CR 190531 associated with the peak pellet exposure issue. The inspectors considered this untimely initiation of a CR to be a CAP performance deficiency.

In addition, NF's subsequent CR evaluation did not properly examine the differences between the code results. Although the CR included a "white paper" that reviewed the codes, it did not provide a sufficient technical justification to resolve the issue raised in the CR; specifically, why it was acceptable that the two advanced computer codes produced higher peak pellet exposures than the currently licensed code.

This issue remains unresolved pending additional NRC review to determine the significance of this issue. **(URI 05000352, 05000353/2004006-01)**

.2 Unit 2 Control Rod Testing for Fuel Channel Bow

Introduction. The inspectors identified a Green, non-cited violation (NCV) because Exelon NF did not promptly identify and correct a condition adverse to quality associated with the testing of four Unit 2 control rods that were susceptible to increased friction caused by the fuel channel bow condition.

Description. In October 2003, Exelon NF personnel noted a problem with the spreadsheet software code used to determine whether a control rod cell was susceptible to channel bow. Contrary to Exelon CAP procedures, they did not initiate a CR for the condition at that time. Consequently, Exelon did not identify and promptly correct a condition adverse to quality, in that four control rods were not being tested for channel bow when necessary to assure that they remained operable. Exelon should have initiated testing of these control rods in the Spring of 2003, because they were part of a population of rods that met the criteria for interim surveillance testing per Exelon operability evaluation OPE 03-066. This evaluation incorporated 10 CFR Part 21 communication, "Interim Surveillance Program for Fuel Channel Bow Monitoring," that was issued on April 30, 2003, by Global Nuclear Fuels.

After NF personnel documented the software problem in a condition report on March 9, 2004, there were additional instances of incomplete evaluation and non-adherence to CAP procedures. First, in early March, NF personnel did not fully evaluate the software problem and therefore initially considered it a low-level, track and trend item. In mid-March, NF suspected that there may be an impact for Unit 2, but they did not communicate this to the site so that operability could be evaluated. Finally, on April 6, NF determined that four control rods were not being tested as required by the operability determination. However, they did not report this immediate operability issue directly to Limerick operations, as required by CAP procedures.

Exelon identified some aspects of the CAP performance deficiencies described above, but did not evaluate the underlying causes of, and promptly correct, the ineffective use of the CAP within the NF group. For example, in December 2003, when NOS personnel identified "less than adequate" use of CAP in NF, Exelon did not perform an apparent cause, common cause, or root cause evaluation to determine the causes of this programmatic issue. Also, when NOS recommended that NF consider providing supplementary guidance to the staff on the threshold for documenting CRs, NF chose not to follow this recommendation. Based on interviews, the inspectors noted that NF personnel still believe they do not have clear guidance on the threshold for writing CRs.

Corrective actions for CAP performance deficiencies in the latter half of 2003 and early 2004 were not fully effective in prompting the documentation of the software problem. Specifically, NF held an all-employees meeting in late September that included a discussion on the need for prompt initiation of CRs. Likewise, an all-employee meeting in January 2004, which included reinforcement of the use of the CAP, also did not prompt a CR on the software problem.

The inspectors determined that while Exelon identified some of the CAP performance deficiencies described above, they did not fully explore the underlying causes for the deficiencies, nor did they recognize that the actions in 2003 and early 2004 to address the CAP performance problems were not fully effective.

Analysis. The inspectors determined that the performance deficiency is that Exelon did not properly identify and take prompt actions to correct a condition adverse to quality; namely, that four Unit 2 control rods were not being surveillance tested for channel bow as required by operability evaluation OPE 03-066. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function, and was not the result of any willful violation of NRC requirements or Exelon procedures. This finding is more than minor because if left uncorrected, it would become a more significant safety concern. Specifically, channel bow is a condition known to degrade over time, and the degradation would have gone undetected because the affected control rods were not being tested. During this timeframe, several other control rods at Limerick were actually affected by channel bow.

The failure to enter this condition adverse to quality in the Limerick CAP, for several months, potentially affected the reactor shutdown function of the rod control mitigating system, because the capability and reliability of four control rods were not demonstrated by the surveillance testing. Thus, the inspectors concluded that this issue affected the Mitigating Systems cornerstone. This finding was assessed using Phase 1 of the SDP for Reactor Inspection Findings for At-Power Situations. The finding was determined to be of very low safety significance (Green), because the control rods passed channel bow surveillance tests in April 2004. There was no actual loss of safety function, and the finding is not potentially risk significant due to seismic, flood, fire, or severe weather initiating events.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. Contrary to the above, prior to April 6, 2004, Exelon staff did not identify and correct the failure to perform surveillance testing of four control rods that were susceptible to friction caused by fuel channel bow, which is a condition adverse to quality. Exelon did not initiate a CR and did not promptly evaluate a problem with the software used to determine susceptibility for channel bow when first discovered in October 2003, thereby delaying the testing of the affected control rods for several months. Because this issue is of very low safety significance and has been entered into Exelon's CAP (CR 213810), this violation is

being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000353/2004006-02)**

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The inspectors reviewed the CRs listed in the attachment to this report to assess whether Exelon adequately prioritized and evaluated problems. The team selected the CRs in areas to cover the seven cornerstones of safety in the NRC Reactor Oversight Program. The team also considered risk insights from the Limerick probabilistic risk assessment (PRA) to focus the inspection sample. The reviews included the appropriateness of the assigned significance level, the timeliness of resolutions, and the scope and depth of the causal analysis. For significant conditions adverse to quality, the inspectors reviewed Exelon's assessment of the extent of condition and the determination of corrective actions to preclude recurrence.

In addition, the inspectors selected a sample of CRs associated with previous NRC NCVs to determine whether Exelon evaluated and resolved problems associated with compliance to applicable regulatory requirements. The inspectors reviewed Exelon's evaluation of industry operating experience (OE) information for applicability to Limerick. The inspectors also reviewed Exelon's assessment of equipment operability, reportability requirements, and extent of condition.

(2) Assessment

The inspectors concluded that, in general, Exelon screened and evaluated problems contained within the CR process at the correct significance level. The staff was generally effective at classifying and performing operability evaluations and reportability determinations for discrepant conditions. However, there were some instances in the screening and initial evaluation phases for CRs involving potentially risk-significant conditions, in which the station did not fully evaluate such factors as underlying causes, extent of condition (CR 228656), or impacts on operability (Unit 2 control rod channel bow, 'B' CREFAS moisture element). As a result, the priority and timeliness assigned to corrective actions were not always commensurate with the significance of the issues. For example, Exelon NF did not fully evaluate a pattern of ineffective use of the CAP until there was a notable consequence; namely, missed surveillance tests for fuel channel bow. Prior to this event, NF did not pursue the underlying causes of their ineffective use of CAP, an issue previously identified by NOS.

The inspectors noted the following examples of less-than-thorough evaluations. These were of minor significance.

- Exelon staff improperly revised their procedure for coping with a station blackout (SBO) to include a precaution to prevent operators from entering an EDG bay during EDG start attempts. This precaution could have inhibited attempts to locally start an EDG, as required by procedure, following an EDG failure during a SBO event.

- Emergency preparedness (EP) did not fully evaluate and critically assess a January 27, 2004, plant event involving a potential emergency action level (EAL) classification. Although the event itself proved to be of no consequence or concern to the station, EP did not effectively use the CAP to identify and correct potential Exelon shortcomings associated with the event.

When CRs were evaluated, Limerick sometimes did not fully consider the implications for risk and uncertainty, as described in CAP procedures. When evaluating risk, the focus tended to be on risk to production, schedule, or regulatory impact (e.g., LER or violation). The evaluations often did not consider PRA risk, such as implications for mitigating systems or initiating events. For example, the inspectors noted that Exelon did not fully appreciate the PRA risk (relative to a potential switchyard-induced initiating event) associated with a March 7, 2004, Unit 1 switchyard transient.

.1 Degraded Control Room Emergency Fresh Air System Moisture Element

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action" for failure to implement appropriate corrective actions for a degraded moisture element on the 'B' control room emergency fresh air supply (CREFAS) train.

Description. In October 2003, an operator identified that the moisture element for the 'A' CREFAS train had failed downscale. The CREFAS system is a two train, safety-related system, common to both units, used to maintain main control room habitability following a reactor accident. A moisture element controls electric heaters to limit the inlet humidity to the charcoal filter beds in each train and is required to function in order to maintain the system operable.

Following this failure, Exelon completed an apparent cause evaluation and determined that the moisture element had failed due to age-related degradation. The vendor indicated that this component had a useable service life of five to ten years from the date of manufacture. The 'A' moisture element had been procured in 1988. Exelon conducted an "extent of condition review" and identified that the installed 'B' CREFAS moisture element was also procured in 1988 and therefore susceptible to the same age-related failure mechanism. Exelon's planned corrective actions for this degraded condition included replacement of the element and initiation of a monthly channel check to confirm proper operation of the moisture element. The inspectors identified that, as of June 2004, these actions had not been completed. Exelon subsequently initiated CR 227798 to address these issues.

Analysis. The inspectors determined that Exelon's failure to promptly replace or implement enhanced monitoring of the degraded 'B' CREFAS moisture element was a performance deficiency. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function, and was not the result of any willful violation of NRC requirements or Exelon procedures.

This finding is more than minor because it affected the Barrier Integrity Cornerstone objective of maintaining the availability and reliability of systems used to maintain control room habitability following a reactor accident. This finding was assessed using Phase 1 of the SDP for Reactor Inspection Findings for At-Power Situations. The finding was determined to be of very low safety significance (Green), because the finding only represented a degradation in the radiological barrier function provided for the main control room.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality such as nonconformances be promptly identified and corrected. Contrary to the above, in October 2003, Exelon identified that the moisture element for the 'B' CREFAS train had significantly exceeded its manufacturer's service life but failed to promptly implement appropriate actions to address this deficiency. Because this issue is of very low safety significance and has been entered into Exelon's CAP (CR 227798), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000352, 05000353/2004006-03)**

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The team reviewed the corrective actions associated with selected CRs to determine whether the actions addressed the identified causes of the problems. The team reviewed CRs for repetitive problems to determine whether previous corrective actions were effective. The team also reviewed Exelon's timeliness in implementing corrective actions and their effectiveness in precluding recurrence of significant conditions adverse to quality. Furthermore, the team assessed the backlog of corrective actions to determine if any, individually or collectively, represented an increased risk due to delays in implementation. The team also reviewed NCVs issued since the last inspection of Exelon's CAP to determine if issues placed in the program had been properly evaluated and corrected.

(2) Assessment

Overall, the team concluded that Exelon developed and implemented corrective actions that appeared reasonable to address the identified problems. Based on the sample reviewed, the team determined that, in general, corrective actions were completed in a timely manner. However, the team observed some instances in which corrective actions were not completed in a comprehensive manner or were not tracked appropriately. Exelon promptly initiated CRs for these corrective action deficiencies. The team also noted that Exelon had self-identified several examples of CRs in which some corrective actions had not been appropriately completed and/or documented.

The team noted some instances in which corrective actions for previous events or degraded conditions did not prevent recurrence because the actions were ineffective, or the actions were delayed or postponed. These Exelon corrective action

shortcomings resulted in increased operator burdens, necessitated temporary plant modifications, and/or adversely impacted safety system reliability. Examples included:

- Toxic gas monitor reliability and availability;
- Core spray room cooler emergency service water (ESW) degraded flow;
- Spray pond chemistry control issues.

The inspectors noted that NOS provided critical and focused assessments covering the broad range of Exelon activities at LGS. Nuclear Oversight consistently documented their identified issues within the CAP. However, the inspectors also noted that NOS missed some opportunities to enhance their effectiveness and improve LGS performance when they repeatedly initiated lower significance level (SL 4D) CRs for recurring issues (failure to initiate CRs, M&TE problems, and occupational safety deficiencies).

(3) Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

The team presented the inspection results to Mr. Bryan Hanson and other members of the Limerick staff on June 25, 2004. No proprietary information was retained by the team.

ATTACHMENT: SUPPLEMENTAL INFORMATION

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Bendyk	System Engineering
E. Callan	Director - Engineering
W. Choromanski	Engineering CAPCO
T. Dougherty	Manager - Nuclear Oversight
B. Hanson	Plant Manager
R. Harding	Regulatory Assurance
W. Harris	Radiation Protection Manager
D. Hocker	Regulatory Assurance
J. Kandasamy	Manager - Electrical Engineering
K. Kemper	Manager - Regulatory Assurance
J. Krais	Senior Manager - Design Engineering
J. Malone	Vice President - Exelon Nuclear Fuels
C. Mudrick	Director - Operations
P. Orphanos	Shift Operations Superintendent
J. Perry	Director - Maintenance
R. Rowcotsky	Design Engineering
D. Spamer	Design Engineering
J. Tusar	Manager - Exelon Nuclear Fuels

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000352, 05000353/2004006-01	URI	Evaluation of differences between three NRC-licensed computer codes in calculations for fuel peak pellet exposure. (Section 4OA2.a.2.1)

Opened and Closed

05000353/2004006-02	NCV	Exelon NF did not identify and promptly correct a condition adverse to quality associated with control rods that were not tested for the effects of channel bow. (Section 4OA2.a.2.2)

05000352, 05000353/2004006-03	NCV	Exelon did not promptly correct a condition adverse to quality associated with age-related degradation of the 'B' CREFAS system moisture element. (Section 4OA2.b.2.1)

LIST OF DOCUMENTS REVIEWED

Audits and Self-Assessments

Site-wide Corrective Action Program (CAP) Self-assessment, May 2004 (AR-195737)
Nuclear Oversight (NOS) Corrective Action Audit Report (NOSA-LG-03-01), dated 2/28/03
Focus Area Self Assessment for Site Safety Culture, May 2003 (AR-146840)
Focus Area Self Assessment for Operator Knowledge and Skills, June 2002 (AR-102394)
Focus Area Self Assessment for NOS Skills & Knowledge, March 2003 (AR-147747)
Focus Area Self Assessment for Security Equipment, March 2003 (AR-146007)
Focus Area Self Assessment for Configuration Control, July 2003 (AR-165782)
Security Audit Report (NOSA-LG-03-03), dated 5/2/03
NOS Operations Functional Area Audit Report (NOSA-LG-03-07), dated 12/12/03
Nuclear Oversight Quarterly Assessment Report (NOSPA-LG-03-4Q), dated 1/23/04
Nuclear Oversight Quarterly Assessment Report (NOSPA-LG-04-1Q), dated 4/25/04
Limerick Nuclear Oversight Monthly Report; dated March 2004, April 2004, and May 2004
NOS Audit of Corporate Nuclear Fuels (NOSA-NCS-KEN-03-09)
Limerick Self Assessment Report, 3rd Quarter 2003
Limerick Self Assessment Report, 4th Quarter 2003
Limerick Self Assessment Report, 1st Quarter 2004
Focused Area Self-Assessment of Reactor Engineering (AR 147725)
Focused Area Self-Assessment of Critical/Non-Critical/Run-to-Failure Components (AR 153065)
Focused Area Self-Assessment of Calculations (AR 153069)

Completed Surveillances or Routine Tests

Inspection of Emergency Diesel Generator Fuel Oil Storage Tank Access Pits (RT-6-100-371-0), dated 5/22/04
D11 Diesel Generator Fuel Oil Transfer Pump, Valve and Flow Test (ST-6-020-231-1), dated 4/27/04
D11 Diesel Generator Slow Start Operability Test Run (ST-6-092-311-1), dated 5/25/04
D12 Diesel Generator Slow Start Operability Test Run (ST-6-092-312-1), dated 6/2/04
D13 Diesel Generator Slow Start Operability Test Run (ST-6-092-313-1), dated 5/15/04
D14 Diesel Generator Slow Start Operability Test Run (ST-6-092-314-1), dated 3/23/04
D21 Diesel Generator Slow Start Operability Test Run (ST-6-092-311-2), dated 5/17/04
D22 Diesel Generator Slow Start Operability Test Run (ST-6-092-312-2), dated 5/24/04
D23 Diesel Generator Slow Start Operability Test Run (ST-6-092-313-2), dated 6/1/04
D24 Diesel Generator Slow Start Operability Test Run (ST-6-092-314-2), dated 4/13/04
D11 Diesel Generator 24 Hour Endurance Test (ST-6-092-111-1), dated 4/28/04
D12 Diesel Generator 24 Hour Endurance Test (ST-6-092-112-1), dated 5/7/03

D13 Diesel Generator 24 Hour Endurance Test (ST-6-092-113-1), dated 6/11/02
D14 Diesel Generator 24 Hour Endurance Test (ST-6-092-114-1), dated 5/19/04
D21 Diesel Generator 24 Hour Endurance Test (ST-6-092-111-2), dated 10/21/03
D22 Diesel Generator 24 Hour Endurance Test (ST-6-092-112-2), dated 2/4/03
D23 Diesel Generator 24 Hour Endurance Test (ST-6-092-113-2), dated 5/5/04
D24 Diesel Generator 24 Hour Endurance Test (ST-6-092-114-2), dated 1/13/04
A Loop Core Spray Pump, Valve and Flow Test (ST-6-052-231-1), dated 4/30/04
B Loop Core Spray Pump, Valve and Flow Test (ST-6-052-232-1), dated 4/6/04
A Loop Core Spray Pump, Valve and Flow Test (ST-6-052-231-2), dated 5/20/04
B Loop Core Spray Pump, Valve and Flow Test (ST-6-052-232-2), dated 4/27/04
A Loop RHRSW Pump, Valve and Flow Test (ST-6-012-231-0), dated 4/2/04
B Loop RHRSW Pump, Valve and Flow Test (ST-6-012-232-0), dated 5/6/04
A RHR Pump, Valve and Flow Test (ST-6-051-231-1), dated 3/30/04
B RHR Pump, Valve and Flow Test (ST-6-051-232-1), dated 5/6/04
C RHR Pump, Valve and Flow Test (ST-6-051-233-1), dated 4/1/04
D RHR Pump, Valve and Flow Test (ST-6-051-234-1), dated 3/26/04
A RHR Pump, Valve and Flow Test (ST-6-051-231-2), dated 4/23/04
B RHR Pump, Valve and Flow Test (ST-6-051-232-2), dated 5/25/04
C RHR Pump, Valve and Flow Test (ST-6-051-233-2), dated 4/9/04D RHR Pump, Valve and Flow Test (ST-6-051-234-2), dated 5/12/04
HPCI Pump, Valve and Flow Test (ST-6-055-230-1), dated 3/2/04
HPCI Pump, Valve and Flow Test (ST-6-055-230-2), dated 3/23/04
RCIC Pump, Valve and Flow Test (ST-6-049-230-1), dated 6/4/04
RCIC Pump, Valve and Flow Test (ST-6-049-230-2), dated 6/2/04
A Loop ESW Valve Test (ST-6-011-203-0), dated 4/3/04
B Loop ESW Valve Test (ST-6-011-232-0), dated 6/3/04

Corrective Action Reports

061220	115852	122123	128549	136380
061268	115907	122229	129541	137390
102394	116023	123126	129572	138075
108707	116060	123179	129659	138392
108974	117547	123699	129953	138766
112633	117754	123874	130054	138788
112780	118139	123932	130418	139118
112908	118209	123934	130771	139133
113001	118795	124900	131472	139239
113319	119205	125155	131641	139997
113822	119273	125619	131890	140522
113865	119903	125697	131913	140568
114157	120325	125779	132555	141413
114368	120746	125783	132707	141479
114441	120993	125788	133142	141507
114530	121077	126710	133530	141513
115166	121214	126860	134420	141763
115443	121418	127830	134483	142097
115591	121473	127931	134935	142242

142649	157502	175265	197624	212686
142813	157582	175800	197717	213719
142895	158342	175959	198535	214003
144211	158483	175983	199553	214012
144433	158716	176020	199566	215020
144523	159519	176239	199749	215122
144992	159523	177745	199836	215330
146073	159528	177757	199841	215353
146556	159530	178580	199850	215454
146663	159825	178756	199901	217518
147631	160991	179862	200997	217706
147891	161496	181094	201313	218029
148169	161511	181181	201539	218636
148212	161560	182647	201557	218729
148238	162127	183527	203527	220938
148640	162739	185353*	206227	221211
149526	162782	185826	206307	221771
150093	163237	185919	206566	222052
150184	163688	186420	206752	225374
150858	163992	186916	206937	225599*
151312	164487	187090	207005	226550
151384	164668	187475	207066	226864
151503	164986	188176	207228	227129*
151923	165190	188986	207309	227143*
152037	165476	189013	207491	227153*
152071	165493	189243	207552	227193*
152451	165910	189492	207595	227469
153568	166280	190318	207900	227488*
153665	166282	190531	208119	227766
153958	166284	190738	208280	227798*
154070	166660	190861	208951	227894*
154205	166667	190947	209252	227910*
154350	167033	191960	209324	228656*
154482	167202	192216	209341	229300
155365	169061	192497	209561	230585
155681	169269	192853	209626	230627*
155684	169587	193465	209687	230715*
156156	170549	194107	210201	231037*
156500	170746	194393	210256	231233*
156974	172394	195175	210731	231250*
156981	173389	195809	211212	231428*
157326	174378	196332	211258	
157497	175105	197594	212642	

*NRC Identified During Inspection

Drawings

Auto Depressurization System (M-1-B21-1060-E-004), Sheet 1, Rev. 14
Auto Depressurization System (M-1-B21-1060-E-005), Sheet 1, Rev. 13

Evaluations

OPE-04-02 (EDG Air Start Check Valve Thread Engagement)
D11 Diesel Generator Outboard Bearing Shaft Nonconformance (LG 04-00030)

Miscellaneous

Risk-Informed Inspection Notebook for Limerick Generating Station Units 1 & 2, Rev. 1
Limerick Generating Station (March 2004) Exelon Corrective Action Performance Indicators
LGS Open Operability Evaluation Tracking Report, dated 4/8/04
Limerick Generating Station Loggable Trend Matrix
LGS Operator Logs; dated 3/9/04, 3/25/04, 4/6/04, 4/22/04, 5/4/04, and 5/12/04
Limerick Generating Station Human Performance Steering Committee Report; dated 2/10/04, 4/13/04, and 5/11/04
Limerick Generating Station Post order, Security Supervision (PO 45), Rev. 60
Limerick Generating Station DEP Drill Evaluation Report, dated 10/7/02
Limerick Biennial Exercise Evaluation Report, dated 6/1/02
Limerick Generating Station Training Drill Report; dated 1/9/03 and 7/3/03
Limerick Generating Station Augmentation (phone-in) Drill Evaluation Report; dated 11/25/02, 3/25/03, and 6/18/03
Prompt Investigation 230585
Limerick Unsolved Mysteries List, updated 5/24/04
Management Observation Reports (Operations Scorecards), dated 4/1/04 - 5/31/04
PEP I0012832, I0012531, I0011692, I0012307, I0012575, I0012758, I0012308, and I0011501
Design Basis Document for Control Room HVAC System (L-S-08B), Rev.10

Non-Cited Violations and Findings

50-352/02-04-02	50-353/03-02-02	50-352, 353/03-04-05
50-352/02-04-03	50-352/03-02-04	50-352/03-05-02
50-352/02-05-04	50-352, 353/03-04-02	50-352, 353/04-02-01

Operating Experience

Scram Solenoid Pilot Valve and Air System Maintenance (GE SIL No. 585), dated 1/4/95
NRC Information Notice 89-69, Supplement 1, Shadow Corrosion Resulting in Fuel Channel Bowing, dated 8/25/03
LGS Response to NRC Information Notice 2001-13, Inadequate Standby Liquid Control System Relief Valve Margin (ECR No. LG 01-00962-001)
LGS Response to NRC Information Notice 2000-001, Operational Issues Identified in BWR Trip and Transient (AR A1252859)
LGS Response to NRC Information Notice 2003-17, Reduced Service Life of Automatic Switch Company (ASCO) Solenoid Valves With Buna-N Material (AR 179556)
Managing Core Design Changes (AR 171992)
Safety Culture Assessment (AR 140445)

LGS Response to Generic Letter 98-04, Potential for Degradation of the Emergency Core Cooling System and Containment Spray System After a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment
NRC Information Notice 84-20, Service Life of Relays in Safety-Related Systems
NRC Information Notice 82-04, Potential Deficiency of Certain Agastat E-7000 Series Time-Delay Relays

Procedures

Operating Experience Procedure (LS-AA-115), Rev. 3
Operability Determinations (LS-AA-105), Rev. 1
Preventive Maintenance (PM) Work Order Process (MA-MA-716-009), Rev. 3
Focused Area Self-Assessments (LS-AA-126-1001), Rev. 2
Self-Assessment Program (LS-AA-126), Rev. 4
Maintenance Rule Implementation (ER-LG-310-1010), Rev. 32
Suppression Pool Gross Input Leak Rate Determination (RT-6-041-490-1), Rev. 10
Scram/ATWS Event Review (GP-18), Revs. 34 and 40
Threat Assessment (SY-AA-101-132), Rev. 3
Loss of All AC Power (Station Blackout) (E-1), Rev. 27
Loss of Off-Site Power (E-10/20), Rev. 34
Performance Centered Maintenance (PCM) Process (MA-AA-716-210), Rev. 3
D11 4.16 KV Emergency Bus Undervoltage Relay 127-115 (RT-2-092-321-1), Rev.14
Routine Inspection of the Control Room Ventilation System (S78.9.A), Rev. 8
A CREFAS Monthly Operability Test (ST-6-078-301-0), Rev. 10

System Health Reports and Trending Data

Residual Heat Removal System Health Overview Report, dated March 2004
Emergency Service Water System Health Overview Report, dated March 2004
HPCI System Health Overview Report, dated March 2004
DC System - System Health Overview Report, dated March 2004
EDG System Health Overview Report, dated January 2004
4 KV System Health Overview Report, dated March 2004

Vendor Information

Terry Turbine Maintenance Guide, HPCI Application (EPRI Technical Report)

Work Orders

A0638861	A1394184	A1427971	A1460547
A1326146	A1397246	A1436042	A1461038
A1340689	A1407063	A1440078	A1462709
A1349003	A1417913	A1444302	A1465326
A1349404	A1414677	A1453183	A1465963
A1390819	A1418809	A1453521	A1466349
A1392047	A1422229	A1458107	A1467643

A1468842 A1471190 A1473267*

LIST OF ACRONYMS

AR	Action Request
CAP	Corrective Action Program
CAPCO	Corrective Action Program Coordinator
CFR	Code of Federal Regulations
CR	Condition Report
CREFAS	Control Room Emergency Fresh Air Supply
DC	Direct Current
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
EPRI	Electric Power Research Institute
ESW	Emergency Service Water
HPCI	High Pressure Coolant Injection
LER	Licensee Event Report
LGS	Limerick Generating Station
M&TE	Maintenance and Test Equipment
MRC	Management Review Committee
NCV	Non-cited Violation
NF	Nuclear Fuels
NOS	Nuclear Oversight
NRC	Nuclear Regulatory Commission
OE	Operating Experience
OPE	Operability Evaluation
PRA	Probabilistic Risk Assessment
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SBO	Station Blackout
SDP	Significance Determination Process
SL	Significance Level
URI	Unresolved Item