April 23, 2003

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

SUBJECT: LIMERICK GENERATING STATION - NRC INTEGRATED INSPECTION REPORT 50-352/03-02, 50-353/03-02

Dear Mr. Skolds:

On March 29, 2003, the NRC completed an inspection at your Limerick Generating Station Units 1 and 2. The enclosed report documents the inspection findings which were discussed on April 15, 2003, with Mr. R. Braun 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 procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the inspectors identified four issues of very low safety significance (Green). Three of these issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny 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 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 Generation Station.

Since the terrorist attacks on September 11, 2001, the NRC has issued two Orders (dated February 25, 2002, and January 7, 2003) and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance controls over personnel access authorization. The NRC also issued Temporary Instruction 2515/148 on August 28, 2002, that provided guidance to inspectors to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the February 25th Order. Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) '02, and the remaining inspections are scheduled for completion in CY '03. Additionally, table-top security drills were conducted at several licensees to evaluate the impact of expanded adversary characteristics and the ICMs on licensee protection and mitigative strategies. Information gained and discrepancies

identified during the audits and drills were reviewed and dispositioned by the Office of Nuclear Security and Incident Response. For CY '03, the NRC will continue to monitor overall safeguards and security controls, conduct inspections, and resume force-on-force exercises at selected power plants. Should threat conditions change, the USNRC may issue additional Orders, advisories, and temporary instructions to ensure adequate safety is being maintained at all commercial power reactors.

In accordance with 10 CFR 2.790 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 Publicly 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).

Sincerely,

/RA/

Mohamed Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 50-352/03-02, 50-353/03-02

Attachment 1: Supplemental Information

cc w/encl: Senior Vice President, Mid-Atlantic Regional Operating Group
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Vice President - Mid-Atlantic Operations Support
Chairman, Nuclear Safety Review Board
Director - Licensing, Mid-Atlantic Regional Operating Group
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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: 50-352/03-02, 50-353/03-02

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Evergreen and Sanatoga Roads
Sanatoga, PA 19464

Dates: December 29, 2002 through March 29, 2003

Inspectors: A. Burritt, Senior Resident Inspector
B. Welling, Resident Inspector
M. Buckley, Resident Inspector, Peach Bottom
J. Noggle, Senior Health Physicist
J. Talieri, Reactor Inspector
A. Lohmeier, Reactor Inspector
H. Gray, Senior Reactor Inspector
K. Jenison, Senior Project Engineer

Approved by: Mohamed Shanbaky, Chief
Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000352-2003-002, IR 05000353-2003-002; Exelon Generation Company; on 12/29/02-03/29/03; Limerick Generating Station, Units 1 and 2; Post Maintenance Testing, Refueling and Outage Activities, Surveillance Testing, and Identification and Resolution of Problems.

This inspection was conducted by resident inspectors, a senior health physicist, a senior project engineer, and reactor inspectors. The inspection identified four Green findings, three of which were non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual (IM) Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. 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. Inspector Identified Findings

Cornerstone: Mitigating Systems

- **Green.** The inspectors identified a finding of very low significance (Green) that is also a non-cited violation of 10 CFR 50, Appendix B, Criterion V "Procedures," because Exelon's procedure governing local power range monitor (LPRM) maintenance did not include provisions to ensure that the associated average power range monitor (APRM) remained operable. Specifically, the procedure did not include steps to ensure the APRM remained within the technical specification required accuracy when changing the LPRM input configuration to the APRM and at the completion of the maintenance.

  This finding was determined to have very low safety significance because it did not result in an actual loss of safety function, and it did not screen as risk significant due to a seismic, fire, flooding, or severe weather initiating event. (Section 1R19)

- **Green.** The inspectors identified a finding of very low significance (Green) that is also a non-cited violation of 10 CFR 50, Appendix "B," Criterion XVI, because Exelon had not implemented adequate measures to preclude repetition of a significant condition adverse to quality, specifically a defective transistor in safety related protection system trip units that resulted in a portion of the reactor protection system being inoperable.

  This finding was determined to have very low safety significance because it did not result in an actual loss of safety function, and it did not screen as risk significant due to a seismic, fire, flooding, or severe weather initiating event.

  The inspectors identified that this finding involved a human performance error because the System Manager performing a review of the test data did not identify that one analog trip unit exceeded the repair criteria. (Section 4OA2)

Cornerstone: Barrier Integrity

- **Green.** The inspectors identified a finding of very low safety significance that is also a non-cited violation of Technical Specification 6.8.1, "Procedures," because maintenance technicians did not follow procedures while performing an inspection of new fuel bundles.

  This finding was determined to have very low safety significance because fuel barrier findings screen as Green.

  The inspectors identified that this finding involved a human performance error because technicians did not follow a maintenance procedure. Additionally, ineffective supervisory oversight, another human performance factor, contributed to this event. (Section 1R20)

- **Green.** The inspectors identified a finding of very low significance (Green) because Exelon's practice of performing preventative maintenance prior to required surveillance testing of the MSIVs masked the as-found conditions of the valves and this practice had not been evaluated by Exelon.

  This finding was determined to be of very low safety significance because the issue involved inadequate testing and did not degrade the MSIVs capability to perform its safety function. (Section 1R22)

B. Licensee-Identified Violation

A violation of very low significance which was identified by the licensee has been reviewed by the inspector. Corrective actions taken or planned by the licensee appear reasonable. This violation is listed in Section 4OA7 of this report.

Report Details

Summary of Plant Status

Unit 1 began this inspection period operating at 100% power and remained at or near that power level except for brief periods of planned testing and control rod pattern adjustments.

Unit 2 began this inspection period operating at 100% power. On January 13, 2003, Unit 2 began end-of-cycle coastdown. On March 3, the unit was shut down for refueling outage 2R07. On March 21, the reactor was taken critical. The unit was restored to full power on March 26, 2003.

1. REACTOR SAFETY
Cornerstones: Mitigating Systems [Reactor - R]

1R04 Equipment Alignment (71111.04)

.1 Partial Walk-downs

a. Inspection Scope

The inspectors performed partial system walk-downs to verify system and component alignment and to note any discrepancies that would impact system operability. The inspectors verified selected portions of redundant or backup systems or trains were available while certain system components were out of service. The inspectors reviewed selected valve positions, general condition of major system components, and electrical power availability. The partial walk-downs included the following systems:

- D21, D23, and D24 emergency diesel generators with D22 out of service for planned maintenance
- "A" loop of emergency service water (ESW) with "B" loop of ESW out of service
- A/C emergency core cooling systems including AC emergency and DC power with B/D emergency core cooling systems out of service during refueling outage

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors toured 13 Kilovolt (KV) Switchgear Area (Fire Area 2) to assess Exelon's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors reviewed the respective pre-fire action plan procedures and Section 9A of the Updated Final Safety Analysis Report (UFSAR). The following documents were also reviewed:

- OP-MA-201-007, Fire Protection System Impairment Control

- ST-2-022-600-0, Fire Detection-Fire Detection Instrumentation Channel Circuit Operability Test, Zones 2, 3, 4, 5, and 6

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

.1 Performance Test Review

The inspectors observed heat exchanger performance testing per routine test RT-2-012-391-2, for the 2B residual heat removal (RHR) heat exchanger. The inspectors also reviewed the associated Work Order R0864114. The inspectors reviewed documentation for potential deficiencies which could mask degraded performance and common cause performance problems.

.2 Performance, Inspection/Cleaning/Bio-fouling

The inspectors observed:

- 2B RHR heat exchanger cleaning, inspection, and tube plugging
- C019497009 2B-E205 non-destructive examination (NDE) (Eddy Current) exam of the 2B RHR heat exchanger.

b. Findings

No findings of significance were identified.

1R08 In-service Inspection (71111.08)

a. Inspection Scope

In accordance with In-service Inspection (ISI) Procedure 71111.08, the inspector reviewed the Exelon ISI program for Unit 2 to verify the effectiveness of activities in monitoring degradation of the reactor coolant system boundary, risk significant piping system boundaries, and reactor vessel internals performed during refueling outage 2R07 in the first period of the second ten-year interval of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, Program B. The inspector reviewed samples of ISI program NDE activities by Unit 2 inspection personnel using ultrasonic testing (UT), magnetic testing, and visual testing of selected safety system components, based upon safety significance of the components. The inspector also reviewed documentation of examination results and disposition of the examination findings to verify that safety issues pertinent to the inspection findings were adequately addressed.

The inspector reviewed the manual UT examinations from the outside surface of the

reactor pressure vessel (RPV) closure head meridional welds over a 120-degree sector. The inspector reviewed the results of the General Electric Company (GE) Nuclear Energy “GERIS 2000" indication examination of meridional RPV welds, conducted to meet ASME Section XI. The inspector also reviewed Exelon’s evaluation and basis for the acceptance of twenty (20) recordable indications, in accordance with the requirements of ASME Section XI, IWB-3500.

The inspector reviewed Exelon’s documented results of examinations of nine circumferential pipe welds. Of these, the inspector observed the performance of one circumferential pipe weld UT, including instrument calibration and review of NDE personnel qualification. The examinations included six bimetallic safe-end-to-nozzle welds in the reactor recirculation and low pressure coolant injection (LPCI) systems, one pipe-to-safe-end weld, one valve-to-pipe weld in the main steam system, and one pipe-to-reducer weld in the high pressure coolant injection (HPCI) system (observed by the inspector). The inspector reviewed the UT results of the safe-end to nozzle VRR-2RD-2A N2G inspection, which used the GE “SMART 2000" system and the acceptability per the requirements of ASME Section XI 1989 Edition, GE SIL-455, and procedure GE-UT-209 V12 for dissimilar weld UT examination.

The inspector reviewed Action Request (AR) A1407435, which discussed indications on Unit 2 shroud head bolt Numbers 1, 7, 10, 11, 28, 34 and 47, which were depicted in GE INR-Li2-03-01 as showing damage during the reactor internals’ visual inspection. The inspector reviewed Exelon’s disposition of each of the indications and the GE evaluation of operating the support system with 34 of the 48 total bolts remaining at the appropriate spacing. The inspector reviewed the corrections made to the shroud head bolt assembly procedure to ensure proper bolt installation and the recommendation to replace shroud head bolt No.10 at the next outage. The inspector reviewed Exelon’s analysis regarding the potential concern associated with the shroud head bolts (EPRI TR-105707).

The inspector reviewed AR A1407063, which discussed the disc repair of check valve HV-051-2F050A, during which a post weld build-up repair was performed in accordance with ASME Section III and XI, Specification P-301.

The inspector reviewed AR A1407439 discussing required evaluation and justification for “using as is” two RPV head flange indications outside the O-Ring groove at stud #3 and at the edge of the O-Ring groove near stud #24.

The inspector reviewed the disposition of the failure of one mechanical snubber (DCA-204-H027) out of an initial sample of 17 hydraulic snubbers and two compensating struts. The inspector also reviewed the examination findings resulting from the required extended sample of 19 snubbers. The functional testing of the snubbers was performed in accordance with Technical Specification 4.7.4.e. and surveillance test ST-1-103-300-2.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated the follow-up actions for selected system, structure, or component (SSC) issues and reviewed the performance history of these SSCs to assess the effectiveness of Exelon's maintenance activities. The inspectors reviewed Exelon's problem identification and resolution actions, as applicable, for these issues to evaluate whether Exelon had appropriately monitored, evaluated, and dispositioned the issues in accordance with Exelon's procedures and the requirements of 10 CFR 50.65(a)(1) and (a)(2), "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classification, performance criteria and goals. The inspectors reviewed the associated maintenance action requests and discussed the issues with engineering personnel. The following issues were reviewed:

- (A1396358) D24 emergency diesel generator (EDG) fuel oil leak
- (A1399857, CR146156) Diesel driven fire pump packing/follower overheating
- R087043001 Inspect 8" check valve internals' HPCI injection check valve to feedwater
- ESW-HV-011-046 valve overhaul

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors reviewed the assessment and management of selected maintenance activities to evaluate the effectiveness of Exelon's risk management for planned and emergent work. The inspectors compared the risk assessments and risk management actions to the requirements of 10 CFR 50.65(a)(4) and the recommendations of NUMARC 93-01, Section 11, "Assessment of Risk Resulting from Performance of Maintenance Activities." The inspectors evaluated the selected activities to determine whether risk assessments were performed when required and appropriate risk management actions were identified.

The inspectors reviewed scheduled and emergent work activities with work control center planning personnel to verify whether risk management action threshold levels were correctly identified. The inspectors assessed those activities to evaluate whether appropriate implementation of risk management actions were performed in accordance with Exelon's procedures.

The inspectors compared the assessed risk configuration to the actual plant conditions and any in-progress evolutions or external events to evaluate whether the assessment was accurate, complete, and appropriate for the issue. The inspectors performed control room and field walk-downs to verify whether the compensatory measures identified by the risk assessments were appropriately performed. The selected

maintenance activities included:

- D12 emergency diesel generator overhaul
- Unit 2, reactor core isolation cooling leak repair
- D22 emergency diesel generator overhaul
- Removal of 2A reactor feed pump from service

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions (71111.14)

a. Inspection Scope

.1 Non-routine/Transient Operations

The inspectors observed and reviewed licensed operator performance in the control room during non-routine events:

- Unit 2 reactor protection system bypass event (CR 138075)
- Removal of Unit 2 6A feedwater heater from service during the end of cycle coastdown

The inspector observed the control room operators' response to the event and an evolution. The inspector verified compliance with applicable procedures and technical specification action statements.

.2 Reactor Trips

On March 25, 2003, operators initiated a Unit 2 main turbine trip due to high main turbine vibrations during the shutdown for the refueling outage 2R07. Following the main turbine trip, an unexpected automatic reactor scram occurred. The inspector was in the control room and observed licensed operators' performance of emergency operating procedures and plant recovery procedures.

The inspectors also reviewed the following documents:

- T-100, Scram/Scram Recovery
- T-101, RPV Control
- OT-110, Reactor High Level
- GP-18, Scram/ATWS Event Review
- Prompt Investigation CR 147279
- CRs 147279 and 147309
- Action Request A1406830

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed operability determinations that were selected based on risk insights, to assess the adequacy of the evaluations, the use and control of compensatory measures, and compliance with the Technical Specifications. In addition, the inspectors reviewed the selected operability determinations to verify whether the determinations were performed in accordance with Exelon Procedure LS-AA-105, "Operability Determinations." The inspectors used the Technical Specifications, UFSAR, associated design basis documents, and applicable action request and condition report documents during these reviews. The issue(s) reviewed included:

- (A1396316, A1396323, A1391217, CR140606) - Standby gas treatment relays beyond service life
- (A1399608, CR 133293, A1399087) - D14 jacket water leaks
- (A1400812) - HPCI rupture disk torque inadequate
- (CR 142874) - Residual heat removal (RHR) room coolers inoperable (Refer to Section 4OA7)
- (CR143352) - 2B RHR snubber failure
- (CR 147292) - "A" loop of shutdown cooling - vibration
- 2B RHR heat exchanger tube - corrosion
- 2F025A pressure relief valve - leaking
- (CR 149191) - 2B RHR heat exchanger and RHR system operability

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

The inspectors reviewed the analysis for the Unit 2 reactor feed pump woodward governor modification to replace the mechanical/hydraulic speed control of the reactor feed pump turbine with a digital control system. This is similar to a modification performed on the Peach Bottom Atomic Power Station reactor feed pump turbines in 1996-1997. The inspectors reviewed the following documents to verify that the design basis, licensing basis, and performance capability of the reactor feed system have not been degraded through this modification:

- ECR 99-02286, "Modification P00662 U2 RFPT: Engineering Documents"
- 10 CFR 50.59 Safety Evaluation for Modification P00662, Reactor Feed Pump Turbine Controls Replacement
- CR 147002
- CR 147053
- CR 147059
- CR 147078

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed portions of post-maintenance testing activity in the field to determine whether the tests were performed in accordance with the approved procedures. The inspectors assessed the test's adequacy by comparing the test methodology to the scope of maintenance work performed. In addition, the inspectors evaluated the test acceptance criteria to verify whether the test demonstrated that the tested components satisfied the applicable design and licensing bases and the technical specification requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied. The maintenance activities reviewed included:

- D22 EDG overhaul
- Div. I 2A1D103 battery charger preventive maintenance including replacing a current limiting resistor. (R0868905, R086503801, ST-4-095-961-2)
- RCIC overspeed testing following a minor overhaul/inspection (RT-4-049-331-2)
- Main Steam Isolation Valve (MSIV) operator replacement - inboard MSIV stroke time setting (R0800004103, C0204556, A1406673)
- Replace main steam line "A" control valve number pressure switch (PS-001-202D), (C0204258, A1404833, ST-2-001-808-2 and ST-2-001-815-2)
- Local power range monitor preventative maintenance (Procedure IC-11-00741)

The following maintenance activities were previously inspected during NRC Inspection

Report 02-05 but were not reported:

- 2B standby liquid control pump piston and packing replacement
- 1A Core spray minimum flow valve maintenance
- RCIC minimum flow valve maintenance

.1 Average Power Range Monitor Operability During Testing

During a control room tour, the inspector observed that local power range monitor (LPRM) maintenance was being performed with the affected average power range monitor (APRM) considered operable. During the preventive maintenance the LPRM inputs are automatically bypassed from the APRM and subsequently restored, one LPRM at a time. Changing the LPRM configuration that provides input to the APRM affects the APRM's indicated power level and accuracy when compared with thermal power. Technical Specification 4.3.1.1-1, Reactor Protection System Instrumentation Surveillance Requirements, item (d), requires that APRM accuracy be maintained within 2% of calculated thermal power.

The inspector reviewed the following documents:

- IC-11-00741, Checkout and Troubleshooting of LPRM Detectors and NUMAC LPRM Channels
- CR 151407
- Work Order R0912683
- Action Request A1387927

b. Findings

Introduction

The inspectors identified a finding of very low significance (Green) that is also a non-cited violation of 10 CFR 50, Appendix B, Criterion V "Procedures," because Exelon's procedure governing LPRM maintenance did not include provisions to ensure that the associated APRM remained operable. Specifically, the procedure did not include steps to ensure the APRM remained within the technical specification required accuracy when changing the LPRM input configuration to the APRM and at the completion of the maintenance.

Description

On January 31, during a control room tour, the inspector identified that Exelon Procedure IC-11-00741, "Checkout and Troubleshooting of LPRM Detectors and NUMAC LPRM Channels," was being performed with the associated APRM being considered operable. The procedure did not have a provision to assure that the affected APRM's average gain adjustment factor was maintained within the 2% accuracy specified in technical specifications, as required for APRM operability. Performing the LPRM maintenance altered the indicated power level of the APRM, without any change in plant conditions, and likely caused the 2% tolerance for accuracy to be exceeded. Further, the procedure did not have post maintenance provisions to ensure that the

average gain adjustment factor was within the required accuracy at the completion of the maintenance and prior to starting work on another instrument. Consequently, the procedure did not specifically demonstrate that the APRM was operable during and after the LPRM work since the failure to monitor APRM accuracy resulted in the APRM accuracy being indeterminate. After the work was completed the automated printouts of core parameters were resumed and operators verified that the average gain adjustment factors were within required tolerances and thereby confirmed that the APRMs were operable.

Analysis

The lack of procedure guidance to ensure that the APRM remained within the required 2% accuracy when performing preventive maintenance on local power range monitors that altered the input configuration to the APRM is a performance deficiency since this maintenance procedure is required to have steps that demonstrate the operability of the APRM following performance of the work. 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 was associated with the Procedure Quality (Maintenance and Testing - pre-event) attribute of the Mitigating Systems cornerstone, and it affected the cornerstone objective. The cornerstone objective was affected because performing the LPRM maintenance without monitoring the APRM resulted in the APRM accuracy being indeterminate and therefore Exelon did not demonstrate that the APRM was operable prior to completion of the work. The finding impacted the Mitigating Systems Cornerstone because it involved the reactivity control system being degraded. This finding was determined to have very low safety significance (Green) by Phase 1 of the Reactor Inspection Findings for At-Power Situations Significance Determination Process because it did not result in an actual loss of safety function, and it did not screen as risk significant due to a seismic, fire, flooding, or severe weather initiating event.

Enforcement

10 CFR 50, Appendix B, Criterion V, "Procedures," requires, in part, that activities affecting quality be prescribed by documented procedures of a type appropriate to the circumstances. Contrary to the above, Exelon IC-11-00741, "Checkout and Troubleshooting of LPRM Detectors and NUMAC LPRM Channels," did not include provisions to ensure that the associated APRM remained operable and was operable following the completion of the work. Because this issue was of very low safety significance and Exelon entered this finding into the corrective action program, this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. This violation is documented in Exelon's corrective action program as CR 151407. **(NCV 50-352;353/03-02-01)**

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors observed and/or reviewed numerous refueling outage activities and controls, including:

- Plant shutdown and cool down activities
- Outage risk management including changes due to emergent work or unexpected conditions
- Outage configuration controls including:
  1) availability and accuracy of reactor coolant system instrumentation
  2) electrical power alignments
  3) decay heat removal system operation
  4) availability of reactor inventory makeup water systems
  5) secondary containment controls and integrity
- Fuel handling operations including fuel movement, fuel assembly tracking, and core verification activities.
- Reactor startup, including system restoration, preparation for reactor mode changes, control rod withdrawal, reactor criticality, reactor coolant system heat up, and reactor power increases.

During the conduct of the refueling inspection activities the inspector reviewed the associated documentation to ensure that the tasks were performed safely and in accordance with plant technical specifications and operating procedures. The procedures reviewed included the following:

- GP-2, Normal Plant Shutdown
- GP-3, Normal Plant Startup
- GP-6.1, Shutdown Operations - Refueling, Core Alteration and Core Off-Loading
- GP-6.2, Normal Plant Startup
- GP-13, Control Rod Drive/Control Rod Blade Outage Maintenance Coordination
- ON-104, Control Rod Problems
- ON-121, Loss of Shutdown Cooling
- ON-125, Loss of Fuel Pool Cooling
- S51.7.A, Draining Reactor Well and Dryer/Separator Storage Pool with RHR
- S51.8.L, RHR Alternate Decay Heat Removal Startup and Shutdown

Prior to the commencement of the reactor startup, the inspector also performed a walkdown of selected SSCs to assess the readiness of the SSCs to support plant restart following the refueling outage.

.1 Dropped New Fuel Bundles

The inspectors reviewed an event in which two new fuel bundles were damaged when they fell out of a shipping container as technicians were raising them to a vertical position. The inspectors discussed the event with station personnel, walked-down the refuel floor area where the event occurred, and reviewed several documents, including:

- Condition Report 141763
- Prompt Investigation Report 141763
- Operator Logs
- Exelon Procedure M-097-044, "New Fuel Receipt and Inspection"

b. Findings

Introduction

The inspectors identified a finding of very low safety significance (Green) that is also a non-cited violation of Technical Specification 6.8.1, "Procedures," because maintenance technicians did not follow procedures while performing an inspection of new fuel bundles.

Description

On January 29, 2003, two new fuel bundles fell out of a shipping container as maintenance technicians were raising them to a vertical position. The bundles were damaged as they struck the refueling floor; however, there was no breach of the cladding and no contamination or other radiological consequences. Exelon shipped the bundles back to the fuel vendor.

This event occurred as technicians were performing inspections of new fuel. The technicians did not follow two separate steps in the inspection procedure that require them to install restraining bars and a strap. These steps also require a second individual to verify ("peer check") satisfactory completion to prevent this event from occurring.

Exelon conducted a prompt investigation of the event. The investigation revealed that:

- Technicians did not use or refer to the fuel inspection procedure
- Technicians were not aware of a recent change to the procedure that required peer checks
- Technicians had received a pre-job brief that covered the critical steps of installing the restraining bars and strap, and
- Supervisors did not provide effective oversight of the evolution

Analysis

The inspectors identified a performance deficiency, because the maintenance technicians did not properly implement a maintenance procedure for new fuel inspections. This procedure is within the scope of procedures described in Regulatory

Guide 1.33, as required by Technical Specification 6.8.1. 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. The finding was considered more than minor because it is similar to example 4.a "Insignificant Procedural Errors" in Appendix E of NRC Inspection Manual 0612, "Power Reactor Inspection Reports." Not following the new fuel inspection procedure adversely affected safety-related equipment, in that it resulted in damage to new fuel bundles. The finding impacted the Barrier Integrity Cornerstone because it is associated with the integrity of the fuel cladding. This finding was determined to have very low safety significance (Green) by Phase 1 of the Reactor Inspection Findings for At-Power Situations Significance Determination Process because fuel barrier findings screen as Green.

The inspectors identified that this finding involved a human performance error because technicians did not follow a maintenance procedure. Additionally, ineffective supervisory oversight, another human performance factor, contributed to this event.

Enforcement

Technical Specification 6.8.1 requires, in part, that written procedures be established, implemented, and maintained covering the applicable procedures in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978. Appendix "A" of Regulatory Guide 1.33 includes procedures for performing maintenance that can affect the performance of safety-related equipment, such as fuel bundles. Exelon Procedure M-097-044, "New Fuel Receipt and Inspection," Section 5.3, states, in part, that technicians shall install hold-down bars on each fuel bundle and a safety strap on the shipping container prior to lifting the bundles to the vertical position. Contrary to the above, technicians did not install these devices, causing two new fuel containers to be dropped during the new fuel inspection evolution. Not properly implementing Exelon Procedure M-097-044 is being treated as a non-cited violation (NCV), consistent with Section VI.A. of the NRC Enforcement Policy. This issue is documented in Exelon's corrective action program as CR 141763. **(NCV 50-353/03-02-02)**

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed and observed portions of following surveillance tests, and compared test data with established acceptance criteria to verify the systems demonstrated the capability of performing the intended safety functions. The inspectors also verified that the systems and components maintained operational readiness, met applicable technical specification requirements, and were capable of performing the design basis functions. The observed or reviewed surveillance tests included:

- 1A Post LOCA Recombiner Test (137963)
- ST-2-041-427-2, NSSS - Main Steam Line Flow - High Flow; Channel "B" Calibration/Functional Test
- ST-6-048-320-2, Standby Liquid Control Operability Verification and Valve Test

- ST-6-092-117-2, D23 Diesel Generator 4 kV SFGD Loss of Power LSF/SAA and Outage Testing
- ST-6-041-202-2, MSIV Cold Shutdown Valve Test

.1 Main Steam Isolation Valve Surveillance Test Preconditioning

During a review of Unit 2 refuel outage scheduled activities, the inspectors identified that preventive maintenance was scheduled to be performed on the MSIV prior to the technical specification required in-service valve closure time test. The preventive maintenance included replacement of the valve's air operator, solenoid valves and other support equipment.

The inspector reviewed the following documents:

- Inspection Manual (IM) Part 9900 technical guidance (Maintenance - Preconditioning of Structures, Systems, and Components Before Determining Operability), which was referenced in Inspection Procedure 71111.22, "Surveillance Testing," issued September 28, 1998
- Information Notice (IN) 97-16, "Preconditioning of Plant Structures, Systems, and Components Before ASME Code In-Service Testing or Technical Specification Surveillance Testing," issued April 4, 1997
- Surveillance test procedure ST-6-041-202-2, MSIV Cold Shutdown Valve Test
- Exelon position paper on pre-conditioning
- Design Specification ML-008
- Action Request A1310125
- CR 146966

b. Findings

Introduction

The inspectors identified a finding of very low significance (Green) because Exelon's practice of performing preventative maintenance prior to required surveillance testing of the MSIVs masked the as-found conditions of the valves and this practice had not been evaluated by Exelon.

Description

The inspectors determined that Exelon has performed preventive maintenance prior to required surveillance testing on MSIVs since at least 1997. The inspectors determined that the MSIV preventative maintenance and subsequent test sequence were not consistent with the sequence discussed in IN 97-16, "Preconditioning of Plant Structures, Systems, and Components Before ASME Code In-Service Testing or Technical Specification Surveillance Testing," and NRC IM Part 9900 guidance regarding preconditioning. The inspectors identified that the preventive maintenance performed on the MSIVs prior to testing preconditioned the valves and, as a result, masked the as-found condition of the valves in each test performed. Exelon had not evaluated whether it was acceptable, from a preconditioning viewpoint, to perform the valve preventive maintenance prior to performing the required surveillance test.

Following a discussion with the inspectors, Exelon determined that their past practices caused unacceptable preconditioning. Exelon also changed the sequence during the most recent refueling outage and performed the required test prior to the planned preventive maintenance. During the most recent outage, five of the eight valves as-found stroke times did not meet the stroke time acceptance criteria in the surveillance test procedure. After maintenance was performed, all of the eight valves were stroked time successfully. Although Exelon appropriately modified the test sequence during the recent Unit 2 refuel outage, they also identified that, since at least 1997, they had previously performed similar maintenance prior to timing tests on the MSIVs and that was unacceptable preconditioning.

Analysis

Not performing as-found in-service timing tests on the MSIV is a performance deficiency, since the practice of performing maintenance prior to testing the valves is not consistent with IN 97-16 and IM Part 9900. 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. The finding was considered more than minor, in that the issue was associated with the Barrier Performance (reliability) attribute of the Barrier Integrity cornerstone, and it affected the cornerstone objective. The Barrier Integrity cornerstone objective was affected because the failure to conduct as-found testing masks any valve degradation which would adversely impact the reliability of the reactor coolant and containment boundary in minimizing radio nuclide releases caused by accidents and events. This finding was also associated with the Equipment Performance (reliability) attribute of the Mitigating Systems cornerstone, and it affected the cornerstone objective. The cornerstone objective was affected because failure to conduct as-found testing masks any valve degradation which would adversely impact the reliability of the power conversion system to respond to initiating events to prevent undesirable consequences. Phase 1 of the At-Power Reactor Safety Significance Determination Process screened this finding to Phase 2 because more than one cornerstone was affected. This finding was determined to be of very low safety significance (Green) because the issue involved inadequate testing and did not degrade the MSIVs capability to perform its safety function. Therefore, no mitigation equipment or sequences in Phase 2 were adversely impacted.

Enforcement

The inspectors concluded that the testing performance deficiency discussed above did not constitute a violation of regulatory requirements because IN 97-16 and IM Part 9900 are not regulatory requirements. This issue is documented in Exelon's corrective action program as CR 146966. **(FIN 50-352;353/03-02-03)**

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspector reviewed the temporary changes to:

- Removal of cooling to the thermal barrier heat exchanger for the 2B recirculation pump
- Temporary power to the rod drive control system

The inspector verified that the temporary changes did not adversely affect system or support system availability, and did not adversely affect a function important to plant safety. The inspector verified that the applicable design and licensing bases were considered and that 10 CFR 50.59 reviews were appropriate. The inspectors compared the actual installations against the temporary modification documents to verify that the implemented changes were consistent with the approved documents.

.1 Removal of Cooling to the Thermal Barrier Heat Exchanger for the 2B Recirculation Pump Modification

The inspectors reviewed selected portions of a temporary modification to the 2B recirculation pump that isolated reactor enclosure cooling water (RECW) to the pump lower seal cooler due to a leak on the RECW supply piping. The inspectors discussed the modification with engineers and reviewed the following documents.

- ECR 03-00139
- 10 CFR 50.59 Screening Document for ECR 03-00139
- LS-AA-104-1000, “Exelon 50.59 Resource Manual”
- CR 149655

.2 Temporary Power to the Rod Drive Control System

The inspectors reviewed selected portions of a temporary modification to provide power to the rod drive control system while the normal source of power was de-energized. The inspectors reviewed the following documents.

- ECR 03-00137
- Work order C0204472

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Controls to Radiologically Significant Areas

a. Inspection Scope

The inspector reviewed the radiation protection access control program by examining the controls established for exposure significant areas, including postings, barricades, locking controls, radiological briefings, and radiation protection technician coverage of workers. The review was with respect to requirements contained in Plant Technical Specifications and 10 CFR 20.1601.

The inspector reviewed the cause, Limerick's detection, response, and corrective actions taken to protect workers during and following a March 6, 2003, refuel floor airborne radioactivity incident. The data reviewed included the health physics control point logs, contamination surveys, air surveys, and whole body counts. In addition, interviews were conducted with applicable station personnel and airborne radioactivity response procedures were reviewed. The cause of the event was attributed to an unanticipated reaction of underwater hydrolazing of Unit 2 reactor vessel nozzles, coincident with the air venting from a piping system passing through the resulting underwater suspended radioactive contamination created by the hydrolazing. Contamination subsequently became airborne a short time after reaching the water filled reactor cavity pool surface. The amount of airborne radioactivity generated was minor and short-lived (peak of 0.8 DAC). The low level airborne radioactivity was filtered and scrubbed by the plant ventilation system, which prevented any offsite release. There were no measurable internal exposures (>10 mrem CEDE) to the radiation workers involved in the event.

Other refueling outage plant areas and activities reviewed included: drywell access to various high radiation areas in the drywell and refueling floor radiological controls. For each of these areas, radiation surveys, radiation work permit controls, and electronic dosimeter alarm setpoints were reviewed with respect to technical specification requirements. Radiological briefings were observed between radiation protection technicians and radiation workers, independent radiation surveys were conducted and the performance of radiological work was observed for the following work activities:

- refueling floor activities;
- reactor vessel bottom head weld ISI on March 13, 2003;
- core spray check valve 6A local leak rate test and repair on March 11-13, 2003;
- LPCI N17C nozzle insulation and whip restraint refurbishment following ISI;
- various drywell scaffold building activities on March 10-13, 2003;
- various snubber replacements in the drywell on March 10-13, 2003; and
- various pipe insulating activities in the drywell on March 10-13, 2003.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

.1 10 CFR 20.1101(b) Requirements

a. Inspection Scope

The inspector reviewed Exelon's As Low As is Reasonably Achievable (ALARA) performance with respect to requirements contained in 10 CFR 20.1101(b). Areas reviewed included an evaluation of ALARA planning for the following five highest exposure outage tasks: drywell inservice inspection, drywell scaffolding, drywell piping insulation, drywell undervessel activities, and refueling floor activities. The specific ALARA job performance observations that were performed were previously listed in Section 2OS1. In addition, the following ALARA inspection activities were conducted:

- independent shielding effectiveness radiation surveys were conducted in the drywell; and
- observation of closed circuit television equipment, teledosimetry, and intercom use in the drywell were conducted with respect to drywell remote health physics work surveillance capability.

b. Findings

No findings of significance were identified.

.2 Unit 2 Refueling Outage

a. Inspection Scope

A review of the dose estimates and ALARA plans for the March 2003 Unit 2 refueling outage was performed. The outage is scheduled for 15 days and 78 person-rem exposure is expected. The following highest exposure outage work activity plans were selected for review:

- Drywell ISI
- Drywell scaffold erection/removal
- Under vessel work
- Control rod drive replacement
- Refueling floor work activities
- Reactor feedwater pump turbine governor modification

The above work activity plans were evaluated with respect to: the method and accuracy of the exposure estimates; the planned application of exposure reduction techniques; and the degree of ALARA planning associated with the work groups. This review was accomplished utilizing information and criteria contained in the following documents and interviews:

- Limerick Generating Station 2R07 refueling outage two month readiness review January 16, 2003 meeting handouts
- ALARA prejob reviews and exposure estimates for the above drywell outage tasks
- Applicable Limerick Unit 2 outage task dose histories
- Work group supervisor interviews with respect to: drywell scaffold, drywell ISI, control rod drive replacement and undervessel work activities, and drywell work scheduling
- Interviews with four ALARA Radiological Engineers and the Radiological Engineering Manager

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA2 Identification and Resolution of Problems (71152)

a. Inspection Scope

.1 Occupational Radiation Safety

The inspector reviewed eleven condition reports relating to occupational radiation safety that were initiated between July 2002 and January 15, 2003, in order to evaluate Limerick's threshold for identifying and resolving problems in implementing the radiation protection program.

.2 Inservice Inspection

The inspector reviewed samples of dispositions of ISI findings that were accepted or rejected in the reports shown in Attachment 1. The inspector verified in each case that problems identified by ISI were evaluated, and where appropriate, were placed into the corrective action program for repair or replacement.

.3 Unexpected Scram Bypass Due to a Degraded Transistor

The inspectors reviewed Exelon's corrective actions for previously identified problems with a transistor in safety-related analog trip units documented in Licensee Event Report (LER) 1-90-03 and LER 1-98-11. The transistor was degraded as a result of moisture being entrapped during the manufacturing process that can cause the transistor to spuriously turn on. The resulting failure mode is that the associated analog trip unit will provide an erroneous trip signal adversely affecting the safety related protective system. In addition, this action occurs without any change in the input signal trip status indicator. The inspectors discussed the issue with engineering personnel and reviewed the following documents:

Procedures and Documents

- LER 1-90-03
- LER 1-98-11
- PEP I0007872
- Nonconformance Report (NCR) LG 98-00591

b. Findings

Introduction

The inspectors identified a finding of very low significance (Green) that is also a non-cited violation of 10 CFR 50, Appendix "B," Criterion XVI, because Exelon had not implemented adequate measures to preclude repetition of a significant condition adverse to quality, specifically a defective transistor in safety related protection system trip units that resulted in a portion of the reactor protection system being inoperable.

Description

In LER 1-90-03, Exelon committed to replace a defective transistor in certain safety related protection system trip units. This was specified as a corrective action to prevent recurrence of erroneous actuations of trip units that could adversely affect safety related equipment. The scope of this corrective action included analog trip units that were energize to actuate and perform a safety function. Subsequently, as documented in LER 1-98-011, Exelon revised their measures to prevent recurrence to prioritize the repairs, relying on measuring of trip unit output voltages to monitor the trip unit performance and to determine if transistor replacement was needed to prevent failure.

The Engineering staff developed a monitoring plan which permitted early detection of analog trip unit problems and established a criterion for repairs to avoid unplanned actuations. The monitoring plan used data gathered quarterly by the Instrumentation and Controls Department using a routine test procedure which was subsequently analyzed by engineering to determine if the measured the transistor leakage current exceeded some repair threshold.

Exelon's investigation determined that the following measures of their corrective action monitoring plan were inadequate: the routine test to collect the data did not specify the predetermined threshold as an acceptance criterion; the engineering review of the data collected was not formally established; and, the review did not provide an independent verification.

As a result of the identified inadequacies, Exelon did not perform required repairs on a transistor in a protective system trip unit. The System Manager's review (December 17, 2002) did not identify that the current leakage values measured on December 1, 2002, exceeded the repair threshold. As a result, on January 3, 2003, the associated analog trip unit erroneously actuated, causing one automatic reactor trip input signal to be inappropriately bypassed based on the actual plant conditions.

Analysis

The inspectors determined that Exelon's inadequate measures for a previously identified

significant condition adverse to quality associated with defective transistors in certain safety related protection system trip units is a performance deficiency because the measures taken did not preclude recurrence as required by 10 CFR 50 Appendix B Criterion XVI. 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. The finding was considered more than minor because it is similar to example 4.g "Insignificant Procedural Errors" in Appendix "E" of NRC IM 0612, "Power Reactor Inspection Reports." The inadequate corrective action adversely affected safety-related equipment, in that the failure bypassed one reactor protection input. The finding impacted the Mitigating Systems Cornerstone because it involved the reactivity control system being degraded. This finding was determined to have very low safety significance (Green) by Phase 1 of the Reactor Inspection Findings for At-Power Situations Significance Determination Process because it did not result in an actual loss of safety function, and it did not screen as risk significant due to a seismic, fire, flooding, or severe weather initiating event.

The inspectors identified that this finding involved a human performance error because the System Manager performing a review of the test data did not identify that one analog trip unit exceeded the repair criteria.

Enforcement

10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," requires in part that in the case of significant conditions adverse to quality, the measures shall assure that the correction action taken preclude repetition. Contrary to the above, the measures in Exelon's degraded trip unit monitoring plan in effect on December 1, 2002, were inadequate in that the routine test to collect the data did not specify the predetermined threshold as an acceptance criterion; the engineering review of the data collected was not formally established; and, the review did not provide an independent verification and, as a result, did not preclude repetition of failure of a degraded analog trip unit that occurred on January 3, 2003, that resulted in a portion of the reactor protection system being inoperable. Because this issue was of very low safety significance and Exelon entered this finding into their corrective action program, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. This violation is documented in Exelon's corrective action program as CR 138075. **(NCV 50-352;353/03-02-04)**

4OA3 Event Followup (71153)

a. Inspection Scope

.1 Reactor Trip

On March 25, 2003, operators initiated a Unit 2 main turbine trip due to high main turbine vibrations during the shutdown for the refueling outage 2R07. Following the main turbine trip, an unexpected automatic reactor scram occurred. The inspector was in the control room and observed licensed operators' performance of emergency operating procedures and plant recovery procedures.

.2 Dropped Fuel Bundles

On January 29, 2003, inspectors responded to an event in which two new fuel bundles were damaged when they fell out of a shipping container as technicians were raising them to a vertical position. This event is discussed in Section 1R20 of this report.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

.1 Exit Meeting

The inspectors presented the inspection results to Mr. Robert Braun and other members of station management on April 15, 2003. The inspectors reviewed proprietary documents of the licensee which have not been included in the inspection report.

.2 Annual Assessment Meeting

On April 3, 2003, the NRC held a meeting with Exelon, that was open for public observation, to discuss the results of NRC's assessment of the Exelon's performance at the Limerick Generating Station for the period January 1, 2002 through December 31, 2002. The handouts from the meeting are available electronically from the NRC's document system (ADAMS) under ascension number ML031040044.

4OA7 Licensee-identified Violations

The following finding of very low significance was identified by the Exelon and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as a Non-Cited Violation.

NCV Tracking Number	Requirement Licensee Failed to Meet
50-352,353/03-02-05	10 CFR 50 Appendix B, Criterion III, “Design Control.” Exelon did not maintain adequate design control over the minimum required emergency service water flow rate for RHR unit coolers. Consequently, RHR sub-systems were rendered inoperable due to inadequate unit cooler heat removal rates on several occasions during the past three years. All periods of inoperability were less than the technical specification allowed outage times. This issue was discovered during an engineering quality review team effort and was documented in CR 142874.

Attachment 1 SUPPLEMENTAL INFORMATION

a. Key Points of Contact

Exelon Generation Company

R. Braun	Site Vice President (Acting)
E. Callan	Director - Operations
R. Dickinson	Manager, NOS
B. Hanson	Plant Manager
W. Harris	Radiation Protection Manager
M. Kaminski	Manager, Regulatory Assurance
C. Mudrick	Director - Engineering
A. Wasong	Director - Training

b. List of Items Opened, Closed, and Discussed

Opened and Closed

NCV 50-352;353/03-02-01	LPRM maintenance procedure did not include provisions to assure operability of associated Average Power Range Monitor
NCV 50-353;03-02-02	Dropped new fuel bundles due to failure to follow procedures
FIN 50-352;353/03-02-03	Main steam isolation valve surveillance test preconditioning
NCV 50-352;353/03-02-04	Inadequate measures to preclude repetition of erroneous actuation of reactor protection system trip units
NCV 50-352,353/03-02-05	Failure to maintain design control of minimum required ESW flow rates for RHR unit coolers

c. List of Documents Reviewed

Codes and Standards

American Society of Mechanical Engineers, Section XI
Title 10 Code of Federal Regulations, Part 50.55a
Limerick Updated Final Safety Analysis Report (UFSAR)

RPV Meridional Weld Examination

Li2/DJ	RPV Closure Head Meridional Weld Indication Summary, ASME B-A/B1,22, including RPV Sizing Data Sheet, Examination Data Sheets, Sizing Data Sheets, RPV Closure and Bottom Head Scan Limitation Drawing, GERIS Indication Evaluation Data Sheets

Relief Request - Dissimilar Welds

ASME Code Case N-578-1	Risk Informed Requirements for Class!, 2, or 3 Piping, Method B, Section XI, Division 1
Regulatory Issue 2003-01	Supplement 10 to App. VIII, ASME Section XI, Examination of Dissimilar Welds
Exelon to USNRC Letter	Response to USNRC Request for Additional Information Concerning a Proposed Alternative Associated with the Risk-Informed ISI Program, 10/16/2002
Exelon to USNRC Letter	Implementation of Performance Demonstration Methods (Supplement Ten (10) - "Qualification Requirements for Dissimilar Metal Piping Welds," 12/13/2002)
Exelon to USNRC Letter	Proposed Alternative Associated with the Risk-Informed ISI Program 1/10/2003
USNRC to Skolds Letter	LGS Units 1&2, ASME B&PV Code Relief for Risk-Informed ISI of Piping (TAC NOS MB4633 and MB4634), 3/3/2003
Exelon to USNRC Letter	Second Ten-Year ISI Program, Risk Informed ISI Program, Alternative to ASME B&PV Code, Section XI Requirements for Class 1 and 2 Piping Welds, 3/15/2003
NRR to Harding Telecon	Acceptance of Limerick 2 Relief Request Indication Limit 3/14/2003

Pipe Circumferential Weld Examination Summaries

VRR-2RD-2A N2F	System RR, Safe-End to Nozzle, ASME B3.13, Augmented to GL 88-01
VRR-2RD-2B N2C	System RR, Safe-End to Nozzle, ASME B3.13, Augmented to GL 88-01
VRR-2RD-2B N2B	System RR, Safe-End to Nozzle, ASME B3.13, Augmented to GL 88-01
VRR-2RD-2B N2E	System RR, Safe-End to Nozzle, ASME B3.13, Augmented to GL 88-01
VRR-2RD-2A N2G	System RR, Safe-End to Nozzle, ASME B3.13, Augmented to GL 88-01, UT Data, Thickness Profiles, UT Charts, Thickness Profiles, Instrument Calibrations, Material Certifications, PDI Qualifications
DCA-418-3 FW1	System LPCI, Pipe to Safe-End, ASME R-A/R1.11
DCA418-3 N17C	System LPCI, Safe-End to Nozzle, ASME R-A/R1.11, AUG-07

EBB-203-1 FW36	System MS, 26" Valve to Pipe, ASME R-A/R1.11
EBB-203-1 FW36	System MS, 26" Valve to Pipe, ASME R-A/R1.2 (Witnessed by Inspector)
EBB-208-2 FW13	(Observed) HPCI System UT 12" pipe to 12"x10" Reducer Calibration and Examination, Indication Sheet, Wall Thickness Profile, PDI Certifications of Qualification, 3/11/03

Reactor Vessel Examinations

Li2/DH	System RPV, Closure Head Weld, ASME b-A/b1.22
A1407439	RPV Head O-Ring Flange Indications, 3/9/2003
A1407063	A Loop 12-900 Testable Check Valve (Drawing 50301-A) Weld Repair

Procedures

GE-PDI-UT-1,Rev. 3	PDI Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds
GE-VT-204 V-6	Procedure for In-Vessel Visual Inspection (IVVI)
GE-UT-209	Procedure for Automated UT Examination of Dissimilar Metal Welds and Nozzle to Safe End Welds

Internal Vessel Visual Inspection

Shroud Head Indication Summary Notes
BWRVIP-06 Safety Assessment of BWR Reactor Internals, Section 3.2.2 Failure Consequences

CR 00148196	VT-3 Examination of the Steam Separator (not dated)
A1407435	Indications on U2 Shroud Head Bolts
GE INR-Li-03-01 R1	Shroud Head Bolt Indication Notification Report, 03/08/03
ISI Drawing XI-BN-2	Reactor Shroud Head Bolt Sketch
EPRI TR-105707-3.2	Shroud Head and Separators

Functional Testing of Snubbers

DCA-204-H027	2R07 Functional Testing
CR 148064	Failure of DCA-204-H027

d. List of Acronyms

ALARA	As Low As is Reasonably Achievable
APRM	Average Power Range Monitor
AR	Action Request
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CR	Condition Report
ECR	Engineering Change Request
EDG	Emergency Diesel Generator
ESW	Emergency service water
GE	General Electric Company
HPCI	High Pressure Coolant Injection
ICMs	Interim compensatory measures
IM	Inspection Manual
IN	Information Notice
ISI	In-service Inspection
kV	Kilovolt
LER	Licensee Event Report
LPCI	Low pressure coolant injection
MSIV	Main Steam Isolation Valve
NCV	Non-cited Violation
NDE	Non-destructive examination
NRC	Nuclear Regulatory Commission
OD	Operability Determination
RCIC	Reactor Core Isolation Cooling
RECW	Reactor enclosure cooling water
RIS	Regulatory Information Summary
RPV	Reactor pressure vessel
RHR	Residual heat removal
RT	Routine test
SDP	Significance Determination Process
SSC	System, Structure, or Component
ST	Surveillance Test
UFSAR	Updated Final Safety Analysis Report