



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I**  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

August 2, 2012

EA-12-165

Mr. Michael J. Pacilio  
Site Vice President, Exelon Generation Company, LLC  
President and Chief Nuclear Officer, Exelon Nuclear  
4300 Winfield Rd.  
Warrenville, IL 60555

**SUBJECT: LIMERICK GENERATING STATION - NRC SUPPLEMENTAL INSPECTION  
REPORT 05000353/2012008; EXERCISE OF ENFORCEMENT DISCRETION;  
AND ASSESSMENT FOLLOW-UP LETTER**

Dear Mr. Pacilio:

On June 15, 2012, the U. S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection pursuant to Inspection Procedure (IP) 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," at your Limerick Generating Station, Unit 2. The enclosed inspection report (IR) documents the inspection results, which were discussed on June 28, 2012, with members of your staff.

As required by the NRC Reactor Oversight Process Action Matrix, this supplemental inspection was conducted because a finding of low to moderate safety significance (White) was identified in the third quarter of 2011. This issue was documented previously in NRC Inspection Report 05000353/2011004, dated November 4, 2011, and involved the failure to ensure sufficient technical guidance was contained in operating procedures to: (1) ensure that a feedwater (FW) motor operated valve (MOV) could close against expected system differential pressures; and (2) prevent operators from attempting to close FW MOVs out of sequence resulting in differential pressures for which they are not designed. The significance of this issue was finalized in NRC Inspection Report 05000353/2011009 and the NRC staff was informed on February 14, 2012, of your staff's readiness for this inspection.

The objectives of this supplemental inspection were to provide assurance that: (1) the root causes and the contributing causes for the risk-significant issues were understood; (2) the extent of condition and extent of cause of the issues were identified; and (3) corrective actions were or will be sufficient to address and preclude repetition of the root and contributing causes. The inspection consisted of examination of activities conducted under your license as they related to safety, compliance with the Commission's rules and regulations, and the conditions of your operating license. The NRC concluded that, overall, the inspection objectives were met. However, several observations regarding the rigor of Exelon's review of the problem identification and root cause documentation aspects of the issue were noted. Taken collectively, these observations were not considered significant in that they did not represent a substantial inadequacy in Exelon's evaluation of the causes of the performance issue, determination of the extent of the performance issue, or actions taken or planned to correct it.

Based on the guidance in IMC 0305, "Operating Reactor Assessment Program," and the results of the inspection, the White finding will be closed and Limerick Unit 2 will transition from the Regulatory Response Column of the NRC's Action Matrix to the Licensee Response Column beginning with the third calendar quarter of 2012.

Additionally, one Severity Level (SL) IV non-cited violation (NCV) of 10 CFR 50.73 was identified for failure to report Technical Specification noncompliances associated with TS 3.5.1 and TS 3.0.3 within the required timeframe, once simultaneous inoperability of the HPCI and RCIC systems was identified. Notwithstanding the SL-IV NCV of 10 CFR 50.73, the noncompliances with TS's 3.5.1 and 3.0.3 were determined to be additional violations associated with the original performance deficiency for the White finding discussed in NRC Inspection Report 05000353/2011004. Specifically, the TS 3.5.1 and 3.0.3 violations were a consequence of RCIC inoperability and would not have occurred if sufficient technical guidance had been contained in operating procedures. Therefore, based on the results of the NRC's inspection and assessment of the TS 3.5.1 and 3.0.3 violations, I have been authorized, after consultation with the Director, Office of Enforcement, to exercise enforcement discretion in accordance with Section 3 of the NRC Enforcement Policy, "Use of Enforcement Discretion."

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Darrell J. Roberts, Director  
Division of Reactor Projects

Docket No.: 50-353  
License No.: NPF-85

Enclosure: Inspection Report 05000353/2012008  
w/Attachments: A – Supplemental Information  
B – Initial Document Request In Support of Limerick 95001  
Inspection

cc w/encl: Distribution via ListServ

Based on the guidance in IMC 0305, "Operating Reactor Assessment Program," and the results of the inspection, the White finding will be closed and Limerick Unit 2 will transition from the Regulatory Response Column of the NRC's Action Matrix to the Licensee Response Column beginning with the third calendar quarter of 2012.

Additionally, one Severity Level (SL) IV non-cited violation (NCV) of 10 CFR 50.73 was identified for failure to report Technical Specification noncompliance's associated with TS 3.5.1 and TS 3.0.3 within the required timeframe, once simultaneous inoperability of the HPCI and RCIC systems was identified. Notwithstanding the SL-IV NCV of 10 CFR 50.73, the noncompliances with TS's 3.5.1 and 3.0.3 were determined to be additional violations associated with the original performance deficiency for the White finding discussed in NRC Inspection Report 05000353/2011004. Specifically, the TS 3.5.1 and 3.0.3 violations were a consequence of RCIC inoperability and would not have occurred if sufficient technical guidance had been contained in operating procedures. Therefore, based on the results of the NRC's inspection and assessment of the TS 3.5.1 and 3.0.3 violations, I have been authorized, after consultation with the Director, Office of Enforcement, to exercise enforcement discretion in accordance with Section 3 of the NRC Enforcement Policy, "Use of Enforcement Discretion."

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Sincerely,  
/RA/

Darrell J. Roberts, Director  
Division of Reactor Projects

Docket No.: 50-353  
License No.: NPF-85

Enclosure: Inspection Report 05000353/2012008  
w/Attachments: A - Supplemental Information  
B - Initial Document Request In Support of Limerick 95001 Inspection

cc w/encl: Distribution via ListServ

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U.S. NUCLEAR REGULATORY COMMISSION (NRC)

REGION I

Docket No.: 50-353

License No.: NPF-85

Report No.: 05000353/2012008

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Unit 2

Location: Sanatoga, Pennsylvania 19464

Dates: June 11, 2012 through June 15, 2012

Inspectors: P. Finney, Susquehanna Senior Resident Inspector, Lead Inspector  
E. Bonney, Beaver Valley Resident Inspector

Approved by: Darrell J. Roberts, Director  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000353/2012008; 6/11/2012 – 6/15/2012; Limerick Generating Station, Unit 2;  
Supplemental Inspection – Inspection Procedure (IP) 95001

A senior resident inspector and resident inspector from Region I, Division of Reactor Projects performed this inspection. One Severity Level (SL) IV finding was identified in this report. The significance of most findings is indicated by their color (i.e., green, white, yellow, or red) using the NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Cross-cutting aspects are determined using IMC 0310, "Components within the Cross-Cutting Areas." 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," dated December 2006.

### NRC-Identified and Self-Revealed Findings

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

The NRC staff performed this supplemental inspection in accordance with IP 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess Exelon's evaluation associated with the inoperability of the Unit 2 reactor core isolation cooling (RCIC) system and a primary containment isolation valve (PCIV) from April 22 to May 23, 2011. The NRC staff previously characterized this issue as having low to moderate safety significance (White), as documented in NRC Inspection Report 05000353/2011004 (ML11308B146). The significance determination was finalized in NRC Inspection Report 05000353/2011009 (ML113410132). Exelon identified the root cause of the issue to be a lack of process controls for maintaining safety-related feedwater (FW) valves HV-041-209A and HV-041-209B, which resulted in the failure of one PCIV to completely close on April 21, 2011. Additionally, Exelon identified two contributing causes: 1) non-conservative original design assumptions; and 2) failure of the downstream non-safety-related MOV (HV-041-210) to close. Corrective actions completed or planned include revision of the long path FW flushing procedure, diagnostic testing of the FW PCIVs on both Units, development, and implementation of fleet-wide guidance for maintaining safety-related MOVs that are not in the GL 89-10 program, and performance of in-body maintenance on the downstream non-safety related MOV that failed to close.

Based on the results of the inspection, the inspectors concluded that Exelon had adequately performed a root cause analysis of the event and that completed and planned corrective actions were reasonable to address the related issues. Given Exelon's acceptable performance in addressing the inoperability of RCIC and a PCIV, the White finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program." Inspectors will review Exelon's implementation of remaining corrective actions during a future inspection. Notwithstanding the above, inspectors made several observations regarding the rigor of Exelon's review of the problem identification and root cause documentation aspects of the issue. Taken collectively, these observations were not considered significant in that they did not represent a substantial inadequacy in Exelon's evaluation of the causes of the performance issue, determination of the extent of the performance issue, or actions taken or planned.

SL-IV: The inspectors identified a SL-IV non-cited violation (NCV) of 10 CFR Part 50.73, "Licensee Event Report System," because violations of Technical Specifications (TS) 3.5.1 and 3.0.3 for the condition of the high pressure coolant injection (HPCI) and RCIC systems being simultaneously inoperable were not reported to the NRC within 60 days of discovery. After this was identified by the inspectors, the issue was entered into Exelon's Corrective Action Program (CAP) as IR 1377559.

The inspectors determined that the failure to revise Licensee Event Report (LER) 05000353/2011-003-00 within 60 days of initial issuance on July 21, 2011 to include the violations of TS 3.5.1 and 3.0.3 in accordance with 10 CFR Part 50.73 was a performance deficiency that was reasonably within Exelon's ability to foresee and correct, and should have been prevented. Because the issue impacted the regulatory process, in that a violation of Technical Specifications was not reported to the NRC within the required timeframe and the NRC's opportunity to review the matter in its entirety was delayed, the inspectors evaluated this performance deficiency in accordance with the traditional enforcement process. Using example 6.9.d.9 from the NRC Enforcement Policy, the inspectors determined the performance deficiency was a SL-IV violation, because Exelon personnel did not make a report required by 10 CFR Part 50.73. The significance of the associated performance deficiency was screened against the ROP per the guidance of IMC 0612, Appendix B, and the inspectors determined it to be minor because it was not similar to Appendix E examples, was not a precursor to a significant event, did not cause a performance indicator (PI) to exceed a threshold, did not adversely affect cornerstone objectives, and if left uncorrected would not have lead to a more significant safety concern. As such, no ROP finding was identified and no cross-cutting aspect was assigned. (Section 4OA4.02)

#### **Other Findings**

No findings of significance were identified.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA4 Supplemental Inspection (95001)

##### .01 Inspection Scope

The NRC staff performed this supplemental inspection in accordance with IP 95001 to assess Exelon's evaluation of a White finding, which affected the Mitigating Systems cornerstone in the Reactor Safety strategic performance area. The inspection objectives were to:

- Provide assurance that the root and contributing causes of risk-significant issues were understood.
- Provide assurance that the extent of condition and extent of cause of risk-significant issues were identified.
- Provide assurance that corrective actions for risk-significant issues were sufficient to address the root and contributing causes and to preclude repetition.

Limerick Unit 2 entered the Regulatory Response Column of the NRC's Action Matrix in the third quarter of 2011 as a result of one inspection finding of low to moderate (White) safety significance. The White finding was associated with the failure of two Unit 2 FW MOVs to fully close on April 21, 2011 and resulted in the subsequent inoperability of the RCIC system and a PCIV from April 22 through May 23, 2011. The finding was characterized as having low to moderate (White) safety significance based on the results of a Phase 3 risk analysis performed by a region-based senior reactor analyst (SRA), as discussed in NRC Inspection Reports 05000353/2011004 and 2011009. On April 21, 2011, two FW MOVs (HV-041-209B and HV-041-210), one of which was a safety-related PCIV (HV-041-209B), failed to fully close, even though remote indications in the main control room showed the valves to be fully closed. The incomplete closure of the MOVs resulted in FW flow being diverted to the main condenser and manifested itself as a loss of electrical megawatts (MWe) from the main generator output that was identified on April 26, 2011. After several days of troubleshooting, on May 23, 2011, Limerick staff identified that the FW MOVs were not fully closed and took successful actions to completely close the valves.

Following identification of the FW MOVs not being fully closed and successfully closing them, Exelon entered the issue in their CAP as IR 1219476 and an Equipment Apparent Cause Evaluation (EACE) was performed. A revision to the FW long path procedure was completed on June 15, 2011, to ensure the downstream non-safety-related FW MOV (HV-041-210) is closed prior to closing the safety-related FW PCIV MOVs (HV-041-209A and 209B). On October 13, 2011, Exelon entered the potential White issue into their CAP as IR 1276176 and a Root Cause Analysis (RCA) was performed. Exelon staff informed the NRC staff on February 14, 2012, that they were ready for the supplemental inspection.

The inspectors reviewed Exelon's Root Cause Report (RCR) in addition to other evaluations conducted as a result of the RCA. The inspectors reviewed corrective actions that were taken or planned to address the identified causes. The inspectors also held discussions with Exelon personnel to ensure that the root and contributing causes and the contribution of safety culture components were understood and corrective actions taken or planned were appropriate to address the causes and preclude repetition.

## .02 Evaluation of the Inspection Requirements

### 02.01 Problem Identification

- a. *IP 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and the conditions under which the issue was identified.*

The inspectors noted that while the RCR does not explicitly recognize who identified the issue, it provides sufficient detail on how the issue was eventually discovered to determine that the issue was self-revealing. Specifically, the RCR discusses a MWe discrepancy on Unit 2 but does not call this self-revealing. Other areas of the RCR describe the MOV failure mode as not self-revealing. The RCR team explained that the MOV self-revealing reference was specific to the initial event and not to the final issue.

On April 26, 2011, IR 1207704 was written due to the fact that Unit 2 main turbine electrical output was less than expected for the given reactor thermal power. During troubleshooting of the reduction in electrical output, via a Failure Mode Causal Tree (FMCT), Exelon determined that two FW MOVs, HV-041-209B and HV-041-210, were not fully closed. The inspectors verified that this information was documented in Exelon's RCR.

Overall, the inspectors determined that Exelon's evaluation of the issue documents who identified the issue and the conditions under which the issue was identified.

- b. *IP 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents how long the issue existed and prior opportunities for identification.*

Exelon's RCR documented that the Unit 2 RCIC system and PCIV HV-041-209B were inoperable from April 22, 2011 to the time of discovery and MOV closure on May 23, 2011. On April 21, 2011, the downstream non-safety related MOV HV-041-210 valve failed to close when it tripped on thermal overload during a FW long path flush. Because the 210 valve indicated an intermediate position in the main control room, Operations staff decided to close the upstream, safety-related MOV HV-041-209B based on: a) procedural guidance not to throttle the 210 valve; and b) the subsequent procedural step was to close the 209B. The 209B valve was taken to the closed position, followed by the 210 valve. Since both valves indicated closed in the main control room, an IR (1206083) was written to document the 210 valve failure and Operations staff continued with alignment of the FW system for Mode 2.

Subsequently, during power operations, an FMCT team was established to determine the cause of a reduction in main generator electrical output. The FMCT consisted of five legs, or potential areas of concern. One leg considered the potential for a FW flow diversion downstream of FW flow measuring equipment. Since the 209A, 209B, and 210 MOVs were a potential cause, Exelon conducted troubleshooting on these valves. On May 3, 2011, the FMCT leg that considered FW flow diversions as a contributor was closed based on incorrect assumptions about expected flow noise in the vicinity of the 209 and 210 valves. On May 10, 2011, the FW flow diversion troubleshooting leg was reopened. However, thermography and acoustic testing on the 210 valve were considered inconclusive due, in part, to testing that was performed from the door of the room. On May 16, 2011, Exelon determined that the 210 was the most probable leak path and completed a valve stroking plan on May 20, 2011. On May 23, 2011, Exelon determined that the 209B and 210 valves were not fully closed and successfully closed both valves.

Despite the RCR discussing the timeliness of troubleshooting, the licensee's RCA team determined that the prioritization of troubleshooting actions was appropriate. During the root cause review, Exelon identified a weakness in troubleshooting in that the portion of the FMCT associated with "feedwater flow being diverted from the reactor downstream of the feedwater flow measurement devices" was incorrectly closed twice. As a corrective action, Exelon developed support/refute training for those staff with troubleshooting certification.

Through interviews, the inspectors observed that Exelon had not considered the precursor 210 valve failure as input to the FMCT, which would have elevated its likelihood as a valid FW diversion path thereby leading to earlier identification of the RCIC and PCIV inoperability. Additionally, the MOV engineer was not informed of the 210 MOV failure until three weeks later. Finally, corporate IR 1223656 acknowledged that "risk insights could have been used to help objectively drive a more timely resolution." The issue of available CAP information not having been considered by the FMCT in a timely manner was not included in the licensee's RCR. The inspectors observed that had Exelon incorporated the 210 MOV failure information, the FW MOVs may have received more aggressive and targeted troubleshooting, hence reducing the risk significance of the issue. The inspectors also observed that had the initial RCA scope been broader, the timeliness aspects of this issue would have been reviewed through causal analysis.

Overall, the inspectors determined that Exelon's evaluation of the issue documented how long the issue existed and prior opportunities for identification.

- c. *IP 95001 requires that the inspection staff determine that the licensee's evaluation documents the plant specific risk consequences, as applicable, and compliance concerns associated with the issue(s).*

Exelon's RCR documented that the finding associated with this issue had low to moderate (White) safety significance. In addition, the RCR documented that the NRC concluded the event was more than minor and provided the NRC's total change in core damage frequency (CDF) as low E-6/year (White) and total change in large early release frequency (LERF) as 3.6E-9/year.

The inspectors noted the absence of Exelon's own risk consequence analysis in the RCR. While Exelon had conducted a separate risk evaluation in support of the SDP, Exelon's own determination of delta CDF and LERF were absent from the stand-alone RCR.

The RCR documents violations of TSs associated with Unit 2 RCIC and PCIVs in that Unit 2 RCIC would not have been able to supply design flow to the reactor and that the 209B valve was unable to perform its safety function as a PCIV in its partially open state. The RCR also documents that the event was reportable and that this communication was completed via LER 05000353/2011-003-00. The inspectors noted that while the LER documented three conditions prohibited by TSs, TS 3.0.4 was not documented in the RCR. Specifically, the LER acknowledges TS 3.7.3 for Unit 2 RCIC, TS 3.6.3 for a PCIV, and TS 3.0.4, entering an Operational Condition when a limiting condition for operation (LCO) was not met. Further, the inspectors identified that Exelon had missed two additional, reportable conditions prohibited by TSs that were not in the RCR or the LER. First, Unit 2 HPCI had been inoperable for six hours from 0300 to 0900 on April 24, 2011 for surveillance testing. TS 3.5.1 provides for HPCI inoperability provided that, with other emergency core cooling systems (ECCSs), RCIC is operable. Second, given the simultaneous inoperability of Unit 2 HPCI and RCIC, Unit 2 had violated TS 3.5.1 and should have entered TS 3.0.3.

The LCO for TS 3.0.3 states, in part, "When a Limiting Condition for Operation is not met, within one hour, action shall be initiated to place the unit in an OPERATIONAL CONDITION in which the Specification does not apply by placing it in STARTUP within the next 6 hours, HOT SHUTDOWN within the following 6 hours, or COLD SHUTDOWN within the subsequent 24 hours." Because Exelon did not initiate action within one hour to place Unit 2 in an Operational Condition in which TS 3.5.1 did not apply, Unit 2 had violated TS 3.0.3. With respect to TS 3.0.3 entries, NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2, Section 3.2.2, states that "it should be considered reportable under this criterion if the condition is not corrected within an hour, such that it is necessary to initiate actions to shutdown, cool down, etc." Therefore, the inspectors determined that Exelon had not reported two conditions prohibited by TSs, TS 3.5.1 and 3.0.3.

After this issue was identified by the inspectors, Exelon entered this issue into their CAP as IR 1377559 to capture the conditions prohibited by TSs and the associated LER information. The inspectors considered the issue to be a weakness in that noncompliance information had been available to Exelon personnel as of the submittal date of the original RCIC LER (July 21, 2011) and had an adequate review of compliance concerns been completed, Exelon would have reasonably discovered the simultaneous past inoperability and properly reported it, yet the licensee did not identify this issue in the RCR. The failure to discuss the applicability of TS 3.5.1 and TS 3.0.3, was not considered to be a significant weakness in that it did not represent a substantial inadequacy in Exelon's evaluation of the root causes of the original event, determination of extent of the performance issues, or corrective actions taken or planned.

Notwithstanding these observations, the inspectors determined that Exelon's evaluation generally documented the plant specific risk consequences and compliance concerns associated with the issue.

d. Findings

Introduction: The inspectors identified a Severity Level (SL) IV NCV of 10 CFR Part 50.73, "Licensee Event Report System," when violations of Unit 2 TS 3.5.1 and TS 3.0.3 were not reported to the NRC within 60 days of discovery. Specifically, the condition of Unit 2 HPCI and RCIC being simultaneously inoperable was a condition prohibited by TSs and actions were not initiated within one hour to place Unit 2 in an operational condition in which the TS did not apply.

Description: From April 22 to May 23, 2011, Limerick Unit 2 RCIC and a PCIV were inoperable due to the failure of two in-series MOVs to close. Based on the duration of the condition, Exelon submitted LER 05000353/2011-003-00, "Condition Prohibited by Technical Specifications due to Inoperable Reactor Core Isolation Cooling System," to the NRC on July 21, 2011. The LER identified that TS 3.7.3 and 3.6.3 were applicable for Unit 2 RCIC and a PCIV respectively. The LER also identified that TS 3.0.4 was violated when Unit 2 entered an Operational Condition when an LCO was not met. However, as described in Section c. above, the licensee missed two additional reportable conditions prohibited by TSs.

Exelon entered this issue into their CAP as IR 1377559 to capture the conditions prohibited by TSs and the associated LER information. The IR documented that on June 3, 2011, a Limerick staff member preparing the LER had sent an email to branch engineers regarding HPCI inoperability and potential TS 3.0.3 noncompliance. However, the email response indicated that HPCI surveillance testing had not resulted in inoperability greater than one hour. Based on the noncompliance information having been available to Exelon personnel as of the submittal date of the original RCIC LER (July 21, 2011), the violation of TS 3.5.1 and 3.0.3 should have been

reported through a revision to the LER within 60 days. The inspectors determined that it was reasonable that had an adequate review of compliance concerns been completed, Exelon would have reasonably discovered the simultaneous inoperability.

Analysis: The inspectors determined that the failure to revise LER 05000353/2011-003-00 within 60 days of July 21, 2011, to include the violations of TS 3.5.1 and 3.0.3 in accordance with 10 CFR Part 50.73 was a performance deficiency that was reasonably within Exelon's ability to foresee and correct, and should have been prevented. Because the issue impacted the regulatory process, in that a violation of Technical Specifications was not reported to the NRC within the required timeframe and the NRC's opportunity to review the matter in its entirety was delayed, the inspectors evaluated this performance deficiency in accordance with the traditional enforcement process. Using example 6.9.d.9 from the NRC Enforcement Policy, the inspectors determined that the performance deficiency was a SL-IV violation, because Exelon personnel failed to make a report required by 10 CFR Part 50.73 when information that the report was required had been reasonably within their ability to have identified. The significance of the associated performance deficiency was screened against the ROP per the guidance of IMC 0612, Appendix B, and the inspectors determined it to be minor because it was not similar to Appendix E examples, was not a precursor to a significant event, did not cause a PI to exceed a threshold, did not adversely affect cornerstone objectives, and if left uncorrected would not have lead to a more significant safety concern. As such, no ROP finding was identified and no cross-cutting aspect was assigned.

Regarding the violations of TS 3.5.1 and 3.0.3, the inspectors determined that the performance deficiency for these issues was the same as the performance deficiency associated with the White finding discussed in NRC inspection report 05000353/2011004, and has been adequately addressed. Specifically, the TS 3.5.1 and 3.0.3 violations were a consequence of RCIC inoperability and would not have occurred if sufficient technical guidance had been contained in operating procedures to ensure full closure of the 209B and 210 MOVs. In addition, the six hours of HPCI inoperability that occurred on April 24, 2011, would not have changed the risk significance of the White finding. Therefore, while violations were identified, enforcement discretion in accordance with Section 3 of the NRC Enforcement Policy, "Use of Enforcement Discretion," is being applied to TS's 3.5.1 and 3.0.3. This discretion, however, is not being applied to the 10 CFR 50.73 violation described below.

Enforcement: 10 CFR 50.73(a)(2)(i)(B) requires, in part, that licensees shall submit a Licensee Event Report within 60 days after the discovery of any operation or condition which was prohibited by the plant's TS. Limerick Unit 2 TS 3.5.1 requires, in part, that with the HPCI system inoperable, HPCI operability shall be restored within 14 days provided other ECCS systems and RCIC remain operable. Furthermore, Limerick Unit 2 TS 3.0.3 requires, in part, that when a Limiting Condition for Operation is not met, action shall be initiated within one hour to place the unit in an operational condition in which the Specification does not apply.

Contrary to the above, Exelon failed to revise LER 05000353/2011-003-00 within 60 days of July 21, 2011, to include the violations of TS 3.5.1 and 3.0.3 despite the noncompliance information being available to Limerick staff beginning on June 3, 2011. Because this SL-IV violation was of very low safety significance, was not repetitive or willful, and was placed in Exelon's CAP as IR 1377559, this violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000353/2012008-01, Failure to Submit an LER Revision for Conditions Prohibited by TS Associated with the HPCI and RCIC Systems)**

## 02.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

- a. *IP 95001 requires that the inspection staff determine that the licensee evaluated the issue using a systematic methodology to identify the root and contributing causes*

Exelon used the following systematic methods to complete the RCR: Event and Causal Factor chart, Taproot, Barrier Analysis, and Cause and Effect Analysis. Exelon identified one root cause, two contributing causes, and one latent organization weakness. The root cause of the issue was a lack of process controls for maintaining safety-related FW PCIVs, which resulted in the failure of one PCIV to completely close on April 21, 2011. Additionally, Exelon identified two contributing causes: 1) non-conservative original design assumptions, with regard to the ability of the PCIV to close under design differential pressure and 2) failure of the downstream non-safety related MOV to close. A Latent Organizational Weakness was determined to contribute to the first contributing cause. Specifically, operational experience (OE) gained during GL 89-10 program implementation pertaining to non-conservative original design assumptions was not adequately evaluated to understand the potential impact of non-MOV program operational and structural limitations on safety-related valves.

Inspectors observed that use of systematic tools during the RCA could have been improved in three respects. First, during use of Cause and Effect Analysis, a causal step of “valve not tested/PM'd” was reached. In the subsequent questioning “Why,” Exelon determined the next causal step was that the valve (209B) was outside of the GL 89-10 program. The inspectors noted that the subsequent causal step could also be answered by the lack of valve maintenance since MOV 209B had not received more than a packing re-torque since 1999. The inspectors noted that, despite Exelon’s exclusion of the 209B valve from the GL 89-10 program, the valve was safety-related and was not run-to-failure and therefore should have been receiving periodic maintenance. Second, during use of Barrier Analysis, the inspectors noted that work history was not considered a failed barrier despite fleet procedural inclusion as a potential barrier. Finally, during the Event and Causal Factor chart analysis, the inspectors noted the absence of any timeline entries between 1989 and 2007, despite the fact that a six-year overhaul PM had been deleted in 1994. The inspectors determined that an aggregate analysis of these observations would have suggested that lack of preventive maintenance was potentially causal. Notwithstanding, the inspectors determined that Exelon’s root cause captured the broader maintenance aspects of the issue.

The inspectors observed that the RCA charter scope included a failure mechanism and appeared unduly narrow in that including a failure mechanism in the charter statement could potentially limit the root cause team’s evaluation of the issue. Specifically, the scope was to determine why Limerick had failed to institutionalize the design limitations of the FW long path flush valves into station programs and procedures. While Exelon assured the inspectors that this scope was considered the minimum the RCA team was to consider, the inspectors observed that providing failures in a root cause charter statement can result in the root cause team reaching pre-determined conclusions. The inspectors also observed that not including the duration of time that the condition existed precluded the root cause team from evaluating prior opportunities of identification as potential contributors to the issue.

With respect to the collection of data to support the RCA, IR 1219476 was written on May 23, 2011, to capture the failed MOV issues and was evaluated using an EACE. The inspectors noted that this IR was not screened as an RCA and did not include justification despite Attachment 3 of fleet procedure, LS-AA-120, “Issue Identification and Screening Process,”

Revision 14, stating that “strong consideration should be given” to completing an RCA when an associated LER was required. Instead, an RCA was started more than five months after the issue. Information gathering via interviews, such as Operations, in this later timeframe regarding what Limerick staff had observed, may have been reduced in effectiveness given the time that had transpired since initial discovery. The RCR recognized that there was missing information regarding the re-opening of the FMCT. Exelon acknowledged that an RCA was not supported until the NRC issue was finalized as low to moderate significance (White).

Despite these observations, the inspectors determined that Exelon had generally evaluated the issue using a systematic methodology to identify root and contributing causes.

- b. *IP 95001 requires that the inspection staff determine that the licensee’s root cause evaluation was conducted to a level of detail commensurate with the significance of the issue.*

Exelon’s RCR included the use of a combination of RCA methods that are complimentary and the question “Why” was generally asked until causal factors were identified that were beyond Exelon’s control. A collective review of the root and contributing causes as well as the Latent Organizational Weakness did not result in the identification of any additional fundamental issues.

However, the inspectors observed that the RCR causal analysis attachments, in general, did not provide the reader with a means of independently drawing the same conclusions. Rather, other documents and sources had to be referenced. For example, the barrier analysis only lists the failed or ineffective barriers without identifying the hazards or the targets. Not listing the hazards and targets for barrier analysis made it more difficult for an independent reader to reach the same conclusions.

The inspectors observed that the second contributing cause, failure of the 210 valve to close, is a general cause and did not reflect a continuation of asking “Why” until a root cause beyond Exelon’s control was reached. In support of this observation, the RCR cause table identifies that the associated Taproot code is “N/A due to unknown failure mode.” However, the RCR provides two potential underlying causes, internal degradation or inadequate stem lubrication, and that the underlying cause will be determined when Exelon performs as-found testing in the spring 2013 refueling outage (Special Plant Condition IR 1276176-24). The RCR stated that “if it is determined that the valve failure was caused by a failure mode which could have been prevented by the PM performance, then the PM change will be considered a contributing cause to this event and the RCR revised accordingly.” The inspectors confirmed that corrective actions planned would bound the potential causes of the non-safety related MOV failure to close.

In addition, the RCR does not document other root or contributing causes that were ruled out. The inspectors noted that the derivation to the particular causes was not provided to allow an independent review to reach the same conclusion. For example, in documenting the second contributing cause associated with the 210 valve failing to close and isolate feedwater, the overload trip is immediately attributed to stem lube or valve internal degradation. The inspectors were subsequently able to obtain cause derivation information through interviews with station personnel.

The inspectors also observed that the RCA team was comprised of four members of the former lost MWe FMCT team. Furthermore, the inspectors noted that at least four of the part-time RCA members and two of the five full-time RCA members were from the Engineering organization. Additionally, there were no RCA team members that were current Maintenance, Work

Management, or Operations department representatives. The inspectors considered that the limited diversity of the RCA team may have contributed to some of the observations in this report.

Despite these observations, the inspectors determined that Exelon's RCR was generally conducted to a level of detail commensurate with the significance of the issue.

- c. *IP 95001 requires that the inspection staff determine that the licensee's root cause evaluation included a consideration of prior occurrences of the issue and knowledge of OE.*

Exelon's RCR included an evaluation of internal and external OE. The inspectors determined that Exelon included sufficient consideration of prior occurrences of similar problems in external OE that included five reports of a similar nature that had occurred over an extended period of time. One external OE report validated Exelon's review of extent of cause for the root cause. However, the inspectors observed that Exelon's review of internal OE was somewhat limited in that it could have been expanded beyond five years when the initial review did not identify any similar events during that period.

The RCA team recognized that Exelon and the industry had OE from years of experience via the GL 89-10 program that MOV valve factors can be low initially and plateau at higher values following valve service and wear. This information was being applied appropriately for GL 89-10 program MOVs and could have been applied to other MOVs. Exelon considered this issue a Latent Organizational Weakness.

Overall, the inspectors determined that Exelon's RCR included a consideration of prior occurrences of the issue and knowledge of OE.

- d. *IP 95001 requires that the inspection staff determine that the licensee's root cause evaluation addresses the extent of condition and extent of cause of the issue.*

The RCR considered the extent of condition associated with the failure of PCIV 209B to fully close. Exelon identified the potential existence of other MOVs not included in the GL 89-10 program that may be operated under significant differential pressure. An extent of condition assessment was performed for MOVs that are redundant to GL 89-10 MOVs, non-safety related MOVs, and passive PCIVs. While procedures were correct, changes were made to highlight the need for proper valve sequencing to prevent attempting to close MOVs against differential pressure for which they were not designed.

The RCR considered the extent of cause associated with the lack of process controls. Specifically, the RCA examined other programs that could allow safety-related components to not be included in the scope of their associated programs. The extent of cause considered check valves, solenoid valves, manual valves, vessel internals under the BWRVIP program, coatings, piping under ISI, heat exchangers, and air operated valves (AOVs). Exelon determined that the AOV program does not require all safety-related AOVs to be in its program. Corrective actions included site and corporate evaluation of safety-related AOVs outside of the AOV program to ensure adequate margin is available to ensure that safety functions are maintained.

The inspectors observed that the RCR did not discuss what other programs had been considered in the extent of cause. Exelon subsequently provided the scope of this review based on inspector questioning during interviews. Overall, the inspectors determined that Exelon's RCR addressed the extent of condition and extent of cause of the issue.

- e. *IP 95001 requires that the inspection staff determine that the licensee's root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components as described in IMC 0305.*

Exelon considered the safety culture aspects of Resources and Operating Experience to be applicable to this issue. Specifically, the failure to maintain design margins impacted the Resources safety culture aspect and a Latent Organizational Weakness in the application of GL 89-10 OE on safety-related MOVs outside the program was reflective of the OE safety culture aspect. Corrective actions were planned or completed taking into consideration the input of the safety culture aspects.

Overall, the inspectors determined that Exelon's RCR included a proper consideration of whether the root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components.

f. Findings

No findings of significance were identified.

02.03 Corrective Actions

- a. *IP 95001 requires that the inspection staff determine that (1) the licensee specified appropriate corrective actions for each root and/or contributing cause, or (2) an evaluation that states no actions are necessary is adequate.*

The RCR documents that immediate corrective actions consisted of: a) revision of procedure SO6.5.A, "Long Path Recirculation and Feedwater System Flushing," to annotate that if the 210 valve or equivalent on Unit 1 are not fully closed prior to closing the upstream PCIVs, then there is a potential for leakby on the PCIVs; and b) evaluation of other passive PCIVs to determine the potential for falsely indicating full closure. Corrective actions for the root and contributing causes included: further revision of the SO6.5.A procedure, generation of PM tasks to periodically perform diagnostic testing of the 209A and 209B valves as well as similar valves on Unit 1, performance of initial diagnostic testing on the these valves, and development and implementation of fleet-wide guidance for maintaining safety-related valves not incorporated in the GL 89-10 program. The inspectors determined that immediate corrective actions had addressed the procedural concerns and that corrective actions from the RCR addressed the root and contributing causes of the issue. The inspectors found the completed and proposed corrective actions to be reasonable with regard to addressing the performance deficiencies identified with this event.

Overall, the inspectors found that Exelon specified appropriate, corrective actions for the root cause, contributing causes, extent of cause, and extent of condition, listed in the RCR.

- b. *IP 95001 requires that the inspection staff determine that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance.*

The inspectors reviewed the prioritization of the corrective actions and verified that actions of a higher priority and risk significance were scheduled for completion in a reasonable time-frame. This included actions which had been completed with regard to timely revision of SO6.5.a, "Long Path Recirculation and Feedwater System Flushing," to annotate the isolation capabilities

of 209A and 209B and the equivalent Unit 1 valves, and to stroke the 209A and 209B valves to reseal them at lower pressure following the completion of long path recirculation.

Overall, the inspectors determined that Exelon had appropriately prioritized corrective actions with consideration of risk significance and regulatory compliance.

- c. *IP 95001 requires that the inspection staff determine that the licensee established a schedule for implementing and completing the corrective actions.*

Exelon's corrective actions and proposed corrective action plan provided dates for completion of actions as described in their RCR. The inspectors reviewed the proposed schedule and determined that the corrective actions could reasonably be accomplished by the dates specified.

Overall, the inspectors determined that Exelon had established an appropriate schedule for implementing and completing the corrective actions.

- d. *IP 95001 requires that the inspection staff determine that the licensee developed quantitative and/or qualitative measures of success for determining the effectiveness of the corrective actions to preclude repetition.*

The inspectors determined that the RCR included an effectiveness review for the corrective actions to prevent recurrence associated with each Unit. The unit-specific effectiveness review actions consist of requirements to verify the closed torque switches for the 209A, 209B, and Unit 1 equivalent MOVs are open, thereby indicating that the MOVs are closed and wedged into their seats. This is to be a one-time activity per unit to verify successful valve performance after diagnostic testing of the 209A, 209B, and Unit 1 equivalent MOVs. A collective effectiveness review is incorporated to evaluate all corrective actions to prevent recurrence and corrective actions. However, the inspectors observed that the collective effectiveness review is generic and specific success criteria were not defined.

Overall, the inspectors determined that Exelon personnel developed quantitative and qualitative measures of success for determining the effectiveness of those corrective actions to preclude repetition.

- e. *IP 95001 requires that the inspection staff determine that the licensee's planned or taken corrective actions adequately address a Notice of Violation (NOV) that was the basis for the supplemental inspection, if applicable.*

This inspection requirement was previously addressed in that the NRC issued an NOV to Exelon on December 8, 2011. That letter concluded that information regarding: (1) the reason for the violations; (2) the actions planned or already taken to correct the violations and prevent recurrence; and (3) the date when full compliance was achieved, were already adequately addressed on the docket in IR 05000352;353/2011004.

- f. Findings

No findings of significance were identified.

#### 02.04 Evaluation of IMC 0305 Criteria for Treatment of Old Design Issues

This risk-significant issue did not meet the criteria provided in IMC 0305 for treatment as an old design issue since it was reflective of a current performance deficiency.

#### 40A6 Exit Meeting

On June 28, 2012, the inspectors presented the inspection results to Mr. Pete Gardner, Plant Manager, and other members of his staff, who acknowledged the findings. Exelon did not identify any proprietary information.

On June 28, 2012, the NRC also conducted a regulatory performance meeting after the conclusion of the exit meeting. The discussion included the performance deficiencies and Exelon's completed and proposed corrective actions. Finally, the meeting discussed the transition of Limerick Unit 2 in the NRC's Action Matrix.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT**Licensee Personnel

J. George, Maintenance Planning Supervisor  
 G. Budock, Root Cause Team Leader  
 B. McCall, Root Cause Team  
 J. Mitman, MOV Program Engineer  
 M. Trexler, Maintenance Rule Coordinator  
 P. Marvel, Operations Shift Manager  
 E. Michelson, Operations Outage Manager, OPCAT  
 M. Farnan, NRR Engineer  
 B. Shultz, Operations Support Manager  
 J. Broillet, Operations Services Manager  
 J. Schwarz, Predictive Maintenance Tech  
 D. Zaharchuk, Motor Engineer  
 P. Tarpinian, Risk Engineer  
 V. Warren, Corporate Risk Engineer  
 C. Shimer, Risk Engineer  
 M. Klick, CAP Manager  
 J. Quinn, Engineering Response Team Leader

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

05000353/2011004-01	NOV	Failure of FW MOVs Resulting in RCIC and PCIV Inoperability for Longer than Allowed by Technical Specifications
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Open/Closed

05000353/2012008-01	NCV	Failure to Submit an LER Revision for Conditions Prohibited by TS Associated with the HPCI and RCIC Systems (Section 4OA4.2)
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**LIST OF DOCUMENTS REVIEWED**Issue Reports (\* indicates NRC-identified Issue Report)

1206083	1217367	1219476	1219842	1223656	1377601*
1377559*	253342	01207704	01206083	01209179	01208927
01215191	01215198	01215507	01219476	01219824	01219842
01219476	01223656	01276176	01363185	1337190	1284103
1364250	1350402	1356721	1326240	1323527	

ARs

A1805321

Work Orders

R1191447-01	R1200033-01	R1183547-01	PM259977	C0184791	C0238277
C0238293	C0238296	C0241414	R0048289	R0463223	R0477218
R1203886	C0238299	C0238303			

Procedures

LS-AA-120, Issue Identification and Screening Process, Revision 14  
 LS-AA-125, Corrective Action Program (CAP) Procedure, Revision 15  
 LS-AA-125-1001, Root Cause Analysis Manual, Revision 8  
 LS-AA-125-1003, Apparent Cause Evaluation Manual, Revision 10  
 SO6.5.A, Long Path Recirculation and Feedwater System Flushing, Revisions 4, 34 through 37  
 MA-AA-723-301, Periodic Inspection of Limatorque Model SMB/SB/SBD-000 through 5 Motor Operated Valves, Revision 7  
 OP-AA-102-103, Operator Work-Around Program, Revision 3  
 ST-6-055-230-02, HPCI Pump, Valve and Flow Test, Revision 70  
 ER-AA-302, MOV Program Engineering Procedure, Revision 5  
 AD-AA-101-1002, Writer's Guide for Procedures and T&RM, Revision 16  
 ER-AA-302-1006, Motor-Operated Valve Maintenance and Testing Guidelines, Revision 12  
 ER-LG-302-1000, Limerick Specific MOV Program Document, Revision 0  
 HU-AA-104-101, Procedure Use and Adherence, Revision 4  
 HU-AA-1212, Technical Task Risk/Rigor Assessment, Pre-job Brief, Independent Third Party Review, and Post-Job Review, Revision 4  
 LS-AA-126-1001, Focused Area Self-Assessment, Revision 7  
 MA-AA-723-300, Diagnostic Testing of Motor Operated Valves, Revision 5  
 MA-AA-723-300-1003, Votes Diagnostic Test Equipment/Sensor Guideline, Revision 2  
 MA-AA-723-300-1004, Quiklook Diagnostic Test Equipment/Sensor Guideline, Revision 3  
 MA-AA-723-300-1005, Review and Evaluation of Motor Operated Valve Test Data, Revision 2  
 MA-MA-716-009, Preventive Maintenance (PM) Work Order Process, Revision 5  
 MA-MA-716-009, Preventive Maintenance (PM) Work Order Process, Revision 7  
 OP-AA-101-111, Roles and Responsibilities of On-shift Personnel, Revision 5  
 OP-AA-101-111-1001, Operations Standards and Expectations, Revision 10  
 OP-LG-103-102-1002, Strategies for Successful Transient Mitigation, Revision 8  
 PMQ-600-022, Periodic Inspection of Limatorque Model SMB-000 thru 4 Motor Operated Valves, Revision 27

Drawings

M-05, Sheet 3, Condensate Unit 2, Revision 23  
 M-06, Sheet 6, Feedwater Unit 2, Revision 24  
 M-41, Sheet 4, Nuclear Boiler Unit 2, Revision 42  
 DBD-205-1, Isometric – Reactor Building Feedwater (Outside Drywell) Unit 2, Revision 7

Miscellaneous

LER 2011-003-00, (ML112020328), Condition Prohibited by TSs, 7/21/11  
 IR 05000353/2011004 (ML11308B146), 3<sup>rd</sup> quarter Resident IR, 11/4/11  
 LIM Response to Greater than Green, (ML113200012), 11/14/11  
 EN 11-039, (ML11339A075), Notification of Significant Enforcement Action, 12/5/11  
 IR 05000353/2011009 (ML113410132), Final Significance Determination, 12/8/11  
 IR 05000353/2012001 (ML12060A142), Annual Assessment Letter, 3/5/12

Maintenance Rule Scope and Performance Monitoring for Feedwater  
L-S-11, Feedwater System DBD, Revision 15  
TCF 90-0651  
MOV PCM Template, Revision 5  
Operations Logs from 4/21/11 to 4/22/11  
TRM 3.6.3  
FSAR 6.2  
LLOT0550, Feedwater Level Control System, Revision 19  
LGSOPS0005, Condensate System, Revision 0  
LGSOPS0006, Feedwater System, Revision 0  
LLOT0380, RCIC, Revision 25  
LLOT0340, HPCI, Revision 25  
DBD L-S-03, High Pressure Coolant Injection System, Revision 19  
DBD L-S-39, Reactor Core Isolation Cooling System, Revision 12  
LGS Operations Initial Training, Condensate System, Revision 0  
LGS Operations Initial Training, Feedwater Level Control System, Revision 19  
LGS Licensed Operator Initial Training, Reactor Core Isolation Cooling, Revision 25  
LGS Licensed Operator Initial Training, High Pressure Coolant Injection, Revision 25  
Limerick Generating Station Unit 2 Operational Logs, dated 4/22/11  
Limerick PORC Meeting minutes, dated 5/6/11  
Maintenance Rule Scope and Performance Monitoring, Containment and Leak Testing System,  
6/13/12  
Maintenance Rule Scope and Performance Monitoring, Reactor Core Isolation Cooling, 6/13/12  
MA-AA-716-004, Complex Troubleshooting Attachment 2, Revision 10 dated 6/17/11  
MIDASCALC calculation, HV-041-109B, dated 1/17/12  
MOV Post-Test Data Review Worksheet, HV-041-109B, dated 2/24/12  
MOV Post-Test Data Review Worksheet, HV-041-110, dated 2/23/12  
MOV Post-Test Data Review Worksheet, HV-041-109A, dated 2/24/12  
Operations Department Interviews from 4/22/11 event  
Performance Improvement Integration Matrix, dated 10/19/11  
Performance Improvement Integration Matrix, dated 1/19/12

## LIST OF ACRONYMS

ADAMS	Agencywide Document Access Management System
ADS	automatic depressurization system
AOV	air operated valve
CAP	Corrective Action Program
CCS	core spray system
CDF	change in core damage frequency
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
EACE	equipment apparent cause evaluation
ECCSs	emergency core cooling systems
FMCT	failure mode casual tree
FW	feedwater
HPCI	high pressure coolant injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
LERF	large early release frequency
LPCI	low pressure coolant injection
MOV	motor operated valve
MWe	electrical megawatts
NCV	Non-Cited Violation
NOV	Notice of Violation
NRC	U. S. Nuclear Regulatory Commission
OE	operating experiences
PARS	Publicly Available Records System
PCIV	primary containment isolation valve
PI	performance indicator
RCA	root cause analysis
RCR	root cause report
RCE	root cause evaluation
RCIC	reactor core isolation cooling
SDP	significance determination process
SL	security level
TS	Technical Specification

22 May 2012

From: Patrick Finney, Limerick 95001 Team Lead  
To: Roy Harding, Limerick Regulatory Affairs  
Subj: Initial Document Request in Support of 95001 Inspection

Please provide the following to the inspection team for review:

- 1) Completed Root Cause Analysis (RCA) and associated attachments to include corrective actions associated with the White inspection finding
- 2) Apparent Cause Evaluations (ACEs) and Evaluations associated with the White finding
- 3) Governing procedures for CAP, CR Screening, CARB, Cause Evaluations, Review of Operating Experience, Troubleshooting/Problem Solving, MOV program, and Conduct of Operations
- 4) CRs generated in the last three years related to RCIC, HPCI, Condensate, and Feedwater for both units to include any corporate CRs concerning the White finding
- 5) Completed surveillance procedures for RCIC and HPCI in the last two years for both units
- 6) Maintenance procedures for the valves and actuators associated with the White finding
- 7) Work orders associated with the White finding valves as well as the RCIC and HPCI valves that are immediately upstream from the Feedwater system
- 8) System Health Reports for RCIC, HPCI, Condensate, and Feedwater for both Limerick units
- 9) Maintenance Rule scoping documents for RCIC, HPCI, Condensate, and Feedwater for both units. If any of these systems are being monitored under 10CFR50.65a(1), provide the recovery plans
- 10) Design Basis Documents for RCIC, HPCI, Condensate, and Feedwater for both units
- 11) Licensed Operator Student Text documents for RCIC, HPCI, Condensate, and Feedwater for both units
- 12) Piping and Instrumentation Diagrams (P&ID) for RCIC, HPCI, Condensate, and Feedwater on 11x17 paper
- 13) Operating procedures for RCIC, HPCI, Condensate, and Feedwater for both units to include General Operating procedures, Startup procedures, Shutdown procedures, Emergency Operating procedures, Operating procedures, Off-Normal procedures
- 14) List of Vendor Manuals associated with the White finding valves and their actuators
- 15) Listing of Points of Contact to include the RCA team, System Engineers, Maintenance Technicians, Licensed, and Non-licensed Operators associated or familiar with the RCA issue