March 30, 2006

CAL 3-05-001

Mr. L. William Pearce
Vice President
FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
10 Center Road, A290
Perry, OH 44081

SUBJECT: PERRY NUCLEAR POWER PLANT CONFIRMATORY ACTION LETTER (CAL) FOLLOWUP INSPECTION INSPECTION PROCEDURE 95002 INSPECTION FOLLOWUP ISSUES ACTION ITEM REVIEW NRC INSPECTION REPORT 05000440/2006007

Dear Mr. Pearce:

The purpose of this letter is to provide you with Inspection Report (IR) 05000440/2006007, detailing the results of a Confirmatory Action Letter followup inspection in the area of Inspection Procedure (IP) 95002 Inspection Followup Issues. During this inspection, the NRC reviewed selected Commitments and Action Items in this area that you completed to address issues identified during previous IP 95002 and IP 95003 inspections and determined whether these items had been adequately implemented. You and other members of your staff attended the March 14, 2006, public exit meeting held at the Quail Hollow Resort in Painesville, Ohio, during which the results of this CAL followup inspection activity were presented. A summary of the public meeting was documented in a letter to you dated March 17, 2006.

As a result of poor performance, the Nuclear Regulatory Commission designated the Perry Nuclear Power Plant as a Multiple/Repetitive Degraded Cornerstone column facility in the NRC's Action Matrix in August 2004. As documented in followup IP 95003 Supplemental Inspection Report 55000440/2005003, with regard to the NRC's review of issues associated with a previous IP 95002 inspection, the NRC determined that actions to address maintenance procedure adequacy and essential service water (ESW) pump failures were still in progress at the end of the IP 95003 inspection. In addition, the NRC identified that one of your corrective actions to address the verification of the quality of ESW pump work was inadequate. Also, actions to address training were still in progress at the end of the inspection. In this case, corrective actions to address the issue had not been timely and at the conclusion of the IP 95003 inspection, had not yet been implemented.

By letters dated August 8, 2005, and August 17, 2005, you responded to the findings and observations detailed in the NRC's IP 95003 supplemental inspection report. As discussed in these letters, the Perry management team reviewed the achievements realized by the Performance Improvement Initiative (PII), NRC findings documented in the IP 95003 supplemental inspection report, and the conclusions from various assessments, and developed updates to the PII. The Perry management team restructured the PII into the Phase 2 PII,

which contained six new initiatives with the overall purpose of implementing lasting actions to improve the overall performance at the Perry Nuclear Power Plant. These actions included actions to address the issues associated with the previous IP 95002 inspection that were identified during the IP 95003 inspection.

The specific purposes of this inspection were to: (1) determine whether your corrective actions to address maintenance procedure adequacy issues were adequate, (2) determine whether your corrective actions to address emergency service water (ESW) pump coupling assembly concerns were adequate, and (3) determine whether your corrective actions to address training issues were adequate.

Overall, we concluded that you satisfactorily implemented the Commitments and Action Items that we reviewed and therefore your actions to address maintenance procedure adequacy, ESW pump coupling assembly, and training were adequate. Notwithstanding this overall conclusion, we also identified some cases where your implementation of these actions was weak, which potentially impacts your overall ability to effectively resolve these issues. Your staff should carefully consider the issues identified in this report regarding our observations of these weaknesses and supplement your actions, as necessary, to address these weaknesses. This will help ensure that the desired improvements at Perry can be realized and our effectiveness review of this area, tentatively planned for later this year, has a positive outcome.

In addition, during the course of this inspection, the inspectors identified numerous human performance errors in which maintenance personnel failed to adhere to procedural requirements during in-field observations of maintenance activities. The human performance area has been a significant concern to us as reflected in our previous identification of this area as a substantive cross-cutting issue. Based on the observations during this inspection, it is not clear whether your corrective action efforts to date have had a positive impact in resolving this issue. Therefore, your continued attention to this area is warranted.

Based on the results of this inspection, two findings of very low safety significance that involved violations of NRC requirements were identified. However, because of their very low safety significance and because these issues have been entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCVs) in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

If you contest the subject or severity of these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Perry Nuclear Power Plant.

You are requested to respond within 30 days of the date of your receipt of this letter. Your response should describe the specific actions that you plan to take to address the issues raised during this inspection.

The NRC will continue to provide increased oversight of activities at your Perry Nuclear Power Plant until you have demonstrated that your corrective actions are lasting and effective. Consistent with Inspection Manual Chapter (IMC) 0305 guidance regarding the oversight of plants in the Multiple/Repetitive Degraded Cornerstone column of the NRC's Action Matrix, the NRC will continue to assess performance at Perry and will consider at each quarterly performance assessment review the following options: (1) declaring plant performance to be unacceptable in accordance with the guidance in IMC 0305; (2) transferring the facility to the IMC 0350, "Oversight of Operating Reactor Facilities in a Shutdown Condition with Performance Problems" process; and (3) taking additional regulatory actions, as appropriate. Until you have demonstrated lasting and effective corrective actions, Perry will remain in the Multiple/Repetitive Degraded Cornerstone column of the NRC's Action Matrix.

In accordance with 10 CFR 2.390 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 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/

Mark A. Satorius, Director
Division of Reactor Projects

Docket No. 50-440
License No. NPF-58

Enclosure: Inspection Report 05000316/2005013
w/Attachments:
1. Supplemental Information
2. Perry Performance Background
3. Perry IP 95003 Inspection Results

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You are requested to respond within 30 days of the date of your receipt of this letter. Your response should describe the specific actions that you plan to take to address the issues raised during this inspection.

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Sincerely,

Mark A. Satorius, Director
Division of Reactor Projects

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-440
License No:	NPF-58
Report No:	05000440/2006007
Licensee:	FirstEnergy Nuclear Operating Company (FENOC)
Facility:	Perry Nuclear Power Plant
Location:	10 Center Road Perry, Ohio 44081
Dates:	January 9 through March 14, 2006
Inspectors:	J. Ellegood, Lead Inspector, Palisades SRI, Region III P. Finney, Reactor Inspector, Region I C. Long, Project Engineer, Region I
Observer:	J. McGhee, Reactor Engineer, Region III
Approved by:	E. Duncan, Chief Branch 6 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000440/2006007; 1/9/2006 - 3/14/2006; Perry Nuclear Power Plant; Confirmatory Action Letter (CAL) Followup Inspection - IP 95002 Issue Followup Action Item Review.

This report covers a 2-week period of supplemental inspection by resident and region-based inspectors. This inspection identified two Green findings, both of which involved non-cited violations of NRC requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." Findings for which the Significance Determination Process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealed Findings

- Green. A finding of very low safety significance and an associated non-cited violation of Technical Specification 5.4,"Procedures," was identified on January 19, 2006, when the inspectors identified during a safety-related breaker maintenance activity, that licensee personnel failed to perform required steps in procedure GEI-0009, "ABB Low Voltage Power Circuit Breaker Types K-600 & K-600S Through K-3000 & K-3000S Maintenance." Specifically, licensee personnel failed to perform required minimum operating voltage testing on the safety-related EF1A05 breaker that provided power to Division 1 Motor Control Center (MCC), Switchgear (SWGR), and Battery Room Supply Fan A. The primary cause of this finding was related to the cross-cutting area of Human Performance because licensee personnel failed to adhere to a step-by-step procedure associated with safety-related equipment. As part of the licensee's corrective actions, an extent of condition review was conducted, which determined that no additional safety-related breakers were affected.

  The inspectors concluded that the finding was more than minor in accordance with example 4.l in IMC 0612, Appendix E, "Examples of Minor Issues," since the subject breaker was subsequently determined to be out of specification. This issue was also associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance because: (1) it did not represent an actual loss of safety function of a system; (2) it did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time; (3) it did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant per 10 CFR 50.65 for greater than 24 hours; and (4) it did not screen as potentially risk significant due to a seismic, fire, flooding, or severe weather initiating event. (Section 3.1)

- Green. A finding of very low safety significance and an associated non-cited violation of Technical Specification 5.4, "Procedures," was identified on January 10, 2006, when the inspectors observed during a calibration check of a Division III Emergency Diesel Generator (EDG) Exhaust Air Damper, that licensee personnel failed to perform required steps prescribed by procedure ICI-B12-0001, "ITT NH90 Series Milliampere Proportional/On-Off Hydramotor Actuator Calibration." The primary cause of this finding was related to the cross-cutting area of Human Performance because licensee personnel failed to adhere to a step-by-step procedure associated with safety-related equipment. As part of their corrective actions, licensee personnel revised ICI-B12-0001 to clarify the requirements of the procedure.

  This finding was more than minor because it was associated with the Mitigating System cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance because: (1) it did not represent an actual loss of safety function of a system; (2) it did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time; (3) it did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant per 10 CFR 50.65 for greater than 24 hours; and (4) it did not screen as potentially risk significant due to a seismic, fire, flooding, or severe weather initiating event. (Section 3.1)

B. Licensee-Identified Violations

None.

REPORT DETAILS

1.0 Background

As documented in NRC Inspection Procedure (IP) 95003 Supplemental Inspection Report 05000440/2005003, with regard to the NRC's review of issues associated with a previous IP 95002 inspection, the NRC determined that actions to address maintenance procedure adequacy and Emergency Service Water (ESW) pump failures were still in progress at the end of the IP 95003 inspection. In addition, the team identified that one of the licensee's corrective actions to address the verification of the quality of ESW pump work was inadequate. Actions to address training were also still in progress at the end of the inspection. In this case, the licensee's corrective actions to address this issue had not been timely and at the conclusion of the IP 95003 inspection, had not yet been implemented. As a result, the NRC concluded that two open White findings associated with the previous IP 95002 inspection would continue to remain open pending additional licensee actions and the NRC's review of those actions. Additional details regarding these White findings is discussed in Attachment 2, "Perry Performance Background," of this report.

By letters dated August 8, 2005, "Response to NRC Inspection Procedure 95003 Supplemental Inspection, Inspection Report 05000440/2005003," (ML052210512) and August 17, 2005, "Corrections for Response to NRC Inspection Procedure 95003 Supplemental Inspection, Inspection Report 05000440/2005003," (ML052370357) Perry Nuclear Power Plant (PNPP) responded to the inspection results discussed in the NRC's IP 95003 supplemental inspection report. A complete summary of all of the inspection results is discussed in Attachment 3, "Perry IP 95003 Inspection Results," of this report. As discussed in these letters, the Perry leadership team reviewed the achievements realized by the Performance Improvement Initiative (PII), NRC findings documented in the NRC's IP 95003 inspection report, and the conclusions from various assessments, and developed updates to the PII. The leadership team restructured the PII into the Phase 2 PII, which contained six new initiatives with the overall purpose of implementing lasting actions to improve the overall performance at the Perry Nuclear Power Plant. These actions included actions to address the issues associated with the previous IP 95002 inspection that were identified during the IP 95003 inspection.

2.0 Inspection Scope

The objectives of this inspection were to:

2. Determine whether licensee corrective actions to address maintenance procedure adequacy issues were adequate.

3. Determine whether licensee corrective actions to address emergency service water (ESW) pump coupling assembly concerns were adequate.

4. Determine whether licensee corrective actions to address training were adequate.

To accomplish these objectives, the following Commitments and Action Items described in the Perry Phase 2 PII Detailed Action and Monitoring Plan (DAMP) and the licensee's August 8 and August 17, 2005, letters that provided the First Energy Nuclear Operating Company (FENOC) response to the findings in the IP 95003 inspection were reviewed:

Procedure Adequacy

- Commitment Item 1.a/DAMP Item B.2.2.3.1: "To date, one hundred eight (108) of the one hundred nineteen (119) procedures have been updated and issued. The remaining maintenance procedures have been updated and are currently going through the owner's review and acceptance review process."

- Commitment Item 1.b/DAMP Item B.2.2.3.2: "CA [Corrective Action] 05-03655-01 is to revise Nuclear Quality Assurance Instruction (NQI)-1001, 'QC [Quality Control] Inspection Program Control,' to specify a method by which classification can be established for additional inspection attention items that have experienced repeat failures. This method will include consideration of failure analysis, the risk-significance of the item, and the probability of failure occurrence in determining the extent of inspection activity."

ESW Pump Coupling Assembly Concerns

- Commitment Item 1.c/DAMP Item B.2.2.3.3: "CA 05-03655-03 is to revise Generic Mechanical Instruction (GMI)-0039, 'Disassemble/Re-assembly of Divisions I and II Emergency Service Water Pumps,' and GMI-040, 'Disassembly/Re-assembly of Division III Emergency Service Water Pump,' to include QC inspection points for work activities associated with pump shaft couplings, as specified by QC."

- DAMP Item B.2.2.5: "Based on the results of the maintenance procedure upgrade plan for key critical components, develop a long term Maintenance Procedure Upgrade Plan and incorporate actions into the FENOC Business Plan (05-04586-01)."

Training

- Review the corrective action of "...development of proper planning for work management to ensure strict compliance of job planning to eliminate misdirection during conduct of the job," described in Perry letter PY-CEI/NRR-2897L dated August 17, 2005.

- Review the corrective action of "...plant manager to discuss 'push back' in the daily plant updates. This discussion will promote a challenging attitude from the employees," described in Perry letter PY-CEI/NRR-2897L dated August 17, 2005.

- Review the corrective action of "...new human performance tools have been rolled out which reinforce use of human performance during stressful times. These tools are discussed in the following human performance procedures: (1) [Nuclear Operating Business Plan] NOBP-LP-2601, 'Human Performance Program'; (2) NOBP-LP-2603,

'Human Performance Tools and Verification Practices'; (3) NOBP-LP-2604, 'Job Briefs,' and (4) NOP-LP-2601, 'Procedure Use and Adherence,'" described in Perry letter PY-CEI/NRR-2897L dated August 17, 2005.

3.0 Procedure Adequacy

3.1 Commitment Item 1.a/DAMP Item B.2.2.3.1

a. Inspection Scope

The inspectors reviewed Commitment Item 1.a/DAMP Item B.2.2.3.1: "To date, one hundred eight (108) of the one hundred nineteen (119) procedures have been updated and issued. The remaining maintenance procedures have been updated and are currently going through the owner's review and acceptance review process."

To accomplish this review, the inspectors performed a sampling of revised maintenance procedures and determined whether the procedures were technically adequate and accurate, were written in a manner that minimized the presence of human performance "traps," had identified critical steps, had incorporated place-keeping, could be accomplished as written, and contained information consistent with that in associated vendor manuals.

When possible, the inspectors also observed the in-field implementation of the revised procedures to determine whether the procedures could be implemented as written and accomplished the prescribed activity.

b. Observations and Findings

The inspectors concluded that the licensee's actions adequately implemented Commitment Item 1.a/DAMP Item B.2.2.3.1.

b.1 Technical Content Review Results

The inspectors reviewed 19 of the 119 revised maintenance procedures. Overall, the inspectors concluded that the maintenance procedures reviewed were an improvement on the previous revisions, both in content, formatting, and ease of use. However, the following weaknesses were identified:

- One procedure was identified to contain a significant technical error. GMI-0050, "Residual Heat Removal Pump Overhaul," Revision 0, that was to be utilized for the overhaul of a Residual Heat Removal (RHR) pump, did not include steps to re-insert pump coupling keys that were removed during pump disassembly. Therefore, the pump overhaul activity, if performed as written, would not return the equipment to a condition in which it would properly function, which was considered a significant technical procedure deficiency. However, because this procedure had not actually been utilized, the inspectors considered this procedure deficiency to be of only minor significance.

- The inspectors noted numerous instances of typographical errors and improper references. While these errors did not significantly impact the ability to implement the procedures, it indicated a lack of attention to detail in the procedure development and review process.

b.2 Identification of Missing "Critical" Procedure Step Designation

The inspectors compared the critical steps identified in the procedures reviewed to the criteria in MAI-0507, "Maintenance Procedures Writer's Guide," Revision 0, which defined a "Critical Step" with the following broad terms:

> "A Critical Step is an action which, if performed improperly, will lead to an unintentional change that adversely impacts the plant, a system, or personnel safety."

In order to be considered as a Critical Step, MAI-0507 provided the following conditions:

- The state of the plant, system, or component, or the safety of an individual depends solely on an individual worker, and

- The outcome of the error is intolerable for personnel safety, the plant, or component (independent of when the consequence is experienced).

The inspectors identified numerous maintenance procedure steps that warranted identification as critical steps in these procedures, but had not been properly identified as such. Specific examples included:

- CMI-0016, "Division I and II Emergency Diesel Generator Starting Air Valve Repair," Revision 3, did not identify measurement and evaluation of cap bore and piston diameter as a critical step although an improper clearance could result in a failure of the emergency diesel generator to start.

- PMI-0040, "Division III Air Start Motor Maintenance," Revision 4, did not identify a rotation check of the air starter during air start motor reassembly as a critical step although improper rotation could result in damage to the component or a slow start.

- GMI-0002, "Maintenance of the Control Rod Drive Pumps," Revision 2, did not identify the measurement of runout clearances as a critical step although improper clearances could lead to premature bearing failure.

MAI-0507 also prescribed that if possible, Critical Steps should be identified and mitigated by using one of the following methods:

- Add a step for breakpoint review.
- Add independent verification.
- Add a step for peer-check.

- Add a step to contact the supervisor.
- Add a step to contact the Control Room to verify a condition before continuing to the next action.

However, contrary to MAI-0507, no examples of mitigation strategies for critical steps could be found in any of the revised procedures. These mitigation strategies were intended to provide additional assurance of proper step completion. Followup discussions with work management personnel indicated that these strategies were intended to be added during the work package development process. However, only one example was identified in which a mitigation strategy was included with a work order containing a critical step. The inspectors concluded that the licensee had not adequately implemented this procedural requirement. However, since the inspectors did not identify any instance where the omission of a mitigating strategy had resulted in improper procedure implementation, the inspectors concluded the issue was of only minor significance.

b.3 Weaknesses in the Use of Placekeeping Tools and Human Factoring

The inspectors confirmed that the licensee added placekeeping blocks to the revised procedures and had reformatted the procedures to address human factoring considerations. The inspectors supplemented this review with in-field observations of the implementation of the revised maintenance procedures. The inspectors noted performance of one procedure with improper use of placekeeping techniques:

- During hydramotor work, the inspectors noted that technicians performed multiple steps in rapid succession without using proper placekeeping.

- In the same procedure, the technicians performed several steps multiple times without using placekeeping for each performance of the step. By procedure, a step may be performed multiple times, but each performance requires separate placekeeping.

In addition, the inspectors noted multiple instances of poorly worded steps that hampered the maintenance worker's ability to successfully complete the procedure. For example:

- The inspectors observed the performance of a motor-operated valve (MOV) maintenance activity. Although the maintenance procedure utilized for this activity had been previously performed more than 100 times on other valves, the workers stopped several times to obtain clarification on the requirements of the procedure.

- The inspectors reviewed a completed work package that utilized maintenance procedure GEI-0009, "ABB Low Voltage Power Circuit Breaker Types K-600 and K-600S Through K-3000 and K-3000S Maintenance." The inspectors identified that workers had incorrectly N/A'd a section of the procedure. The inspectors noted that the procedural directions regarding performance of that section of the procedure were unclear. (Section b.4)

- The inspectors observed the performance of maintenance procedure ICI-B12-001, "ITT NH90 Series Milliampere Proportional/On-Off Hydramotor Actuator Calibration." During implementation of the procedure, maintenance workers failed to remove all required access covers to the hydramotor. The inspectors noted that the procedure did not specifically identify the covers to be removed. (Section b.5)

b.4 Inappropriate Use of Not Applicable (N/A) in Procedure Steps

The inspectors identified that many of the revised maintenance procedures applied to multiple different styles of components. As a result, these procedures required that maintenance workers determine the applicable steps of the procedure to be performed since all steps may not apply to a particular component. When a step was not performed, the worker would mark the step N/A [not applicable]. Based on the procedures reviewed, the inspectors concluded that the typical number of N/As required during the implementation of a procedure represented a potential human performance trap. During the inspection, the inspectors identified the following specific example in which a procedure step was inappropriately N/A'd. In addition to this example, the inspectors observed a nonsafety-related air-operated valve (AOV) rebuild activity during which maintenance workers improperly N/A'd a step that prescribed a valve stem inspection.

Failure to Perform Required Steps Prescribed by Procedure GEI-0009

Introduction: A finding of very low safety significance and an associated non-cited violation of Technical Specification 5.4,"Procedures," was identified on January 19, 2006, when licensee personnel failed to perform required steps in procedure GEI-0009, "ABB Low Voltage Power Circuit Breaker Types K-600 & K-600S Through K-3000 & K-3000S Maintenance." Specifically, licensee personnel failed to perform minimum operating voltage testing on the safety-related EF1A05 breaker that provided power to Division 1 Motor Control Center (MCC), Switchgear (SWGR), and Battery Room Supply Fan A.

Description: As part of the review of revised maintenance procedures, the inspectors reviewed completed work orders that implemented revised maintenance procedure GEI-0009, "ABB Low Voltage Power Circuit Breaker Types K-600 & K-600S Through K-3000 & K-3000S Maintenance," Revision 17. During a review of work order (WO) 200038182, which incorporated this procedure for a nonsafety-related condensate transfer pump breaker, the inspectors identified that subsection 5.2.3, "Minimum Operating Voltage and Anti-Pump Verification," was marked as not applicable (N/A) and was therefore not accomplished. Additionally, the verification of associated acceptance criteria in Section 6.0 was "checked" as having been verified although the data that would have been obtained in subsection 5.2.3 to compare against the acceptance criteria was marked as N/A. The inspectors questioned, based on the type of breaker tested, whether this procedure subsection should have been accomplished. In response to the inspectors' questions, the licensee determined that this procedure section should have been performed.

Licensee personnel also conducted an extent of condition review to identify additional safety-related breakers that may have been impacted. During this review, licensee personnel identified that WO 200035188 accomplished maintenance on breaker "EF1A05, MCC, SWGR & Battery Room Supply Fan A." In this work order, subsection 5.2.3 was left blank and neither "Sat" nor "Unsat" was marked in Attachment 1, the quality document data sheet for the maintenance performed. This omission indicated that the subsection could not be credited as having been performed, although required for this particular breaker. Fortuitously, the breaker was not reinstalled in the plant following the maintenance activity. Instead, it was shipped to a vendor facility for refurbishment to address previous breaker failures associated with NCV 05000440/2005005-003 and CR 05-04796. However, vendor facility testing identified that the as-found minimum trip voltage at the trip coil was 81 Volts Direct Current (VDC), which was well outside the design voltage of 70 VDC. As such, the vendor concluded that the breaker "would NOT have performed its intended function in its 'as found' condition." Proper performance of the licensee's maintenance activity would have identified the discrepant condition.

As part of the licensee's corrective actions, an extent of condition review was conducted, which determined that no additional safety-related breakers were affected.

The inspectors determined that the licensee's failure to adhere to the steps in procedure GEI-0009 for safety-related breaker maintenance, which prevented the identification of a breaker that did not satisfy all required attributes to be considered functional, was a performance deficiency warranting a significance evaluation.

Analysis: The inspectors concluded that the finding was more than minor in accordance with example 4.l in IMC 0612, Appendix E, "Examples of Minor Issues," since the subject breaker was subsequently determined to be out of specification. This issue was also associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences.

This finding also affected the cross-cutting area of Human Performance since licensee personnel failed to properly adhere to a step-by-step procedure associated with safety-related equipment where adequate implementation of human performance tools would have prevented errors from occurring.

The inspectors completed a significance determination of this issue using Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," of IMC 0609, "Significance Determination Process," dated November 22, 2005. The inspectors determined that the finding was of very low safety significance, in accordance with the Phase 1 screening worksheet, because: (1) it did not represent an actual loss of safety function of a system; (2) it did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time; (3) it did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant per 10 CFR 50.65 for greater than 24 hours; and (4) it did not screen as potentially risk significant due to a seismic, fire, flooding, or severe weather initiating event. In particular, no single failure

would result in loss of heating, ventilation, and air-conditioning (HVAC) to both motor control center (MCC), switchgear and miscellaneous electrical equipment areas.

Enforcement: Technical Specification 5.4, "Procedures," required, in part, that written procedures be implemented covering applicable procedures recommended by Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, dated February 1978. Regulatory Guide 1.33, Appendix A, paragraph 9a, stated, "Maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances." Contrary to this requirement, on January 19, 2006, licensee personnel failed to perform required steps in procedure GEI-0009, "ABB Low Voltage Power Circuit Breaker Types K-600 & K-600S Through K-3000 & K-3000S Maintenance," Revision 17. Specifically, licensee personnel failed to perform minimum operating voltage testing on the safety-related EF1A05 breaker that provided power to Division 1 Motor Control Center (MCC), Switchgear (SWGR), and Battery Room Supply Fan A. However, because of the very low safety significance and because the issue has been entered into the licensee's corrective action program (CR 06-00283), the issue is being treated as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000440/2006007-01).

b.5 Failure to Perform Required Steps Prescribed by Procedure ICI-B12-0001

Introduction: A finding of very low safety significance and an associated non-cited violation of Technical Specification 5.4, "Procedures," was identified on January 10, 2006, when during a calibration check of a Division III Emergency Diesel Generator (EDG) Exhaust Air Damper, licensee personnel failed to perform required steps prescribed by procedure ICI-B12-0001, "ITT NH90 Series Milliampere Proportional/On-Off Hydramotor Actuator Calibration."

Description: On January 10, 2006, as part of their review of revised maintenance procedures, the inspectors observed the implementation of procedure ICI-B12-0001, "ITT NH90 Series Milliampere Proportional/On-Off Hydramotor Actuator Calibration," Revision 4, during a calibration check of a Division III Emergency Diesel Generator (EDG) Exhaust Air Damper hydramotor. This procedure was categorized as Step-by-Step Use and in accordance with procedure NOP-LP-2601, "Procedure Use and Adherence," Revision 0, required that "the user shall perform the following: Read each step prior to performing it. Use approved placekeeping methods. Perform each step as written. Self-Check or Peer Check that the step was performed correctly. Read and perform each step in sequence." During implementation of ICI-B12-0001, the inspectors identified the following examples (listed chronologically) in which licensee personnel failed to adhere to NOP-LP-2601:

- Step 5.9.2 of ICI-B12-0001 directed the user to verify the subject hydramotor had been full-stroke cycled a minimum of five times. Although procedure steps which prescribe this type of verification permit the re-positioning of plant components, in accordance with NOP-LP-2601, these actions must be specifically authorized by plant procedures. In this case, and as observed by the inspectors, although

this guidance did not exist, licensee personnel performed future procedure steps out-of-sequence in order to accomplish Step 5.9.2.

- Step 5.9.3 of ICI-B12-0001 directed that screw-on covers be removed to support testing. In this case, plant personnel failed to remove the necessary covers to continue with the proper testing.

- Step 5.9.4 of ICI-B12-0001 directed the connection of a multi-meter to a limit switch in accordance with Attachment 7, Figure 1. Contrary to this, plant personnel connected the multi-meter in accordance with Attachment 10 and continued with the calibration check. This error was identified by the inspectors observing the test when conflicts were discovered at a later procedure step.

- Steps 5.9.5 through 5.9.9 of ICI-B12-0001 directed the manipulation of the hydramotor actuator for verification and recording of proper valve seating and stem travel. Contrary to procedure use guidance, plant personnel did not complete these steps via the read-then-perform approach. Additionally, NOP-LP-2601 directed that repeated steps shall be provided with “separate documentation” and “placekeeping on the steps”. These steps were repeated by plant personnel to satisfy the requirements of Step 5.9.2 without separate documentation and placekeeping annotation.

- Step 5.9.10, 5.9.10.a and 5.9.10.b of ICI-B12-0001 directed the connection of a multi-meter to position switches followed by actuator manipulation until such switches actuate. Contrary to procedure use guidance, steps were marked as complete concurrently without verifying individually that each step had been completed.

As part of their corrective actions, licensee personnel stopped the work activity and revised ICI-B12-0001 to clarify the requirements in Section 5.9 of the procedure. Licensee personnel also revised the use category from "Step-by-Step" to "In-Field Reference.”

The inspectors determined that the licensee’s failure to adhere to the steps in calibration procedure ICI-B12-0001 was a performance deficiency warranting a significance evaluation.

Analysis: The inspectors concluded that the finding was more than minor in accordance with Appendix B, “Issue Screening,” of IMC 0612, “Power Reactor Inspection Reports,” dated September 30, 2005. The findings was associated with the Mitigating System cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, to address the issues that occurred during the implementation of this procedure, the licensee incurred more than 18 hours of unnecessary unavailability of the Division III EDG Exhaust Air Damper hydramotor, which potentially affected the reliability of the Division III EDG.

This finding also affected the cross-cutting area of Human Performance since licensee personnel failed to properly adhere to a step-by-step procedure associated with safety-related equipment where adequate implementation of human performance tools would have prevented errors from occurring.

The inspectors completed a significance determination of this issue using Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," of IMC 0609, "Significance Determination Process," dated November 22, 2005. The inspectors determined that the finding was of very low safety significance, in accordance with the Phase 1 screening worksheet, because: (1) it did not represent an actual loss of safety function of a system; (2) it did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time; (3) it did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant per 10 CFR 50.65 for greater than 24 hours; and (4) it did not screen as potentially risk significant due to a seismic, fire, flooding, or severe weather initiating event.

Enforcement: Technical Specification 5.4, "Procedures," required, in part, that written procedures be implemented covering applicable procedures recommended by Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, dated February 1978. Regulatory Guide 1.33, Appendix A, paragraph 9a, stated, "Maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances." Contrary to this requirement, on January 10, 2006, during a calibration check of a Division III EDG Exhaust Air Damper, licensee personnel failed to perform required steps prescribed by procedure ICI-B12-0001, "ITT NH90 Series Milliampere Proportional/On-Off Hydramotor Actuator Calibration," Revision 4. However, because of the very low safety significance and because the issue has been entered into the licensee's corrective action program (CR 06-00125), the issue is being treated as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000440/2006007-02).

3.2 Commitment Item 1.b/DAMP Item B.2.2.3.2

a. Inspection Scope

The inspectors reviewed Commitment Item 1.b/DAMP Item B.2.2.3.2: "CA 05-03655-01 is to revise Nuclear Quality Assurance Instruction (NQI)-1001, 'QC Inspection Program Control,' to specify a method by which classification can be established for additional inspection attention items that have experienced repeat failures. This method will include consideration of failure analysis, the risk-significance of the item, and the probability of failure occurrence in determining the extent of inspection activity."

To accomplish this review, the inspectors reviewed NQI-1001, Revision 5, and determined whether the revised procedure accomplished that stated goal.

b. Observations and Findings

The inspectors concluded the licensee's actions adequately implemented Commitment Item 1.b/DAMP Item B.2.2.3.2.

As part of the corrective actions, the licensee implemented two major revisions to NQI-1001. The first revision was intended to satisfy the commitments to the NRC. The second revision was not only intended to satisfy the specify CAL commitment, but also to achieve fleet standardization. The inspectors reviewed the licensee's most recent revision to NQI-1001 (Revision 5) to determine whether the revised version included additional inspection activities for items that experienced multiple failures.

The inspectors concluded that NQI-1001, Revision 5, appropriately incorporated the consideration of failure history, risk significance, and failure probability in assigning QC inspection hold points. However, the inspectors identified that the methods identified and in use did not take full advantage of all site programs. In particular, the procedure did not prescribe the review of the maintenance rule database, which collects pertinent component failure data, nor did it integrate the probabilistic risk assessment (PRA) model, which provides component-specific risk information.

The inspectors reviewed seven work orders performed using NQI-1001, Revision 5, to determine whether QC inspection points had been appropriately selected. In all cases, the inspection points assigned were consistent with NQI-1001 requirements.

4.0 ESW Pump Coupling Assembly Concerns

4.1 Commitment Item 1.c/DAMP Item B.2.2.3.3

a. Inspection Scope

The inspectors reviewed Commitment Item 1.c/DAMP Item B.2.2.3.3: “CA 05-03655-03 is to revise GMI-0039, 'Disassemble/Re-assembly of Divisions I and II Emergency Service Water (ESW) Pumps,' and GMI-040, 'Disassembly/Re-assembly of Division III Emergency Service Water Pump,' to include QC inspection points for work activities associated with pump shaft couplings, as specified by QC.”

To accomplish this activity, the inspectors determined whether appropriate QC hold points had been incorporated into all of the subject procedures.

b. Observations and Findings

The inspectors concluded the licensee's actions adequately implemented Commitment Item 1.c/DAMP Item B.2.2.3.3.

The inspectors confirmed that the licensee had added appropriate QC hold points to the coupling reassembly sections of ESW pump rebuild procedures GMI-0039 and GMI-0040.

4.2 DAMP Item B.2.2.5

a. Inspection Scope

The inspectors reviewed DAMP Item B.2.2.5: "Based on the results of the maintenance procedure upgrade plan for key critical components, develop a long term Maintenance Procedure Upgrade Plan and incorporate actions into the FENOC Business Plan (05-04586-01)."

To accomplish this activity, the inspectors reviewed the FENOC and Perry Business Plans and determined whether these plans incorporated actions from the Perry Maintenance Procedure Upgrade Plan.

b. Observations and Findings

The inspectors concluded the licensee's actions adequately implemented DAMP Item B.2.2.5.

The inspectors observed that the licensee completed revisions to the initial set of 119 procedures and planned to revise these procedures, as needed. In addition, the inspectors confirmed that the licensee had planned to revise several hundred additional maintenance procedures, some of which had already been accomplished. The inspectors observed that the licensee had begun organizing plant and contractor personnel to revise additional procedures. The inspectors noted that closer craft involvement was planned for this second phase of procedure updates to improve the procedure validation process. In addition, licensee management planned to place more reliance on the licensee staff to complete these revisions.

The inspectors confirmed the FENOC and Perry Business Plans incorporated actions from the Perry Maintenance Procedure Upgrade Plan and provided the necessary resources to upgrade the remaining procedures.

5.0 Training

5.1 Review of Development of Proper Planning for Work Management

a. Inspection Scope

The inspectors reviewed the corrective action of "...development of proper planning for work management to ensure strict compliance of job planning to eliminate misdirection during conduct of the job," described in Perry letter PY-CEI/NRR-2897L, dated August 17, 2005.

To accomplish this activity, the inspectors reviewed closure documentation for the associated condition report. In addition, the inspectors interviewed plant personnel to determine what changes had occurred to ensure proper job planning.

b. Observations and Findings

The inspectors concluded the licensee's actions adequately implemented the corrective action that prescribed the development of an appropriate work planning process to improve the overall preparation for work activities.

The inspectors determined that although the work planning process had not been revised, licensee management had taken actions to enforce the existing work planning process requirements.

Licensee personnel provided data that demonstrated that the enforcement of existing work standards had drastically reduced the number of work orders that had not been strictly planned within the constraints of the work order process. The inspectors concluded that the intent of this corrective action, which was to improve preparation for work activities such that work activities would be ready to work when scheduled, had been met.

5.2 Review of Plant Manager Discussion of “Push Back” in Daily Plant Updates

a. Inspection Scope

The inspectors reviewed the corrective action of “...plant manager to discuss 'push back' in the daily plant updates. This discussion will promote a challenging attitude from the employees,” described in Perry letter PY-CEI/NRR-2897L, dated August 17, 2005.

To accomplish this activity, the inspectors reviewed available records regarding this issue and determined whether the discussions were sufficient to address the problem. The inspectors interviewed licensee personnel from the operations and maintenance departments and determined whether the training had an impact on their attitude toward "push back."

b. Observation and Findings

The inspectors concluded the licensee's actions adequately implemented the corrective action that prescribed that the plant manager would discuss push back in the daily plant updates.

The inspectors reviewed the Plant Manager's daily updates. The plant manager provided periodic daily updates that in some manner discussed push back. The inspectors were only able to identify one example in which the term “push back” was explicitly used to address the issue. However, because other updates discussed situations that in some manner involved workers displaying a questioning attitude toward directions given that were contrary to written instructions or previous training, the inspectors concluded that the intent of the actions had been at least minimally satisfied. The inspectors also noted that this action item was closed after a single update and that no method had been established to identify and trend additional updates.

Although the focus of this corrective action was somewhat limited, the inspectors were aware of other licensee initiatives to address this issue. For example, the licensee had

an ongoing activity to implement new human performance tools across the site. In addition, the licensee had previously emphasized procedure use and adherence as a condition for employment. Finally, the Phase 2 PII contained additional elements that addressed this issue.

5.3 Review of Human Performance Tools to Reinforce Human Performance Under Stress

a. Inspection Scope

The inspectors reviewed the corrective action of "...new human performance tools have been rolled out which reinforce use of human performance during stressful times. These tools are discussed in the following human performance procedures: (1) NOBP-LP-2601, 'Human Performance Program'; (2) NOBP-LP-2603, 'Human Performance Tools and Verification Practices'; (3) NOBP-LP-2604, 'Job Briefs'; and (4) NOP-LP-2601, 'Procedure Use and Adherence.'"

To accomplish this activity, the inspectors reviewed the human performance tools that were "rolled out" and determined whether those tools were appropriate to address the problem. The inspectors also determined whether the human performance procedures were revised as planned and interviewed operations and maintenance personnel and determined whether these individuals were knowledgeable of these new tools.

b. Observations and Findings

The inspectors concluded the licensee adequately implemented the corrective actions that prescribed new human performance tools to reinforce human performance during stressful periods.

The license developed four procedures to provide human performance tools. At the end of the inspection, the licensee had completed training about 50 percent of the plant employees on the new human performance tools with plans to train the remainder. The inspectors observed portions of the training class and reviewed the course syllabus.

However, during in-field observations, the inspectors observed that craft personnel, while generally familiar with these tools, were not experienced in their use. The inspectors noted that first line supervisors appropriately discussed these human performance tools with maintenance workers during pre-job briefings. For example, during several pre-job briefings between mechanics and supervisors, the inspectors observed discussions regarding the suspension of work and placing equipment in a safe condition should conditions arise in the field that could not be resolved without further clarification. In several instances, the inspectors observed workers stop work activities and seek clarification prior to proceeding with the work. However, in one instance the inspectors observed personnel proceed with work activities despite uncertainty of the requirements.

While observing the rebuild of a fire protection deluge valve, a procedure step in the work package required the inspection of valve internals to evaluate the condition of the valve, including the condition of internal moving parts. When questioned about the presence of moving parts, licensee personnel were unsure if the valve contained moving

parts. Despite this lack of knowledge, licensee personnel signed off the step as complete. Upon further review, the inspectors determined that the work package was incorrect and referenced a section of the technical manual for a valve that contained moving parts although the valve inspected did not contain moving parts.

However, since this error had no actual adverse impact on the deluge valve inspection results, the inspectors concluded the issue was of only minor significance.

6.0 Exit Meeting

On March 14, 2006, the inspectors presented the inspection results to Mr. L. Pearce, Vice President, and other members of his staff, who acknowledged the findings and observations.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENTS:
1. SUPPLEMENTAL INFORMATION
2. PERRY PERFORMANCE BACKGROUND
3. PERRY IP 95003 INSPECTION RESULTS

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

G. Leidich, Chief Nuclear Officer, FENOC
D. Pace, Senior Vice President, Fleet Engineering and Services, FENOC
J. Hagan, Chief Operating Officer, FENOC
J. Rinckel, Vice President, Oversight, FENOC
L. Pearce, Vice President, Perry
F. von Ahn, Plant Manager, Perry
F. Cayia, Director, Performance Improvement, Perry
K. Howard, Manager, Design, Perry
J. Lausberg, Manager, Regulatory Compliance, Perry
T. Lentz, Director, Performance Improvement Initiative, Perry
J. Messina, Manager, Operations, Perry
J. Shaw, Director, Engineering, Perry
M. Wayland, Director, Maintenance, Perry

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000440/2006007-01	NCV	Failure to Perform Required Steps Prescribed by Procedure GEI-0009
05000440/2006007-02	NCV	Failure to Perform Required Steps Prescribed by Procedure ICI-B12-0001

Discussed

None.

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC team reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Condition Reports

CR 04-04059; Site Human Performance Barriers May Be Lost During Stressful Times; dated August 5, 2004
CR 05-03654; NRC ID: Procedure Enhancements to CMI-16 EDG Starting Air Valve Repair; dated April 21, 2005
CR 05-03655; NRC ID: Potential NCV for Inadequate QC Inspection; dated April 20, 2005
CR 06-00112; L1109 Blast Deflector Hood Appears to be Misaligned; dated January 10, 2006
CR 06-00125; NRC ID: Procedure Not Followed Correctly; dated January 10, 2006
CR 06-00143; NRC ID: Hydraulic Control Unit has Leak on Valve Packing; dated January 10, 2006
CR 06-00148; New Revision Could Not Be Performed As Written; dated January 12, 2006
CR 06-00166; NRC ID: Inadequacies/Issues Identified in IMI-E2-39; dated January 12, 2006
CR 06-00181; NRC ID: Inconsistency in Identifying Critical Steps; dated January 12, 2006
CR 06-00182; NRC ID: Failure to Follow NOP-SS-3301 Guidance; dated January 13, 2006
CR 06-00187; NRC ID: Issues/Improvements Associated with GMI-0187; dated January 12, 2006
CR 06-00198; Pre-job Briefing for 290A Repack Not Up to Standards; dated January 15, 2006
CR 06-00199; Unnecessary Delay in Heater Isolation; dated January 15, 2006
CR 06-00201; NRC ID: F788 Valve Handle Vibrated Loose; dated January 15, 2006
CR 06-00204; Valve 290A Stem is Found Steam Cut During Inspection; dated January 15, 2006
CR 06-00205; Alternate Level Controller for Heater Acting Erratically; dated January 15, 2006
CR 06-00235; Foreign Material Found in D1A08 Breaker During Preventive Maintenance; dated January 17, 2006
CR 06-00269; NRC ID: Valve Stem Inspection 'N/A' During Valve Repack; dated January 18, 2006
CR 06-00281; Craft Confusion During Performance of PMI-0030; dated January 18, 2006
CR 06-00283; NRC ID: GEI-0009 Breaker Step Was Incorrectly N/A'd and Not Performed; dated January 19, 2006
CR 06-00295; NRC ID: FME [Foreign Material Exclusion] Observed on Crafts' Hands For Installation of Valve Diaphragm; dated January 19, 2006
CR 06-00312; NRC ID: Issues Identified in IMI-E3-23; dated January 20, 2006

Procedures

CMI-0016; Division I and II Emergency Diesel Generator Starting Air Valve Repair; Revision 3
GEI-0001; Performing Insulation Resistance Checks; Revision 9
GEI-0007-A; Instructions for Cable and Wire Terminations; Revision 0
GEI-0009; ABB Low Voltage Power Circuit Breaker Types K-600 & K-600S Through K-3000 & K-3000S Maintenance; Revision 17

GEI-0135; ABB Power Circuit Breakers 5KV Types 5HK250 and 5HK350 Maintenance; Revision 10
GEI-0136; ABB Power Circuit Breakers 15KV Type 15HK1000 Maintenance; Revision 16
GMI-0001; Coupling Alignment; Revision 4
GMI-0002; Maintenance of the Control Rod Drive Pumps; Revision 2
GMI-0021; General Torquing; Revision 8
GMI-0037; Disassembly of the Control Complex Chilled Water and ECC [Emergency Closed Cooling] Pumps; Revision 2
GMI-0039; Disassemble/Re-assembly of Divisions I and II Emergency Service Water Pumps; Revision 19
GMI-040; Disassembly/Re-assembly of Division III Emergency Service Water Pump; Revision 6
GMI-0042; Reactor Core Isolation Cooling Pump Overhaul; Revision 0
GMI-0050; Residual Heat Removal Pump Overhaul; Revision 0
GMI-0051; Disassembly and Repair of the HPCS Pumps; Revision 0
GMI-0061; Valve Packing Instruction; Revision 6
GMI-0130; Reactor Water Cleanup Pump Overhaul; Revision 0
GMI-0187; Motor Driven Reactor Feedwater Pump Overhaul; Revision 0
ICI-B12-0001; ITT NH90 Series Milliampere Proportional/On-Off Hydramotor Actuator Calibration; Revisions 4, 5, and 6
IMI-E02-0039; Woodward Motor Operated Potentiometer; Revisions 3 and 4
IMI-E03-0023; Division III HPCS Diesel Generator Woodward Governor Maintenance; Revision 4
NOBP-LP-2019; Corrective Action Program Supplemental Expectations and Guidance; Revision 1
NOBP-LP-2601; Human Performance Program; Revision 0
NOBP-LP-2603; Human Performance Tools and Verification Practices; Revision 0
NOBP-LP-2604; Job Briefs; Revision 0
NOP-LP-2018; Quality Control Inspection of Maintenance and Modifications; Revision 0
NOP-LP-2601; Procedure Use and Adherence; Revision 0
NOP-SS-3001; Procedure Review and Approval; Revision 9
NOP-SS-8001; FENOC Activity Tracking; Revision 0
NQI-1001; QC Inspection Program Control; Revision 5
OJT 5000-003-01; Maintenance Qualification Card Indoctrination
PAP-0528; Procedure Use and Adherence Supplemental Items; Revision 4
PAP-0905; Work Order Process; Revision 24
PMI-0019; Division I and II Diesel Generator Rocker Arm and Valve Lifter Maintenance; Revision 6
PMI-0030; Maintenance of Limitorque Valve Operators; Revision 11
PMI-0040; Division III Air Start Motor Maintenance; Revision 4
PMI-0053; Division I and II Standby Diesel Generator Connecting Rod and Piston Maintenance; Revision 5
PMI-0065; Division I and II Diesel Generator Starting Air Dryer Maintenance; Revision 2
PMI-0109; V-Belt and Sheave Inspection; Revision 1
PYBP-PMS-0001; Human Performance; Revision 0
PYBP-PNMD-0003; Perry Maintenance Department Directives; Revision 2

Work Orders

WO 200008968; Division 1 Right Bank #8 Cylinder; Revision 0
WO 200034344; Overhaul Breaker EF1C04; Revision 0
WO 200035165; Exercise and Service Breaker D1A08; Revision 0
WO 200010019; Cylinder Left Head #5; Revision 0
WO 200061000; Static MOV/RHR RCIC [Reactor Core Isolation Cooling] Steam Supply Inboard Isolation; Revision 0
WO 200147230; Perform Governor Loop Tuning on the Division 2 Diesel; Revision 0
WO 200098338; Maintenance Division 1 Starting Air Dryer; Revision 0
WO 200173161; Replace J/W [Jacket Water] Outlet Couplings; Revision 0
WO 200115794; Prepare Breaker & Auxiliary/Cell Switch for L1109; Revision 0
WO 200076176; Perform Breaker F2C08 Trip Device Checks; Revision 0
WO 200078672; Breaker EH1204 Overhaul; Revision 0
WO 200035191; Perform Breaker EF1B05 Overhaul; Revision 0
WO 200034337; Overhaul Breaker EF1D1Q FD>MCC ED2D-11; Revision 0
WO 200034363; EF1D04 10 Year Breaker Overhaul; Revision 0
WO 200035188; Overhaul Breaker EF1A05; Revision 0
WO 200034351; Overhaul Breaker EF1A04 F/P Recirculation Pump; Revision 0
WO 200038182; Exercise-Service/Relay Checks Breaker F1F09; Revision 0
WO 200046165; Perform a Preliminary Calibration of Actuator IAW [In Accordance With] ICI-B12-1; Revision 0
WO 200105690; Performance of PMI-0030 on RCIC Turbine Exhaust Valve; Revision 0
WO 200117498; Heater 6A Drain to Heater 5A, Repair of Valve 160A; Revision 0
WO 200062807; Scram Discharge Volume Level Transmitter; Revision 0
WO 200135940; Functional Test Air Start Valves; Revision 0
WO 200158593; Dry Well Radiation Monitor Lube and Inspection; Revision 0
WO 200012901; Insulation Resistance Test of Division III Room Supply Fan; Revision 0
WO 200152120; Insulation Resistance Test of 'A' RHR motor; Revision 0
WO 200114544; Replacement of Backup Scram Valve; Revision 0
WO 200002734; Repair of CRD [Control Rod Drive] Flow Control Valve; Revision 1
WO 200008639; Replacement of Off Gas 1-Inch Manual Globe Valve; Revision 1
WO 200034344; Overhaul Breaker EF1C04; Revision 0
WO 200134833; Calibration Check AS Voltmeter Bus; Revision 0
WO 200062754; Replace Flow XMTR [Transmitter] 1P45N0051B; Revision 0
WO 200152254; Pressure Switch 1R45N0005A; Revision 0
WO 200170404; Spare Water Leg Pump for E12/E22/E51 Needs to be Refurbished; Revision 0
WO 200188241; ECC "B" Pump Bearing Bubbler Adjustment and Verification; Revision 0

Other Documents

FENOC Letter PY-CEI/NRR-2897L; Response to NRC Inspection Procedure 95003 Supplemental Inspection, Inspection Report 05000440/2005003; dated August 8, 2005
FENOC Letter PY-CEI/NRR-2902L; Corrections for Response to NRC Inspection Procedure 95003 Supplemental Inspection, Inspection Report 05000440/2005003; dated August 17, 2005
E-mail from M. McFarland dated January 19, 2006
FENOC Observation Cards - PYF2006-0065 and PYF2006-0067
Human Performance Fundamental Course - Lesson Plan
Perry Memoranda dated April 8, 2005 and April 22, 2005

File #109; Transamerica Delaval Motor Driven Feedwater Pump
File #113; Delaval Model DSRV-16-4 Diesel Engine
File #110; Standy Diesel Generator Manual - Volume 1; Revision 25
File #906; Valve Operators Manual; Revision 29
File #G49; Union Pump Manual
File #165; Installation, Operation, and Maintenance Instruction Manual, Goulds Pumps Inc., Vertical Pump Division
File #0044; Bingham-Willamwette Pump Instruction Manual
GE 23A1860; Union Pump Manual
Byron Jackson Procedure IT-5981; Bolt Torquing Procedure for Residual Heat Removal, Low Pressure Core Spray and High Pressure Core Spray Pumps for General Electric
File #G040; Byron Jackson Pump Division; Pump Manual
Perry Maintenance Department Expanded Maintenance Procedure Upgrade Project Plan; Revision 0
Project Plan for Maintenance Procedures Upgrade Associated with Key Critical Components; Revision 1
2006 Perry Excellence Plan; Section PGMT-6500
FirstEnergy Nuclear Operating Company Business Plan 2006-2010
FirstEnergy Nuclear Operating Company Business Plan 2005-2007
Dresser Measurement, Universal RAI Blower Bulletin IRP-103-098
FENOC Field Observation Card PYF2006-0106
Selected Daily Plant Updates from F. von Ahn; dated June 1 through December 31, 2005

LIST OF ACRONYMS USED

ADAMS	Agency Document and Management System
AOV	Air-Operated Valve
CAL	Confirmatory Action Letter
CAP	Corrective Action Program
CFR	*Code of Federal Regulations*
CR	condition report
CRD	Control Rod Drive
DAMP	Detailed Action and Monitoring Plan
ECC	Emergency Closed Cooling
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
FENOC	FirstEnergy Nuclear Operating Company
FME	Foreign Material Exclusion
GMI	General Mechanical Instruction
HPCS	High Pressure Core Spray
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
J/W	Jacket Water
LPCS	Low Pressure Core Spray
MCC	Motor Control Center
MOV	Motor-Operated Valve
N/A	Not Applicable
NCV	Non-Cited Violation
NQI	Nuclear Quality Assurance Instruction
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PII	Performance Improvement Initiative
PNPP	Perry Nuclear Power Plant
PRA	Probabilistic Risk Assessment
QC	Quality Control
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RI	Resident Inspector
SCAQ	significant condition adverse to quality
SDP	Significance Determination Process
SRI	Senior Resident Inspector
SWGR	Switchgear
TS	Technical Specification
XMTR	Transmitter

PERRY PERFORMANCE BACKGROUND

As discussed in the Perry Annual Assessment Letter dated March 4, 2004, plant performance was categorized within the Degraded Cornerstone column of the NRC's Action Matrix based on two White findings in the Mitigating Systems cornerstone. An additional White finding in the Mitigating Systems cornerstone was subsequently identified and documented by letter dated March 12, 2004.

The first finding involved the failure of the high pressure core spray (HPCS) pump to start during routine surveillance testing on October 23, 2002. An apparent violation of Technical Specification (TS) 5.4 for an inadequate breaker maintenance procedure was identified in IR 05000440/2003008. This performance issue was characterized as White in the NRC's final significance determination letter dated March 4, 2003. A supplemental inspection was performed in accordance with IP 95001 for the White finding. Significant deficiencies in the licensee's extent of condition evaluation were identified. Inspection Procedure 95001 was subsequently re-performed and the results of that inspection were documented in IR 05000440/2003012, which determined that the extent of condition reviews were adequate.

The second finding involved air binding of the low pressure core spray (LPCS)/residual heat removal (RHR) 'A' waterleg pump on August 14, 2003. A special inspection was performed for this issue and the results were documented in IR 05000440/2003009. An apparent violation of TS 5.4 for an inadequate venting procedure was identified in IR 05000440/2003010. This performance issue was characterized as White in the NRC's final significance determination letter dated March 12, 2004.

The third finding involved the failure of the 'A' Emergency Service Water (ESW) pump, caused by an inadequate maintenance procedure for assembling the pump coupling that contributed to the failure of the pump on September 1, 2003. An apparent violation of TS 5.4 was documented in IR 05000440/2003006. This performance issue was characterized as White in the NRC's final significance determination letter dated January 28, 2004.

As documented in IP 95002 Supplemental Inspection Report 05000440/2004008, dated August 5, 2004, which reviewed the licensee's actions to address these issues, the NRC concluded that the corrective actions to prevent recurrence of a significant condition adverse to quality (SCAQ) were inadequate. Specifically, the same ESW pump coupling that failed on September 1, 2003, failed again on May 21, 2004. This resulted in the ESW pump White finding remaining open.

As a result, Perry entered the Multiple/Repetitive Degraded Cornerstone column for Mitigating Systems in the Reactor Safety strategic performance area for having two White inputs for five consecutive quarters. Specifically, for the third quarter of 2004, the waterleg pump finding remained open a fourth quarter while the ESW pump finding was carried open into a fifth quarter as a result of the findings of the IP 95002 supplemental inspection.

PERRY IP 95003 INSPECTION RESULTS

As a result of poor performance, the Nuclear Regulatory Commission (NRC) designated the Perry Nuclear Power Plant (PNPP), owned and operated by FirstEnergy Nuclear Operating Company (FENOC), as a "Multiple/Repetitive Degraded Cornerstone Column" facility in the NRC's Action Matrix[1] in August 2004. Accordingly, a supplemental inspection was performed in accordance with the guidance in NRC Inspection Manual Chapter (IMC) 0305 and Inspection Procedure (IP) 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs, or One Red Input."

In addition, the scope of the IP 95003 inspection included the review of licensee actions to address deficiencies identified during a previous IP 95002 inspection. In particular, the NRC reviewed the licensee's root cause and corrective actions to address the areas of procedure adequacy, procedure adherence, and training deficiencies identified in the previous IP 95002 inspection; as well as the problem identification, root cause review, and corrective actions to address repetitive emergency service water (ESW) pump coupling failures.

By letter dated September 30, 2004, FENOC advised the NRC that actions were underway to improve plant performance. To facilitate these performance improvements, FENOC developed the Perry Performance Improvement Initiative (PII). As part of the NRC's IP 95003 inspection, the team conducted a detailed review of the PII.

As documented in IP 95003 Supplemental Inspection Report 50-440/2005003, the NRC determined Perry was being operated safely. The NRC also determined that the programs and processes to identify, evaluate, and correct problems, as well as other programs and processes in the Reactor Safety strategic performance area were adequate. Notwithstanding these overall conclusions, the NRC determined that the performance deficiencies that occurred prior to and during the inspection were often the result of inadequate implementation of the corrective action program (CAP) and human performance errors.

The team identified that a number of factors contributed to CAP problems. A lack of rigor in the evaluation of problems was a major contributor to the ineffective corrective actions. For example, in the engineering area, when problems were identified, a lack of technical rigor in the evaluation of those problems at times resulted in an incorrect conclusion, which in turn affected the ability to establish appropriate corrective actions. The team also determined that corrective actions were often narrowly focused. In many cases a single barrier was established to prevent a problem from recurring. However, other barriers were also available that, if identified and implemented, would have provided a defense-in-depth against the recurrence of problems. The team also identified that problems were not always appropriately prioritized, which led to the untimely implementation of corrective actions.

A number of programmatic issues were identified that have resulted in the observed CAP weaknesses. For example, the team identified a relatively high threshold for classifying deficiencies for root cause analysis. As a result, few issues were reviewed in detail. In addition, for the problems that were identified that required a root cause evaluation, the team

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[1]The NRC's Action Matrix is described in Inspection Manual Chapter 0305, "Operating Reactor Assessment Program."

found that the qualification requirements for root cause evaluators were limited and multi-disciplinary assessment teams were not required. The team also identified that a lack of independence of evaluators existed. This resulted in the same individuals repeatedly reviewing the same issues without independent and separate review. In addition, the team identified weaknesses in the trending of problems, which has hindered the ability to correct problems at an early stage before they become more significant issues. Finally, the team determined that a lack of adequate effectiveness reviews was a barrier to the identification of problems with corrective actions that had been implemented.

In the area of human performance, the team determined that a number of self-revealed findings relating to procedure adherence occurred that had a strong human performance contribution. These findings were derived from events that resulted in an unplanned engineered safety feature actuation, a loss of shutdown cooling, an unplanned partial drain down of the suppression pool, an inadvertent operation of a control rod (a reactivity event), and other configuration control errors. The team reviewed the events that occurred during the inspection and identified that the procedure adherence problems had a number of common characteristics. In a number of cases, personnel failed to properly focus on the task at hand. Although pre-job briefings were held prior to many events, and procedures were adequate to accomplish the intended activity, personnel failed to sufficiently focus on the individual procedure step(s) being accomplished and performed an action outside of that prescribed by the procedure. In some cases, the team determined that a lack of a questioning attitude contributed to the procedure problems that occurred. Although information was available to personnel that, if fully considered, could have prevented the procedure adherence issues that occurred, that information was not sought out or was not questioned. The presence of supervisors with the necessary standards to foster good procedure adherence could have acted as a significant barrier to prevent some of the problems that occurred. However, adequate supervisory oversight was not always available or used. Further, the team identified that available tools for assessing human and organizational performance had not been effectively used.

In the area of design, the IP 95003 inspection team concluded that the systems, as designed, built, and modified, were operable and that the design and licensing basis of the systems were sufficiently understood. Notwithstanding the overall acceptability of performance in the engineering area, the team identified common characteristics in a number of problems identified during the inspection. These characteristics included a lack of technical rigor in engineering products that resulted in an incorrect conclusion. Also, there appeared to be a lack of questioning by the licensee staff of some off-normal conditions. Finally, weaknesses in the communications between engineering and other organizations such as operations and maintenance sometimes hindered the resolution of problems.

In the area of procedure adequacy, the team determined that the licensee's procedures to safely control the design, maintenance, and operation of the plant were adequate, but warranted continued management focus and resource support. In particular, process-related vulnerabilities in areas such as periodic plant procedure reviews, procedure revisions, and use classifications were identified by the team.

In the area of equipment performance, the team acknowledged that the licensee had completed numerous recent plant modifications to improve equipment performance. In addition, improved engineering support and management oversight of equipment performance were noted.

Notwithstanding the above, the team identified numerous examples that indicated that the resolution of degraded equipment problems and implementation of the CAP continued to be a challenge to the organization.

In the area of configuration control, the team identified numerous examples that indicated the resolution of configuration control issues and implementation of the CAP continued to be a challenge to the organization. The team agreed with the licensee's assessment that continuing configuration control problems were primarily the result of inappropriate implementation of procedural requirements rather than the result of configuration management procedural shortcomings. However, given the errors associated with equipment alignment, as well as multiple errors associated with maintenance configuration control such as scaffolding erection, the team concluded that adequate evaluations of the root causes of configuration control errors had not been performed. The team also concluded that the licensee lacked rigor in its efforts to resolve latent configuration control issues. Several licensee-identified issues have not been corrected, and contributed to configuration control shortcomings.

In addition, in the area of emergency preparedness, the team determined that there were some performance deficiencies associated with the licensee's implementation of the Emergency Plan. A number of findings were identified in which changes to the Emergency Plan or Emergency Action Levels were made without required prior NRC approval. In addition, the results of the augmentation drill where personnel were called to report to the facility for a simulated emergency were unsatisfactory.

With regard to the NRC's review of issues associated with the previous IP 95002 inspection, the NRC determined that actions to address procedure adequacy and ESW pump failures was still in progress at the end of the IP 95003 inspection. In particular, the team identified that one of the licensee's corrective actions to address the verification of the quality of ESW pump work was inadequate. In addition, in light of the continuing problems in human performance and the impact on procedure adherence, the team concluded that actions to address procedure adherence had not been fully effective. Finally, actions to address training were also still in progress at the end of the inspection. In this case, the licensee's corrective actions to address this issue had not been timely and at the conclusion of the IP 95003 inspection, had not yet been implemented. As a result, the NRC concluded that the open White findings associated with the IP 95002 inspection would continue to remain open pending additional licensee actions and the NRC's review of those actions.

In the assessment of the licensee's performance improvements planned and implemented through the Perry PII, the team determined that the Perry PII had a broad scope and addressed many important performance areas. The IP 95003 inspection team also observed that, although substantially completed, the PII had not resulted in significant improvement in plant performance in several areas. There were a number of reasons identified as why this occurred, one being that the PII was largely a discovery activity, and as such, many elements of the PII did not directly support improving plant performance. Instead, the problems identified through the PII reviews were entered into the CAP and the proper resolution of these problems depended upon the proper implementation of the CAP. During the IP 95003 inspection, the NRC identified that in some cases the CAP had not been implemented adequately to address the concerns identified during PII reviews. The team identified that although many PII actions had been completed, some of the more significant assessments, such as in the area of human performance, were still in progress at the end of the inspection. Overall, based on the factors

discussed above, the NRC was unable to draw any definitive conclusions regarding the overall effectiveness of the Perry PII. As a result, further reviews were deemed to be necessary to determine whether the PII was sufficient to address and resolve the specific issues identified.