November 17, 2000

Mr. John K. Wood
Vice President - Nuclear
FirstEnergy Nuclear Operating Company
P. O. Box 97, A200
Perry, OH 44081

SUBJECT: PERRY NUCLEAR POWER PLANT - NRC SUPPLEMENTAL INSPECTION REPORT 50-440/00-13(DRP)

Dear Mr. Wood:

On October 26, 2000, the NRC completed a supplemental inspection at the Perry Nuclear Power Plant. The enclosed report documents the inspections results, which were discussed with you and other members of your staff on October 26, 2000.

The purpose of the supplemental inspection was to review the evaluation and corrective actions developed to address the white 2nd Quarter, 2000, Safety System Unavailability, Heat Removal System performance indicator (PI). Based on the results of this inspection, the inspector concluded that your staff performed an adequate evaluation of the reactor core isolation cooling (RCIC) system unavailability time that resulted in the white PI, that the extent of condition was appropriately addressed, and that corrective actions were initiated to prevent recurrence of this issue.

No findings of significance were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available **electronically** for public inspection in the NRC Public Document Room **or** from the *Publicly Available Records (PARS) component of NRC's document system (ADAMS)*. *ADAMS is accessible from* the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA by Steven A. Reynolds Acting for/

Geoffrey E. Grant, Director
Division of Reactor Projects

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

Enclosure: Inspection Report 50-440/00-13(DRP)

See Attached Distribution
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FirstEnergy Nuclear Operating Company
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Geoffrey E. Grant, Director
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DATE	11/09/00		11/09/00		11/17/00			

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-440
License No:	NPF-58
Report No:	50-440/00-13
Licensee:	FirstEnergy Nuclear Operating Company (FENOC)
Facility:	Perry Nuclear Power Plant, Unit 1
Location:	P.O. Box 97 A200 Perry, OH 44081
Inspection Dates:	October 17 - October 26, 2000
Inspector:	Christine A. Lipa, Senior Resident Inspector
Approved by:	Thomas J. Kozak, Chief, Reactor Projects Branch 4 Division of Reactor Projects

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner, which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

SUMMARY OF FINDINGS

Perry Nuclear Power Plant
NRC Inspection Report 50-440/00-13

IR 05000440-00-13, on 10/17-10/23/2000, FirstEnergy Nuclear Operating Company, Perry Nuclear Power Plant. Supplemental Inspection for white 2nd Quarter, 2000, Safety System Unavailability, Heat Removal System performance indicator (PI).

Cornerstone: Mitigating Systems

This supplemental inspection was conducted by the NRC to assess the licensee's evaluation associated with the white performance indicator (PI) for Safety System Unavailability, Heat Removal System for 2nd Quarter, 2000. The inspection was conducted by the Senior Resident Inspector. During this supplemental inspection, which was conducted in accordance with Inspection Procedure 95001, the inspector concluded that the licensee conducted an adequate evaluation of the reactor core isolation cooling (RCIC) system unavailability time that resulted in the white PI, that the extent of condition was appropriately addressed, and that corrective actions were initiated to prevent recurrence of this issue. During the 3rd Quarter, 2000, the PI data for the RCIC system returned to the green band. No findings were identified during this inspection.

Report Details

01 Inspection Scope

The purpose of the supplemental inspection was to review the evaluation and corrective actions developed to address the white 2nd Quarter, 2000, Safety System Unavailability, Heat Removal System (RCIC) performance indicator (PI). The licensee reported an average RCIC system unavailability of 4.1 percent over the previous 3 years. This exceeded the NRC's green-to-white threshold of >4 percent. This performance issue is related to the mitigating systems cornerstone in the reactor safety strategic performance area.

02 Evaluation of Inspection Requirements

02.01 Problem Identification

a. Determination of who (i.e., licensee, self-revealing, or NRC) identified the issue and under what conditions.

For the past several years, plant material condition has been improved and operator work-arounds have been eliminated during safety system on-line outages. The goals of the maintenance rule (MR) program and the plant-specific risk assessment were taken into consideration while the on-line outages were planned. In January 2000, the licensee became aware of the PI thresholds associated with the NRC's Revised Reactor Oversight Process (RROP) and noted that, while all Perry system unavailability times were in the green band, some were close to the green-to-white threshold. As a result, the licensee took into account the RROP PI thresholds, which were more restrictive than MR program goals, when managing system unavailability times. In June 2000, the licensee identified that the reactor core isolation cooling (RCIC) system unavailability was likely to exceed the green-to-white threshold. This was the result of scheduled maintenance taking longer than planned in March 2000 and emergent equipment issues requiring additional RCIC system out-of-service time in June 2000. When the data for the 2nd quarter of 2000 were formally compiled and reviewed on July 11, 2000, licensee personnel initiated Condition Report (CR) 00-2102 to document that the green-to-white threshold had been crossed. The licensee's Independent Safety Engineering Group (ISEG) also initiated an assessment of the RCIC system unavailable time.

b. Determination of how long the issue existed, and prior opportunities for identification.

The RCIC system unavailability time had been close to the green-to-white threshold (at 3.8-4.0 percent) since the first submittal of PI data to the NRC in January 2000. Based on the licensee's planned maintenance at that time, the PI was forecast to remain green in the year 2000. When one planned outage went longer than expected (March 2000) and two unplanned outages occurred due to emergent items (June 2000), the extra unavailability time caused the PI to exceed the white threshold value of >4 percent.

The ISEG report pointed out that the CR (00-0610) investigation following the March 2000 extended system outage was weak in that the cause of the extended outage was not addressed and the CR was inappropriately closed to a different, but not directly related CR (00-0988). Additionally, the ISEG team identified other missed opportunities to identify problems in work execution by not formalizing the lessons learned from earlier maintenance critiques. The ISEG group initiated CR 00-2815 to require that lessons learned and recommendations from the work week critiques be routinely entered into the CR Program. The inspector concluded that the licensee evaluated all prior opportunities to identify this condition and developed corrective actions to prevent recurrence.

c. Determination of the plant specific risk consequences and compliance concerns associated with the issue.

The inspector determined that licensee personnel adequately evaluated the risk associated with each of the RCIC system outages as part of their on-line maintenance risk assessment program. The RCIC system outages resulted in a "medium risk" condition or lower for the duration of the outage as defined by their program when the core damage frequency per reactor-year exceeded 2.0E-05. During the system outages, protected equipment was properly posted with signs to minimize entry into the area and as a result minimize plant risk. It was determined during the licensee's assessments that the RCIC system unavailability time was within the MR program goals and resulted in minimal risk significance. There were no compliance concerns since each of the RCIC system outages was completed within the 14-day Action Statement of Technical Specification 3.5.3.A.

The inspector identified that the ISEG report referenced lower risk importance than actually existed in discussing the relative risk-significance of having the RCIC system out-of-service as compared to the motor feed pump, high pressure core spray system, and emergency diesel generators. The inspector discussed the discrepancy with the ISEG team and the licensee's risk assessment engineer. Condition Report 00-3312 was written to document the discrepancy and correct the ISEG report. The use of the incorrect risk information did not significantly change the outcome of the evaluation.

02.02 Root Cause and Extent of Condition Evaluation

a. Evaluation of methods used to identify root causes and contributing causes.

The licensee used a combination of condition report apparent cause reviews and an assessment by the ISEG to determine the extent of condition and causes of this issue. The licensee initiated CR 00-2102 to investigate the condition after the RCIC system unavailability time exceeded the green-to-white threshold of >4.0 percent. The CR was assigned as a category 2 CR, which requires either a root cause or apparent cause to be conducted and also requires Corrective Action Review Board (CARB) approval of the investigation. The decision was made by plant management to conduct an apparent cause evaluation rather than a root cause evaluation for this issue based on their assessment of the circumstances associated with the RCIC system unavailability. The inspector determined that the licensee followed its procedural guidance for conducting a category 2 apparent cause evaluation. Separately, the ISEG group conducted an

assessment of the RCIC system unavailability time which was also conducted in accordance with site procedures.

b. Level of detail of the root cause evaluation.

Previous RCIC system failures that resulted in unavailable time were reviewed by the licensee during both the ISEG assessment and the CR investigation, but an in-depth review was not conducted of planned outages prior to the March 2000 outage. The investigator explained that the previous unavailability time was managed according to goals developed in the MR program; therefore, the focus of his investigation was on the recent unavailability time that occurred under the current programs in place. It was determined during the CR investigation that the contributing causes for the PI entering the white band was the initially high but acceptable RCIC system unavailability time combined with complications in the preparation and execution of the on-line system outage in March 2000 and insufficient plant walkdowns during the plant shutdown in June 2000. The ISEG report discussed the multiple performance indicators used at Perry to measure key safety system performance. These include the INPO indicators, the Maintenance Rule indicators, the Perry System Quarterly Assessment Report, and the NRC indicators. The ISEG team concluded that management action was taken when the lower thresholds associated with the NRC PIs became known, but that development and communication of clear expectations could be improved. Specifically, the ISEG report noted that there is no overall written policy regarding balancing on-line maintenance and system unavailability for key safety systems and that this has led to differences within the organization in understanding the importance of minimizing system unavailability time when planning and scheduling system outages. The inspectors determined that, while the licensee did not conduct a formal root cause evaluation for the white PI, the reviews conducted were adequate to identify the primary causes for the PI entering the white band.

c. Consideration of prior occurrences of the problem and knowledge of prior operating experience.

The licensee's evaluation of historical RCIC system performance identified all failures including two of which were considered to be maintenance preventable functional failures (MPFF). There were no repeat MPFFs and no fault exposure time for any of the RCIC failures. The inspectors reviewed several of the historical RCIC system failures and had no concerns with the licensee's assessment of MPFFs or fault exposure time.

d. Consideration of potential common causes and extent of condition of the problem.

The investigation for CR 00-2102 addressed the unavailability time for other safety systems such as emergency AC power, the high pressure core spray (HPCS) system, and the residual heat removal (RHR) system. While the PIs were in the green band for these systems, unavailability time has also accrued for these systems due to on-line outages conducted to improve the system's material condition prior to the implementation of the NRC's RROP. Although the emergency AC power and HPCS system PIs had significant margins to the green-to-white threshold, the RHR system was projected to approach the threshold early in the year 2001. One of the CRs written by the ISEG team was CR 00-2816, which documented that the RHR system

unavailability time may cross the threshold in the near term. This CR investigation was scheduled for completion by October 28, 2000, and the licensee has ensured corrective actions developed for the RCIC system white PI have been applied to other safety system planned outages.

02.03 Corrective Actions

a. Appropriateness of corrective actions.

As part of the evaluation for CR 00-2102, corrective action to prevent recurrence (CATPR) 00-2102-001 was developed which required a policy to be generated to outline management expectations and provide site-wide guidance for preparation and execution of on-line divisional/RCIC equipment outages. The CATPR was assigned to the Work Control Section and was scheduled for completion by December 22, 2000. The CARB planned to review the completed CATPR. Five new CRs resulted from the ISEG report (00-2812, 2815, 2816, 2817, 2818). One CR required that a policy/guidance document be developed to address the need to balance on-line maintenance with system unavailability for the key safety systems. The other CR evaluations had not been completed as of the time of the inspection. However, those corrective actions developed to date addressed the primary causes for the PI green-to-white threshold being crossed and were appropriate to the circumstances. Per the licensee's corrective action program, each CR remaining open requires evaluation and the development of necessary corrective actions.

b. Prioritization of corrective actions.

The corrective actions were prioritized appropriately within the licensee's corrective action program.

c. Establishment of a schedule for implementing and completing the corrective actions.

The corrective action resulting from CR 00-2102, CATPR 00-2102-001 was scheduled for completion by December 22, 2000. The other CRs were scheduled for the investigations to be completed by November 12, 2000. The schedule was consistent with the licensee's corrective action program and considered to be reasonable by the inspectors.

d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence.

The licensee assigned a Condition Report Remedial Action (CRRA) to perform an effectiveness review of the actions taken to prevent recurrence. This was assigned as CRRA 00-2102-001 to be due on July 26, 2001. The requirement in the CRRA was to assess how well the policy developed per CATPR 00-2102-001 is being implemented, if the organizational ownership has been established and maintained, if the appropriate personnel have an understanding of the various performance indicators and if the indicators are being used appropriately in decision making for system outages.

03 Management Meetings

Exit Meeting Summary

The inspector presented the inspection results to Mr. J. Wood, Vice President - Nuclear and other members of licensee management at the conclusion of the inspection on October 26, 2000. The licensee acknowledged the findings presented.

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

KEY POINTS OF CONTACT

J. Wood, Vice President-Nuclear
C. Angstadt, Independent Safety Engineering Group
P. Arthur, Manager, Work Control Section
N. Bonner, Director, Nuclear Maintenance Department
G. Brewer, Work Week Manager
W. Colvin, Maintenance Rule Engineer
G. Dunn, Manager, Regulatory Affairs
D. Gudger, Supervisor, Compliance Unit
D. Johnson, Supervisor, Work Control
G. Kindred, Plant Safety Assessment Engineer
T. Lentz, Manager, Design Engineering
J. Mikolaj, Supervisor, Plant Engineering
K. Ostrowski, Director, Nuclear Services Department
R. Parker, Independent Safety Engineering Group
M. Peterson, Plant Engineer, RCIC system
D. Phillips, Manager, Plant Engineering
T. Rausch, Director, Nuclear Engineering Department
K. Russell, Compliance Engineer
R. Schrauder, General Manager, Nuclear Power Plant Department

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

DOCUMENTS REVIEWED

CR No. 99-0169, RCIC trip due to inadequate reset of turbine following earlier testing
CR No. 00-0610, RCIC work exceeded expected duration
CR No. 00-1623, RCIC steam supply valve failed to reopen after closure for surveillance
CR No. 00-2120, Evaluation of White PI for RCIC
PIF No. 97-2243, RCIC failure due to overspeed as a result of governor control valve binding
PIF No. 98-0369, RCIC governor valve difficult to stroke due to particulate oil contamination
PNSD Operational Surveillance Report 00-035, RCIC Outage
ISEG Report 00-007, Independent Safety Engineering Group RCIC Unavailability Assessment Report
Probabilistic Safety Assessment, Period 6 Week 6, August 13-19, 2000
NRC Performance Indicator Desktop Guideline, Revision 0
PAP-130, "Schedule Development," Revision 2, dated September 9, 1999
Weekly On-line Schedule Performance Reports (Critiques):
Week 10 Period 5 Cycle 8 (06/00)
Week 6 Period 6 Cycle 8 (08/00)
Week 6 Period 4 Cycle 8 (03/00)

LIST OF ACRONYMS AND INITIALS USED

ADAMS	Agency-Wide Documents Access and Management System
CARB	Corrective Action Review Board
CATPR	Corrective Action To Prevent Recurrence
CFR	Code of Federal Regulations
CR	Condition Report
CRRA	Condition Report Remedial Action
DRP	Division of Reactor Projects
FENOC	FirstEnergy Nuclear Operating Company
HPCS	High Pressure Core Spray
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IR	Inspection Report
ISEG	Independent Safety Engineering Group
MPFF	Maintenance Preventable Functional Failures
MR	Maintenance Rule
NRC	Nuclear Regulatory Commission
PAP	Plant Administrative Procedure
PARS	Publicly Available Records
PI	Performance Indicator
PSA	Probabilistic Safety Assessment
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RROP	Revised Reactor Oversight Process