

July 31, 2000

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

SUBJECT: PERRY - NRC INSPECTION REPORT 50-440/2000007(DRS)

Dear Mr. Wood:

On July 20, 2000, the NRC completed an inspection at your Perry Nuclear Power Plant, Unit 1 reactor facility. The enclosed report presents the results of that inspection. The results of this inspection were discussed on July 20, 2000, with Mr. B. Boles and other members of your staff.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas the inspection consisted of a review of specific procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection no findings 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 on the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

John M. Jacobson, Chief
Mechanical Engineering Branch
Division of Reactor Safety

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

Enclosure: Inspection Report 50-440/2000007(DRS)

See Attached Distribution

J. Wood

-2-

cc w/encl: B. Saunders, President - FENOC
G. Dunn, Manager, Regulatory Affairs
R. Schrauder, Director, Nuclear
Engineering Department
W. Kanda, General Manager
Nuclear Power Plant Department
N. Bonner, Director, Nuclear
Maintenance Department
H. Bergendahl, Director
Nuclear Services Department
State Liaison Officer, State of Ohio
R. Owen, Ohio Department of Health
C. Glazer, State of Ohio Public
Utilities Commission

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cc w/encl: B. Saunders, President - FENOC
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Engineering Department
W. Kanda, General Manager
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 50-440/2000007(DRS)

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Perry Nuclear Power Plant, Unit 1

Location: P.O. Box 97 A200
Perry, OH 44081

Inspection Dates: July 17–20, 2000

Inspector: V. Patricia Lougheed, Reactor Inspector

Approved by: John M. Jacobson, Chief
Mechanical Engineering Branch
Division of Reactor Safety

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

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness

Radiation Safety

- Occupational
- Public

Safeguards

- Physical Protection

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. And 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

IR 05000440-00-07, on 07/17-07/20/2000; FirstEnergy Nuclear Operating Company; Perry Nuclear Power Plant, Unit 1. Reactor Safety specialist report.

This report covers the initial biennial baseline heat sink inspection. This was a four day inspection by a Region III specialist engineer. No findings were identified during this inspection.

Report Details

Summary of Plant Status: The plant was at 100 percent power this inspection period.

1. **REACTOR SAFETY**

Cornerstones: Initiating Events and Mitigating Systems

1R07 Heat Sink Performance

a. Inspection Scope

The inspector reviewed the documents associated with thermal performance testing of the residual heat removal B heat exchanger, the emergency closed cooling A heat exchanger and the Division 2 emergency diesel generator jacket water cooler. These heat exchangers were chosen for review based on either high risk achievement worths in the station's probabilistic safety assessment and/or trend information supplied by the licensee. The inspector reviewed completed surveillances and associated calculations, performed walkdowns to verify instrumentation setup, and performed hand calculations to confirm that the heat exchangers met their design basis heat removal requirements.

The inspector reviewed condition reports concerning heat exchanger or heat sink performance issues to verify that the licensee had an appropriate threshold for identifying issues. The inspector also evaluated the effectiveness of the corrective actions to the identified issues, including the engineering justification for operability, if applicable. The documents that were reviewed are included at the end of the report.

b. Findings

No findings were identified during this inspection.

4. **OTHER ACTIVITIES**

4OA3 Event Followup

(Closed) Licensee Event Report (LER) 50-440/1999-001-00: Control Complex Building Architectural Walls Not Included in Tornado Differential Pressure Loading Design. This LER documented the licensee's discovery that the internal walls inside the control complex would not withstand a design basis tornado differential pressure transient. The licensee is tracking this issue under condition report 99-0603. This item is closed.

4OA5 Other

- a. (Closed) Unresolved Item 50-440/98011-02: Vendor Recommendations Not in Agreement with Procedure. During the 1998 breaker inspection, the NRC identified discrepancies between the vendor manual, a 1992 letter from the vendor, and the procedure used to test the breakers, GEI-0124, "Types SS-3, SS-4, and SS-5 Solid State Trip Devices Testing and Calibration Using Multi-amp CB-8160 Test Set." This issue is 5

captured in the licensee's corrective action program as condition report 98-1166. The licensee contacted the vendor to resolve the conflicts between the three documents. Based upon the November 16, 1999 response from the vendor, the licensee revised the procedure. The inspectors had no further concerns. This item is closed.

- b. (Closed) Unresolved Item 50-440/98011-03: Use of Unapproved Cleaner. During the 1998 breaker inspection, the NRC determined that the licensee was using a cleaner on safety-related breakers which had not been evaluated for use. The licensee evaluated this concern under condition report 99-1528. The licensee discontinued use of the cleaner and performed tests which determined that use of the cleaner had no deleterious effects. The inspectors had no further concerns. This item is closed.
- c. (Closed) Violation 50-440/98011-04: Inadequate Voltage Calculation. During the 1998 breaker inspection, the NRC determined that one voltage calculation contained several design basis errors. The licensee wrote condition report 98-1167 to address the issue and prepared an operability determination which concluded the breakers involved were operable. The licensee took appropriate corrective actions to correct the immediate discrepancies and to ensure that other calculations were acceptable. This item is closed.
- d. (Closed) Unresolved Item 50-440/99009-02: Evaluation of Ultimate Heat Sink. This issue was opened due to inspectors' questions regarding the licensee's implementation of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Power Plants," Revision 2, January 1976, which the licensee is committed to in its updated safety analysis report. The inspectors determined that the ultimate heat sink design bases were properly considered during the implementation of Regulatory Guide 1.27 and that no provisions were needed in the technical specifications for actions to be taken in the event that conditions threaten a partial loss of the ultimate heat sink capability. This conclusion was based primarily on the fact that the ultimate heat sink for Perry is Lake Erie, which is a large body of water. The regulatory guide states that such provisions are not necessary when large bodies of water serve as the ultimate heat sink for a plant. Therefore, the licensee has adequately implemented this aspect of Regulatory Guide 1.27 and this item is closed.
- e. (Closed) Violation 50-440/99013-03: Failure to Correctly Derive Essential Core Cooling System (ECCS) Pump Technical Specification Surveillance Requirements from the Updated Safety Analysis Report (USAR). During the 1999 engineering inspection, the NRC identified that the minimum performance requirements specified for all the ECCS pumps in technical specifications 3.5.1.4 and 3.5.2.5 were below the USAR design requirements. The licensee confirmed that the USAR design requirements were correct and submitted a request to change the technical specifications. The surveillance requirements were revised by Amendment 111, issued March 30, 2000. This item is closed.
- f. (Closed) Unresolved Item 50-440/99013-05: Using Regulator Limits Instead of Design Basis Limits During an Operability Determination. This unresolved item concerned the acceptability of using the limits specified in 10 CFR Part 100 in an operability determination, rather than the lower limits specified in the USAR. This question was submitted to the Office of Nuclear Reactor Regulation, who determined that the licensee's approach was acceptable. This item is closed.

4OA5 Management Meetings

.1 Exit Meeting Summary

The inspector presented the inspection results to Mr. B. Boles, Plant Engineering Manager, and other members of licensee management at the exit meeting held on July 20, 2000. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

B. Boles, Manager, Plant Engineering
R. Dame, Supervisor, Test and Performance Section
G. Dunn, Manager, Regulatory Affairs
F. Eichenlaub, Generic Letter 89-13 Test Engineer
T. Rausch, Operations Manager
S. Sanford, Senior Compliance Engineer

NRC

C. Lipa, Senior Resident Inspector
R. Vogt-Lowell, Resident Inspector

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

50-440/98011-02	URI	Vendor Recommendations Not in Agreement with Procedure
50-440/98011-03	URI	Use of Unapproved Cleaner
50-440/98011-04	VIO	Inadequate Voltage Calculation
50-440/99009-02	URI	Evaluation of Ultimate Heat Sink
50-440/99013-03	VIO	Failure to Correctly Derive Essential Core Cooling System Pump Technical Specification Surveillance Requirements from the Updated Safety Analysis Report
50-440/99013-05	URI	Using Regulator Limits Instead of Design Basis Limits During an Operability Determination
50-440/99001-00	LER	Control Complex Building Architectural Walls Not Included in Tornado Differential Pressure Loading Design

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of licensee documents reviewed during the inspection, including documents prepared by others for the licensee. Inclusion on this list does not imply that NRC inspectors 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.

Calculations

E12-86	Residual Heat Removal B/D Performance Test Results Evaluation - 1997, Revision 0
E12-93	Residual Heat Removal B/D Performance Test Results Evaluation - 5/14/98, Revision 0
E12-95	Residual Heat Removal B/D Performance Test Results Evaluation - 11/18/98, Revision 0
E12-96	Residual Heat Removal B/D Performance Test Results Evaluation - 6/22/99, Revision 0
E12-98	Residual Heat Removal B/D Performance Test Results Evaluation - 11/17/99, Revision 0
P42-033	Evaluation of Heat Transfer Coefficient and Minimum Required Wall Thickness for Emergency Closed Cooling Heat Exchanger 1P42-B0001A/B, Revision 0
P42-040	Emergency Closed Cooling Heat Exchanger Performance Test Evaluation -1997, Revision 0
P42-043	Emergency Closed Cooling Heat Exchanger Performance Test Evaluation - 9/19/98, Revision 1
P42-045	Emergency Closed Cooling Heat Exchanger Performance Test Evaluation - 9/14/99, Revision 0
R46-012	Evaluation of Heat Transfer Coefficient and Minimum Required Wall Thickness for Division 1&2 Diesel Generator Jacket Water Heat Exchanger 1R46-B0002A/B, Revision 1
R46-016	Division 2 Diesel Generator Jacket Water Heat Exchanger Performance Test Results - 1997, Revision 0
R46-020	Division 2 Diesel Generator Jacket Water Heat Exchanger Performance Test Results - 8/27/98, Revision 0
R46-021	Division 2 Diesel Generator Jacket Water Heat Exchanger Performance Test Results - 7/28/99, Revision 0

Condition Reports

98-1024	Step Increase in Essential Service Water Side of B Loop Residual Heat Removal Heat Exchangers, April 30, 1998
98-1166	Inconsistencies Between ABB Vendor Manual; September 22, 1992, ABB letter; and GEI-1024, May 21, 1998
98-1167	Discrepancies in DES/ELP Calculation PRDC-007, Revision 4, May 22, 1998
98-1899	A Potential Fouling Mechanism May Be Introduced into the Essential Service Water from Inherent Design, September 3, 1998
99-0381	Increasing Pressure on Residual Heat Removal Heat Exchanger A; 1E12R616A Was Reading 60 Pounds per Square Inch Gauge, February 20, 1999

- 99-0603 Architectural Walls Used in the Control Complex Have Not Been Designed to Consider Potential Tornado Depressurization Loads, March 17, 1999
- 99-1261 Operability Determination for Problem Identification Form 96-3390 Should Not Have Been Closed, April 24, 1999
- 99-1528 Acceptability of Using Unevaluated Cleaner (Windex), June 1, 1999
- 99-1556 Chemistry Sampling of Division 1 Emergency Diesel Generator Jacket Water Indicates a Potential Heat Exchanger Tube In-leakage of Essential Service Water, June 3, 1999
- 99-2010 Determine if a Total of 490 Plugged Tubes is Acceptable for the 1P44B0001B Heat Exchanger, August 23, 1999

Correspondence

Letter from D. Pickett, Senior Project Manager, NRC, to J. Wood, Vice President - Nuclear, FirstEnergy, "Perry Nuclear Power Plant, Unit 1 - Issuance of Amendment Re: Nine Minor Miscellaneous Changes to the Technical Specifications (TAC MA6462)," March 30, 2000

Memorandum from J. F. Eichenlaub to R. W. Dame, "Results of PTI-E12-P0002 and Calculation E12-94, R0, for the RHR A Loop Heat Exchanger," July 11, 2000

Memorandum from J. F. Eichenlaub to D. R. Gruver, "Results of PTI-E12-P0003 and Calculation E12-99, R0, for the RHR B Loop Heat Exchanger," July 11, 2000

Memorandum from J. F. Eichenlaub to D. R. Gruver, "Results of PTI-E22-P0007 and Calculation E22-40, R0, for the Division 3 Diesel Generator Jacket Water Heat Exchanger," July 11, 2000

Memorandum from J. F. Eichenlaub to D. R. Gruver, "Results of PTI-M39-P0002 and Calculation M39-13, R0, for the High Pressure Core Spray Pump Room Cooler," July 11, 2000

Memorandum from J. F. Eichenlaub to D. R. Gruver, "Results of PTI-P42-P0001 and Calculation P42-45, R0, for the Emergency Closed Cooling A Heat Exchanger," July 11, 2000

Memorandum from J. F. Eichenlaub to D. R. Gruver, "Results of PTI-P42-P0002 and Calculation P42-46, R0, for the Emergency Closed Cooling B Heat Exchanger," July 11, 2000

Memorandum from J. F. Eichenlaub to D. R. Gruver, "Results of PTI-R46-P0002A and Calculation P46-22, R0, for the Division 1 Diesel Generator Jacket Water Heat Exchanger," July 11, 2000

Memorandum from J. F. Eichenlaub to D. R. Gruver, "Results of PTI-R46-P0002B and Calculation P46-21, R0, for the Division 2 Diesel Generator Jacket Water Heat Exchanger," July 11, 2000

Heat Exchanger Data Sheets

Delaval Engine	Jacket Water Cooler
General Electric	Residual Heat Removal Heat Exchanger Post Accident Suppression Pool Cooling with Five Percent Tubes Plugged (Sizing or Design Mode)
Struthers Wells	Emergency Closed Cooling Water Heat Exchanger

Probabilistic Safety Assessment

Ranking of Heat Exchangers by Risk Achievement Worth, July 2000

Procedures

PTI-E12-P0003	Residual Heat Removal Heat Exchangers B and D Performance Testing, Revision 5
PTI-P42-P0001	Emergency Closed Cooling A Heat Exchanger Performance Testing, Revision 2
PT1-R46-P0002B	Division 2 Diesel Generator Jacket Water Heat Exchanger Performance Testing, Revision 1

Surveillances

PTI-E12-P0003	Completed November 1997
PTI-E12-P0003	Completed May 1998
PTI-E12-P0003	Completed November 1998
PTI-E12-P0003	Completed June 1999
PTI-E12-P0003	Completed November 1999
PTI-P42-P0001	Completed July 1997
PTI-P42-P0001	Completed August 1998
PTI-P42-P0001	Completed July 1999
PT1-R46-P0002B	Completed September 1997
PT1-R46-P0002B	Completed September 1998
PT1-R46-P0002B	Completed September 1999

Work Order

960005554	Heat Exchanger 1P42B001A Needs Inspecting, November 3, 1997
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