

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-440
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Report No.: 50-440/99010(DRP)

Licensee: FirstEnergy Nuclear Operating Company
P.O. Box 97 A200
Perry, OH 44081

Facility: Perry Nuclear Power Plant

Location: Perry, OH

Dates: August 26 through October 7, 1999

Inspectors: C. Lipa, Senior Resident Inspector
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EXECUTIVE SUMMARY

Perry Nuclear Power Plant NRC Inspection Report 50-440/99010(DRP)

This inspection report included resident inspectors' evaluations of aspects of licensee operations, engineering, maintenance, and plant support activities.

Operations

- The inspectors concluded that while the overall conduct of operations continued to be professional with an appropriate focus on safety, a decline in operator human performance occurred during this inspection period. This was based on the inspectors' identification of several instances where operators did not thoroughly question unexpected conditions or demonstrate adequate attention-to-detail during the performance of routine activities (Section O1.1).
- Overall, plant material condition and housekeeping were good. However, the inspectors identified several items that did not meet plant management expectations for housekeeping. These items were promptly corrected (Section O2.1).
- The inspectors concluded that ladders were improperly stored within the suppression pool swell region of the containment which had the potential to impact safety-related equipment in the area. The condition was promptly corrected and entered into the licensee's corrective action program. This was a Non-Cited Violation (Section O2.2).
- While the inspectors concluded that the self-assessment activities observed were effective in ensuring identified issues were appropriately dispositioned, inconsistencies existed in the way data was entered in condition reports to request operability evaluations. Although the inconsistencies did not lead to any missed operability evaluations, the potential existed for personnel to misinterpret this data (Section O7.1).

Maintenance

- The inspectors concluded that two in-plant activities were not well communicated and coordinated with the control room. This was a departure from the licensee's typically good performance with regard to communicating and coordinating work activities (Section M1.1).
- The inspectors identified that an inadequate procedure was used to perform emergency diesel generator (EDG) fuel oil transfer pump testing. The procedure rendered the EDG inoperable during the test, however, there was no information in the surveillance test procedure to alert the shift supervisor that equipment operability was affected (Section M1.2).

Engineering

- The inspectors concluded that engineering provided good support to operations in evaluating several operability questions throughout the inspection period (Section E1.1).

Report Details

Summary of Plant Status

The plant was operated at approximately 100 percent power throughout most of this inspection period. On August 29, the licensee reduced power to approximately 70 percent for a control rod sequence exchange and to conduct turbine valve testing.

I. Operations

O1 Conduct of Operations

O1.1 Review of Routine Plant Operations (71707)

a. Inspection Scope

The inspectors followed the guidance of Inspection Procedure (IP) 71707 and conducted frequent reviews of plant operations. This included observing routine control room activities, reviewing system tagouts, accompanying plant operators on routine rounds, attending shift turnovers and crew briefings, and performing panel walkdowns.

b. Observations and Findings

The conduct of operations was professional. The inspectors observed strict use of procedures and thorough shift turnovers. Overall, emergent equipment issues were promptly addressed and the conduct of operations was appropriately focused on safety. The inspectors identified several minor issues which represented a slight decline in the questioning attitude and attention-to-detail on the part of plant operators. Examples included:

1. On September 7, 1999, during a routine high pressure core spray system surveillance test, annunciator "RCIC PUMP SUCTION PRESSURE HIGH" unexpectedly alarmed. The Shift Supervisor (SS) stated to the inspectors that while this alarm was received during previous surveillance tests, he was unsure of the reason for it. After the inspectors held further discussions concerning this issue with another SS, Condition Report (CR) 99-2172 was initiated to request an engineering review of this issue.
2. On September 22 and 24, 1999, when the Division 2 emergency diesel generator (EDG) was placed in pull-to-lock for testing, both starting air compressors started unexpectedly. Since this was clearly an unexpected condition, the inspectors questioned why there was no CR written to document and review this issue. Through subsequent discussions with engineering department personnel, it was explained that this was initially being treated as part of an unrelated issue with the Division 2 EDG, but then CR 99-2367 was initiated to review this issue.

3. On September 15, 1999, the inspectors observed portions of a planned RCIC system outage and the restoration of the system to service. After the system was placed in standby readiness, the operators were observing the RCIC system high steam flow (leak detection) instruments on the back panels to determine when to proceed with system testing. The RCIC System Operating Instruction (SOI) provided guidance that the instruments needed time to stabilize following system isolation and restoration, at which point they would indicate approximately 0 ± 15 inches. The inspectors observed that the instruments were reading approximately -10 to -30 inches for over 1 hour after the RCIC steam isolation valves were fully open. The inspectors questioned the SS on whether the leak detection instruments were operable during this time because the zero offset was in the non-conservative direction and higher flow would be required to trip the instruments. After discussions with the inspectors, the SS entered the 24-hour limiting condition for operation (LCO) per Technical Specification 3.3.6.1.a. A short time later, the instruments indicated within the 0 ± 15 inches described by the SOI and the LCO was exited. The SS initiated CR 99-2236 to request engineering review of how much zero offset was acceptable without resulting in inoperable instruments.
4. On September 17, 1999, the inspectors identified that the two operator aid placards in the control room used to indicate the safety-related DC system lineup did not match each other. The dates written on the placards were different and a breaker was shown closed on one placard and open on the other. One placard was located near the Unit Supervisor (US) desk and the other was located near the Operator at the Controls desk. The placards were promptly updated to reflect the current plant status.
5. The inspectors identified several Condition Report examples where operators failed to fully implement the guidelines of the corrective action program (CAP) when performing the initial "Operations Review" of the issue. This is discussed in more detail in Section O7.1.

c. Conclusions

The inspectors concluded that while the overall conduct of operations continued to be professional with an appropriate focus on safety, a decline in operator human performance occurred during this inspection period. This was based on the inspectors' identification of several instances where operators did not thoroughly question unexpected conditions or demonstrate adequate attention-to-detail during the performance of routine activities.

O2 Operational Status of Facilities and Equipment

O2.1 General Plant Tours and System Walkdowns (71707)

a. Inspection Scope

The inspectors followed the guidance of IP 71707 in walking down accessible portions of several systems and areas, including:

- Emergency Core Cooling System (ECCS) Room Coolers
- Emergency Diesel Generators (EDG)
- Reactor Core Isolation Cooling System (RCIC)
- Control Complex
- Containment
- Annulus Exhaust Gas Treatment System (AEGTS)
- Fuel Handling Building
- High Pressure Core Spray (HPCS) System
- Standby Liquid Control System

b. Observations and Findings

Equipment operability was acceptable in all cases. While overall material condition and housekeeping were good, the inspectors identified some discrepancies which were brought to the licensee's attention. The licensee indicated that these items did not meet plant management's expectations for housekeeping and the conditions were corrected in a timely manner. Examples included:

1. The inspectors identified concerns with the storage of ladders within the suppression pool swell region of the containment. This issue is discussed in detail in Section O2.2. Following discussions with the SS, corrective actions were initiated immediately.
2. The inspectors identified degradation and peeling of the insulation material inside several ECCS room coolers. The inspectors questioned whether this material could continue to peel off and plug the intake filters for these room coolers or peel off internally to the ventilation unit and impact long term fan operation. The responsible system engineers toured the areas with the inspectors and initiated CR 99-2168 to determine the extent of condition and correct the degradation. The licensee determined that the degradation of the insulation was not an operability concern.
3. Several floor drains had tape rings around them which were coming loose. In one instance, the tape ring was completely separated from the floor and was found on top of the floor drain. This could become a concern for blocking flow into the drains. The tape rings were replaced as necessary.

4. A wheeled cart was not secured in place near the standby liquid control transfer tank in the Intermediate Building per housekeeping expectations. The cart was subsequently chained to a support.
5. There were several piles of dirt and debris on the floors in all three EDG rooms. The licensee subsequently cleaned the areas.

c. Conclusions

Overall, plant material condition and housekeeping were good. However, the inspectors identified several items that did not meet plant management expectations for housekeeping. These items were promptly corrected.

O2.2 Improper Storage of Ladders Within the Suppression Pool Swell Region of Containment

a. Inspection Scope (71707)

The inspectors followed the guidance of IP 71707 in walking down accessible portions of the Containment Building. The inspectors identified several concerns with the storage of ladders in the suppression pool swell region of the containment. The inspectors reviewed applicable drawings (D-511-611, "Reactor Building CRD [Control Rod Drive] Maintenance Equipment, Storage and Restraints," Rev 0) and procedures and held discussions with operations and engineering department personnel.

b. Observations and Findings

On October 1, 1999, the inspectors identified several concerns with the storage of ladders in the containment adjacent to the hydraulic control units and other safety-related equipment. There are two designated ladder storage locations on the 620 ft. elevation of containment. Each location was designed to store two ladders. In each location, there is a pool swell deflection plate fastened to the grating to shield the ladders from potential pool swell conditions within the containment and a bracket with chains to restrict movement and prevent the ladders from becoming unanalyzed missiles. The inspectors identified that there were three ladders (instead of two, as authorized) at one of the locations, that the ladders did not fit onto the deflection plate, and that the chain was not securely fastened to restrict movement of one of the ladders.

The inspectors discussed the observations with the US and requested information regarding the details of these storage locations. The US promptly had the extra ladder removed from containment and wrote CR 99-2385 to request engineering personnel to assist in determining the details of the approved storage design. During a subsequent walkdown by engineering department personnel, it was determined that there were other concerns with the ladder storage and a second CR was written (CR 99-2405) to document differences between the actual installation and the requirements of Drawing D-511-611, which was used during the installation of this modification. The differences between the as-found installation and the drawing included the storage of 6 ft. ladders rather than 4 ft. ladders, an S-hook rather than a padlock secured the chain, and

the chain was not secured around at least one ladder rung to assure vertical restraint against the pool swell uplift. The condition was promptly corrected after the results of this walkdown were reported to the control room.

Criterion V of 10 CFR Part 50, Appendix B, requires that activities affecting quality be prescribed by procedures, instructions, or drawings and be accomplished according to these documents. Drawing D-511-611 was a document which prescribed the requirements for the storage of ladders in the pool swell region of containment, an activity affecting quality. The failure to follow the requirements of Drawing D-511-611 is a violation of 10 CFR Part 50, Appendix B, Criterion V. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's CAP as CRs 99-2385 and 99-2405. (NCV 50-440/99010-01(DRP))

c. Conclusions

The inspectors concluded that ladders were improperly stored within the suppression pool swell region of the containment which had the potential to impact safety-related equipment in the area. The condition was promptly corrected and entered into the licensee's corrective action program. This was a Non-Cited Violation.

O7 Quality Assurance in Operations

O7.1 Licensee Self-Assessment Activities (37551, 71707)

During the inspection period, the inspectors reviewed multiple licensee self-assessment activities, including:

- Daily review of new Condition Reports by Plant Managers
- Quality Assurance Audit Exit on Effectiveness of Corrective Actions
- Corrective Action Review Board (CARB) Weekly Meeting

The licensee maintained a low threshold for entering issues into the CAP. During the CARB meeting, a review of higher level CRs was conducted to ensure corrective actions were appropriate to prevent recurrence.

The inspectors identified some inconsistencies in the review of new CRs for potential operability issues. Although there were no specific operability concerns identified, the blocks on the form, which are used to request operability evaluations from engineering personnel, were not filled out correctly in several cases. The inspectors found that the meaning of each of the blocks was not consistently understood by various SSs. For example, in some cases, "Operability - Yes" was checked when a SS wanted an operability evaluation and in others, "Operability - Yes" was checked when there was no question of system operability. In other cases, no blocks were checked at all and the request for an operability evaluation was specified in the comments section of the CR. In response to these findings, Operations Management updated PAP-1608, "Corrective Action Program Reference Guide," to clarify the expectations for completing CRs correctly. While the inspectors concluded that the self-assessment activities observed

were effective in ensuring identified issues were appropriately dispositioned, inconsistencies existed in the way data was entered in condition reports to request operability evaluations. Although the inconsistencies did not lead to any missed operability evaluations, the potential existed for personnel to misinterpret this data.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Review of Routine Maintenance and Surveillance Activities

a. Inspection Scope (62707, 61726)

The inspectors observed or reviewed portions of the following activities:

- SVI-E51-T2001, "RCIC Pump and Valve Operability Test"
- SVI-C41-T2001B, "Standby Liquid Control B Pump and Valve Operability Test"
- SVI-R45-T2002, "Division 2 DG Fuel Oil Transfer Pump and Valve Operability Test"
- SVI-C71-T0046, "Turbine Stop Valve Closure and Turbine Control Valve Fast Closure"
- SVI-E22-T1319, "Diesel Generator Start and Load, Division 3"
- SVI-E22-T0194G, "HPCS Condensate Storage Tank Low Level Channel G Calibration"

b. Observations and Findings

The observed activities were performed appropriately according to controlled procedures. There were thorough pre-job briefings for more complex activities and there was generally good communication during the activities. The inspectors identified two instances where activities were not adequately communicated and coordinated between the control room staff and in-plant personnel. Examples included:

- On September 2, 1999, during the performance of a surveillance test on the HPCS system, the inspectors observed that scaffolding was being built in the RCIC pump room. The inspectors questioned the control room SS and determined that the SS and US were not aware that this activity was occurring in the plant. The SS immediately stopped the scaffold building until the HPCS system test was completed. Through interviews, the inspectors determined that there had been a miscommunication between the scaffold builders and the SS on duty the previous day. The scaffold builders thought they had received permission to build scaffold in the RCIC pump room all week long. As corrective

action, Operations management held a meeting with Maintenance management to discuss this and other scaffolding coordination issues. The results of the meeting were placed in the control room as a Standing Instruction.

- On September 20, 1999, the inspectors identified that the EDG fuel oil transfer pump surveillance test line-up rendered the EDG inoperable for short periods of time. This was not highlighted in the surveillance procedure or coordinated with the control room ahead of time and was not recognized by the SS prior to authorizing the test. Details are discussed in Section M1.2.

c. Conclusions

The inspectors concluded that two in-plant activities were not well communicated and coordinated with the control room. This was a departure from the licensee's typically good performance with regard to communicating and coordinating work activities.

M1.2 Inadequate Surveillance Test Instruction for EDG Fuel Oil Transfer Pumps

a. Inspection Scope (61726)

The inspectors followed the guidance of IP 61726 in reviewing a surveillance test of the Division 2 EDG fuel oil transfer pumps. The inspectors reviewed system drawings, test procedures and applicable sections of TS and USAR.

b. Observations and Findings

On September 20, 1999, while observing SVI-R45-T2002, "Division 2 Diesel Generator Fuel Oil Transfer Pump and Valve Test," the inspectors identified that the EDG was rendered inoperable for short periods of time during this test. Through previous discussions with the control room, the SS explained that the test was not expected to impact EDG operability because there are two redundant fuel oil transfer pumps for each EDG and the test is set up to only test one pump at a time. The inspectors observed the test and identified that during portions of the test, one of the pumps was throttled to the ASME reference range and the discharge valve for the other pump was closed for short periods of time to obtain some readings. The inspectors discussed this observation with the control room operators and the SS initiated CR 99-2276 to request engineering review of the test procedure.

Based an engineering review of the test procedure for all three Divisional EDGs, one pump in Division 2 and two pumps in Division 1 could be throttled to below their minimum required flow rates during the surveillance test. Therefore, in these cases, the EDG would be inoperable when the discharge valve on the redundant pump was closed. The engineering department personnel initiated procedure changes to re-sequence the steps within the surveillance procedure to prevent the EDG from becoming inoperable during the test.

PAP-517, "Preparation of Surveillance Instructions," Revision 1, has specific requirements for information to include in the test procedure when the surveillance test causes equipment to be inoperable. The required information was not included in the

specified sections of SVI-R45-T2001, and T2002. Criterion V of 10 CFR Part 50, Appendix B, requires that activities affecting quality be prescribed by documented instructions of a type appropriate to the circumstances. The failure of the fuel oil transfer pump surveillance instruction to contain the required information to alert the SS that the test caused the EDG to be inoperable was a violation. However, this failure constitutes a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

The inspectors identified that an inadequate procedure was used to perform emergency diesel generator (EDG) fuel oil transfer pump testing. The procedure rendered the EDG inoperable during the test, however, there was no information in the surveillance test procedure to alert the shift supervisor that equipment operability was affected.

III Engineering

E1 Conduct of Engineering

E1.1 Review of Routine Engineering Activities

a. Inspection Scope (37551)

The inspectors evaluated engineering involvement in the resolution of emergent material condition problems and other routine activities. The inspectors reviewed areas such as operability evaluations, root cause analyses, and self-assessments. The effectiveness of the licensee's controls for the identification, resolution, and prevention of problems was also examined.

b. Observations and Findings

The inspectors reviewed several engineering-related issues and operability evaluations. Specific issues reviewed were as follows:

- CR 99-2108. On August 29, 1999, during turbine control valve testing, valve TCV-1 failed to "fast close" during the end of the valve stroke as expected. Engineering department personnel reviewed the drawings and test requirements and provided guidance for an alternate test method that would ensure requirements were met.
- CR 99-2157. On September 1, 1999, divers in the intake structure identified an apparent crack in the service water pumphouse intake tunnel liner. An operability evaluation was performed and additional actions were scheduled to obtain additional data, determine the cause of the crack, and periodically monitor the condition.

- CR 99-2365. On September 29, 1999, mechanics identified a broken fastener on a tie plate between the two Division 2 EDG turbo chargers. An operability evaluation was performed to assess the as-found condition.
- CR 99-2301. During a routine EDG surveillance test on September 22, 1999, unexpected "trip annunciators" were received in the control room. The alarms cleared before the EDG tripped. Engineering department personnel provided troubleshooting guidance and researched potential causes for the alarms. An operability determination was prepared to document the basis for operability of the EDG.

Operability evaluations were generally well documented. The inspectors determined that Engineering personnel provided good support to Operations by promptly evaluating and dispositioning emergent equipment issues.

c. Conclusions

The inspectors concluded that engineering personnel provided good support to operations, in evaluating several operability questions throughout the inspection period.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on October 7, 1999. The licensee acknowledged the findings presented.

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

PARTIAL LIST OF PERSONS CONTACTED

Licensee

H. Bergendahl, Director, Nuclear Services Department
B. Boles, Manager, Plant Engineering
N. Bonner, Director, Nuclear Maintenance Department
S. Davis, Superintendent, Plant Operations
G. Dunn, Manager, Regulatory Affairs
D. Gudger, Supervisor, Compliance
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S. Sanford, Senior Compliance Engineer
R. Schrauder, Director, Nuclear Engineering Department
J. Sears, Manager, Radiation Protection
J. Sipp, Manager, Radwaste, Environmental, and Chemistry
J. Wood, Vice President, Nuclear

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
IP 61726: Surveillance Observation
IP 62707: Maintenance Observation
IP 71707: Plant Operations
IP 71750: Plant Support
IP 92901: Followup - Operations
IP 92902: Followup - Maintenance
IP 92903: Followup - Engineering

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-440/99010-01 NCV Improper storage of ladders within the suppression pool swell region of containment

Closed

50-440/99010-01 NCV Improper storage of ladders within the suppression pool swell region of containment

Discussed

None

LIST OF ACRONYMS USED

AEGTS	Annulus Exhaust Gas Treatment System
CAP	Corrective Action Program
CARB	Corrective Action Review Board
CFR	Code of Federal Regulations
CR	Condition Report
CRD	Control Rod Drive
DRP	Division of Reactor Projects
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generators
HPCS	High Pressure Core Spray
IP	Inspection Procedure
IR	Inspection Report
LCO	Limiting Condition for Operation
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PAP	Plant Administrative Procedure
PDR	Public Document Room
RCIC	Reactor Core Isolation Cooling
SOI	System Operating Instruction
SS	Shift Supervisor
SVI	Surveillance Instruction
TS	Technical Specification
US	Unit Supervisor
USAR	Updated Safety Analysis Report