

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/85080 (DRP); 50-441/85026 (DRP)

Docket No. 50-440; 50-441

License No. CPPR-148; CPPR-149

Licensee: Cleveland Electric Illuminating Company  
Post Office Box 5000  
Cleveland, OH 44101

Facility Name: Perry Nuclear Power Plant, Units 1 and 2

Inspection at: Perry Site, Perry, OH

Inspection Conducted: November 4-8 and November 11-15, 1985

Inspector: *CH Scheibelhut*  
C. H. Scheibelhut

11/22/85  
Date

*RC Knop*  
Approved by: R. C. Knop, Chief

Reactor Projects, Section 1A

12/02/85  
Date

Inspection Summary

Inspection on November 4-8, November 11-15, 1985 (Reports No. 50-440/85080 (DRP); 50-441/85026 (DRP))

Areas Inspected: Routine safety inspection by a Regional Inspector of licensee actions on previous inspection findings, 10 CFR 50.55(e) items, and evaluation of licensee action with regard to IE Circulars and confirmatory items called for in the Safety Evaluation Report. The inspection involved a total of 72 inspector-hours onsite by one NRC inspector and includes 0 inspector-hours during off-shifts.

Results: No violations, deviations, or safety significant issues were identified.

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## Details

### 1. Persons Contacted

#### Cleveland Electric Illuminating Company

- \*C. M. Shuster, Manager, Nuclear Quality Assurance Department (NQAD)
- \*J. J. Waldron, Manager, Perry Plant Technical Department (PPTD)
- \*E. Riley, General Supervisor, Construction Section, NQAD
- \*B. D. Walrath, General Supervising Engineer, NQAD
- \*K. R. Peck, General Supervising Engineer, Nuclear Construction Department (NCD)
- \*B. S. Ferrell, Licensing Engineer, Nuclear Engineering Department (NED)
- \*B. B. Liddell, Operations Engineer, PPTD
- \*P. A. Russ, Compliance Engineer, PPTD
- \*N. J. Lehman, Staff Analyst, PPTD
- R. J. Tadych, General Supervisor, Perry Plant Operating Department (PPOD)
- M. A. Robinson, Quality Engineer, NQAD
- K. C. Kaplan, Sr. Engineering Technician, NED

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\*Denotes attendance at the November 15 exit meeting.

The inspector also interviewed other licensee and contractor personnel during the course of the inspection.

### 2. Licensee Actions on Previously Identified Items (92701)

- a. (Closed) Open Item (440/85033-13 (DRP)): "HPCS, RCIC, SLCS and D/GSA as-built walkdown discrepancies". The inspector examined the Division 1 Diesel Generator Starting Air System (D/GSA), the High Pressure Core Spray System (HPCS), the Reactor Core Isolation Cooling System (RCIC), and the Standby Liquid Control System (SLCS) to verify that the as-built mechanical configurations of the systems were as described in the controlled facility drawings including posted design change documents. Discrepancies were noted in each of the systems examined. These included: mislabeled valves, unlabeled valves, and one case of an incorrect piping size. Also noted were unlabeled components and incorrect blue test jurisdiction tags.

The licensee explained that components such as air dryers, pumps, strainers, orifices, and various sensors would not be labeled. The inspector agreed that this would not be a requirement. The licensee corrected the discrepancies detailed in the inspection report by labeling or relabeling valves and correcting the Piping and Instrumentation Diagrams (P&IDs). The licensee has underway a program to reconcile Valve Lineup Instructions (VLIs) with P&IDs and with the as-built condition of the plant.

The inspector reviewed the corrected P&IDs and conducted a field inspection to determine if a sample of the mislabeled/unlabeled valves were correctly labeled. The review and inspection indicated

that the problems identified previously had been corrected. The inspector also determined that the VLI reconciliation program is in progress. Therefore the inspector concludes that the valve labeling and P&ID discrepancies have been resolved and a program is in progress to discover and rectify other discrepancies that may exist. This item is closed.

- b. (Closed) Open Item (440/85033-16 (DRP)): "Conflicting commitments to IEEE 450 and ICSB6". The inspector reviewed the licensee's commitments with respect to battery maintenance in various sections of the Final Safety Analysis Report (FSAR). FSAR Table 1.8-1, when discussing Regulatory Guide (RG) 1.129 states that the licensee will implement IEEE 450-1975. FSAR Table 8.1-2 states that IEEE 450-1980 will be implemented. Also, FSAR Table 8.1-2 indicates implementation of NRC Branch Technical Position ICSB6 which references IEEE 450-1972.

To resolve the conflicting commitments, the licensee amended the FSAR as follows:

- FSAR Table 1.8-1, when discussing RG 1.129, is adopting IEEE 450-1980 in lieu of IEEE 450-1975.
- FSAR Table 8.1-2 no longer references Branch Technical Position ICSB6 since it was replaced by RG 1.129.
- FSAR Table 8.1-2, when discussing RG 1.129, is adopting IEEE 450-1980 in lieu of IEEE 450-1975.

The inspector reviewed the amended FSAR and concludes that the discrepancies have been resolved. This item is closed.

- c. (Closed) Unresolved Item (440/85033-18 (DRP)): "ELI-R42, Revision 0. Discrepancies". During a review of Electrical Lineup Instruction (ELI)-R42, Rev. 0, the inspector found three potential discrepancies. They were as follows:

- A motor control center was not addressed in the ELI.
- The function of two switches in another motor control center was reversed by an Engineering Change Notice (ECN). This change was not reflected in the ELI.
- The function of a switch in another motor control center was changed by another ECN. This change was not reflected in the ELI.

The licensee found the following: Revision 1 of ELI-R42 was approved on June 14, 1985 and had an effective date of June 24, 1985. The inspection was performed sometime between June 14 and June 24. The first two discrepancies noted do not exist in Rev. 1 of the ELI. The third discrepancy existed. Temporary Change Notice (TCN) 001 was added to the ELI to correct the discrepancy. This had not been done at the time of the inspection because the instruction

revision process requires revised drawings before TCNs are written and in that instance, the drawing had not yet been revised. In addition Special Project Plan 0501, "Operations Manual Verification", has been implemented. This plan was designed to review applicable instructions to assure consistency with the as-built condition of the plant.

The inspector reviewed Revisions 0 and 1 of the VLI and concluded that the first two discrepancies were known and corrected at the time of the inspection. The third discrepancy was also known, but was in the revision process at the time of the inspection. TCN 001 to the ELI was issued in due course to correct the discrepancy. The inspector also reviewed the Special Project Plan and concluded that it provides extra assurance that the instructions will be consistent with the as-built condition of the plant. This item is closed.

No violations or deviations were identified.

3. Safety Evaluation Report Follow-up Inspection Items (92701)

The Office of Nuclear Reactor Regulation (NRR) has requested that Region III inspectors confirm that the licensee has acceptably implemented certain Three Mile Island (TMI) action items and confirmatory issues as described in the Safety Evaluation Report (SER) for Perry, Unit 1 (NUREG-0887 with Supplements 1 through 6). In Inspection Reports 50-440/85022, 50-441/85012, and 50-440/85033, these items were listed as Open Items and entered into the Region III tracking system for future inspection. Reported below are the results of the inspection of certain of the items.

- a. (Closed) SER Open Item (440/85022-02 (DRP)): "TMI Items I.A.1.2 and I.C.3; Determine that the shift supervisor's administrative duties are established to reduce his ancillary responsibilities (SER 13.5.1.8)". The main concern of these TMI items was that the shift supervisor's primary responsibility be the safe operation of the plant.

Plant Administrative Procedure (PAP)-0104, "Operations Section Organization", contains the statement, "The primary responsibility of the Shift Supervisor is safe plant operation. No other duties shall interfere with this primary responsibility". Supervisor training has also emphasized this primary responsibility.

The inspector interviewed the general supervisor of the operations section and found that the concerns of the TMI items were recognized from the beginning and that shift and unit supervisor training was designed to emphasize this aspect of their duties. In addition, a "work center" has been established adjacent to the shift supervisor's office. This center assures the correctness of all paper work associated with operating the unit and performs clerical duties associated with the paper work.

The inspector also interviewed a shift supervisor who had four years of previous experience as a shift supervisor at another nuclear plant. This person felt that while the paper work load was very



heavy, his responsibility for safe operation of the plant was not impaired. He also felt that the work center was a great help.

During a previous inspection trip, the inspector reviewed portions of the shift/unit supervisor's training program curricula with training center personnel and concluded that the program emphasized safe operation of the plant. The inspector therefore concludes that the licensee management has complied with the requirements of the TMI items and considers the item closed.

- b. (Closed) SER Open Item (440/85022-12 (DRP)): "TMI Item I.C.7, Determine that the NSSS vendor reviews low power and power ascension tests and emergency procedures in accordance with SER 13.5.2.2". In Inspection Report 50-440/85053, the inspector determined that General Electric (GE), the NSSS vendor, had reviewed and commented on the low power and power ascension tests and closed that portion of the open item.

The licensee has now received GE's review of the emergency procedures. This review came in the form of a memo from D. R. Pankrantz, GE San Jose, CA to A. E. Pedersen, GE Perry, OH, dated October 18, 1985; Subject: Perry Emergency Instruction Review. This memo was then transmitted to the licensee. The inspector reviewed the memo and determined that the Perry Emergency Instructions had received the required review. This item is closed.

- c. (Closed) SER Open Item (440/85022-30 (DRP)): "TMI Item II.K.3.3, Determine that controls are in place to report SV and RV failures and challenges. (SER 13.5.2.5)". This item requires the licensee to report safety valve and relief valve failures promptly and challenges yearly.

Plant Administrative Procedure (PAP)-1604, "Reports Management", indicates that documentation of all challenges to safety/relief valves and a summary of failures shall be included in the annual report (indicated on form PAP-1604-3). PAP-0603, "Licensee Event Reports", indicates that safety/relief valve failures are events that require a Licensee Event Report to be submitted to the NRC within 30 days after the discovery of the event (indicated in Section 6.1.2 and Attachment 1 to the PAP).

The inspector reviewed the PAPs and concluded that the reporting requirements for SV and RV failures and challenges are included in the licensee's administrative procedures. This item is closed.

No violations or deviations were identified.

4. Licensee Actions on 10 CFR 50.55(e) Items (92700)

- a. (Closed) 10 CFR 50.55(e) Report (440/84048-EE (DAR 213)); (Open) 10 CFR 50.55(e) Report (441/84048-EE (DAR 213)): "20 inch Class 1 gate valve would not fully open due to gate binding on body mounted guide rails. Borg Warner nuclear valve. Part 21 from Borg Warner dated November 19 1984". During reactor pressure vessel flushing

activities, a 20 in. Borg Warner (BW) ASME Class 1 gate valve could not be fully opened. Under Nonconformance Report (NR) SCG-062, the valve was disassembled to investigate the cause. The examination showed galling deformation of the guide rails and elongation damage at the valve stem to gate connection. Also, the guide rail material was not in conformance with the procurement specification or the manufacturer's fabrication drawings. The licensee notified the NRC of a potential 10 CFR 50.55(e) condition. BW's investigation showed the following: (1) A design error allowed the guides to be welded in a position which created a misalignment between the gate and body guide rails. (2) The fillet weld for welding in the guides to the body was undersize. (3) While the guide rail material was not in accordance with the drawings, the material used conforms to industry standards and is acceptable under Section III of the ASME Boiler and Pressure Vessel Code. BW issued a 10 CFR 21 report of the condition.

Subsequent investigation by the licensee found that the problem was more widespread than initially thought. To summarize, seven BW gate valves failed during cycling or examination; the two distinct failure modes that were identified were gate seizure and gate guide disengagement. Gate seizure occurred in four BW valve models; gate disengagement occurred in three BW valve models. Gate seizure was defined as galling of the body guide rails by the gate bearing surface corner to the extent that further gate travel is impeded. Gate disengagement is a condition in which the gate drops off the top of the body guide rails in the backseated position thus preventing valve closure. To precipitate these types of failures, the valve had to be installed with the stem orientation more than 22-1/2 degrees off of vertical. BW specified a stem orientation of less than 22-1/2 degrees off of vertical for only one 8 in. valve model. The licensee's experience indicated that this orientation limitation should be applied to all BW gate valves 8 in. and larger with body guide rails installed by welding.

The licensee took the following corrective actions:

- The installed stem orientation of all BW gate valves in unit one was determined.
- Representative samples (in the warehouse) of all valves installed in a nonstandard configuration (stem orientation greater than 22-1/2 degrees off of vertical) were inspected for physical configuration and percent engagement when back-seated. These samples were also cycled in orientations similar to installed valves or in orientations more susceptible to failure.
- Installed valves of models exhibiting failure in sample inspections were repaired by installation of hard-faced guide rails which reduced operating clearance and increased gate engagement at both travel extremes.

- New hard-faced lower guide rails (as a minimum) were installed in all unit one BW valves having welded guides and located in horizontal piping with valve stem orientation greater than 22-1/2 degrees off of vertical.
- All other valves determined susceptible to failure which are installed in horizontal piping with a stem orientation less than 22-1/2 degrees off of vertical were exercised through multiple cycles to verify operability.
- All unit two and warehoused valves determined to be susceptible to failure have been identified on NRs and tagged as requiring repair.
- The guide-to-body fillet weld was increased as directed by BW in all 20 in. valves that required it.
- The body guides in the two 20 in. gate valves that had mis-aligned guides were replaced with correctly aligned guides.
- Valves that were susceptible to gate/guide disengagement had their body guides replaced with longer guides.

To summarize, a total of 56 valves were inspected/cycled in a variety of positions to determine susceptibility to failure. During this program the parameters required for failure were determined. A total of 21 valves installed in unit one and common areas were repaired/reworked to prevent failure during operation. A total of 55 unit two warehoused valves were identified as possibly requiring rework/repair depending on installed configuration.

The inspector audited the assembled paper work record for the problem. The record included the pertinent Nonconformance Reports, memoranda, correspondence with the vendor, meeting minutes, purchase orders, etc. Included with each NR was the record of the disposition. This included the Work Authorizations, Work Orders, repair/rework procedures, Quality Control records, copy of the contractor's ASME "N" or "NR" stamp certificate, copy of the ASME "NR-1" report for the work, and the pertinent nondestructive examination records. The audit revealed that the work was in accordance with the licensee's and contractor's QA plans, was well documented, and complied with the requirements of Section III of the ASME Boiler and Pressure Vessel Code. The inspector concludes that the work is complete for unit one and the item is closed for unit one. The item remains open for unit two. While the deficient unit two valves have been identified, rework/repair activities have not been completed.

- b. (Closed) 10 CFR 50.55(e) Report (440/84050-EE (DAR 218)); (Open) 10 CFR 50.55(e) Report (441/84050-EE (DAR 218)): "Overpressurization of some isolated pipe systems during a LOCA inside dry well". During a review brought about by IE Bulletin 80-25, "Operating Problems with Target Rock Safety-Relief Valves at BWRs", the licensee identified four piping volumes inside the dry well that

could reach pressures above the design pressure for the piping and components. This condition was documented in Engineering Design Deficiency Report (EDDR)-138. These elevated pressures would be caused by the elevated dry well temperature following a LOCA. These volumes were described as all piping and components in volumes bounded by:

1. The check valves B21F036 and the non-ADS Safety/Relief Valve (SRV) solenoid valves.
2. The check valves B21F039 and the ADS SRV solenoid valves.
3. The check valves B21F024 and the MSIV control valves.
4. The dry well personnel airlock check valves on the inner door and the inner door inflatable seals.

For Volume 4 identified above, another 10 CFR 50.55(e) Report (440/83023-EE, 441/83023-EE (DAR 147)) concerning the environmental qualification of the airlock inflatable seals was written. Resolution of the problem required, among other things, the addition of a relief valve in the piping. Therefore resolution of DAR 147 provided a resolution of Volume 4 of this DAR. Inspection Report 50-440/85030 details the closure of DAR 147. The licensee's Architect-Engineer, Gilbert Commonwealth, Inc. (GCI), performed a Design Verification (Mechanical/Nuclear-0428) of Volumes 1, 2, and 3 described above. The results of the calculations showed that the piping and components bounded by the valves indicated for the three volumes can withstand the overpressurization caused by LOCA conditions. General Electric (GE) tested the effects of increased pressures on the ADS-SRVs at temperature. (The non-ADS-SRVs are identical.) Results of the tests indicated that the ADS-SRVs will operate at the higher pressures achievable during post-LOCA. The successful testing was witnessed by licensee personnel as described in a licensee memo dated June 12, 1985, W. Kahler to R. Solt. GE's evaluation of the ASCO solenoids mounted on the MSIVs showed that they would not be satisfactory at the higher pressures. GE suggested that some means of limiting the pressure to these valves be considered. Accordingly, the licensee wrote ECN 28386-86-2189 to add a relief valve to Volume 3 described above.

The inspector reviewed DAR 147, the design verification, the results of GE's ADS-SRV tests, and the ECN. The review showed that the problem was adequately resolved for unit one. The inspector verified in the field that the relief valve described in the ECN had been installed. Therefore the item is closed for unit one. Since the work described in DAR 147 and the ECN has not been completed for unit two, the item remains open for unit two.

No violations or deviations were identified.



5. Evaluation of Licensee Action with Regard to IE Circulars (92717)

For the IE Circulars listed below, the inspector verified that the Circulars were received by the licensee management, that a review for applicability was performed, and if the Circular was applicable to the facility, appropriate corrective actions were taken or scheduled to be taken.

- a. (Closed) IE Circular 81-05 (440/81005-CC, 441/81005-CC): "Self-Aligning Rod End Bushings for Pipe Supports". Based on field reports, self-aligning rod end bushings in the saddles of pipe supports can become disengaged if there is sufficient clearance in the clamp. This condition can seriously degrade the performance of the pipe support. The Circular recommended a number of actions that the licensees should take.

In Inspection Report 50-440/85047, 50-441/85019, the inspector found that procedures required to perform a pre-service inspection were not complete and the item was left open until they were approved and reviewed by an inspector.

In reviewing the item, the licensee found that the piping and HVAC contractors had performed final inspections of their hangers that were considered responsive to the pre-service inspection recommended by the Circular. The procedures were: Pullman Power Products Procedure IX-INSP-6, "Installation and Inspection of Pipe Supports (Inspection section only)" and Johnson Controls, Inc. Procedure QAS-1104, "Installation and Inspection of Mechanical Shock Absorbers and Variable Support Hangers".

The inspector reviewed both procedures and found that the final inspections called for in both met the intent of the pre-service inspection recommended by the Circular. The inspector also determined that these inspections have been completed and documented. This item is closed.

- b. (Open) IE Circular 80-09 (440/80009-CC, 441/80009-CC): "Problems with Plant Internal Communications Systems". The Circular noted problems caused by the use of two-way portable radios in an operating plant. When transmitting in the vicinity of certain electronic equipment, they induced false signals in the electronic equipment.

The licensee made an engineering study and marked up building drawings showing areas of the plant in which portable radios are not to be used. These areas have been posted with signs prohibiting the use of portable radios.

After the engineering study had been made and the drawings marked to show prohibited areas, the NRC issued IE Information Notice No. 83-83, "Use of Portable Radio Transmitters Inside Nuclear Power Plants". The licensee's file on the Notice indicated that the problem was handled as part of IE Circular 80-09.

The inspector reviewed the Circular and Notice and the drawings showing the areas off-limits to portable radio use and made a tour of the plant. The review and tour indicated that there are areas of the plant that are vulnerable to Radio Frequency Interference (RFI) of the type described in the Notice and not included in the current prohibited areas. Examples of these are the two reactor protection system power supply rooms and numerous racks of instrumentation around the plant that the inspector considered vulnerable to RFI. This item remains open until the licensee makes an engineering study that includes the examples and advice given in the Notice and the study and results reviewed by an inspector.

No violations or deviations were identified.

6. Exit Interview (30703)

The inspector met with the resident inspector and licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on November 15, 1985. The resident inspector summarized the scope and findings of the inspection. The licensee acknowledged the inspector's findings. The licensee did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.