U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/85038(DRS)

Docket No. 50-440 License No. CPPR-148

Licensee: Cleveland Electric Illuminating Company
Post Office Box 50000
Cleveland, Ohio 44101

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

Inspection At: Perry Site, Perry, Ohio

Inspection Conducted: June 11-13, 1985

Inspectors: J. H. Neisler for — 7/11/85 Date

K. Tani for — 7/11/85 Date

Approved By: C. C. Williams, Chief
Plant Systems Section — 7/11/85 Date

Inspection Summary

Inspection on June 11-13, 1985 (Report No. 50-440/85038(DRS))
Areas Inspected: Routine unannounced inspection of electrical cable installation and termination records, instrumentation systems installation and quality records, followup licensee activities relative to previous inspection findings and 10 CFR 50.55(e) reports. The inspection involved a total of 42 inspector-hours onsite by two NRC inspectors.
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Principle Licensee Employees

*C. Shuster, Manager, Quality Assurance
*E. Riley, General Supervisor, CQS
K. Cemorelli, Lead Quality Engineer, CQS
*G. Parker, Unit Supervisor, CQS
*S. Tulk, Unit Supervisor, CQS
*M. Kritzer, Unit Supervisor, CQS
*V. Higaki, Unit Supervisor, OQS
K. Rusack, Quality Engineer, CQS
R. Neuendorf, Quality Engineer, OQS
*B. Ferrell, Licensing Engineer, NED
*K. Kaplan, Senior Engineering Technician, NED
E. Condo, Quality Engineer, CQS
W. Morris, Quality Engineer, CQS
W. Boyd, Quality Engineer, CQS
W. Pechar, QA Consultant, NTS
J. Marden, QA Consultant, NTS

*Denotes those personse attending exit interview.

2. Licensee Action on Previous Inspection Findings

a. (Closed) Unresolved Item (440/84007-5): Test reports on dielectric tests for Rockbestos cable and Cutler-Hammer MCCs not available for review. The inspector reviewed Rockbestos and Cutler-Hammer certified test reports showing the test results for their respective products. The tests reports included dielectric tests, insulation resistance tests, conductor resistance tests, flame-out tests, and aging. The test results had been reviewed and approved by the architect engineer.

b. (Closed) Unresolved Item (440/83030-02): Program for replacement of fuses. This item was addressed in Inspection Report No. 50-440/84-18 and was held open pending issuance of procedure PAP-307. The inspector reviewed procedure PAP-307 "Operation, Maintenance and Testing of Fused Circuits", Revision 0, dated October 29, 1984. The procedure establishes a program for ensuring that fused circuits are maintained according to design documents, provides guidance for testing fused circuits and for correction of fuse design upon discovery of inadequacies in the installed circuits.

c. (Closed) Open Item (440/83037-01): Followup on DAR 150, Defective Brown Boveri Electric Inc. 5KV circuit breaker puffer piston. The inspector reviewed reports showing that the 5KV breakers had been inspected for defective puffer piston rods. NCRs OQC-884, OQC-885, and OQC-886 were issued to require replacement of defective puffer piston rods. The inspector verified that requirements for periodic inspection of the piston rods are included in Procedure GEN-E-016, Revision 9 and Procedure TWP-018.

d. (Closed) Noncompliance (440/83037-02): Followup on the two elements of this violation as outlined below:

(1) LKC Procedure 4.1.4 does not specify steps to be taken to re-examine a candidate who failed his Level II examination.

(2) During a walkdown of safety related raceway and conduit installation, three cases were identified which violated the design separation criteria specified in drawing D-214-004, Revision K titled "Conduit and Tray Separation Criteria."

The inspector verified that LKC Procedure 4.1.4 was revised June 10, 1984 to establish re-examination requirements.

The inspector also reviewed the licensee's program for identifying raceway separation deficiencies and installing appropriate barriers for correcting separation problems. The inspector observed completed barrier installations in the essential service water pumphouse and barrier installation and inspection activities in process on the 620 foot elevation in the control complex. The actions taken by the licensee and the inspection were found to be satisfactory.

e. (Closed) Noncompliance (440/81-19-11): Conduits separated by less than six inches in cable spreading room. The inspector reviewed quality control inspection reports and a nonconformance reports that were issued to assure corrective action. Additional training was conducted by the licensee/contractor on raceway separation requirements. The licensee quality organization performed audit No. 717 to verify separation procedure implementation.

Based on the inspectors review of non-conformance reports, inspection and training records, regulatory requirements and observation of conduit separation, the licensee's corrective actions were found to be acceptable.

f. (Closed) Noncompliance (440/84-07-03): Inadequate design review and verification of safety-related schematic and wiring diagrams. The inspector reviewed ECN 23789-86-618 and nonconformance reports CQC-3493 and P33-931. These documents were issued to effect the corrective actions required to resolve the deficiencies identified by the NRC inspectors. Additional training in drawing review procedures was provided for the reviewers to preclude future problems of this nature. All licensee actions were acceptable.

g. (Closed) Open Item (440/84-07-04): Engineering analysis to justify less than one inch separation between wiring and barriers in the PGCC. The inspector reviewed a copy of a change to FSAR Section 8.3.1.4.1.6.(a) that was submitted to clarify the separation requirements. Inspection of wiring separation in control room panels 717, bay A and B and 702 revealed no wiring touching the barriers between divisions of Class 1E wiring. The barriers in this

area are double thickness three-sixteenths inch steel plate. This analysis, the FSAR revision and the results of the inspection were all found to be acceptable.

3. Construction Deficiency Reports (10 CFR 50.55(e)

a. (Closed) 85004-EE (DAR 223) Voltage drops in certain M32 control circuits may be sufficient to result in the loss of division 1 and 2 essential service water (ESW) pumphouse ventilation fans. The potential temperature rise in the pump house could impair the operation of the P45 emergency service water system.

The inspector reviewed Engineering Design Deficiency Report, EDDR-197 and ECN 25987-86-1135. These documents were issued to correct the excessive voltage drops in the ESW ventilation fan control circuits. The corrective action consisted of the addition of an interposing relay in the fan A control circuits and higher rated control transformers in both the A and B control circuits.

The inspector also reviewed preoperational (startup) test Report 1M32-P001. This test was performed subsequent to modifying the control circuits. Both fan units operated during the test and met or exceeded the acceptance criteria for the test.

The closure of this item is based on the inspectors review of the corrective action and the preoperational test results.

b. (Closed) 85005-EE (DAR 224) Voltage drop in some circuits affecting the essential service water pumps and valves. The architect/engineer's calculations indicate control circuit voltage drop in the close control circuits of division 1, 2, and 3 essential service water pumps valves 1P45-C001A, 1P45-C001B and 1P45-C002 may be excessive and might result in the pumps not being able to supply cooling to safety related components.

The inspector reviewed ECN 25802-86-1077, Revision B. This ECN added a time delay relay to circuit breaker close circuitry to prevent excessive voltage drop at the discharge valves limit switches during generator loading and added interposing relays to reduce the voltage drop in the circuit breaker close circuits in division 1 and 2. The inspector reviewed the results of tests on these pumps and their associated valves. The tests proved that the units would perform as designed.

The licensee withdrew this deficiency report as a result of the systems operating properly under test. The inspector concurs with the licensee's withdrawal.

c. (Closed) 85003-EE (DAR 222) Voltage drop in power feeder cables to motor operated valves 1E51-F013, 1E51-F045 and 1E51-F510 may be sufficient to cause the valves to be inoperable. Calculations by the architect/engineer indicated that these valve motors may be incapable of starting due to excessive voltage drop in the valve motor power circuit when the circuits are energized.

The valve manufacturer, Limitorque, in their Procedure SEL-3, claims that limitorque operators will produce whatever torque is demanded and that reduced voltage resulting from inrush current will be compensated by an increased current to produce the required torque and that reduction of supply voltage will result in a reduction of speed. The valves tests indicated that the valves motors were capable of starting, however, the tests were performed at full voltage. This matter as originally reported is resolved. However, the following associated unresolved issue was identified:

> General Electric Letter PER 85-3016 dated May 30, 1985 indicates that with the inclusion of the safety related rod pattern control system, the consequences of a rod drop is minimized such that fission product release would not reach the level to trip the MSIV radiation monitoring system, hence, no reactor isolation would occur, thus eliminating the need for RCIC or HPCS. However, the Perry FSAR indicates that the HPCS is needed for a rod drop incident and that RCIC is to provide a backup function for HPCS. The licensee indicated that they were considering whether to change the FSAR to clarify the issue. This matter is unresolved pending the inspectors review of the licensee's actions regarding the FSAR change (440/85038-01).

4. Review of Electrical Quality Records for Cables and Terminations

The inspector examined installation and quality records for cables, including terminations and associated hardware and related equipment to ascertain whether the records were in accordance with established procedures and practices and whether the records reflect that work was accomplished according to applicable requirements.

Cable systems selected for review included class 1E 4160 volt cables, 480 volt cables, 125 volt DC cables, and instrument and control cables.

Records packages reviewed contained inspection reports of raceway walkdowns; nonconformance reports; corrective action reports; cable pull slips showing cable size, length and routing; cable pull tension calculations, cable pull inspection reports; results of insulation resistance/continuity tests where applicable; documentary evidence of special training; termination cards, and termination inspection checklist and routing changes.

Electrical cable and termination quality records inspected were determined to be adequate as to completeness, accuracy, and retrievability.

No violations or deviations were identified.

5. Instrument Components and Systems Record Review

a. The NRC inspector reviewed records and observed completed work associated with instrument components and systems to determine the following:

(1) That the licensee's system for preparing, reviewing and maintaining records are functioning properly.

(2) That the records reflect work accomplishment consistent with NRC requirements and FSAR commitments.

(3) That any potential problems such as management control inadequacies or weaknesses of safety significance are identified and corrected promptly.

b. To accomplish the objectives of this inspection, the NRC inspector performed a review of records identified below and observed completed installations in the RPS Division 3 instrument and Auxiliary Relay Panel (Panel #1H13-P693)"

(1) Work authorization No. NTS-85-6304, Revision 0, dated May 16, 1985.
Work authorization No. NTS-85-5596, Revision 0, dated April 30, 1985.

(2) NCR No. NTS-235, Revision 0, dated February 11, 1985.
NCR No. NTS-278, Revision 0, dated February 28, 1985.

(3) Instrument calibration records for instrument No. 1C71-N652D and 1C71-N052D.

(4) Field disposition instruction (FDI) No. WNRW, Revision 1, dated March 2, 1983 (closed out December 2, 1983 - ECN deferred verification).

(5) Engineering Change Notice No. 13982-86-225, Revision B, dated May 20, 1985 (Implementation of Regulatory Guide 1.63).

(6) The NRC inspector selected three as-built drawings (Drawing No. 04-4549-B-208-013, sheet No. 06, latest revision - Nuclear Steam Supply Shutoff System Logic A, B, C, and D; Drawing No. 45-49-48-241-11-12 and Drawing No. 45-49-48-241-2-9 (connection wiring diagram RPS logic).

(7) Procedure No. TPI-18, Revision 1 (Alterations).

(8) Work authorizations, as-built drawings and other associated documents were prepared by CEI - Nuclear Test Section (NTS).

(9) System's design technical, completeness and accuracy review was performed by GAI - System Engineering Response Team and CEI - Nuclear Test Section (NTS).

c. Conclusion

(1) During this inspection of these items, a violation of the requirements and other issues were identified as outlined below.

(2) Review and inspection of item (4) above indicated the field TB-AA-34 thru 37 internal conductors in panel 1H13-P693 were not connected to the TB stated, nor in accordance with the as-built drawings. However, the FDI No. WNRW, Revision 1 had

been closed out. The licensee indicated that they are going to research this NRC finding to determine if there was some other design change document that removed the conductors from the TB. Pending a review of the licensee's research results, this is considered an open item (440/85038-02(DRS).

(3) A review of as-built drawing No. 45-49-48-241-11-12 latest revisions, and NRC field inspection indicated the following discrepancies (item b(4) above):

- The drawing shows that terminal TB-DD-38 and 39 are manufacturers spares, however, field inspection revealed that these terminals are used or connected to conductors.

- The drawing shows that TB-DD-41 and 42 are manufactures spares, however, field inspection revealed that these terminals are used or connected to conductors.

(4) The following discrepancies were observed on Drawing No. 45-49-48-241-2-9 latest revision:

- The drawing shows conductor No. C71A1539C terminated at TB-1-1 of device No. B21-N678C, however, field inspection revealed that this conductor does not exist.

- Jumper installed from TB-1-2 to TB-1-8 of device No. B21-N678C is shown labeled as C71A1539C on the elementary diagram, however, the connection diagram and field inspection indicated that this jumper is not labeled.

These issues (3 and 4 above) are considered an unresolved item (440/85038-03(DRS)).

(5) A review of as-built Drawing No. 04-4549-B-208-013-06, Revision F indicated that the permissive relay contacts that allows the reset of the MSIV isolation circuit following an isolation signal were not shown in the logic. The inspector discussed this apparent deficiency with the licensee. The licensee indicated that they will determine whether permissive circuits are required for the channel A and C MSIV isolation circuit, and if there are any change documents in place to add these permissive circuits. Pending a review of the licensee's research results, this shall be considered an open item (440/85038-04(DRS)).

(6) The inspector observed work in Panel 1H13-P693, and noted numerous lifted leads and pulled fuses within the panel. The NRC inspector interviewed two startup test engineers (STES) who were assigned to System 1C71A regarding the observed condition and the status of their knowledge of their assigned systems. The inspector believes that the STE's were not fully aware of the status and condition of their assigned system as required by Procedure TPI-9, Revision 1, Section 3.2 and 4.1.7. Further, Procedure No. TPI-18, Revision 3, Section 3.2. states, "Notify

the test coordinator, by memorandum when his review/approval signature will be required prior to implementing or removing temporary alterations on a system under his jurisdictional control." Contrary to the above, there was no such memorandum in file for System 1C71A. The procedure further states in Section 3.2 that the test coordinator shall inform the STE of temporary alterations affecting their systems. There was no documentary evidence available at the time of this inspection to indicate that the test coordinator notified the STE as required by the procedure. Procedure No. TPI-9, Revision 1, Section 4.1.7 states that, "Any and all other parties desiring to perform work, utilize, or manipulate the equipment will perform these activities only with the knowledge and express will of the STE via a work authorization per Project Administration 110/." Subsequent to the inspectors noting the above items, conversations with other Regional inspectors indicate there may be information regarding these issues which the inspector was not provided prior to leaving the site. For this reason, the above issue of adequate control of lifted leads, fuses and jumpers is considered an unresolved item pending additional review (440/85038-05(DRS)).

6. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector and which involves some action on the part of the NRC or licensee or both. Open items are identified in Paragraph 5 of this report.

7. Unresolved Items

An unresolved item is a matter about which more information is required in order to ascertain whether they are acceptable items, violations or deviations. Unresolved items are identified in Paragraphs 3 and 5 of this report.

8. Exit Interview

The inspectors met with the licensee representatives (denoted under Persons Contacted) at the conclusion of the inspection and summarized the scope and findings of the inspection. The licensee acknowledged the inspectors comments. The inspectors also discussed the likely information content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary.