

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/85039 (DRP); 50-441/85017 (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: June 3-7 and June 10-14, 1985

Inspector: *C. H. Scheibelhut*
C. H. Scheibelhut

24 June 85
Date

RC Knop
Approved by: R. C. Knop, Chief
Reactor Projects, Section 1A

July 2, 1985
Date

Inspection Summary

Inspection on June 3-7 and June 10-14, 1985 (Reports No. 50-440/85039 (DRP); 50-441/85017 (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. The inspection involved a total of 72 inspector-hours onsite by one NRC inspector and includes 0 inspector-hours during off-shifts.

Results: No items of noncompliance were identified in the three areas inspected.

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Details

1. Persons Contacted

Cleveland Electric Illuminating Company

C. M. Shuster, Manager, Nuclear Quality Assurance Department (NQAD)
F. R. Stead, Manager Nuclear Engineering Department (NED)
M. D. Lyster, Manager, Plant Operations Department (PPOD)
B. D. Walrath, General Supervising Engineer, Operational Quality Section (OQS)
D. J. Takcas, General Supervisor, Maintenance, PPOD
W. R. Kanda, General Supervising Engineer, Plant Technical Department (PPTD)
T. A. Henderson, System Engineer, PPTD
N. J. Lehman, Staff Analyst, PPTD
E. M. Buzzelli, Senior Licensing Engineer, NED
B. Ferrell, Licensing Engineer, NED
M. R. Kritzer, Unit Supervisor, Construction Quality Section (CQS)

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

The personnel listed above attended the exit interview on June 14, 1985.

2. Licensee Actions on Previously Identified Items

- a. (Closed) Item of Noncompliance (440/85002-04(DRP)) "ADS/SRV Preoperational Test B218-P-001 does not demonstrate design requirements of five SRV actuations at atmospheric pressure." During a review of preoperational test procedures, the inspector found that the Final Safety Analysis Report (FSAR) requirement for sufficient capacity in air accumulator tanks was not being tested. The Automatic Depressurization System (ADS) Safety Relief Valves (SRVs) must have accumulators large enough to support five valve actuations assuming failure of the air supply. The test procedure required only two actuations. The test had not been run when the deficiency was found.

The licensee revised test procedure No. 1B-21B-P-001 "ADS/SRV Preoperational Test" to include five valve actuations at atmospheric drywell pressure without makeup air to the accumulators during the test.

The inspector reviewed the revised procedure and found that it would test the ADS/SRV accumulator capacity in accordance with the FSAR.

The licensee's corrective actions taken to preclude further noncompliance resulted in a Special Project Plan No. 1102 "Test Procedure Assurance Review" Rev. 1 dated June 13, 1985. The success of this plan is being tracked under open item 440/85002-05. Therefore, this item is closed.

- b. (Open) Item of Noncompliance (440/84015-02(DRP)) "Instrument air system cleanliness not verified during testing." In the Perry Final Safety Analysis Report (FSAR) the licensee committed to testing the Instrument Air System (IP52 system) in accordance with the requirements of Regulatory Guide 1.80, "Preoperational Testing of Instrument Air Systems" using American National Standards Institute (ANSI) Standard MC 11.1-1976, "Quality Standard for Instrument Air" for air quality criteria. The inspector found that the licensee had only blown the systems clean using a "pillow case" sample to verify Class C cleanliness. Class C criteria allow particles as large as 400 micrometres maximum diameter for particulates in the air. The ANSI standard limits particulates to a maximum diameter of 3 micrometres.

The licensee revised nonconformance report OQS-2010 (which was being used to document a previous air system contamination problem) to document this problem and provide a disposition. The licensee made a list of all air-operated safety-related equipment in the plant and asked the suppliers to recommend air particulate contamination size criteria for their equipment. In all cases the criteria were no more restrictive than 40 micrometres. Accordingly, the licensee amended the FSAR to change the ANSI Standard requirement of 3 micrometres to 40 micrometres (Amendment 15 submitted December 31, 1984). The licensee obtained an electronic particle counter, Hiac/Rayco Model 4100, to quantitatively measure the particulate contamination level in the instrument air system. The preoperational test procedure SP-1P52-001 was revised to require the use of the electronic particle counter and test the system for particulates. This was done, and in no location were particulates larger than 20 micrometres found.

The inspector reviewed the correspondence with the air equipment vendors and agrees with the conclusion that a 40 micrometre maximum particulate size is reasonable. Also reviewed were the retest data collected with the electronic particle counter. The inspector has some further concerns with the system. The system currently has a cleanliness class of C and is not safety-related. While the system currently is clean, future design changes or maintenance activities need not receive the quality assurance attention required to maintain the cleanliness level. For instance, the pillow case test used during the initial system blowdown is qualitative and cannot be considered a go-no go test for system cleanliness. The draft plant administrative procedure PAP-0204 Rev. 1 that was reviewed gives the plant instrument air system an internal cleanliness requirement of C which is inadequate. Therefore, this item remains open until these concerns are addressed by the licensee and reviewed by an inspector.

No items of noncompliance or deviations were identified.

3. Licensee Actions on 10 CFR 50.55(e) Items

- a. (Closed) 10 CFR 50.55(e) Report (440/84025-EE, 441/84025-EE (DAR 186)) "480 Volt circuit breakers on R23 system may contain silicon controlled rectifiers which exhibit excessive leakage that would

result in false circuit breaker trips. Brown Boveri Electric reported per 10 CFR 21." Brown Boveri Electric (BBE) notified the licensee, per 10 CFR 21 requirements, that certain of their 480 volt circuit breakers may contain trip units with silicon controlled rectifiers (SCRs) exhibiting excessive current leakage. This condition could result in false circuit breaker trips that would shut down safety-related equipment.

The licensee wrote Nonconformance Reports (NRs) NDS-0045 and NDS-0046 for units 1 and 2 respectively to document the condition and track the corrective action. BBE sent drawing #661899 rev. 0 "SCR leakage stress test" that gave the details for in-situ testing of the trip units and criteria for acceptance or rejection of the units. The licensee tested the 248 installed trip units. Inspection Reports (IRs) R85-1117, R85-1118 and R85-1181 covered Unit 1 testing while IRs R84-9368 and R85-1186 covered Unit 2 testing. The test program uncovered a total of 9 deficient trip units - 6 in Unit 1 and 3 in Unit 2. The nine deficient units were returned to BBE. These were replaced by BBE with acceptable units. The acceptable units were installed in the breakers. The following IRs verified that defective units were returned and new units installed: R85-1175 (6 units in Unit 1) and R85-1286 (3 units in Unit 2).

The inspector reviewed the BBE drawing, the testing IRs and the removal/reinstallation IRs. Based on the documents reviewed, it is concluded that the defective trip units have been removed from the site, and acceptable units installed. This item is closed for units 1 and 2.

- b. (Closed) 10 CFR 50.55(e) Report (440/84032-EE, 441/84032-EE (DAR 196)) "ECCS pump mechanical seal heats up after 10 second run; attributed to removal of stuffing box bushing at recommendation of Ingersol Rand." Before the initial running of the Emergency Core Cooling System (ECCS) pumps, it was noticed that one of them exhibited a binding problem. Accordingly, the licensee wrote Work Authorization (WA) NTS-84-2507 to disassemble the pump to determine the cause. The pump was found to contain a stuffing box bushing. Since the pumps have mechanical seals, such a bushing is unnecessary and was thought to be the cause of the binding. Nonconformance Report (NR) OQC-0999 was written to document the condition and provide a disposition. The pump vendor, Ingersol Rand, was contacted and advised the licensee to remove the bushing. This was done and the pump reassembled. On running the pump, the mechanical seal immediately overheated and the pump was shut down. NR OQC-1030 was written to document the condition. The vendor sent a field engineer to investigate the problem. The pump was disassembled (WA NTS-84-3750) and the field engineer found that the pump was misaligned at the factory. The pump shaft was not centered in the housing. The bearing supports were reworked and redowelled to provide proper alignment under the direction of the field engineer (WA NTS-84-4136). The pump was reassembled and test run successfully (WA NTS-84-3750). None of the other pumps of the same type have exhibited binding or overheating of the seals during operation. The inspector reviewed the NRs and WAs and concludes

that the deficiency was an isolated occurrence that has been rectified. This item is closed.

- c. (Closed) 10 CFR 50.55(e) Report (440/84038-EE, 441/84038-EE(DAR 202)). "Rosemount transmitters Model No. 1153 Series B Potential environmental leakage into transmitters resulting in an electrical failure. (Part 21 from Rosemount dated 9/10/84)." Rosemount notified the licensee under 10 CFR 21 regulations of a potential leakage path in the seal between the sensor module and the electronics housing of Model No. 1153 Series B pressure transmitters manufactured after January 10, 1984. Further investigation by the licensee and Rosemount disclosed that sixty-three transmitters were possibly affected. Thirty-two had been installed on Unit 1, four had been installed on Unit 2, with the balance in the warehouse.

The licensee wrote NRs TAS93 and TAS94 for units 1 and 2, respectively, to document the problem and corrective actions. Rosemount determined that improper curing of the sealant was the cause of the potential problem. The licensee returned the 63 suspect pressure transmitters to Rosemount for rework per Warehouse Equipment Return Sheet No. 6197 dated November 1, 1984. Rosemount returned the reworked units with the required QA documentation as evidenced in receipt inspection reports MR-36588R, MR-36045R and MR-34805R.

The inspector reviewed the warehouse equipment return sheet, the receipt inspection reports, and the closed nonconformance reports. The review indicates that there are no potentially deficient Rosemount pressure transmitters at the Perry site. This item is closed.

- d. (Closed) 10 CFR 50.55(e) Report (440/84040-EE, 441/84040-EE (DAR 204)). "FSAR Design Evaluation revealed that a non-safety related moisture detector was used in the HVAC for the control complex." During a routine FSAR Design Evaluation, it was discovered that a "high energy" steam line (not safety-related) was in an environmental zone classified as a mild environment. Non-safety related (redundant) humidity detectors monitor the zone for adverse environmental conditions. It can be postulated that a seismic event would cause the failure of the line and humidity detectors leading to environmental conditions that could cause the failure of redundant control room HVAC equipment in the zone.

The person discovering the condition wrote Engineering Design Deficiency Report (EDDR)-182 to document the condition, determine the cause, and provide corrective actions. The line in question is a small (1-1/4 in.) line carrying 5 psig steam from an electrically heated boiler to the control room HVAC ducts to maintain proper humidity conditions in the control room. Because its normal temperature is over 200°F, it is classified as a high energy line. Calculations showed that it would take 20 minutes following line rupture for the zone to exceed mild environment conditions. Safety-related humidity detectors are not available.

The original design did not consider the existence of the high

energy line in the zone. The licensee surveyed the plant for similar conditions and found none. To resolve the deficiency, the licensee changed the operations manual Off-Normal Instructions (ONI) D51 (Earthquake) to require an inspection of the zone for leakage from the humidification system within 20 minutes of an earthquake alarm. If the system is leaking, it must be shut down. If an inspection cannot be made within 20 minutes, the system must be shut down until subsequent inspection shows it to be leak-free.

The inspector reviewed the EDDR, the plant survey for similar conditions, and the revised operating manual section (ONI-D51) dealing with earthquakes. The review showed that the deficiency was an isolated occurrence, that other systems were not affected, and that the resolution was acceptable. This item is closed.

- e. (Closed) 10 CFR 50.55(e) Report (440/84042-EE, 441/84042-EE (DAR 206)). "Excessive vibration in 100 HP motors for fan supplying air to MCC and SG (made by Reliance). Sent back to manufacturer." During acceptance testing of some safety-related HVAC blowers, two 100 horsepower Reliance Electric motors exhibited excessive noise and vibration.

The licensee wrote Nonconformance Report (NR) OQC-1166 for motor M23C001A and NR OQC-941 for motor M23C002B to document the condition and provide a disposition. The motors were returned to the vendor, Reliance Electric, for rework and determination of cause. The vendor inspected the motors and determined that the noise was coming from the bearings. No damage was found in the motors. The bearings were replaced. The noisy bearings were examined and found to be in a condition that would allow them to continue their function as designed. In a letter to the licensee dated November 30, 1984, Reliance Electric concluded that the noise observed was an unusual occurrence and considered an isolated case with no failure discovered.

The inspector reviewed the NRs, the vendor's letter and the vendor's "Engineering Failure Analysis of Reliance Motor" dated November 1, 1984, and concludes that there was no significant deficiency. This item is closed.

- f. (Closed) 10 CFR 50.55(e) Report (440/84049-EE (DAR 216)). "Gilbert Part 21 - Jet impingement design for feedwater system was nonconservative." Gilbert Commonwealth, Inc. (G/C), the licensee's Architect/Engineer, filed a 10 CFR 21 report which stated that in designing for postulated pipe rupture of the feedwater system, the jet force and jet shape information used for the outside-of-containment was also used for the inside-of-containment design. It was subsequently determined that this assumption was in error, and that the total jet force inside of containment may be 25% greater and the jet shape potentially different.

The licensee wrote Engineering Design Deficiency Request (EDDR) 187 to document the problem and provide a disposition. G/C reviewed the jet pressure calculations for all of the other pertinent systems and

found that the discrepancy existed only in the feedwater system. For the feedwater system inside containment, the G/C review found that four new shields were required and one existing shield required reinforcement. Accordingly, Engineering Changes Notices (ECN's) 27199-809-68, 27200-809-68, and 27201-809-68 were prepared to accomplish the work for Unit 1. Surveillance/Inspection Reports (SIRs) C-6615, C-6624, and D-6637 documented the QC inspections of the work for the ECNs respectively.

The inspector determined that the four new shields and the reinforced shield were in place in Unit 1. A review of the EDDR, the ECNs and SIRs showed that the design and work were done in accordance with the licensee's QA manual. No work was done in Unit 2. Therefore, this item is left open for Unit 2 until the work is done and reviewed by an inspector. This item is closed for Unit 1.

- g. (Closed) 10 CFR 50.55(e) Report (440/85006-EE, 441/85006-EE (DAR 225)). "Filter on TDI Diesels not rated for pressure used in service. Part 21 received from DeLaval on 01/22/85." The emergency diesel generator's vendor, Transamerica DeLaval, Inc. (TDI) notified the licensee under the requirements of 10 CFR 21 that the plastic bowls for the air filters mounted inside of the control panels were rated at 150 psig. Normal operating pressure cycles between 200 and 250 psig. Rupture of the filter bowl could cause damage inside the control panel that would affect the availability of the emergency diesel generator.

The licensee wrote NRs OQC-1616 for Unit 1 and OQC-1713 for Unit 2 to document the problem and track the disposition. TDI supplied the licensee with new metal bowls, part number F-527-002, rated at 250 psig. The licensee installed the new metal bowls, scrapped the plastic bowls, and changed the diesel generator parts list to incorporate the new part number.

The inspector verified that the new bowls were installed in the four diesel generator control panels. This item is closed.

- h. (Open) 10 CFR 50.55(e) Report (440/85008-EE, 441/85008-EE (DAR 229)). "A design change to the position of the scram discharge volume level switch resulted in a condition that would have prevented upper level actuation." The scram discharge volume has redundant Magnetrol level switches that sense the water level. There are two channels in the reactor protection system. Both channels must show a high level for a reactor scram. If one channel shows a high level, a condition known as a half scram exists. The Magnetrol level switches function by moving a magnet attached to a float past a magnetic switch. As the water level rises, the magnet moves past the switch and closes it. This causes the half scram condition. As the water level rises further, the magnet moves past the switch and it reopens. It was thought that this would reset the half scram condition. If there were variations in the elevation of the Magnetrol switches, it could be postulated that the reactor would not scram on high level in the volume. NR NTS-0210 was written to document the condition and provide a disposition.

Further investigation by the licensee and GE found that the half scram condition does not automatically reset even though the Magnetrol switch does reopen. The half scram condition must be reset by the operator. Before resetting, the operator has level information provided by other devices on the scram discharge volume.

This item is being reviewed by the NRC for acceptability and will be reviewed further during a subsequent inspection.

No items of noncompliance or deviations were identified.

4. Evaluation of Licensee Action with Regard to IE Circulars

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 79-09 (440/79009-CC, 441/79009-CC). "Occurrences of split or punctured regulator diaphragms in certain self-contained breathing apparatus." The circular informed licensees of problems in self-contained breathing apparatus regulators sold by Scott Air Pak and Presur-Pac.

The licensee determined that all self-contained breathing apparatus on site was manufactured by the Mine Safety Appliances Company and the circular does not apply to Perry. The inspector concurs. This item is closed.

- b. (Closed) IE Circular 79-15 (440/79015-CC, 441/79015-CC) "Bursting of high pressure hose and malfunction of relief valve and "O"-ring in certain self-contained breathing apparatus." The Circular informed licensees of problems with self-contained breathing apparatus sold by the Surviv-Air Company.

The licensee determined that all self-contained breathing apparatus on site was manufactured by the Mine Safety Appliances Company and the Circular does not apply to Perry. The Inspector concurs. This item is closed.

- c. (Closed) IE Circular 79-24 (440/79024-CC, 441/79024-CC). "Proper installation and calibration of core spray pipe break detection equipment." In certain older boiling water reactors, the differential pressure transmitters and switches had a 0 to +10 psi range. Under certain conditions, the differential pressure was negative and the system ineffective. Hardware changes were necessary (reversing the high and low pressure tap) to make the system operable. At Perry, the transmitters and switches have a -10 to +10 psi range. They are identified as E31-N080 A,B and E31-N680 A,B. The GE specifications data sheet 22A3735AD has been revised to reflect set point and calibration instructions based on the concerns in the

Circular. The field setting of the set points cannot be done until the reactor pressure vessel is at operating temperature and pressure. Because of the type of equipment at Perry, no hardware changes were required.

The inspector reviewed the Circular and the GE specification data sheet and concludes that the pipe break detection equipment will work as required. This item is closed.

- d. (Closed) IE Circular 80-21 (440/80021-CC, 441/80021-CC). "Regulation of Refueling Crews." Because of misunderstanding, some licensees did not consider refueling a reactor as an activity during which the reactivity of the reactor was changed. The Circular was written to clarify the NRC's position and present guidelines for refueling activities.

When the licensee wrote Plant Administrative Procedure (PAP)-1033, "Fuel Handling", the guidance in the Circular was incorporated.

The inspector reviewed the Circular and PAP-1033 Rev. 0 and found that all of the concerns and guidelines were incorporated. The PAP has been reviewed and approved for use. Therefore, this item is closed.

No items of noncompliance or deviations were identified.

5. Exit Interview

The inspector met with the resident inspector and licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on June 14, 1985. The resident inspector summarized the scope and findings of the inspection. The licensee acknowledged the inspector's findings.