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Al Kaplan
VICE PRESIDENT
NUCLEAR GROUP

October 14, 1988
PY-CEI/NRR-0922 L

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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
Allegation Review

Gentlemen:

Enclosed is Cleveland Electric Illuminating Company's response to the letter from Mr. Edward G. Greenman, Director, Division of Reactor Projects, Region III dated August 28, 1988 concerning an allegation that you received.

Per your request, we are submitting the enclosure to this letter as exempt from disclosure according to 10 CFR 2.790. If you have any further questions, please feel free to call.

Very truly yours,

Al Kaplan
Vice President
Nuclear Group

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Enclosure
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cc: Document Control Desk (with enclosure) - ~~Enclosure contains~~
E. Greenman (with enclosure) - ~~10 CFR 2.790 information.~~
T. Colburn (w/o enclosure) - ~~Upon separation this~~
K. Connaughton (w/o enclosure) - ~~page is decontrolled.~~
USNRC Region III (w/o enclosure)

AS DISCUSSED WITH
ED GREENMAN, DDC,
NCFR 2.790 (2) EXEMPTION
DOES NOT APPLY TO
ALLEGATION RESPONSE;
SUBSTITUTED BY GREENMAN.
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Introduction

By letter from Edward G. Greenman, Director, Division of Reactor Projects, Region III, the NRC requested that CEI review and follow-up on an allegation concerning the Perry Nuclear Power Plant. The letter also requested that CEI submit the results of CEI's review and disposition of the matter to Region III.

The enclosure to the letter described the allegation as originating in a newspaper article by Mr. James Lawless appearing in the September 5, 1987 Plain Dealer. The enclosure summarized the article into two concerns:

1. About half of the electrical connections on the control room annunciator panels at the Perry Nuclear Power Plant are improperly wired (crimped rather than soldered). This happened because the vendor who supplied the panels to Perry did not wire the panels in accordance to its own specifications.
2. Electricians who have worked on the control room annunciator panels say the wires literally fall apart when they are touched. If the panels were bumped or if there was an earthquake, the wiring could separate and the annunciator lights would not operate properly. Although some of the lights have been repaired, a request by Perry technical workers to inspect all of the panels' wiring was rejected by CEI.

(The concerns raised in the newspaper article relate to indicator lights in the control room, not annunciator panels and annunciator lights. The referenced newspaper article does not mention annunciator panels or annunciator lights and the quality assurance documents associated with this allegation involve indicator lampholders, not annunciator panels and annunciator lights. The lights referred to provide indication of status of items such as fans (on-off) or valves (open-closed)).

Summary

The allegations set forth in the September 5, 1987 newspaper article arise out of two 1986 Nonconformance Reports (NR's) which were evaluated and dispositioned in the normal course of the Perry Quality Assurance program. In addition, immediately after CEI became aware of the newspaper article, the company initiated an investigation of the allegations through its Call for Quality program. That investigation, completed in May 1988, included discussions with plant personnel, review of vendor and CEI procedures and records, and a plant trend investigation. Finally, following receipt of the NRC's inquiry letter, a number of connections were physically examined. Based upon all of these efforts, CEI has concluded that there is no substantive evidence to support the claim that the electrical connections for the control room panel indicator lights are improperly wired.

Evaluation

On August 9, 1986, an inspector in the Maintenance Modification Quality Section (MMQS) initiated a Nonconformance Report, NR-MMQS-1243. The NR stated that a specific "little fuse lampholder", identified as the red indicator lamp labeled "238° SRV B21F51B" (GE part #204B6586) on control panel 1H13P628 was not properly installed. The specific deficiency noted was that the lug was not soldered to the lampholder terminals. The appropriate procedures, GEI-0013, Rev. 0 and GE-MSP 17.008, required that the connector be crimped and soldered. Following standard procedures, General Electric received a copy of the NR and on August 15 recommended that the lampholder be reworked in accordance with the existing site procedure GEI-0013. This disposition was accepted by CEI's Nuclear Engineering Department, then by MMQS on August 19. The portion of the NR entitled "Steps to Prevent Recurrence" was answered by Engineering which stated that "there is a lack of evidence of this being a generic problem".

On August 14, 1986 (i.e. following initiation of NR-MMQS-1243 but prior to its disposition), the same individual who initiated NR-MMQS-1243 initiated another NR. The second Nonconformance Report, NR-MMQS-1260, also addressed the "little fuse lampholder", GE Part No. 204B6586. This NR, however, seemed to address these lampholders in all 20 control room panels which contain indicator lampholders. It stated that the lugs were not soldered to the lampholder terminals. According to the NR, "during troubleshooting, it was found that the little fuse lampholders #911401X GE #204B6586 were not installed per procedure..." and that "an inspection of other lampholders revealed the same condition". However, none of these other lampholders were identified. The only reference to a specific defective installation in NR-MMQS-1260 was its cross-reference to the single lampholder identified by NR-MMQS-1243.

On August 20, 1986, GE provided its review of NR-MMQS-1260. GE's reviewing engineers stated that the NR provided no evidence of a generic or widespread manufacturing problem. It was GE's conclusion that because work had taken place in these panels for the previous seven years, any major soldering problem would have revealed itself. For example, conditions such as intermittent or flickering lights would have generated numerous NR's. CEI's Nuclear Engineering Department rejected the NR as not adequately reflecting the actual conditions in the field. At the same time, Engineering recommended that MMQS closely follow the condition of defective lights in the future to determine if there were any common mode failure trends.

The next event was the publication of the September 5, 1987 newspaper article described above. Immediately upon reviewing the article, CEI's Call for Quality program initiated an investigation to determine if (1) the connections were properly terminated at GE, (2) the connections were properly terminated during repairs, and (3) if adverse trends regarding the connections have been experienced. The investigation reviewed GE procedures, Product Quality Certifications (PQC's) issued by GE for the control panels, NR's written on

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the PQC's, NR's associated with each control panel, CEI maintenance records and inspection reports on the lampholders. In addition, the investigators contacted a number of individuals within CEI and GE, and initiated a Suspected Trend Investigation Report. Based upon all these efforts, Call for Quality's conclusion was that the allegation was unsubstantiated.

The Call for Quality investigation reviewed the GE procedures used in the installation of the lampholders and found that they specifically called for both crimping and soldering. The relevant GE inprocess inspection procedure also covered both crimping and soldering. The GE Product Quality Certification for each of the twenty control panels referenced by NR-MMQS-1260 was reviewed and found to be in order. These certifications state that the panels were manufactured under a controlled quality assurance program and conform with the procurement quality requirements.

Call for Quality initiated a Suspected Trend Investigation Report (STIR) to determine whether there were any common mode failure trends with respect to the lampholders. This STIR was intended to carry out the recommendation of the Nuclear Engineering Department in its disposition of NR-MMQS-1260 to follow the condition of defective lights. The investigation reviewed one hundred and eight (108) Inspection Reports contained in work orders which performed on-site repair/installation of lamps or lampholders pursuant to the site procedure for lampholder connections (GEI-0013). These reports extended back at least to 1982. No adverse trend was found, nor were any instances identified where connections were not soldered.

The Call for Quality investigation also reviewed the status of all NR's on the applicable PQC's and all NR's associated with each of the 20 control room panels. All these NR's had been closed. From this listing of all the NR's issued against the panels, a subsequent review was performed to identify any involving lampholders, installation concerns, indicating lights, or generic wiring concerns. No instances were identified where lampholder connections were not soldered.

In yet another aspect of the Call for Quality Investigation, the I&C Supervisor was questioned about connector installation in the Control Room and the experience of the I&C Section with those connectors. The I&C Supervisor reported that I&C technicians have done a great deal of work involving the connectors in question and have not found any connectors which were crimped but not soldered.

Finally, the Call for Quality investigation stated that no adverse conditions related to these panels were noted during the startup, testing and operations phases and, in response to the allegations statement (as reported in the Lawless newspaper article that "if there were an earthquake, the wiring could separate and the lights would not operate properly"), the investigation pointed out that the January 1986 seismic event near Perry did not result in any adverse conditions with respect to these panels.

Based on all of these considerations, the Call for Quality investigation concluded that the allegation is unsubstantiated.

Notwithstanding the extensive review which the lampholder connection issue had already received, following receipt of the NRC's letter, CEI undertook direct inspection of lampholder connections. Because the connections are sealed with heat shrink tubing, the soldered and crimped connection is not normally accessible for visual inspection. To remove and replace the heat shrink seals from the Unit 1 control panels would be impracticable given the Unit's operational status. However, since the Unit 2 control panels were fabricated and installed to the same procedures and specifications less than a year after the Unit 1 panels, it was judged that the condition of the Unit 1 connections could reasonably be confirmed by a sampling of the Unit 2 connections. As a result, a Unit 2 control room panel (2H13P800, the equivalent of one of the panels referenced in the NR) was accessed and the heat shrink seals removed from 14 lampholder connections. In each case, inspection disclosed that the connection was both crimped and soldered.

In summary, CEI's evaluations support the conclusion that the allegations contained in the Plain Dealer newspaper article on defective lampholder connections are unsubstantiated. This is based on review of GE procedures and records, on-site trend analysis, review of plant documentation, discussions with knowledgeable plant personnel and plant operating history.

Conclusions

Based upon the investigations described above,

Concern No. 1: The physical and documentary evidence does not support the claim that about half of the electrical connections for control room panel indicator lights are improperly wired (crimped rather than soldered)

Concern No. 2: The physical and documentary evidence does not support the claim that wires for control room panel indicator lights literally fall apart when they are touched. Technicians in the I&C Section who have done a great deal of work with these connectors have not found any that were crimped but not soldered. CEI did reject an NR that suggested wide-spread installation deficiencies (i.e. lack of soldering). The judgments and determinations reflected in the rejection of that NR have been confirmed by subsequent studies.