U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/92014(DRS)

Docket No. 50-440 License No. NPF-58

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

Facility Name: Perry Nuclear Power Plant

Inspection At: Perry Site, Perry, OH

Inspection Conducted: July 6, 1992, through August 7, 1992

Inspectors: _____ 9-11-92
G. M. Nejfelt Date

_____ 9-11-92
P. M. Lerch Date

_____ 9-11-92
K. Salehi Date

Approved By: _____ 9-11-92
B. L. Burgess, Chief Date
Operational Programs Section

Inspection Summary
Inspection conducted from July 6, 1992, through August 7, 1992 (Report No. 50-440/92014 (DRS))
Areas Inspected: Announced, routine, safety inspection of engineering and technical support (E&TS) (MC 37700).
Results: Engineering management was effective in their oversight of engineering activities as observed with modification controls, adverse trends identification, and system engineers involvement in day-to-day activities (see Paragraphs 3 and 4). Also, comprehensive independent verifications of engineering functions were accomplished by the Perry Nuclear Assurance Department (PNAD) and Independent Safety Evaluation Group (ISEG) (see Paragraph 7). Demonstrated strengths were effective use of system engineers and performance-based audits of on-site engineering activities.

One unresolved item was identified concerning the thoroughness of the root cause analysis and corrective actions to correct personnel errors for three LERs (see Paragraph 3.c). No demonstrated programmatic weaknesses were identified.

DETAILS

1. Persons Contacted

Cleveland Electric Illuminating Company

S. F. Kensicki, Director, Perry Nuclear Engineering Department (PNED)
E. Riley, Director, Perry Nuclear Assurance Department (PNAD)
D. K. Cobb, Superintendent, Plant Operations
W. R. Kanda, Manager, Electrical Design Section (EDS), PNED
K. R. Pech, Manager, Outage Planning Section (OPLS), PNPPD
V. J. Concel, Manager System Engineering Section (SES), PNED
B. D. Walrath, Manager, Performance Engineering Section (PES), PNFD
J. P. Eppich, Manager, Mechanical Design Section (MDS), PNED
E. M. Root, Manager, Engineering Project Support Section (EPSS), PNED
V. J. Concel, Manager, Systems Engineering Section (SES), PNED
D. Igyarto, Manager, Perry Training Section (PTS), Perry Nuclear Support Department, (PNSD)
W. J. Wright, Acting Manager, Instrumentation & Control Section (ICS), Perry Nuclear Power Plant Department (PNPPD)
M. W. Gmyrek, Manager, Perry Operations Section (POS), PNPPD
R. J. Tadych, Manager, Quality Control Section (QCS), PNAD
K. P. Donovan, Manager, Licensing & Compliance Section (LCS), PNSD
W. E. Coleman, Manager, Quality Assurance Section (QAS), PNAD

The inspectors also contacted and interviewed other licensee's personnel during this inspection.

U. S. Nuclear Regulatory Commission (NRC)

B. Burgess, Operational Programs Section, Chief, DRS
A. Vegel, Resident Inspector

2. Design Changes and Modifications (37700)

Design Change Packages (DCPs) and temporary modifications evaluated by the inspectors were effectively managed and prepared, and met technical, programmatic, and regulatory requirements. The design change and temporary modification programs and backlog were evaluated. This was accomplished by interviews and review of documentation. These reviews considered formal mechanisms to prepare, evaluate, document, and verify the adequacy of modifications.

a. Design Change Packages (DCPs)

Four design change packages (Nos. 91-099, 92-009, 92-075, and 92-091) were reviewed for design assumptions, safety-evaluations, post-modification testing, supporting procedures, and unreviewed safety questions. No discrepancies were noted.

b. Temporary Modifications

Four temporary modifications and portions of other temporary modifications were reviewed. Temporary modifications were classified either as a Type 1 or Type 2. Only Type 1 temporary modifications could potentially affect plant operations. Only 10 of the 75 open temporary modifications were classified as Type 1.

The 75 open temporary modifications represented approximately a 100 percent reduction from one year earlier. The licensee was aware of the temporary modification status and continued to work to reduce this number. Several minor program deficiencies were found. For example, an open temporary modification to upgrade a condensate system pressure gauge was found to be obsolete. The deficiencies were discussed with the licensee.

c. Backlog of Engineering Modifications

The licensee had approximately 700 open modifications. Nearly 200 of these modifications were scheduled for the next outage. The remaining modifications were either for contingencies, such as a sudden component replacement, or for low priority enchancements. Approximately 300 of the 700 modifications nad been open for more than three years. Examples of modifications opened greater than three years were:

- an electrical supply to the Turbine Building Test Shed (DCP No. 88-287),
- 120 VAC power receptacles to support health physics activity (DCP No. 89-198), and
- a public address system speaker in the Hot Meteorological Laboratory (DCP No. 88-0356).

The licensee committed to re-evaluate methods for closing these modifications to reduce their number.

3. Extent and Quality of Engineering Involvement in Site Activities

The extent and quality of E&TS management and staff involvement in site activities were good. This was based on inspector's reviews, observations, and interviews regarding routine and reactive engineering activities, and engineering performance in identifying and resolving problems. Areas reviewed included identification of deficiencies, trending group, corrective actions, and performance of routine and reactive activities.

a. Identification of Deficiencies and Adverse Trends

The identification of deficiencies and adverse trends was good. The inspectors examined trending activities done by equipment performance engineers and the trending group. Management had initiated a trending program and created the trending group to evaluate various data-bases for adverse trends. The trending group used condition reports, non-conformance reports, and engineering design change requests. The classification and cross referencing of condition reports with equipment failures, procedural inadequacies, and personnel errors provided useful management information. Equipment performance engineers trended traditional indicators, such as vibration and oil analysis. In addition, engineers were developing component trending, for example electrical breakers, and were applying industry standards for thermography.

b. Trending Group

The correction of engineering adverse trends was adequate. Within the licensing and regulatory assurance organization, a trending group was designated to evaluate trends of Condition Reports (CR) and Licensing Event Reports (LER). Each quarter the trending group generated and internally disseminated a report of their evaluation of the previous quarter. The program evaluated events, LERs and CRs and examined their trends. The report included a trending summary, specific recommendations, and an evaluation section. The evaluation section typically provided: causal analysis of problems categorized by equipment failures, procedural deficiencies and personnel errors; results analysis of LERs and CRs; and effectiveness of corrective actions for previous LERs and CRs.

The inspectors examined the Licensee's trending program including the four quarterly trending reports for 1991 and the first two quarterly reports for 1992. The inspector's examination evaluated the licensee's management response to the specific recommendations made in the previous trending reports. Although the licensee's effort to identify causes of adverse trends was commendable, the program's effectiveness appeared to be hampered by a lack of follow through on program recommendations. Two of six recommendations in the first quarter report of 1991 were still open. The licensee's trending group custodian agreed that future recommendations of this program would receive a greater scrutiny and response.

c. Corrective Actions

The corrective actions performed by the licensee for LERs and CRs were generally adequate. Examples of positive actions by the engineering organization were:

- Condition Report 92-071 corrected a potentially undesirable cross connection of battery supplies when the high pressure core spray (HPCS) system and the Division III diesel generator were out-of-service.

- An RSE took corrective actions to prevent spurious tripping of heater fans.

- Guidance was provided to responsible system engineers (RSEs) for selecting appropriate retest of systems and components.

One concern was identified by the inspectors regarding the effectiveness of corrective actions taken for three licensee event reports (LERs). LER Nos. 90-32, 92-10, and 92-13, stated identical corrective actions for personnel errors which resulted in procedural steps being either omitted or incorrectly sequenced. These corrective actions failed to prevent recurrences. Performance in the following three areas was not thorough for these LERs:

(1) Procedure Generation Control: The root cause analysis of these three events identified human error as the root cause. However, the analysis did not address why the instrument and control (I&C) technicians made repeated errors in generating the written procedures.

(2) Procedure Review Process: Procedure reviewers failed to identify the procedural errors. The root cause analysis did not address the failures of the review process.

(3) Documentation of Root Cause Analysis: Discussions with the licensee provided additional information regarding the root causes and the corrective actions that were considered. However, this information was not included in these LERs.

The effectiveness of corrective actions that were taken for these LERs was considered as an unresolved item (URI) (50-440/92-014-01(DRS)) pending review of a written response requested from the licensee.

d. Performance of Routine Activities

Performance of routine activities was good. By observing meetings, conducting interviews, and reviewing documents, the inspectors observed the performance of routine activities. Routine activities that were well-performed included: meetings were attended by appropriate level managers prepared to make meaningful inputs; DCPs were appropriately approved and later reviewed for completeness prior to the release of equipment; and responsible system engineers performed functions that were well-defined.

e. Performance of Reactive Activities

The licensee's response to reactive events were adequate as documented in LERs and condition reports. The inspectors examined 24 LERs from 1991, and the remainder of the LERs from 1992, for responses, corrective actions, and trends. Although the licensee's conclusions in three LERs were questioned (see Paragraph 3.c), the responses for the other LERs were acceptable. The condition reports that were examined were also acceptable.

4. Plant Design Bases Maintenance and Utilization for Engineering Activities

Responsible system engineers (RSEs) used plant design bases documentation effectively. Procedural safeguards for maintenance and modifications were established to ensure that: (1) design criteria were not degraded, (2) potentially affected components and features were tested, and (3) commitments were referenced in procedures. RSEs utilizing plant design bases documentation resulted in:

- rejection of a 400-ampere battery test switch proposed by EDCR No. 90-0074, because Calculation No. 686-85-45, Revision 0, indicated that the breaker was undersized for this particular application; and

- issue of EDCR No. 92-0036 to reduce the outage risk of losing a voltage source.

5. Effectiveness of Engineering Organizational Structure

The engineering organization functioned well as indicated by the successful management of tasks, the initiatives taken, and the development of the engineering staff. Three of the five engineering sections were examined by the inspectors using interviews and documentation reviews.

Effective engineering supervision was demonstrated by the weekly work load assigned to each engineer, which limited the past year's average overtime to approximately 6 percent. Initiatives taken by engineering sections included: a pilot program to summarize resources available to improve responsible system engineer (RSE) performance; implementation of a computerized search of the control room operator logs for use in root cause analyses; and development of a maintenance schedule to optimize equipment operation. Administrative problems identified by the inspectors were minor and isolated (e.g., resubmission of completed work in EDCR No. 88-334; and administrative inaccuracies in a department procedure, NEDP-0101, Revision 5).

6. Extent and Effectiveness of Engineering Communication

Communication among engineering sections, and between PNED and other departments was good. The inspectors attended meetings and reviewed written correspondences.

Priorities for engineering activities and support to other departments were routinely balanced based upon need. Effective communication was demonstrated by engineering to resolve a high priority security item to install additional lighting (EDCR No. 91-0174). Written communications were effective to evaluate technical problems. An example of written communication feedback between system and design engineers, was provided in EDCR No. 91-0040 that considered a proposal for installing additional valves to isolate a heat exchanger.

7. Engineering Assessments and Initiatives

Engineering assessments were excellent. The audits and surveillances performed by independent groups, such as,

Perry Nuclear Assurance Department (PNAD) and Independent Safety Engineering Group (ISEG) were performance-based and critical. Corrective actions were handled timely. Two initiatives, the Quarterly Assessment Report and the Engineering Improvement Team, taken to resolve engineering responsibilities and to improve communications were good. The inspectors' conclusions were based upon examination of audits, surveillances, and the licensee's assessments of engineering activities.

a. Engineering Assessments

PNAD and ISEG were independent groups that evaluated engineering performance.

(1) Perry Nuclear Assurance Department (PNAD)

A review of PNAD audits and surveillances found good oversight of engineering functions. PNAD systematically re-evaluated engineering activities such as design control and equipment qualification using a two-year cycle. Findings by PNAD demonstrated technical knowledge and organizational insight. Examples of findings were: (1) incorrect replacement of an environmentally qualified (EQ) component (PA 91-28), (2) not preparing condition reports (PA 92-07), and (3) communication problems between engineering sections (Surveillance 91-174).

In discussions with the inspectors, several PNAD staff personnel used the term "customer." It was explained that this term was used to emphasize that PNAD would provide the best service possible. This information was substantiated by the support PNAD provided to PNED as one of its customers. To ensure the thoroughness for an equipment qualification audit (PA 91-28), PNAD contracted a seismic specialist to provide an input outside PNAD's expertise.

Review of PNAD action requests (ARs) found that ARs were handled in a timely fashion. PNAD recommendations for improvements were implemented, although slowly. The protracted implementation of recommendations was attributed by inspectors to their negligible safety significance and failure to maintain the status of the recommendations. For example, the resolution to a recommendation proposed in 1988 for data-base improvements, was scheduled for implementation by December 1992.

(2) Independent Safety Engineering Group (ISEG)

The inspectors reviewed the ISEG recommendations from 1991 to the present and concluded that ISEG effectively provided independent reviews of engineering activities. For example, ISEG Project Report 89-003 initiated a PNED re-evaluation to demonstrate that a potential RHR water hammer described in NRC Information Notice (IN) 87-10 was not a significant hazard at Perry.

b. Engineering Initiatives to Evaluate Performance

Initiatives taken to evaluate engineering activities were good. Two initiatives reviewed were the Quarterly Assessment Report and the Engineering Improvement Team (EIT) activities. .

(1) Quarterly Assessment Reports

Quarterly Assessment Reports were produced by a collective effort by PNED, PNAD, and ISEG management and staff. The reports of the past year provided a good management perspective of plant engineering activities. For example, the 1991 Fourth Quarter Assessment Report cited the need to reduce the number of temporary alterations that would remain active into the next fuel cycle.

(2) Engineering Improvement Team

In response to a management survey performed in 1991, a special seven-member Engineering Improvement Team (EIT) was organized. The EIT mandates were to resolve engineering survey concerns by December 1992. Topics to be addressed in the final report were establishing responsibilities, responding to plant needs, improving communications, improving morale, and streamlining the design change process. The EIT categorization of items into workable units was considered good.

The inspectors evaluated the progress and control of the EIT program as good. However, the program's effectiveness seemed to be hindered because the staff relied upon verbal commitments to implement EIT recommendations, and the licensee did not address five of the ten areas identified

for improvements. One area not addressed was a concern that crisis management preempted adequate root cause analyses. These concerns were communicated to the licensee.

8. Unresolved Item

An unresolved item was a matter requiring more information in order to ascertain whether it was an acceptable item, violation, or deviation. During this inspection, an unresolved item was presented in this report (see Paragraph 3.c).

9. Exit Meeting

The inspectors met with the licensee representatives (see Paragraph 1) on August 7, 1992, to conclude the inspection. The inspectors summarized the inspection purpose, scope, and findings. One unresolved item (URI) was identified for recurrences of LERs with identical corrective actions (see Paragraph 3.c). The licensee acknowledged the information and did not identify any information as proprietary.