



Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

April 29, 1983

Mr. James G. Keppler, Regional Administrator
Directorate of Inspection and
Enforcement - Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Byron Station Units 1 and 2
30 Day Response to IE
Inspection Report Nos.
50-454/83-06 and 50-455/83-05
NRC Docket Nos. 50-454/455

Reference (a): R. L. Spessard letter to Cordell Reed
dated March 31, 1983

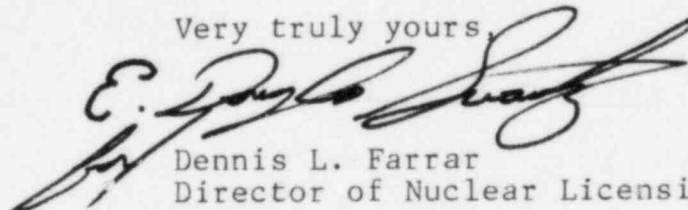
Dear Mr. Keppler:

Reference (a) provided the results of an inspection conducted by Mr. I. T. Yin of your office during the periods of December 27-29, 1982 and January 27-28, 1983 at Byron Station site; on January 11-13 and 17, 1983 at Sargent and Lundy Engineers; and on January 19, 1983 at Commonwealth Edison Company of activities at Byron Station. During that inspection, certain activities appeared to be in noncompliance with NRC requirements. The Attachment to this letter provides the Commonwealth Edison Company response to the Notice of Violation as appended to Reference (a).

To the best of my knowledge and belief, the statements contained in the Attachment are true and correct. In some respects these statements are not based on my personal knowledge but upon information furnished by other Commonwealth Edison employees, Consultants and Contractors. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

Please address any questions that you or your staff may have concerning this matter to this office.

Very truly yours,



Dennis L. Farrar
Director of Nuclear Licensing

Attachment

cc: RIII Inspector - Byron
6483N

8305270489 830524
PDR ADDCK 05000454
Q PDR

MAY 2 1983

ATTACHMENT

RESPONSE TO NOTICE OF VIOLATION

Violation No. 1

10 CFR 50, Appendix B, Criterion VI, states, in part, that "Measures shall be established to control the issuance of documents...including the changes thereto, which prescribe all activities affecting quality. These measures shall assure that documents, including changes, are reviewed...and approved...by authorized personnel and are distributed to and used at the location where the prescribed activity is performed."

Commonwealth Edison Company Topical Report CE-1-A, "Quality Assurance Program for Nuclear Generating Stations", Revision 15, dated January 2, 1981, states in Section 6, that "A document control system will be used to assure that documents such as specifications, procedures, and drawings are reviewed for adequacy and approved for release by authorized personnel. Such documents will be distributed to and used at the locations where the prescribed activity is performed. Changes to these documents will be handled similarly and will be reviewed and approved by the same organization that performed the original review and approval, unless delegated by the originating organization to another responsible organization."

Contrary to the above, the Westinghouse site design procedure used for friction anchors was documented in an inter-department memorandum without proper issuance, review and approval prior to its implementation.

Response to Item 1

Corrective Action Taken and Corrective Action Taken To Avoid Further Noncompliance

Westinghouse Electric Corporation has reviewed all relevant procedures specific to Byron Station. These procedures have been compiled into a manual with controlled distribution. Issuance of the manual, future revisions to existing procedures and future additions of procedures will require approval of the Manager of the Midwest Nuclear Technology Center who is responsible for technical management of the Byron Station project.

Date When Full Compliance Will Be Achieved

The manual was issued to Byron Station for site use on April 15, 1983.

Violation No. 2

10 CFR 50, Appendix B, Criterion XV, states, "Measures shall be established to control material, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. These measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations. Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures."

Commonwealth Edison Company Topical Report CE-1-A, "Quality Assurance Program for Nuclear Generating Stations", Revision 21, dated June 6, 1982, states in Section 15, that "Items involving construction, maintenance and modifications which are found nonconforming to the engineering requirements or specifications, drawings and instructions for modifications or workmanship standards or which are lacking required documentation upon receipt will be controlled to prevent their inadvertent use or installation. Nonconforming items are identified, documented and segregated for disposition."

Contrary to above, the Hunter Corporation activities were identified to be deficient in that (1) for the items listed in the Weekly Hanger Status Report, for the week ending December 19, 1982, five nonconforming conditions were listed, however, they were not included in the Nonconformance Report system, (2) Deficiency Reports were being used to document deficient conditions, however use of these reports was not procedurally defined and controlled, and (3) deficiencies listed in the Weekly Hanger Status Reports were being utilized to trend hanger deficiencies without procedural control and followup.

Response to Item 2

Corrective Action Taken and Results Achieved:

Hunter Corporation Site Implementation Procedure 4.201 has been revised by Revision 6, dated 02-15-83 to procedurally define and control the trend analysis conducted on Daily Inspection Reports; and to procedurally define and control trend analysis conducted on Discrepancy Reports. Through Site Implementation Procedures 4.201 and 11.101, a nonconformance system with the following hierarchy exists: Daily Inspection Reports, Discrepancy Reports, Nonconformance Reports. Trend analysis are conducted on each level of the hierarchy, and these are procedurally recognized.

Corrective Action Taken To Avoid Further Noncompliance

We believe that with the incorporation of the identified features into applicable procedures, further noncompliance should be avoided. The ongoing system of surveillances and audits are the means to assure that procedures are properly being implemented.

Date When Full Compliance Will Be Achieved:

Revision 6 of the Hunter Corporation Site Implementation Procedure 4.201 was approved for use March 24, 1983. Full compliance was achieved on April 22, 1983.

Violation No. 3

10 CFR 50, Appendix B, Criterion XVI, states, in part, that "Measures shall be established to assure that conditions adverse to quality...are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition."

Commonwealth Edison Company Topical Report CE-1-A, "Quality Assurance Program for Nuclear Generating Stations", Revision 21, dated June 6, 1982, states in Section 15, that "A corrective action system will be used to assure that such items as failures, malfunctions, deficiencies, deviations, defective material and equipment and nonconformances which are adverse to quality and might affect the safe operation of a nuclear generating station are promptly identified and corrected.... Implementation of corrective action will be accomplished at the source of deficiency by appropriate contractor personnel as directed by cognizant Edison engineers. Project or Station Construction, as applicable has responsibility for implementation of the correction. Quality Assurance is responsible for follow-up and final approval that the nonconformances have been corrected satisfactorily".

Contrary to the above, the licensee's corrective measures to preclude repetition of snubber damage during installation were deficient in that for the 38 Deficiency Reports reviewed, six specified replacement of a snubber due to damage. The lack of proper handling of snubbers during installation was an item of noncompliance in Region III Inspection Reports No. 50-454/80-05; 50-455/80-05.

Response to Item 3

Corrective Action Taken And Results Achieved:

The corrective action of 50-454/80-05-05, 50-455/80-05-05 was to cease installation of safety related mechanical and hydraulic snubbers, and removal of those mechanical and hydraulic snubbers that had been installed. Additionally, the corrective action included that installation of mechanical and hydraulic snubbers would not be reinitiated until the building construction environment was such that the exposure to damage is minimal, or until protection can be provided and maintained for installed snubbers. The foregoing actions were taken in that: installed snubbers were removed in 1980; and installation was not reinitiated until March, 1982 for sizes PSA 3 and above, which are more substantial in materials of construction and therefore more resistant to damage than the smaller sizes; installation of the smaller was not reinitiated until approximately October, 1982. The snubber when installed was provided protection by the

following means: snubber housing and stroke tube were encapsulated with a barrier to afford protection from debris entering housing; at certain more susceptible locations structural angles were strapped to the assembly to afford protection from falling objects or personnel climbing loads. The foregoing precautions have resulted in the following statistics: of over 1110 assemblies installed as of 01-15-83, 37 or 3.3% have been discovered to be damaged. Of the 37 which have been discovered to be damaged, some have been identified during preinstallation inspection, some at installation inspection, and some during one of the multiple post installation surveillance type inspections. For the CV system, which is the system the Inspector conducted a partial review of, of 367 assemblies installed as of 01-15-83, 14 or 3.8% have been discovered to be damaged. Ongoing post installation surveillance type inspections are the established ways and means of detecting post installation damage. With this and the preventive measures previously established, detection of damage and prevention of damage should be held to an acceptable level.

Corrective Action Taken To Avoid Further Noncompliance

In our judgement, no further action than that stated above is required to avoid further noncompliance.

Date When Full Compliance Will Be Achieved

Compliance was achieved 01-15-83.

Violation No. 4

10 CFR 50, Appendix B, Criterion III states, in part, that "Measures shall be established to assure that applicable regulatory requirements and the design basis...are correctly translated into specifications, drawings, procedures and instructions."

Commonwealth Edison Company Topical Report, CE-1-A, "QA program for Nuclear Generating Stations", Revision 21, dated June 6, 1982, states in Section 3, that "The fundamental vehicle for design control involves multi-level review and/or evaluation of design documents by individuals or groups other than the original designer or designer's immediate supervisor whose authority and responsibility are identified and controlled by written procedures.

The design documents include, but are not limited to, system flow diagrams, design and construction specifications, load capacity data sheets, design reports, equipment specifications, and process drawings.

Design calculations are also subject to two or more levels of evaluation or review including that performed by the originator plus review and audit by Station Nuclear Engineering where design work is performed by the Architect Engineer or other vendors or contractors".

Contrary to the above, the S&L control of pipe whip restraint design was deficient in the following areas.

- a. Angular offset dynamic testing was not specified for the Energy Absorbing Material (EAM) even though actual installations employed configurations with offset loads.
- b. The calculated impact velocity for installed WR's utilizing EAM was significantly greater (over 2 1/2 times) than that which had actually been tested for material qualification.
- c. Pipe whip restraint (WR) calculations were performed long after WR's had been installed in place.
- d. The S&L technical and design internal QA audit program measures and implementation were considered deficient in that (1) since the initiation of WR design activities (over seven years) only two internal design audits had been performed, and (2) the audits performed did not include a review for utilization of correct assumptions and engineering practices and a verification for correctness of computations.

Response to Item 4a.

- 4a. Angular offset dynamic testing was not specified for the Energy Absorbing Material (EAM) event though actual installations employed configurations with offset loads.

The Commonwealth Edison Company will conduct testing of the EAM material in configurations corresponding to design configurations where the EAM will experience load angularity. This testing is expected to be completed by August 1, 1983. The results of these tests are expected to be summarized in report form by August 15, 1983.

The phenomenon of load angularity in the Byron/Braidwood pipe whip restraints only occurs during compression of the EAM. At initial load impact no angularity exists between the axis of the loading and that of the EAM. The effects of similar load angularities were investigated in detail for Commonwealth Edison Company on our LaSalle County Project. Through detailed finite element analysis and testing of EAM, the attached report was written which shows that the effect of load angularity does not significantly affect the ability of the pipe whip restraints to perform their intended function. Because the Byron/Braidwood pipe whip restraints experience similar angularity effects when compared the LaSalle County restraints, it is our judgement that additional testing is not required nor justified. Therefore, we consider the testing which is being conducted to be confirmatory in nature, and we believe that no further action is required to avoid further noncompliance.

Response to Item 4b

- 4b. The calculated impact velocity for installed WR's utilizing EAM was significantly greater (over 2 1/2 times) than that which had actually been tested for material qualification.

In our judgement, increased impact velocities will result in higher energy absorption in the EAM. However, the testing noted in Item 4a above will be conducted at the highest practical velocity in order to confirm this velocity/energy absorption relationship. We believe that no further action beyond this is required to avoid further noncompliance.

Response to Item 4c.

- 4c. Pipe whip restraint (WR) calculations were performed long after WR's had been installed in place.

The pipe whip restraint design calculations were performed by Sargent & Lundy before the corresponding drawings were released for fabrication. The calculations which were performed after fabrication release were performed as a result of the NRC

questions concerning load angularity effects on the LaSalle County Project. These calculations only established what the resulting load angularity would be for each restraint after compression straining of the EAM. Based on these calculations, it was concluded that the angularity effects were similar to the LaSalle Project conditions and further analysis or testing was not required.

In the Inspection Report included with the Notice of Violation, Item 6d (page 9) described the review of the pipe whip restraint calculation for restraint MS-P6. The inspector expressed a concern that this restraint, as designed, would allow excessive movement of the pipe such that it would strike the concrete structure. However, the calculations which were included in the inspection report were based on the assumption that a single piece of EAM would be required to deflect the total 3.75 inches which is the deflection required by design to absorb the pipe whip energy. Instead, each piece of EAM is required to deflect only 1.87 inches in order for the total EAM deflection to be 3.75 inches.

Therefore, the total pipe deflection will be within the design limit and the restraint will function acceptably. No further action is required to avoid further noncompliance.

Response to Item 4d.

4d. The S&L technical and design internal QA audit program measures and implementation were considered deficient in that (1) since the initiation of WR design activities (over seven years) only two internal design audits had been performed, and (2) the audits performed did not include a review for utilization of correct assumptions and engineering practices and a verification for correctness of computations.

1. Sargent & Lundy Quality Assurance audit plan is structured on the basis of QA program elements, and QA Department and Project procedures which governs quality related activities. As such, the audit plan does not necessarily address each plant system, such as the pipe whip restraint design. Therefore, the fact that only two internal QA audits have directly involved the pipe whip restraint calculations and drawings is not evidence that the audit frequency is insufficient. Furthermore, audits have been performed regarding practices affecting the pipe whip design activities but which do not directly involve the whip restraint design documents such as audits of personnel qualification, of technical training, etc.

2. Sargent & Lundy conducts audits based on the applicable elements of the QA Program and implementing procedures and on procedural project instructions, approved procedural deviations, departmental procedural standards and division procedures. Audits include an objective evaluation of quality related practices, procedures, instructions, activities and items. A review of documents and records ensure that the Quality Assurance Program is effective and properly implemented.

As part of the audit function, the auditor investigates whether the information generated by one discipline is correctly incorporated into documents of another discipline, whether the reviewer has performed an independent review of design documents in accordance with approved procedures. However, the auditor does not perform a complete independent design review of the design activity to evaluate such items as whether an equation was correctly used or complete verification of the adequacy of the computation. This is the function of the reviewer.

This is also in compliance with the Sargent & Lundy Quality Assurance Program which has been accepted by the NRC, the requirements of 10 CFR 50 Appendix B Criterion 18, Auditing, and Standard Review Plan NUREG 0800, Chapter 17.1.

In order to further evaluate adequacy of design, Sargent & Lundy has generated procedures in each engineering department for technical re-review of selected design documents and of the procedures for their generation. Evaluations may be initiated by the department manager, design director, project manager or the responsible division head for a design activity. Evaluations are in addition to normal supervisory scrutiny of design activities as they proceed. When such evaluations are performed and completed they are audited on a sampling basis by QA Division for compliance with the requirements of the governing procedures and for the effectiveness of the evaluations in their results and conclusions, including any corrective actions which may be indicated. Audits of the evaluation process and results are incorporated into the auditing schedule.

Regarding the two S&L audits Nos. 30 and 41, stated in the Inspection Report, the auditors did actually check for signatures and pages. Inadequate page numbers and certainly inadequate or missing signatures are unacceptable and are legitimate audit questions. In addition, the audits in question covered the following items as evidenced by the checklists of these audits: adequacy and completeness of documentation, inclusion of design assumptions, identification of sources of formulae and equations used, documentation of design input, proper identification of computer programs used, review process documentation, effect of interfacing

disciplines, updating of status reports, drawing preparation, review and approval, and use of appropriate standards. Based on the above, we believe that no corrective action is required to preclude further noncompliance.

Regarding the inspection conducted at Commonwealth Edison on January 19, 1983, a follow-up telephone discussion between Commonwealth Edison's Director of Quality Assurance and the Inspector resulted in complete agreement and no further information was required.

Attachment

6483N