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UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76011

02 APR 1981

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MEMORANDUM FOR: James Sniezek, Director, Division of Resident and Regional Reactor Inspection, IE

FROM: John T. Collins, Deputy Director, Region IV, IE

SUBJECT: INSPECTION OF SARGENT AND LUNDY REGARDING REGION III CONCERNS

In accordance with your request, an inspection of Sargent and Lundy (S&L) was conducted March 17-20, 1981, to follow up concerns identified by Region III during site inspections of the Clinton and Zimmer projects. The inspection team composition was C. J. Hale (RIV), I. T. Yin (RIII) and J. B. Henderson (IE:HQS). The scope and results of this inspection are attached.

Briefly, the inspection scope included an evaluation of S&L's performance and responsibility concerning several site related problems identified by Region III personnel, and the effectiveness of S&L's generic corrective and preventive actions in response to their internal inspection and audit findings and those of others, i.e. NRC and client. While items of nonconformance were identified during this inspection, they do not indicate a significant breakdown of the S&L quality assurance program. However, before a final determination is made further inspection within the same scope is necessary. Accordingly, this inspection will be continued April 6-10, 1981, with two Region IV inspectors and assistance by at least one Region III inspector. If there are significant changes in this preliminary determination, we will advise you immediately. Otherwise, the report of this inspection, including the follow up inspection, will be processed routinely.

John T. Collins
John T. Collins
Deputy Director

Attachment as stated

- cc: K. Seyfrit
- U. Potapovs
- C. Norelius, RIII
- ~~R. Warnick, RIII~~
- D. Davidson, RIII
- C. Hale
- J. Henderson, HQS
- I. Yin, RIII
- G. Reinmuth, HQS

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SARGENT AND LUNDY INSPECTION - MARCH 17-20, 1981

A. Inspection Scope

1. Evaluate S&L's performance and responsibility concerning the following site identified problems.
 - a. Inadequate review and approval of "as built" drawings submitted by IPC (Clinton).
 - b. Issuance of snubber and hanger designs before calculations were performed, in some cases, and before calculations were reviewed and approved in others (Clinton).
 - c. Nonconformances relating to the installation of guard pipe penetrations for the reactor water cleanup systems (Clinton).
 - d. No criteria for assessing weight loads on cable trays when specifying cable loadings (Zimmer).
 - e. Maximum heat loads in cable trays being exceeded, known by S&L as early as 1978, and this nonconformance not being documented for correction and follow up (Zimmer).
2. Evaluate each element in Item 1., first on the identified project, then for its generic applicability to other projects and the effectiveness of S&L's corrective and preventive actions on the projects, as applicable.
3. Assess the effectiveness of S&L's corrective and preventive actions relative to previously identified NRC inspection findings.

B. Inspection Results

1. S&L's Review and Approval of "As Built" Drawings Submitted by Illinois Power Company (IPC)

Based on a review of the Project Scope of Work (SL3021 and SL356), S&L issues documents that define standard parts that are to be used for local supports. The design of each support is identified and located, and a specific parts list is assembled. Instructions for the assembly and orientation of each support are given, including such things as required length and size of attachment welds.

Baldwin Associates, under an IPC contract, converted the above documents into a series of assembly drawings. These assembly drawings illustrated the parts in proper position, the size, length and location of attachment welds, and other pertinent information. Crafts people assembled and installed the supports with the guidance of the assembly drawings.

IPC identified that certain of the installed supports did not conform to the S&L requirements, and so notified RIII under 10 CFR 50.55(e).

As corrective action, IPC revised the original scope of work to require that S&L review all Baldwin assembly drawings for conformance to S&L requirements. For those installed supports identified as discrepant and those considered suspect, S&L was requested to determine whether they met S&L's design criteria, even though they may not meet the prescribed details. If the design criteria was not met, S&L was to recommend corrective action, either modification or replacement. As preventive measures, IPC, required that all future installations were to be made only after receipt of S&L's concurrence with the assembly drawings and their release for construction without comment, or with defined corrections. S&L is also providing site liaison engineers to assist Baldwin personnel in understanding drawing and specification requirements, processing field engineering change requests, etc.

This particular division in S&L's scope of work appears unique to the Clinton project, therefore the generic aspects of this problem would not be applicable to other S&L projects. This problem appears to have occurred on site before S&L became involved in this particular area of work. No nonconformances were identified that related to S&L's performance.

2. Issuance of Snubber and Hanger Designs Before Calculations Were Performed.

As a part of the overall effort required by the trial team inspection program, mandated by IE:HQ, carried out at Clinton project site during February and March 1981, the RIII inspector selected nine installed piping suspension system components including snubbers, variable spring hangers, sway struts, rigid supports, and rigid hangers to be reviewed at the S&L office to determine whether sufficient design consideration and documentation had been in place prior to issuance of design drawings for hardware fabrication and installation. The review was performed in S&L office, Chicago, on February 18, 1981.

During discussions with the S&L responsible personnel, it was determined that the lack of design calculation documentation was first identified on the Zimmer project in October 1978, and resulted in a change to S&L QA program procedure GQ-3.08, "Design Calculation", on March 5, 1979 (Revision 4), adding Paragraph 3.0.C.1, stating that, "Calculation shall be approved prior to the start of fabrication or start of construction of affected item(s)." The calculations reviewed were not in compliance with the GQ-3.08 requirement, even though they were completed after the effective date of the revised GQ-3.08.

During this inspection, S&L's generic corrective and preventive actions were evaluated concerning this problem on the Zimmer, Clinton, Marble Hill, and Bryon-Braidwood projects. S&L's principal system for obtaining such actions is their internal audit system. Several problems with the S&L internal audit system were identified and resulted in our issuance of an item of nonconformance. (See paragraph C).

S&L's failure to follow their procedure GQ-308 appears to be an item of nonconformance; however, we have not determined the effective dates and status of all corrective and preventative action commitments in this area resulting from earlier findings by licensees, Region III inspectors, and S&L's internal audits. Consequently, we will be inspecting this area further during our April inspection in an attempt to determine if further enforcement action is appropriate.

3. Nonconformances Relating To The Installation Of Guard Pipe Penetrations For The Reactor Water Cleanup Systems

On February 26-27, 1981, the RIII inspector observed the installation of the second set of the seismic guides in the RWCU steam tunnel pipe penetration assembly. In accordance with the S&L Drawing No. M06-1000, Sheet 6, "Guard Pipe Details," Revision H, dated May 21, 1981, the gap between all four seismic guides should be 0.010". In actual measurement, it was found that all four guides were bound tight against the process pipe wall. As a result, the contractor issued a Nonconformance Report (NCR) No. 4151 on March 2, 1981, to document the problem including a detail mapping of the gap measurements on all four seismic guide shoes. In addition, the licensee agreed that no further work on the steam tunnel penetration assemblies will be permitted prior to S&L's resolution and evaluation of this nonconformance, together with other possible nonconformances that might exist.

During this inspection, the inspector discussed this design issue with the S&L Project Manager, and the Head of Engineering Mechanics Division, and was told that S&L was in the process of evaluating the nonconforming conditions and will not be ready to discuss any generic or specific issues until early April, 1981.

Although there was an apparent lack of contractor installation and QC inspection program procedures to ensure design gap requirements will be met, the root cause of the problem may be that the S&L design engineer was insensitive to the installation difficulties. This item will be reviewed further during our April inspection to determine its status and if S&L was in error.

4. No Criteria For Assessing Weight Loads On Cable Trays.

This item as well as the one following (5.) were identified onsite. Based on information available at the site, it appeared that weight loads on cable trays were not being considered, consistent with SAR commitments.

As a result of this inspection, S&L's design approach to cable tray loadings (weight and heat) was clarified, and this item was resolved based on commitments by S&L, including a revision to the applicable Project Instruction. Further details relating to this item are discussed in the following paragraphs.

5. Maximum Heats Loads In Cable Trays Have Been Exceeded and the Nonconformance Has Not Been Documented For Correction and Follow Up.

S&L has developed a system for continually monitoring the cable tray heat and weight loadings to be used for the duration of cable placement. A simplified description of the system is as follows.

A "design index" number is established by taking the sum of the cross-sectional areas of all cables in a tray (for conservation, the diameter of a given cable is used to calculate the area of a square which is used as the cable cross-sectional area) divided by the cross-sectional area of the cable tray filled to the 2" level.

Periodically, and as work progresses, the "design index" for each cable tray is computed. When the "design index" for a tray exceeds 1.25, S&L must consider specifically the cables in the tray to assure that weight and heat load criteria are not violated before final approval of that tray. While cable placement activities are ongoing S&L performs sampling calculations of those trays with the larger "design index" numbers as a means of monitoring their compliance with tray loading criteria. It was these interium calculations, when compared to the "design index" numbers, that was the source of Region III's concern.

S&L uses this same design approach for cable trays on their other projects. No nonconformances were identified during this inspection concerning S&L's design approach and calculational methods relative to cable tray loadings. S&L reaffirmed their commitment to perform formalized calculations, as required by their Project Instruction, before final approval of the cable tray loadings.

Region III identified several items that require correction/clarification during their site inspection which will be documented in the Region III report. S&L has completed action on some of these. One nonconformance was identified by Region III concerning the tracking by S&L of an item not conforming to design. Because of its generic applicability, the same nonconformance will be issued to S&L in the Region IV report. (See paragraph C below).

6. Effectiveness of S&L's Corrective and Preventive Actions Relative to Inspection Findings By Others.

Of the several concerns expressed by Region III relative to S&L, there was an apparent lack of effective follow up on other projects of inspection findings identified by the licensees or Region III on a specific project. This concern was expanded, for this inspection, to include S&L's generic consideration of inspection findings made during previous Region IV inspections.

No significant reduction in the effectiveness of S&L's corrective and preventive action system was identified during this inspection; however, our effort in this area is not complete and will be continued during the April 6-10, 1981 inspection. The following item was identified, but it is not considered significant, unless other such examples are identified during the April inspection.

In the Region IV 99900507/79-04 inspection, we issued a deviation (nonconformance) concerning QA training. S&L's response committed that "personnel that fail to complete their required QA training as scheduled would be removed from quality-related activities on nuclear projects until the requirement was met."

In sampling the status of 10 individuals' training records, one individual was found that has done safety related work without having completed QA training. Another was doing safety related work without a clear definition of the QA training required for him.

A new QA training element was added to the requirements for a large segment of personnel in at least 2 departments. This addition was made as early as September 1980 but the training is still not complete and the personnel are continuing to perform safety-related work.

C. Nonconformances Identified

The following nonconformances were identified during the conduct of this inspection and will be documented in inspection report 99900507/81-02 to be issued following the April inspection.

1. Contrary to Criteria III and XV of 10 CFR Part 50, Appendix B, two cables on the Zimmer project were identified by project personnel as not complying with individual cable heat load criteria; however, these items were not entered into any formalized tracking system to assure proper resolution.

Region III identified this nonconformance and plans to include it in their inspection report also. We are including it in our report to assure that generic corrective and preventive actions are taken by S&L in addition to the specific project action.

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