U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/85026(DRS)

Docket No. 50-461 License No. CPPR-137

Licensee: Illinois Power Company
500 South 27th Street
Decatur, Illinois 62525

Facility Name: Clinton Power Station, Unit 1

Inspection At: Clinton Site, Clinton, Illinois

Inspection Conducted: April 29, 30, May 1-3, 22, 23, June 3-6, 19-21, July 10-12, and August 14, 1985

Inspector: D H Danielson for P. D. Kaufman — 8/21/85 Date

D H Danielson for J. F. Schapker — 8/21/85 Date

Approved By: D. H. Danielson, Chief
Materials and Processes Section — 8/21/85 Date

Inspection Summary

Inspection on April 29 through August 14, 1985 (Report No. 50-461/85026(DRS))
Areas Inspected: Special, unannounced safety inspection to followup on previous inspection findings and allegations. The inspection involved a total of 185 inspector-hours by two NRC inspectors, including 10 inspector-hours of in-office review.
Results: Of the areas inspected, one apparent violation was identified (identifying and correcting nonconforming conditions by unacceptable methods - Paragraph 4.b (Concern 5)).

DETAILS

1. Persons Contacted

Illinois Power Company (IP)

W. Gerstner, Executive Vice President
*D. Hall, Vice President
J. Wilson, Plant Manager
*J. Loomis, Construction Manager
R. Wright, Director, Configuration Management
*H. Daniels, Jr., Project Manager
J. Greene, Manager, Startup
**D. Wilson, Supervisor, Licensing Administration
H. Victor, Manager, NSED
*J. Palchak, Supervisor, CCCD
*J. Perry, Manager, Nuclear Program Coordinator
R. Campbell, Director, Quality Systems and Audits
*J. Sprague, QA Specialist
*E. Kant, Assistant Manager, NSED
*F. S. Spangenberg, Director, Nuclear Licensing
*W. Connell, Manager, QA
*G. Bell, Director, Construction and Procurement QA
*R. Weber, Supervisor, Quality Systems
*E. Corrgan, Director, QE&V

Soyland Power Coop., Inc./Western Illinois Power Co-op., Inc.

J. Greenwood, Manager Power Supply

Baldwin Associates, Inc. (BA)

A. King, Jr., Project Manager
*L. Osborne, Manager, Q&TS
P. Adams, QC Inspector, P/M
J. DeVine, Assistant Piping Engineer
R. Neeb, Senior Piping Engineer
J. Poulos, Senior Engineer, BOP
*J. Thompson, QE Manager

Sargent & Lundy Engineer (S&L)

J. Blattner, Mechanical Engineering Supervisor
D. Schopfer, Project Site Manager
S. Raupp, Structural Engineering Supervisor
P. Odisho, Project Engineer, EMD
*R. Suslick, Project Manager

Stone & Webster Engineering Corporation (S&W)

J. M. Gruber, Program Manager, 50.55(e) Investigations

*Denotes those attending the onsite exit meeting on July 12, 1985.

**Denotes those telephonically contacted on August 14, 1985 for the final exit interview.

2. Licensee Action on Previous Inspection Findings

a. (Closed) Noncompliance (461/81-05-01): Lack of adequate hanger installation and QC inspection procedures. Lack of necessary detail in a restraint installation procedure. The licensee established Procedure BAP 3.2.5, "Piping Component Supports," which has sufficiently improved upon the installation and inspection of piping component supports/hangers, as previously documented by Region III Inspection Report No. 50-461/81-14. The licensee also revised the associated QC instructions, including checklists to reflect the new installation and inspection procedure requirements. The inspector reviewed these procedures, instructions and checklists and found them adequate.

b. (Closed) Noncompliance (461/81-05-02): Safety-related hangers and pipe penetration seismic guides inside RWCU guard pipe not installed in accordance with construction/design drawing requirements. The licensee conducted training classes of the new Procedure BAP 3.2.5, "Piping Component Supports," which provided specific and generic instructions to the craft, supervisory, quality control, and technical services personnel on the fabrication, installation, and inspection of pipe supports. Hangers previously installed were then inspected and reevaluated to the criteria of the new procedure. Region III reviewed this reverification inspection activity to ensure procedural adequacy of the program and concurred with the effectiveness of the new QC program results, which is documented in Region III Inspection Report No. 50-461/81-14. This inspection revealed that an improved installation traveler had been instituted that incorporated additional detail and steps to minimize weld distortion when installing seismic guides inside guard pipe assemblies. A review of S&L's engineering evaluation determined that a zero clearance condition would not result in unacceptable stresses for any of the assemblies. Tests performed on a penetration assembly, which was witnessed by a Region III inspector, revealed that a minimum or no preload existed within the assembly. Thus, substantiating S&L's engineering evaluation and disposition "accept-as-is" to NCR 4151.

c. (Closed) Noncompliance (461/81-07-02): Additional example of failure to follow procedures for installation and inspection of large bore piping suspension systems as identified in Region III Inspection Report No. 50-461/81-05. Resolution to this matter is described above in Paragraph 2.b.

d. (Closed) Noncompliance (461/81-05-03): Hanger inspection program ineffective and insufficient. The licensee developed and instituted a three phase program for the installation and inspection of piping component supports/hangers to provide a more timely inspection program. This program provides an improved methodology to identify repetitive problems so that corrective action can be initiated to prevent recurrence. A review of the implementation of this program (new procedure, BAP 3.2.5) was conducted by a Region III inspector and the results were found to be acceptable as documented by Region III Inspection Report No. 50-461/81-14. In addition, this three phase program was again sampled by a RIII inspector and found to be sufficiently acceptable as documented by Region III Inspection Report No. 50-461/84-28.

e. (Closed) Noncompliance (461/81-05-04): Failure to perform effective audits in the area of hanger design and installation activities. A review of the licensee's construction QA surveillance program was conducted and found to be upgraded to include a plan and pre-prepared detailed surveillance checklists which are used during in-process surveillance of hanger installation/inspection activities. Also, the licensee has instituted a field verification/ overinspection program in this area which was reviewed and found acceptable.

The plan for coordinated licensee and contractor audits and surveillances was developed and implemented in conjunction with a trial three phase hanger installation and inspection program. A Region III review of this trial program was conducted and found to be effective and being implemented adequately per Region III Inspection Report No. 50-461/81-14.

f. (Closed) Noncompliance (461/81-05-11): Pipe suspension components were fabricated and installed prior to formal calculations (design verification) being performed and documented including review and approval by authorized personnel. Management failed to act to prevent further fabrication and installation of seismic supports when the apparent problem concerning lack of formal approval of calculations had been identified. Sargent & Lundy had issued ECN 2071, which put the remaining uninstalled (but previously fabricated) non-verified dynamic hangers on hold until load verification was complete. Drawings for dynamic supports installed without verification of new loads and those on hold were reissued based on new load verification and formal design calculations which have now been reviewed and approved by authorized personnel.

All unfabricated dynamic supports for the Containment, Fuel and Auxiliary Buildings were put on hold in late 1978 by ECNs 844 and 908, because of response spectra changes to those buildings. Installation of dynamic supports continued in the Control and Diesel Generator Buildings, since the response spectra changes in those buildings were minimal.

g. (Closed) Unresolved Item (461/81-05-13): Any generic design changes should be accomplished with ECNs, which are a function of the A-E, and not FCRs which are site generated design change requests. Procedure BAP 1.2, "Field Change Requests," was revised by PCR-156-82, and form JV-255-Field Change Request was revised to provide for review and approval by the appropriate design organization. The provision for field implementation of generic FCR changes has also been removed from Procedure BAP 1.2.

h. (Closed) Unresolved Item (461/81-05-14): Design safety margins could be reduced as a result of the issuance of an FCR that does not have an engineering basis firmly established. The licensee issued NSED Procedure D.8, "Handling Clinton Power Station Field Change Requests," which emphasizes the need for concurrences by responsible design organizations on FCRs prior to the start of work, as outlined by Paragraph 12 of this procedure.

i. (Closed) Unresolved Item (461/81-14-01): The installed existing condition of sway strut hanger 1RH-20001R was questionable in the following three areas: (1) no clearances between the pipe clamp and the vertical structural frame members, yet the design did not call for a horizontal restraint; (2) one vertical frame member was welded approximately ⅛ inch from the floor embedment plate edge; (3) whether or not rigidity of the embed plate was considered. S&L evaluated the above conditions and determined that the installed configuration was unacceptable, because the support would function as a rigid type support. S&L has revised the support to widen the distances between the vertical frame members to enable horizontal movement. Rework has been completed in accordance with NCR 5410. The support base plate was changed to 12"x17" and welded on both sides across the existing embed, thus eliminating the ⅛ inch embedment edge distance problem. The 1½ inch minimum edge distance requirement which S&L has specified is a limitation put on Baldwin Associates for hanger relocation. The 1½ inch minimum edge distance does not apply to S&L designed hanger drawings. The embedment plate had been previously analyzed. The pull-out load for this 15"x15" plate is rated at 6 kips at the most conservative point.

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

(Closed) 50.55(e) Item (461/84-15-EE): Skewed auxiliary steel connections installed without design details. This item is also associated with allegation RIII 85-A-0047 concerning S&L using the wrong weld symbol for fillet welds, documented in Paragraph 4.b of this report.

4. Followup on Allegations

a. (Closed) Allegation RIII-84-A-0182

On December 14, 1984, Region III received information concerning a pipe hanger that may not have calculations supporting the as-built

field installation, since calculations performed on this hanger in August 1984 were for the design drawing, which was different than the as-installed hanger configuration. The alleger did not know the particular hanger number, but that it could be located by looking through S&L's August 1984 log books for a hanger prepared and reviewed by persons with certain specified initials.

NRC Review

Since the alleger could not identify the specific hanger number involved, the inspector during a site visit on April 29 through May 3, 1985, reviewed S&L's internal uncontrolled hanger transmittal log books which listed pipe supports sent to the Structural Engineering Department (SED) from Mechanical Design Drafting (MDD). Four hangers were found in the log books which were analyzed in the August 1984 time frame with the specified initials. The hanger numbers/transmittal numbers are as follows:

Large Bore Support Log Book

Transmittal No.	Hanger No.
5592	M-1FW03049R, Revision D_2
5565	M-1HG20005, Revision D_1
5530	M-1SC07004V, Revision D_1

Small Bore Support Log Book

Transmittal No.	Hanger No.
10947	M-1RB11505G, Revision C_1

S&L was asked to compile the latest design drawings for the above supports so a field verification walkdown could be conducted by the inspector. S&L performed their own walkdown of these supports on April 30, 1985. S&L informed the inspector of their findings. It was pointed out by S&L that the particular hanger involved was probably M-1FW03049R, which is a non-safety related Class D pipe support in a non-safety related building (Turbine Building). Of the four supports walked down by S&L, this was the only one which differed from the latest design drawing and supporting structural calculations. S&L informed the inspector that this particular Class-D support was forwarded to S&L's (SED) group on August 28, 1984, from S&L's (MDD) group on transmittal No. 5592 to revise the auxiliary steel calculations for increased loads due to the IE Bulletin 79-14 as-built piping analysis program. This IE Bulletin 79-14 program consisted of using the as-built support locations on the piping and re-running the pipe stress analysis to reflect the actual support locations and loads. This program was not meant to reflect the as-built configuration of the pipe supports.

Since this Class-D hanger was located on a high energy system line in a Non-Category 1 building, BA was required by S&L to verify that the as-installed hanger coincides with the hanger configuration of the design drawing. This requirement is known as the Class-D Reverification Program. BA generated a marked-up field drawing of this hanger on February 9, 1985, which indicated the discrepancy between the as-installed support condition and the design drawing. BA then transmitted the marked-up hanger drawing to S&L on March 25, 1985, for review and evaluation of Balance of Plant (BOP) Sub-Boundary 1FW03.

Subsequently, the NRC inspector and a BA QC inspector conducted their own field verification walkdown of these supports to the latest S&L design drawings and found only the one discrepancy noted above, which pertained to a non-safety related hanger in the Turbine Building. The NRC inspector determined from the calculational design review and field walkdown that this was the alleged hanger.

Conclusions

The inspector concluded that the required design interfaces are being performed and met in accordance with Baldwin Associates Project Procedures Manual BAP 3.2.5, "Piping Component Supports," BAP 3.2.9, "Piping As-Builts," BAP 3.2.10, "Non-Safety Piping and Instrumentation Hanger Verification," and Sargent & Lundy Engineers Project Instruction PI-CP-028, "Field Installation Data Required to Permit Configuration of Piping Subsystem Analysis."

Thus, the inspection substantiated the alleged as-installed non-safety related (Class D) hanger was, in fact, different than the design drawing and supporting calculations. However, implementation of the above procedures assured that the required design interfaces were and are being met by virtue of BA's BOP Sub-Boundary 1FW03 transmittal to S&L, dated March 25, 1985.

b. (Open) Allegation RIII-85-A-0047

On February 28, 1985, an alleger contacted a Region III inspector at the Clinton NRC Resident Inspector office with various concerns. While Allegation RIII 85-A-0047 remains open pending completion of the Department of Labor's review of certain aspects of the alleger's concerns, the technical aspects of the concerns have been evaluated and are closed as described in the following paragraphs.

Concern (1)

Unqualified engineers are performing final traveler reviews. Many of the reviewers do not have a degree or required experience for a Field Engineer in accordance with BA's "Job Description" requirements for a Field Engineer in the Piping Construction Department.

NRC Review

The personnel in BA's Resident Engineering Departments-Traveler Preparation and Review Group (TPRG) who prepare and perform "final reviews of piping, instrumentation, head-fitting fabrication and installation travelers and associated component support travelers" are classified per BA's "Job Description" as Technical Assistants in TPRG not Field Engineers. The educational requirement of this position is the minimum of a high school diploma preferably with two or four years of college education, and the required work experience preferably two years nuclear.

Conclusions

The concern was not substantiated, in that individuals performing final traveler reviews are not required to be an engineer or have an engineering degree by BA's job description for a Technical Assistant in (TPRG). Thus, the personnel performing these final traveler reviews were qualified for their positions.

Concern (2)

Traveler Package Review Group (TPRG) is not permitted to prepare NCRs or FCRs.

NRC Review

In accordance with BA Procedure BAP 1.0, "Nonconformances," Revision 17, an individual or organization which is identified as having responsibilities within this procedure is Resident Engineering (RE). Classified within the RE group is TPRG. Any BA project personnel can identify nonconforming conditions, but only personnel in Quality & Technical Services (Q&TS), RE, or Subcontract Manager (SC) can initiate the NCR per this procedure.

Even though the program and procedures existed which permitted TPRG to initiate NCRs, a BA audit found that TPRG wasn't always preparing NCRs when they should have been.

BA issued Corrective Action Request, CAR-246, dated May 14, 1985, as a result of the audit which was conducted because the alleger contacted the SAFETEAM and Concerns Research Group. The CAR was written against TPRG for circumventing the NCR program during final traveler reviews. Nonconforming conditions were being identified on BA Interoffice Memorandum in lieu of an NCR.

BA procedure BAP 1.2, "Field Change Requests," Revision 12C, governs the generation of FCRs. It gives no restrictions on who can initiate an FCR. It denotes that employees are responsible for identifying conditions that prevent fabrication, installation, and inspection in accordance with existing documentation or request clarification shall initiate an FCR and forward it to the Resident Engineer.

Conclusions

BA procedure BAP 1.0 and program allows for and permits the initiation of NCRs by TPRG personnel.

BA procedure BAP 1.2 limits the initiation of an FCR to no one, and further requires employees to identify the above conditions on FCRs. Thus, this concern was not substantiated.

Concern (3)

BA is not authorized to "vault" travelers without permanent hangers being installed.

NRC Review

The particular traveler alluded to was Instrumentation/Tubing Traveler RT-957, Revision 5, which was vaulted with only temporary hangers installed. BA Procedure BAP 2.6, "Instrumentation," Paragraph 5.7.2(c) requires that final walkdown inspections of instrumentation pipe and tubing be documented on a Instrumentation Piping/Tubing Traveler Walkdown Inspection Checklist, Form JV-843. The particular inspection checklist Form JV-843 for the above traveler, which was dated October 27, 1984, was marked "NA" in the sequence step attribute "Supports Installed and Accepted." This would indicate that the permanent hangers have not been installed/inspected to the RT-957, Revision 5, traveler package. Temporary hangers were installed to support integrated flush and RPV hydro milestones and then the travelers were vaulted to avoid loss.

Permanent hangers are installed on the instrumentation pipe and tubing by the use of a JV-704 Form, "Instrument Hanger Installation Travelers", and the final acceptance inspections of hangers are documented on JV-842 Form, "Instrumentation Hanger Inspection Checklist."

Conclusions

The concern was not substantiated, since BA procedure BAP 2.6 does not preclude the vaulting of instrumentation pipe/tubing travelers with only temporary hanger installations. Furthermore, it permits the issuance and processing of supplemental travelers as required after original travelers have been initiated and forwarded to the vault. In addition, supplemental QC inspection checklists are generated, as necessary, to include provisions for reinspections.

Concern (4)

QC inspectors are not checking instrument piping bend radius/ovality to "limited bend radius" requirements. A clarification to BA Procedure 2.6, Revision 7, was requested on a BA "Request for Procedure Clarification" (RPC) form, dated December 14, 1984, which was not processed, so how is QC verifying radius/ovality when there are no requirements?

NRC Review

The "Request for Procedure Clarification" (RPC) form dated December 14, 1984, was assigned a specific tracking number RPC-121. The responsible organization reviewed, approved, and properly provided a timely response, dated December 18, 1984, to RPC-121. The RPC resulted in a BA procedure change. BAP 2.6, Revision 7A, was issued on March 7, 1985, to include the change referred to in the answered RPC (inclusion of pipe ovality requirements). However, the individual requesting this procedure clarification did not receive a response to his RPC. The response to this RPC was inadvertently transmitted to a different building location because of an incorrect mail locator code (V-350 versus V-530) being used on the RPC.

An inspection program had been previously established to check instrument piping bend radius/ovality per the provisions of BA Procedure Quality Control Instruction, QCI-302, "Piping/Mechanical QC Inspection Criteria Piping Systems Fabrication/Installation." Implementation of this procedure by the BA Quality Control inspection personnel was found to be inadequate, as was QCI-302; in the area of pipe bend and ovality verification, as previously documented by Region III Inspection Report No. 50-461/83-15. To correct this condition the licensee committed to 100% reinspection of all two inch and under ASME pipe bends.

Conclusions

The concern was not substantiated, in that the RPC was, in fact, processed as evidenced by the resulting procedure change to BAP 2.6 and QC was checking bend radius/ovality previously per BA Instruction QCI-302. When BA deleted QCI-302 per BA Quality Procedure Change Request (QPCR) 84-150 and incorporated the requirements into Procedure BAP 2.14, they neglected to additionally incorporate these requirements into BA procedure BAP 2.6. BAP 2.6, Revision 8A, currently in use does provide adequate controls for verifying bending radius and ovality. Controls were also provided by Procedure BAP 2.14, Revision 10, "Fabrication/Installation of Items, Systems, and Components." The inspector reviewed instrumentation travelers and found these attributes (bending radius and ovality) were being verified by BA QC.

Concern (5)

Traveler Addendums are being used to correct nonconforming conditions rather than Nonconformance Reports.

NRC Review

The specific case given by the alleger was identified to be contained in Traveler Package No. H-SM-910-E. Upon review of the documents in this package, it was revealed that previously installed and accepted hardware (bolting material) was corrected and changed via a BA Interoffice Memorandum generated by the Final Review Group in TPRG to the Resident Engineer (RE) group dated November 9, 1984. Field Engineering, which is part of the RE group, then initiated Traveler Addendum No. 3 to the above traveler package to remove the incorrect bolting hardware, replace it with the correct material, and perform reinspection. BA Procedure BAP 1.0, "Nonconformances," requires that the above type deviating condition be documented on an NCR.

Conclusions

The concern was substantiated, in that nonconforming conditions were, in fact, being resolved and corrected by using traveler addendums and interoffice memorandums. Hardware deficiencies are being corrected in the field by traveler addendums originated by RE Field Engineering. Utilization of this method to correct existing nonconforming conditions was, in fact, circumventing BA's Nonconformance Procedure BAP 1.0. The licensee was informed that identifying and correcting nonconforming conditions by memos and traveler addendums is bypassing the NCR program and is a violation of 10 CFR 50, Appendix B, Criterion XV (461/85026-01).

Concern (6)

The same material requisition number (P62361) appears on several piping travelers. The travelers indicate that approximately 332 feet of tubing was requisitioned.

NRC Review

The specific seven piping travelers which the alleger identified are as follows: RT-913, RT-914, RT-920, RT-904, RT-910, RT-911, and RT-912. The above travelers were reviewed and the material being requisitioned was ½ inch outside diameter stainless steel tubing, SA213/TP316L, identified by RIR Number S14460 and Heat Number 466162. The total length of tubing requisitioned amounted to 320 feet on these travelers. A review of documentation records indicated a total quantity of 13,895 feet of this material with the above Heat Number/RIR Number was procured.

The assigning of requisition numbers to material requisitions is the responsibility of the Warehouse Superintendent who obtains these numbers from a sequential warehouse log book. A review of this log book indicated an error was made since the same requisition number (P62361) was placed on two different material requisition, one dated June 11, 1984, for 20 feet of ½ inch tubing, and the other dated June 13, 1984, for 300 feet of ½ inch tubing.

Conclusions

The concern was substantiated, in that the same requisition number (P62361) was found on two separate material requisitions. However, these warehouse material requisitions do not become part of the traveler packet, because QC/TS verify and document an item's identification markings on the appropriate forms (JV-028 or JV-490) which become part of the traveler packet to ensure traceability verification during the fabrication/installation process. Also, the warehouse requisitions are removed from the traveler packet in accordance with BA procedure BAP 2.6, Paragraph 5.8.3, since the material traceability (Heat Number/RIR Number) are documented on the above JV-forms. Thus, the warehouse requisitions only serve as a means by which to obtain material from the warehouse and the sequential numbers recorded on the requisitions are essentially meaningless numbers as a quality document.

Concern (7)

Closure of three NCRs (8562, 11653 and 22670) were improperly dispositioned since the design organization, Sargent & Lundy (S&L), was not routed copies for concurrence as required by ECN-4598, when referencing Code Case N-316.

NRC Review

ECN-4598 issued by S&L on October 18, 1984, requires their design concurrence for the use of Code Case N-316, "Alternate Rules for Fillet Weld Dimensions for Socket Welded Fittings," when applied against piping design tables other than those listed on the ECN.

The three NCRs (8562, 11653, and 22670), each of which superseded the other, resulted in an "accept-as-is" disposition by GE and NSED, not S&L, for the final NCR-22670. GE's disposition, dated October 17, 1984, to the final NCR was based on referencing Code Case N-316. NSED reviewed the NCR and agreed with GE's disposition and closed NCR-22670 on October 30, 1984. Since the NCR was against an orifice flange supplied by GE for the Reactor Water Cleanup System, RT-904 Isometric, under GE's Specification K-2801, it was their responsibility to disposition the NCR and not S&L's. ECN-4598 only applies to S&L designed systems and components supplied under S&L Specification K-2882.

Conclusions

The concern was not substantiated, in that NCR-22670 was properly dispositioned by GE and closed out by NSED. In addition, Code Case N-316 has been endorsed and accepted by the NRC as referenced in Regulatory Guide 1.84.

Concern (8)

NCR 23198 was improperly closed. The designers disposition required that permanent supports be installed in order to obtain proper slope of the instrument sensing line. However, slope was verified and accepted with only temporary supports and the NCR was closed.

NRC Review

The designers disposition in block 18 of the subject NCR, specified to install the supports per the design; the required permanent supports. BA's QC inspections performed on November 24, 1984, and documented on Form JV-843, "Instrument Piping/Tubing Travelers Walkdown Inspection Checklist," was marked N/A for the attribute "Supports Installed and Accepted." This indicated that permanent supports were not installed. BA then issued Inspection Report (IR) No. M84-4426, dated November 24, 1984, and closed the NCR.

The designers disposition was not complied with, since permanent supports were not installed per design. Pipe slope was accepted with temporary supports installed. This problem (generic) occurred because piping/tubing travelers were turned over to support integrated flush and RPV hydro milestones and BA's QC accepting the travelers without the permanent supports being installed.

Subsequently, BA realized there was no procedural method or program in effect by which QC would reverify slope after the installation of permanent supports, and BA issued Corrective Action Request (CAR-226), on February 7, 1985.

BA's QE group reviewed the turned over piping/tubing travelers to determine if slope was inspected and compiled a list of travelers requiring reinspection. The list of travelers requiring slope reverification are documented in BA letter JLT-1649-85. BA implemented a "Z" traveler program for finalized piping/tubing travelers which were accepted without permanent supports being installed, so slope could be properly verified after all required permanent supports are installed and accepted.

Conclusions

The concern was substantiated, in that the NCR was incorrectly closed since slope was verified and accepted with only temporary hangers installed. A "Z" traveler program has been implemented to correct the problem, which will be verified by the NRC during future inspections.

Concern (9)

Sargent and Lundy (S&L), Architect-Engineer (AE) is using the wrong weld symbol for fillet welds. The symbol is not per AWS. S&L uses the same symbol for a "bevel groove" and "fillet" weld. (Example provided)

NRC Review

The inspector reviewed the examples provided by the alleger. The alleger's example references a skewed joint design where the skewed angle exceeds that which is exhibited in the American Welding Society (AWS) Structural Welding Code D1.1. AWS D1.1, Figure 2.7.1, requires the skewed angle for fillet welds be limited to from 60 to 90 degrees on the acute angle of the skew. The AE utilizes the fillet weld symbol for skewed joints ranging from 30° on the acute angle of the skew. This is a departure from the AWS D1.1, Figure 2.7.1; however, the AE has performed calculations which takes in account the reduction of throat on the obtuse angle and the incomplete penetration in the acute angle. This weld configuration was qualified by the contractor onsite. Inspection requirements for this type of weld were addressed in NRC Inspection Report 50-461/82-20 as an open item (461/82-20-05). This item was closed in NRC Inspection Report 50-461/84-28. In addition, a 50.55(e) deficiency report (461/84-15) was submitted to the NRC by the licensee.

Conclusions

Although the AE specified the skewed joint angle in excess of the ASW D1.1 60° limit for fillet welds, the contractor prepared and qualified an acceptable welding procedure that was utilized by the AE to perform weld strength calculations to assure that an adequate weld size was included in the weld joint design due to increase in the angle of the skewed joint. The inspection criteria was evaluated by the AE to include the variables of the increased angle, and these requirements were invoked in the applicable design documents. The NRC found the welding procedure, the weld joint design, the design analysis, and the inspection criteria to be adequate.

Concern (10)

Hilti bolts were procured non-safety related and they are being installed in safety-related systems.

NRC Review

This deficiency was previously reported to the NRC on January 11, 1984, as a 10 CFR 50.55(e) deficiency report (55-84-02 - Material Traceability). The licensee's response was as follows:

"Baldwin Associates Quality Engineering has qualified Hilti as a safety-related suppler utilizing documentation obtained through the Coordinating Agency for Supplier Evaluation (CASE) and other sources. Past purchase orders for Hilti bolts have been evaluated. The results of this evaluation determined that the materials and certifications meet the requirements of S&L Specification K-2944 (Ref. Letter Y-18116, dated January 29, 1985)."

The inspector reviewed the CASE audit performed by another nuclear utility for applicability to the requirements the licensee's program. The evaluation examined the adequacy of the Quality Assurance Program (QAP) and its implementation. The QAP was evaluated against the applicable requirements of 10 CFR 50, Appendix B, and ANSI N45.2. The audit appeared to be adequate to assure compliance to the licensee's Quality program requirements. In addition to the CASE audit, the licensee obtained documentation of audits and surveys performed by an architect-engineering firm who qualified the supplier for Hilti fasteners for nuclear construction from May 12, 1977, through March 15, 1984.

On September 11 and 12, 1979, onsite testing was performed by Hilti, Inc., on the Kwik Bolt drilled in, expansion-type, concrete anchor. The tests were required to verify that the Kwik Bolt anchor could meet the AE performance requirements detailed in Form CPS-1-CEA. The test results in this report exceeded the load requirements specified by the AE.

Conclusions

The licensee's evaluation of the supplier of Hilti bolts, both present and past, was adequate to assure the supplier had in place a quality assurance program which meets the requirements of 10 CFR 50, Appendix B. The supplier of Hilti bolts was required to supply certificates of compliance with each purchase order and the onsite testing provides adequate assurance that the Hilti fasteners will perform their design function when utilized in accordance with approved procedures.

c. (Closed) Allegation RIII-85-A-0078

Basic Engineers strut type pipe clamps (BE-412) are being installed in the Control Building on the Instrument Air System without any installation procedures or criteria and carbon steel shims are being used on these supports rather than the lead shims called for by the drawing.

NRC Review

The inspector requested the licensee to conduct a walkdown of the Instrument Air System in the Control Building to determine where these clamps were located on the piping system, so the inspector could view the clamps in the as-installed condition. All of the 3/4" or greater piping was visually walked down by the licensee's NSED group since this clamp is only utilized on piping 3/4" and greater. NSED documented their findings on IP Interoffice Memo Y-36042 L42-85(06-27)-L 4F.190, dated June 27, 1985. NSED denoted in the interoffice memo that no installations of the BE-412 clamp were found on the Instrument Air piping in the Control Building.

BA's procedure BAP 3.2.5, "Piping Component Supports," Revision 7, identifies the installation requirements for the BE-412 type clamp on page 3 of Attachment 4. Also, installation tolerances for this type clamp are contained on Sargent and Lundy's drawing M09-1001N, "Component Support Installation Tolerances and General Notes for 2½" Diameter and Larger Piping," Sheet 7.

Conclusions

The allegation was not substantiated, since the BE-412 clamps couldn't be located on the Instrument Air Systems piping in the Control Building. No installation of the subject clamps could be found on the Instrument Air System in the Control Building; however, adequate established controls existed in the approved BA procedure, BAP 3.2.5, should these clamps have been used.

d. (Closed) Allegation RIII-85-A-0063

Inadequacies in the Design and Installation of Seismic Conduit and Cable Tray Hangers and Supports

The alleger verbally presented the following concerns to the licensee. The licensee presented to the NRC the recorded conversation of the alleger's concerns at the alleger's request. The concerns were categorized into seven issues (concerns) and were addressed by the licensee as follows:

Licensee Response

Concern (A) states: "Concerned about the following three aspects on the topic of Design and Documentation of Auxiliary Steel (AS) for Nuclear Safety Related Seismic Category I conduit supports:

1. The AS components are changed at random by unclarified revisions in the remarks column of the Conduit Support Schedule (EIT) drawings.

2. Supports are attached to AS that are only identified in the remarks column of the EIT drawing.

3. There is no consolidated index tying AS to conduit supports. There is no way to identify which AS members are still needed."

The licensee's SAFETEAM contacted the Baldwin Associates (BA) Electrical Engineering department who stated, when the requirements of an AS member are changed, the new requirements are entered into the remarks column of the EIT drawing. The change document that requested the change of the AS member is also entered.

In addition to being identified in the remarks column of the EIT drawing, AS members are also identified on the Conduit Hanger Floor Plan (EIH) drawing. EIH drawings identify specific locations of conduit supports and the corresponding AS member number is entered directly below the support identification number.

Conduit supports (CS) are listed on the corresponding EIT drawing alphanumerically. EIT support lists are structured according to system designation. If changes to a conduit support or an AS member are required, the EIT drawing is revised. Sargent & Lundy's Engineering department stated that the existing system adequately controls changes to the AS members and there is no need for a consolidated index.

Concern (B) states: "Conduit runs that attach to cable tray hangers are not tabulated in the remarks column on the drawings, making identification of that run difficult in seismic areas."

The Sargent & Lundy architect general construction drawing for all disciplines (e.g., Mechanical, Piping, Electrical and Civil/ Structural) is interrelated and tabulated by disciplines with specific and general tolerances, allowances, technical requirements and typical information.

If there were a requirement for Sargent and Lundy to correlate, tabulate and break down all items on the existing drawing, the quantity of drawing onsite would double.

It is the responsibility of each individual involved to review and become familiar with tolerances, allowances, and typical information on the drawings.

Concern (C) states: "Sargent & Lundy (S&L) conduit installation drawings do not convey any three-dimensional configuration. Because of this, field engineering cannot tell what the three-dimensional configuration of the conduit run should be."

S&L conduit installation drawings are not designed to specifically represent three-dimensional configuration. Conduit Hanger Floor Plan drawings (EIH) reference elevation points where conduit attaches to a support. Elevation reference points are also identified to reflect changes in conduit run configuration. Specification K-2999 Division 9 (Conduit and Support Work) and Standard STD-EB-146 provide additional design installation tolerances for conduit and support installation.

The Senior Electrical Field Engineer may field route conduit in accordance with S&L's field route criteria. (Reference S&L's E05-1900 series drawings.) When this option is utilized, a Field Conduit Change Notice (FCCN) shall be generated and incorporated into the Traveler by Traveler revision. Copies of the FCCNs are transmitted to S&L for their reference. FCCNs are addressed in Baldwin Associates Procedure (BAP) 3.3.1.

Concern (D) states: "Sargent & Lundy (S&L) drawing E29-1002 series for Diesel Generator Building for nuclear safety category I conduit supports. This drawing was revised and released on March 20, 1981, without traceable documentation recorded on the original. Through reproduction the construction prints were distributed in field document control stations. Therefore, due to S&L improper documentation the correlation between design and actual nuclear safety related seismic category I conduit supports may be indeterminate. Without trackable documentation with specific descriptive parameters, the interpretation of diagrammatical changes within a drawing revision cloud is subject to conflicting decisions concerning design intent, installation requirements and quality posture." No specific examples were given.

The licensee's SAFETEAM investigated Baldwin Associate program of Traveler review. These reviews assure the installation meets all current program requirements.

Nuclear Support Procedure NS1.51, Nuclear Station Engineering Department (NSED) Procedures D.1, D.3, and D.4 should add understanding of the review, approval and issue of drawings. NSED Procedures X.0 - X.7 should answer your questions concerning changes to drawings, "as builts," and revision configuration control.

The E29-1002 series drawings were reviewed and found to contain references to traceable documentation. These references were on each E29-1002 Diesel Generator series drawing examined. In addition, change documents were posted on the applicable drawings.

Concern (E) states: Concerned about the drafting presentation of Sargent & Lundy drawings. You could look at electrical installation (EI), electrical installation hanger (EIH), or conduit drawings sectional views and see that the conduit support numbers aren't there. You end up with a multitude of struts, or supports, coming from the hanger. None of these are identified in the drawing which results in confusion. Craft is trying to attach the conduits to various supports and the conduit in the section views are not even identified.

Baldwin Associates' Procedures (BAP) 3.3.14 explains electrical installation. Section view drawings must be used in combination with other documents. One set of these documents is the electrical installation tabulation (EIT) series drawings. The E-05 1990 series drawings, allowable conditions, and 1980 series drawings can also be used in combination with the EITs to clarify section view drawings. The combination of these drawings should provide the exact location of each support. The typical support will also be identified as well as the tolerances for installation.

Concern (F) states: "The conduit separation criteria of Baldwin Associates (BA) Quality Control (QC) checklists consists of one sentence which asks the inspector to make sure that a conduit does not touch another plant component. Such a criteria is not much more than a general sort of statement. Because of this, the actual separation criteria called for by the consulting engineer may not be inspected. No specific separation problems were cited as examples."

SAFETEAM has investigated your concern and learned that the current checklist used in conduit installation by Baldwin Quality Control has eight specific requirements related to conduit separation adequacy, and includes the architect/engineer's separation criteria. The checklist (Form JV-1173, effective date October 12, 1984, nine pages) requires verifications of conduit separation.

Item	Checklist Part	Attribute/Criteria Synopsis
1.	III	Verify conduit diameter to drawing
2.	V.A	Verify conduit end length to drawing
3.	V.E	Verify flex conduit length (max=72")
4.	V.J	Verify no kinked conduit
5.	V.K	Verify conduit for instrumentation/ controls have 1" horizontal/vertical separation
6.	V.K	Verify shielded cables parallel to power cables have 1" horizontal/ vertical separation
7.	V.L	Verify conduit routed through block wall has a minimum of ¼" clearance
8.	VI.B	Verify separation criteria of drawing E05-1980 are met (this is a Sargent & Lundy - Architect/ Engineer, i.e., design criteria, drawing)

Quality Control inspection parameters are found in a variety of places in Baldwin work documentation packages (Travelers). The Travelers incorporate the technical intent of the architect/ engineer generated specifications and drawings. Separation criteria may appear in Travelers several ways. This can include, but is not limited to, the following items that may have separation criteria:

- Form JV-854-1 usage. (Included here is a specific construction acceptability verification of drawing configuration adherence, and conduit attachment detail adherence.)
- Engineering Change Notices
- Field Engineering Changes Notices
- Field Change Requests
- Nonconformance Reports

- Field Conduit Change Notices (This includes specific separation criteria verifications and interference checks).
- S/L Design Drawings (EI/EIH/EIT/E05-1900)
- Work Procedures
- Flex conduit lengths
- Flex conduit overall fit up
- Final flex conduit installation
- Architect/engineer resolutions

And finally, BA QC inspection conduct, per BAP 3.3.1, Revision 17, and/or BAP 3.5.12, Revision 2, can include, but is not limited to, the following additional actions, each of which may apply to conduit installation/conduit separation checking:

- Initial Traveler reviews (entire)
- Final Travel reviews (entire)
- Preinspection familiarization with applicable codes, standards, drawings, procedures, and Travelers
- Conduit routing
- Conduit spans
- Conduit attachment locations
- Specification changes
- Nonconformance Reports
- Containment tolerances for attachments

Concern (G) states: Conduit numbers can only be correlated through the Traveler. Correlation on conduit numbers is an interpretation of indeterminate items within the Traveler.

Travelers define and describe the scope of the work to be performed.

The fabrication and installation Traveler describes location of the run (from item to item), the embedments the run will attach to, and the identification required on the conduit run, determined by the Sargent & Lundy routing criteria.

Indeterminate items throughout the system are controls by engineering by Field Change Requests, Engineering Change Notices, and the Nonconformance Reports.

All Traveler packages and inspection records are combined into one complete area turnover package. This compiled turnover package correlates all work performed within the area to be turned over to Illinois Power.

All conduit at the Clinton Power Station has been ordered and supplied with a certificate of conformance (C of C). The C of C permits BA to install and use conduit in both safety related areas and non-safety related areas.

NRC Review

The inspector reviewed the licensee's SAFETEAM response, performed interviews of SAFETEAM personnel, performed field verification of their responses, reviewed applicable procedures, drawings and traveler packages, with no adverse findings.

Conclusions

The concerns of the alleger appeared to be critical of the Architect-Engineer's (AE) drawing program. The concerns expressed were difficult to comprehend and in most cases were vague and generalities. No specific safety violations were addressed. Although some of the statements the alleger made were factual, there was no safety significance as a consequence. The licensee's and contractor's QA programs adequately specify the installation of seismic conduit, conduit and cable tray hangers and associated auxiliary steel. The AE drawings adequately depict the installation requirements, and the QA program has traceable documentation as required by federal regulations.

It should however be noted that Region III and the NRC's Construction Assessment Team (CAT) have identified electrical separation issues which are basically a design issue at Clinton. The licensee and the AE are currently working to resolve these issues. The NRC will perform followup inspections to assure this issue is adequately resolved.

5. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the onsite portion of the inspection and discussed the scope and concerns of this inspection. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary. Additional information was discussed telephonically with a licensee representative (denoted in Paragraph 1) on August 14, 1985.