U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-456/86040(DRS)

Docket No. 50-456

License No. CPPR-132

Licensee: Commonwealth Edison Company Post Office Box 767 Chicago, IL 60690

Facility Name: Braidwood Station, Unit 1

Inspection At: Braidwood Site, Braidwood, IL

Inspection Conducted: August 5-7 and 19-21, 1986

Dreslangetton Inspector

Approved By:

D. H. Danielson, Chief Materials and Processes Section

Inspection Summary

Inspection on August 5-7 and 19-21, 1986 (Report No. 50-456/86040(DRS)) Areas Inspected: Routine safety inspection of the verification of as-built conditions associated with structural installations (37051), and onsite design activities as they relate to structural and mechanical construction (37055). Results: No violations or deviations were identified.

9/19/86 Date 9/19/01

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DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*N. Kaushal, Project Field Engineering Manager
*E. Wendorf, Project Field Engineering Mechanical Supervisor
*A. D'Antonio, Regulatory Assurance
*D. Cecchett, Regulatory Assurance
*B. Acas, Construction Field Engineer
*D. Boone, Construction Field Engineer
*S. Mehta, Quality Assurance

Sargent and Lundy Engineers (S&L)

*D. Gallagher, Project Manager, Field
*M. Flynn, Mechanical Field Coordinator
*A. Lundardini, Structural Field Coordinator
F. Schallwane, Senior Structural Engineer

NRC Inspectors

*W. Kropp, Senior Resident Inspector, Construction *J. Muffett, Section Chief, Plant Systems

The inspector also contacted and interviewed other contractor employees.

*Denotes those attending the final exit interview on August 21, 1986.

2. Verification of As-Built Conditions (37051)

a. Documents and Procedures Review

The NRC inspector reviewed the relevant portions of the following documents and procedures pertaining to as-built structural installations to determine whether appropriate procedures have been established and whether they comply with NRC requirements and the licensee's commitments. The NRC inspector noted that the procedures and instructions appeared to be acceptable in terms of performing work activities associated with structural installation and inspection.

- S&L Standard Specification for Fabrication of Structural Steel, May 10, 1973.
- S&L Standard Specification for Erection of Structural Steel, July 12, 1966.

- S&L General Structures Work, Section 5-2, Miscellaneous Metalwork, Structural Steelwork and Embedded Work, December 27, 1983.
- S&L Instruction PI-BB-08, Processing of Commonwealth Edison Site Non-conformance Reports, Onsite Contractors Non-conformance Reports, S&L Engineering Change Notices and Advance Design Changes, June 4, 1986.
- S&L Instruction PI-BB-13, Procedure for Processing Commonwealth Edison Company Field Change Requests (FCR's).
- G. K. Newberg Construction Company QC Procedure Section 26, Welding, March 25, 1986.
- G. K. Newberg Construction Company QC Procedure Section 31, Erection and Inspection of Structural Steel, April 8, 1986.

b. Field Inspection of Structural Members

The NRC inspector randomly selected the following structural beams and columns for a verification inspection to determine whether the as-built configurations are consistent with the design documents.

Containment Building:

Beam Nos. 31707, 31902, 42102, 51602, 62001, 70154, 70576, 72159

Column Nos. R31 at Elevation 404'-0" R33 at Elevation 404'-0"

Auxiliary Building:

Beam Nos. 8AB198, 8AB241, 8AB291N, 8AB261 8.5AB44N-2T, 8.5AB55N-2T, 8.5AB220

Column Nos. S-17 at Elevation 451'-0" V-18 at Elevation 451"-0"

The above structural steel beams and columns were inspected with respect to the applicable design drawings for configuration, identification, location/orientation, connections, member size, and damage/protection. In general, the appearance of the structures was acceptable and the structural members were installed in accordance with design documents.

c. As-Built Structures Versus Final Load Check Program

During the inspection, the NRC inspector noted that many structural members had been modified or redesigned as a result of the licensee's implementation of the final load check program. In the containment

building for example, 171 out of a total of 1423 structural members, including beams, columns, and braces had been modified in accordance with the latest design loads. Additionally, 1058 connections out of a total of 2846 had been modified in accordance with the latest design drawings. Structural evaluations in conjunction with the final load design calculations and field inspection of structural members is also addressed in Inspection Report No. 50-456/86035.

d. Field Inspection of Pipe Hangers

During the field inspection of structural members, the NRC inspector also performed a visual examination of pipe hangers in the adjacent area to determine whether these hangers had properly been installed in accordance with established procedures. The NRC inspector noted that a discrepancy was identified on pipe hanger 1W031012R, Revision B, in the chilled water system. This hanger was designed to withstand a vertical force of 1,792 pounds during the emergency condition. Upon inspection it was found that the hanger had a loose turnbuckle such that the hanger was not load bearing and a 7/16 inch gap was observed between the connections. This safety-related pipe hanger had previously been inspected by the licensee's QC inspectors in accordance with the final linewalk verification checklist which requires that all nuts, bolts, turnbuckles, etc. be verified. The NRC inspector held discussions with licensee's representatives regarding the above concerns. Discrepancy Report No. DR-5436F and Nonconformance Report No. 6834 were subsequently issued as a result of the NRC's finding. In addition, four hangers in the adjacent area were reinspected by the licensee's QC inspector with no discrepancies being identified. This activity was documented in Monitoring Report No. 13,354. The licensee also selected 27 additional hangers for further evaluation, as documented in Monitoring Report No. 13,406. Results of the above hanger reinspection revealed that no similar occurrences were identified. This matter is believed to be an isolated occurrence and is considered resolved.

Within the areas inspected, no violations or deviations were identified.

3. Onsite Design Activities (37055)

a. Design Procedures Review

Sargent and Lundy is the major organization responsible for onsite design activities associated with the construction of the Braidwood facility. S&L's engineering personnel are involved in various activities in the areas of piping stress analysis, pipe support design, and civil/structural modifications. The following procedures and instructions were selected for review:

- S&L's DC-ST-03-BY/BR, Structural Project Design Criteria, Section 8: Codes, Standards, References, Design Reports, and Procedures, Revision 18, July 22, 1985.
- Structural Project Design Criteria, Section 10: Project Loads and Load Combinations, Revision 18, July 22, 1985.
- Structural Project Design Criteria, Section 37: Mechanical Component Support Design Criteria, Revision 18, July 22, 1985.
- Project Instruction PI-BB-25, Activities of the Onsite Structural Design Group, Revision 2, June 4, 1986.
- Project Instruction PI-BB-28, Activities of the Braidwood Station Mechanical Engineering, Piping Design, Support Design, Analysis and HVAC Systems Field Personnel, Revision 7, June 4, 1986.
- Project Instruction PI-BB-29, Distribution and Control for Design Documents for S&L Field Personnel at Braidwood Station, Revision 3, December 5, 1985.
- Design Control Summary, Assumptions and Procedures for Large Bore Pipe Supports: Calculation Book No. 13.1.1 and 13.2.1, Revision 8, March 15, 1985.
- Design Control Summary, Assumptions and Procedures for Hot Small Bore Piping Supports: Calculation Book No. 13.4.12, Revision 4, March 8, 1985.

The NRC inspector reviewed the relevant portions of the above procedures and instructions associated with onsite design activities to determine whether appropriate procedures/instructions have been established and whether they comply with NRC requirements and licensee commitments. The NRC inspector found that the aforementioned procedures/instructions pertaining to onsite design of piping systems and structures appeared to be acceptable.

b. Design Process Review

The NRC inspector randomly selected the following documents for review:

(1) Drawing Revisions Resulting from Design Changes

Drawing No.

Piping System

1CCF107014T, Revision A Component cooling 1CV17105T, Revision B Chemical and volume control 1FW96C001T, Revision D Feedwater 1MS93A002T, Revision C 1RC21118G, Revision B Main steam Reactor coolant

(2) Engineering Change Notice (ECN) Pertaining to Hanger Field Problems

Engineering Change Notice No. 09490 09500 09504

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Pipe Hanger No.

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1AF05065X, Revision E
1SX02072X, Revision F
1CV44037X, Revision B
1CCF38024G, Revision D
1RC11098S, Revision C

(3) Engineering Change Notice Associated with Structural Field Problems

ECN No.	Reason for Design Change
32901	Verification of Material Strungth
32910	Structural Medifications
32921	Structural Modifications
32927	Structural Modifications
32928	Structural Modifications

(4) Field Change Request Pertaining to Mechanical and Structural Problems

FCR Nc.	Reason for Change Request
21868	To meet separation criteria
21998	To permit hydrotesting at 150 psig
22004	Lack of test isolation capability
22257	To permit performance of hydrotest
22985	To expedite construction
23022	To expedite construction
23025	For fire damper accessibility
23035	To suit for field condition

(5) Release of Latest Drawings to Contractors

Structural Drawing No.	Location
S-2112, Revision G	Containment Building
S-2125, Revision AP	Containment Building
M-913, Revision G	Containment Building
S-2147-BR, Revision AF	Auxiliary Building
S-2155, Revision T	Auxiliary Building

Pipe Hanger Drawing No.

Piping System

1CCF107014T, Revision A 1CV17105T, Revision B 1FW96C001T, Revision D 1MS93A002T, Revision C 1RC21118G, Revision B Component cooling Chemical and volume control Feedwater Main steam Reactor coolant

The NRC inspector reviewed the relevant portions of the above selected documents with respect to the applicable procedures, instructions, NRC requirements, and the licensee's commitments. Further, the NRC inspector verified that the latest structural and pipe hanger drawings issued by S&L were being used in the field. The NRC inspector also verified several design parameters with the onsite design engineers who performed the calculations resulting from the design changes.

On the basis of the above review, it was determined that, in general, onsite design activities were implemented in accordance with the established procedures and instructions.

c. Review of Licensee's QA Audit Report

The NRC inspector reviewed QA Audit Report No. 20-86-506 conducted by the licensee's QA Department on February 18-21, 1986. The purpose of the audit was to determine whether S&L was effectively implementing the applicable sections of its QA program. The major scope of the audit was design control and document/procedure control. Results of the audit revealed that the design calculations were reviewed and approved in accordance with procedural requirements, and that FCR's were properly incorporated in drawing revisions. The audit concluded that S&L was properly implementing the requirements of its QA program in the areas reviewed.

Within the areas inspected, no violations or deviations were identified.

4. Exit Interview

The inspector met with site representatives (denoted in Persons Contacted paragraph) at the conclusion of the inspection. The inspector summarized the scope and findings of the inspection noted in this report. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.