U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/83-12(DE)

Docket No. 50-483 License No. CPPR-139

Licensee: The Union Electric Company
Post Office Box 149
St. Louis, MO

Facility Name: Callaway, Unit 1

Inspection At: Callaway Site, Reform, MO

Inspection Conducted: June 7 - 8, 1983

Inspector: I. T. Yin 6/28/83

Approved By: D. H. Danielson, Chief 6/28/83
Materials and Processes Section

Inspection Summary

Inspection on June 7 - 8, 1983 (Report No. 50-483/83-12(DE))
Areas Inspected: Pipe whip restraint design control, installation, and QC inspection activities; review of upgraded site hanger QC inspection program; and followup on previously identified items. The inspection involved a total of 16 inspector-hours onsite by one NRC inspector.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Union Electric Company (UE)

*J. R. Veatch, Supervising Engineer, Construction QA
*K. W. Kuechenmirster, Supervising Engineer, Construction
*L. H. Kamickel, Assistant QA Engineer
*T. H. McFarland, Superintendent, Site Liaison
*R. L. Powers, Assistant Manager, QA
*W. H. Weber, Manager, Nuclear Construction
*C. J. Plows, QA Consultant
M. I. Doyne, General Superintendent
K. L. Redhage, Engineer, Hangers

Daniel International Company (DI)

*D. R. Dunning, Construction Quality Engineer
*M. K. Smith, Audit Response Coordinator
*W. L. Petrie, PQAE
*R. E. Pitts, PPM
S. Barr, Lead Whip Restraint Engineer
G. Gilbert, Hanger Engineer

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*J. H. Neisler, Senior Resident Inspector

*Denotes those attending the management exit interview on June 8, 1983.

2. Licensee Action on Previously Identified Items

(Closed) Unresolved Item (483/80-09-01): The snubbers and rigid struts installed on the charging pump pulsation damper tank SBG05-112 were without proper connection pins. The inspector reviewed Union Electric Action Item File AB23.02 including the NCR 2SN-6921-M, closed on March 31, 1983, and considered the measures taken to be acceptable.

(Closed) Violations (483/80-09-04; 483/82-20-03; and 483/82-20-04): Lack of timely piping suspension system component QC inspection, and inadequate corrective actions taken to resolve deficient areas identified during previous Region III inspections. The inspector reviewed the licensee's upgraded program and considers this matter resolved. See Paragraph 3.b for details.

(Open) Unresolved Item (483/80-09-05): Questionable implementation of site document control procedures. Further review of documents in the area of pipe whip restraint installation was conducted. See Paragraph 3.a(iv) for details.

(Closed) Violation (483/82-20-05): Failure to specify a specific scope and limitations on use of the QC Hanger Discrepancy Report System. The inspector reviewed the revised procedures and implementation of their requirements. See Paragraph 3.c for details.

3. Functional or Program Areas Inspected

a. Inspection of Pipe Whip Restraints (WR)

(i) The inspector reviewed the following documents and considered the design criteria adequate:

. BPC Specification 10466-C-0 (Q), "Civil and Structural Design Criteria for Standardized Nuclear Unit Power Systems (SNUPPS)", Revision 5, dated August 23, 1976, including paragraph 5.0 Construction Materials, paragraph 6.0 Design Bases, and Appendix C, Design Guide for Pipe Whip Restraints.

. BPC Specifications 10466-C-202D (Q), "Technical Specification for Purchase of Energy Absorbing Material (EAM) for the SNUPPS", Revision 3, dated April 28, 1982.

(ii) The inspector reviewed all of the WR installation drawings, BPC drawings C-0003 to C-0054, and C-03AB50 to C-03FC02. The application of energy absorbing material (EAM) within the WR systems is technically sound. Possible undesirable lateral impact loading conditions do not appear to be present.

(iii) The inspector reviewed the following WR installation and inspection procedures, and technical specification:

. DI WP-212, "Field Fabrication and Installation of Pipe Whip Restraints", Revision 4, dated March 28, 1983.

. DI QCP-212, "Inspection of Field Fabrication and Installation of Pipe Whip Restraints", Revision 3, dated February 22, 1983.

. BPC Specification 10466-C202 (a)(Q), "Technical Specification for Contract Erection of Pipe Whip Restraints, Pipe Whip Restraint Embeds, and NSSS Support Embeds for the SNUPPS", Revision 7, dated November 23, 1981.

During a previous inspection, the inspector identified that the above QCP did not provide for timely QC inspection of WR location, configuration, and orientation. (Reference in Region III Inspection Report Nos. 50-483/80-09 and 50-483/82-20). While corrective actions had been carried out for piping suspension systems, the responsible site staff had not identified and corrected similar problems in the WR program. However, the inspector's review of activities concluded: (1) there has been site control of the WR installations and final QC inspection program, (2) a minimum number of deficiencies were identified

in the past, (3) the design is not complicated, and (4) shimming is used to establish the final position of the EAM. Union Electric committed to have a modified program in place by July 8, 1983 (see the Attachment to this report). The revised program will be verified by the inspector during a future site inspection. This is an unresolved item (483/83-12-01).

(iv) The inspector evaluated the effectiveness of the site document control system by verifying the following WR drawings at the construction site in addition to the procedures and specifications discussed above.

- C-0053(Q), Revision 6
- C-03AE52(Q), Revision 9
- C-03BB60(Q), Revision 5

Six documents were checked against the central document control files. Five were up-to-date revisions. A copy of BPC Specification 10466-C202(a)(Q) at a work location was found to be two revisions out-of-date. The latest revision was Revision 9, dated December 13, 1982. Further, it was revealed that the DI Lead Engineer was not on the BPC WR Specification distribution list. The licensee promptly initiated a comprehensive check and found that the identified deficiency was an isolated case, and that the changes between Revision 7 and Revision 9 were of a minor nature. The inspector agreed with this conclusion. The licensee further committed to conduct extensive audits to ensure generic document control system deficiencies do not exist. Unresolved item 483/80-09-05 remains open.

(v) The inspector reviewed the following DI and UE site WR installation and inspection QA surveillance and audit records:

- DI Quality Assurance Report (QAR) No. 82-08, conducted 8/2-31/82, including Audit Findings Report (AFR) No. 82-08-03, "Audit of Fabrication and Installation of Pipe Whip Restraints".

- DI QAR No. 83-01, conducted 1/3-31/83, including AFR No. 83-01-06, "Surveillance of Pipe WR Drawing Control", and AFR No. 83-01-10, "Surveillance of (WR) NDE of Full Penetration Double Sided Welds".

- DI QAR No. 83-04, conducted 4/1-29/83, including AFR No. 83-04-04, "Surveillance of Fit-up Gaps on Pipe WRs".

- UE Surveillance Report (SR) No. 7/81-27, conducted on 7/27/81, "Inspection of Welds on Pipe WRs".

- UE SR Report No. 7/81-25, conducted on 7/23/81, "Installation and Inspection of Pipe WRs".

- UE SR No. 4/83-16, conducted on 1/24-27/83 and 4/12-13/83, "Traceability of Cires (Steel Company) Pipe WR Material".

The inspector noted that although audits and surveillances have not included WR location, configuration and orientation as part of their review, there has been continued observations of WR installation activities.

b. Timely Hanger QC Inspection

(i) In response to previous Region III findings, the licensee extensively upgraded their piping suspension system component inspection program. During this visit, the inspector reviewed the upgraded DI construction Procedure QCP-200, "Inspection of Fabrication and Installation of Safety Related Piping and Component Supports, Section B (Supports)", Revision 18, dated April 12, 1983, including Interim Change to Procedure (ICP)-1, Revision 0, dated April 28, 1983, and ICP-3, Revision 0, dated June 3, 1983. The revised program provisions and measures are considered to be adequate for performing timely in-process QC inspections of system support location, orientation and configuration.

(ii) The inspector reviewed the following staff training program and craft training sessions and had no adverse comments:

- Mechanical Engineering Department (MED) training, subject: M-060202, conducted on March 25, 1983
- MED training, subject: MS-25 and EIF's, conducted on March 3, 1983
- Hanger Department training, subject: WP-205, conducted on March 25, 1983
- Craft training sessions conducted for crew No. PFS 26, 11, and 95 on March 21, 1983.

(iii) The status of the licensee's implementation of their revised program, as of June 8, 1983, is as follows:

- Among the 1183 hangers erected without timely QC inspection, 878 had been inspected.
- Since January 22, 1983, when the new program was in place, there had been 1020 new supports built.
- There will be approximately 550 additional Q-Type hangers built.
- The total estimated Q-Type hangers and restraints is approximately 5500.

The inspector stated that the progress of program implementation appeared to be acceptable, but urged the licensee to complete inspection on all previously uninspected components

in the near future. The licensee stated that they will place priority on the closeout inspection action.

c. Inspection of Revised Hanger Discrepancy Report (HDR) System

(i) The failure of the licensee to establish a specific scope for and limitations on the use of HDRs was identified during a previous Region III site inspection. During this visit, the inspector reviewed the following upgraded administration and implementation procedures, and had no adverse comments:

. DI Interim Change to Procedure (ICP)-2 "AP-VII-02, Nonconformance Control and Reporting, Revision 12", Revision 0, dated May 19, 1983, including the Appendices.

. DI WP-200, "Field Fabrication and Installation of Safety Related Piping and Component Supports (Q)", Revision 21, dated March 18, 1983, including:

(1) Exhibit BF, "Hanger Discrepancy Report (HDR)"
(2) Exhibit BG, "Instructions for Completing the HDR Log Sheet"
(3) Appendix B, IV, "Flow Chart for HDR"

(ii) The inspector reviewed the personnel training sessions held for the site work staff and craftsman, including the Piping Department training sessions held on June 3, 1983. The inspector stated that the training appeared to be adequate.

(iii) The inspector reviewed the trend analysis performed for HDRs. The results were as follows:

		a	b	c		
Trend Analysis No.	Time Period	Approx No. of Hanger Installations	No. of HDRs Generated	No. of HDRs w/violations of Installation Criteria	Calculated % $\frac{c}{b}$	Calculated % $\frac{c}{a}$
1	1/22 to 2/28/83	755	553	175	32	23
2	3/1 to 31/83	820	387	125	32	15
3	4/1 to 30/83	521	264	93	35	18
4	5/1 to 31/83	388	203	76	37	20

The inspector reviewed the DI Project Piping Discipline Manager Inter-Office Memorandum PPDM No. 648 (A 36.60), "Trending Analysis No. 31", and questioned the adequacy of licensee actions to reverse the adverse trends in HDRs, particularly in the area of craft violation of hanger installation criteria. This is an unresolved item (483/83-12-02).

4. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. Two unresolved items disclosed during this inspection are discussed in Paragraphs 3.a.(iii) and 3.c.(iii).

5. Exit Interview

The inspector met with licensee representatives at the conclusion of the inspection on June 8, 1983. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the findings reported herein, including their commitment to promply complete inspection on all previously uninspected hanger and whip restraint installations.

Attachment

Callaway Pipe Whip Restraints

The following is a synopsis of the present status of pipe whip restraints concerning installation and inspection, the present installation and inspection program, and the proposed revisions to the installation and inspection program.

1. Status of Pipe Whip Restraints

The pipe whip restraint installation group issues a weekly status report that includes:

- Number of field complete restraints
- Number of Q. I. accepted restraints
- Number of restraints on HOLD and group imposing HOLD
- Number of restraints requiring extra work
- Status of each restraint concerning above information

This weekly report also includes status information concerning EAM and U-bolt installations.

A total of 295 pipe whip restraints are required by present design. The present status (as of 6/8/83) of the structural portion of these whip restraints is:

- 274 restraints structurally complete
- 211 restraints accepted by Engineering
- 175 restraints accepted by Q. I.

2. Present Installation and Inspection Program

Pipe whip restraints are currently installed and inspected in accordance with construction procedures WP-212, rev. 4 and QCP-212, rev. 3, respectively. These procedures reference the controlling specifications and codes and other applicable construction procedures. These procedures require that a documentation folder be generated and maintained for each pipe whip restraint. Construction forces are required to notify Welding Q. I. of intent to perform welding on a restraint. Welding Q. I. inspects welding as required. Pipe Whip Restraint Group verifies that structural and miscellaneous steel is in tolerance or as-built location has been approved by A/E. Mechanical Q. I. verifies that restraint is structurally complete and physically acceptable in accordance with latest design drawings. Whip Restraint Group verifies with other disciplines that pipe is in its final position. Mechanical Q. I. is notified of intent to perform EAM or U-bolt installation. If welded connections are required, Mechanical Q. I. verifies "H" dimensions for EAM's and "F" dimensions for U-bolts prior to welding in place. EAM and U-bolt installations are made. Installations are inspected by Mechanical Q. I. Following "buy-off" by Q. I., all documentation for the restraint is processed as a QA record.

It should be noted that the Whip Restraint Group is involved in the installation process at all times.

3. Proposed Revisions to Installation and Inspection Program

Due to concerns raised by the NRC involving inspection of whip restraints, the inspection program at Callaway will be modified to include a "phased" inspection by Q. I. This program will be in-place within 30 days. It is anticipated that this modification will be similar to the recent modifications made in the hanger inspection program concerning "phased" inspection. Also, final inspections for the 99 structurally complete restraints not yet inspected by Q. I. will be performed prior to August 1, 1983.