U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-454/82-26(DE); 50-455/82-20(DE)

Docket Nos. 50-454; 50-455 Licenses No. CPPR-130; CPPR-131

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

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, IL

Inspection Conducted: December 27-29, 1982, and January 25-28, 1983

Inspector: I. T. Yin 2/10/83

Approved By: D. H. Danielson, Chief 2/10/83
Materials and Processes Section

Inspection Summary

Inspection on December 27-29, 1982, and January 25-28, 1983 (Reports No. 50-454/82-26(DE); 50-455/82-20(DE))
Areas Inspected: Followup on allegations relating to piping support installation and QC inspection deficiences. The inspection involved a total of 24 inspector-hours onsite by one NRC inspector.
Results: Within the areas inspected, no items of noncompliance or deviations were identified.

DETAILS

Persons Contacted

CECo

*G. Sorensen, Construction Superintendent
*R. Tuetken, Assistant Superintendent, Project Construction Department (PCD)
*M. A. Stanish, QA Superintendent
*M. E. Lohmann, Project Mechanical Supervisor, PCD
*J. T. Westermeier, Project Engineering Staff
*W. F. Segersell, Project Engineering Staff
*J. F. Harchut, Field Engineer, PCD
*K. J. Hansing, QA Supervisor
*R. Westberg, QA Staff

S&L

*R. J. Netzel, Senior Structural Project Engineer
W. Wellborn, Field Engineer

Hunter

*M. Somsay, QA Supervisor

US NRC - Region III

*K. A. Connaughton, Resident Inspector

*Denotes those attending the management exit interview on January 28, 1983.

Functional or Program Areas Inspected

Mr. Michael A. Smith, a former Hunter Corporation site employee within their QA organization from October 1978 to January 1980 signed an affidavit on September 21, 1982 stating a number of problems at the site. A followup inspection relative to the safety related technical issues was conducted by the inspector.

The findings are as follows:

1. Allegation: Policies regarding Concrete Expansion Anchors and piping supports were inadequately defined in the areas of installation and inspection.

   The inspector reviewed the following Concrete Expansion Anchor procedures:

   a. The present date procedure, Hunter SIP No. 20.513, "Installation of Concrete Expansion Anchors," Revision 12, dated September 8, 1982. The procedure incorporates S&L ECN No. 2999 "Standard Specification for Concrete Expansion Anchor Work" Revision 17, dated October 6,

1982 and is a part of the S&L Specification No. 2722, "Plant Structure." SIP No. 20.513 is considered to be acceptable in the areas reviewed, including:

(1) minimum embedment depth,
(2) torquing,
(3) minimum edge distance,
(4) minimum bolt distances,
(5) repair of abandoned holes,
(6) allowable plate hole relocation,
(7) prohibited hole drilling areas.

Relative to various manufacturers products, including Hilti Kwik-Bolt, ITT Phillips Red Head Wedge, Trubolt Wedge, Rawl-Stud Wedge, and Parabolt Wedge, the inspector questioned: (1) whether or not they had all been qualified in accordance with the IEB 79-02 (refer to Paragraph 1.c for discussion) requirements, and (2) whether or not the unique sets of installation values provided in the S&L Specifications could cover all the manufacturer's product capacity/rating requirements. This is an unresolved item (454/82-26-01; 455/82-20-01).

b. Hunter SIP No. 20.513, Revision 1, dated July 10, 1978. As a result of the review, the inspector determined that the procedure contained the essential elements in Concrete Expansion Anchor installation. However, this procedure had less detail and coverage when compared with Revision 12, the revision presently in use.

c. The generic problems relating to the design and installation of concrete expansion shell and wedge type anchor bolts were discovered in 1979. As a result of various licensee reports and NRC inspections and studies, an NRC IE Bulletin No. 79-02, Revision 1, "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts" was issued on August 20, 1979 to address and to correct the industry wide problems and deficiencies. Since then, the inspection of Concrete Expansion Anchors, including the design considerations being given to base plate stiffness and the associated prying effect which results in bolt load increases, had been incorporated into the overall NRC review/inspection program.

In conclusion, the inspector could not substantiate the specific alleged item relative to the Concrete Expansion Anchor installation. However, the failure of the QC inspection program to include Concrete Expansion Anchors and the general problems within the industry were substantiated (Paragraph 2).

2. Allegation: The QC inspectors would inspect only the welding process but not the location of any piping support. Could not verify location because they had no tools.

The inspector reviewed:

- Hunter SIP 20.509, "To provide instruction for the installation of hangers," Revision 2, dated February 14, 1977. The procedure did not require timely QC hanger inspections to verify location, configuration, and deficient conditions.

- In CECo General Office QA Audit Report, dated May 31, 1979, Observation No. 4 states, "There is no evidence to indicate that the major mechanical contractor, Hunter, has any QC inspections of piping support installations other than the associated welding. They are not being inspected to verify location and completness of installation. Hunter QC does a quarterly surveillance of hanger installations (S.I.P. 20.509), but this only covers reviewing the blocking devices."

The allegation was substantiated. Relative to the statement that there were no tools to verify support locations, the site representatives stated that the tools were available but since there were no program requirements, they were not used by the QC inspectors.

The Region III inspection conducted in March 1980 also identified the Hunter QC inspection program shortcomings. The finding is discussed in the Inspection Reports No. 50-454/80-05; 50-455/80-05, Paragraph 4. The Region III followup inspection to ensure licensee program improvements is discussed in Paragraph 8 of this report.

3. Allegation: In October and November 1979, one support was found without any documentation, and the more extensive audit of 100 to 150 supports drawn out at random showed 100% non-compliance with the proper locations indicated by the design drawings.

The one support without documentation appears to be 1CC12004R (Auxiliary Building 383'). The hanger Job Travel Package (JTP) has a handwritten note showing 100% completion yet there is no indication of weld rod being consumed. The installation date was October 20, 1977. As to the 100 to 150 supports drawn at random, the inspector selected 10 from the hanger population contained in the QA Audit Report No. 059-3, dated July 19 through August 28, 1979 for review and evaluation in addition to the 1CC12004R hanger.

- JTP 1CC12004R was reviewed in the areas of welding, location, orientation, and configuration QC inspections. The hanger was installed on September 20, 1977 per S&L drawing, Revision A, dated January 15, 1977. The Weld Material Record, dated September 20, 1977 for field welds No. 1, 2, 3, and 4 showed electrode type, size, and heat numbers. S&L revised the design subsequent to installation, and the new configuration is shown on S&L drawing Revision B, dated June 28, 1979. However, modification to the hardware installation was not initiated until recently. The record shows that hanger rework was completed on January 28, 1982 to S&L drawing, Revision C, August 14, 1981 with

proper location/configuration QC inspection. There is no record for the original installation, but the modified installation was signed on February 2, 1982.

. The following 10 hangers were reviewed in the areas of QC inspection, location, and orientation in accordance with design.

S&L Hanger No.	Installation Completion Date	QC Inspection Date
1AB09003X, Revision C	01/14/82	01/14/82
1AF01011R, Revision C	03/15/82	03/16/82
1CC22006R, Revision C	09/01/81	09/02/81
1FP05002R, Revision B	11/12/81	11/16/81
2SX40007R, Revision A	08/27/79	08/10/81
2FP03075R, Revision B	09/16/82	09/17/82
1SI21007S, Revision D	12/08/82	12/20/82
2SX40015R, Revision B	04/20/82 (FCR No. 53351 dated 12/23/82)	04/21/82 01/05/83
2SX40017V, Revision B	Hanger was deleted	
1SI01006S, Revision D	04/09/82	04/13/82 (Saragate) 07/14/82 (Snubber)

As a result of the review, and in conjunction with the fact that hanger location deviation tolerances were not provided to the site until December 20, 1977 (S&L M-916 Drawing, "Byron/Braidwwod Station Units 1 and 2 Component Support General Notes and Details" Sheet 12, Revision A, dated November 14, 1977), it is the inspector's conclusion that from start of work to December 1977, very few, if any hangers could be installed "exactly" per design drawing locations.

The approximate number of supports listed in Audit No. 059-3 and the followup audit were 91 and 50 respectively. Subsequent to the review of the audit report, the inspector concluded that it is possible that ("100% non-compliance with the proper locations indicated by the design drawings") M-916 Drawing tolerances had not been utilized during hanger installation, and the crafts did not provide QA adequate as-built documentation for review and verification (see Paragraph 4).

However, present site inspection results show that the installed hangers do receive QC inspections relative to location, orientation, and configuration.

4. Allegation: No one had given the QA department any as-built data. We did a followup audit to verify that the problems stated in my findings had been corrected or that as-built documentation was provided. That is, the drawings and documentation for each support were changed to show as-built data and properly signed. In all but a few instances, this was done. In the cases where it was not done, nonconformance reports (NCRs) were written up and the matter was out of my hand.

With regard to the allegation that 100-150 hangers installed between April 1978 to August 1979 were without adequate craft produced as-built drawings; this finding is identified in Hunter Audit Report 059-3 Findings No. 6, No. 7, and Observation No. 2. The use of inter-office memorandum (HC-QA-23) to instruct craft to make as-built drawings, and to require QC to verify their adequacy was cited as a noncompliance item in Region III Inspection Report No. 50-454/80-05 and 50-455/80-05. The basis for the citation was that interoffice memorandum bypass the site document control QA procedural requirements.

By reviewing the as-built drawings contained in Audit No. 059-3, and comparing them with the present JTP file as-built drawings, the inspector concluded that the deficiencies observed by Mr. Smith were factual. This could have resulted from an inadequate procedure (HC-QA-23) being used at the time of his audits.

The inspector also reviewed the following past and present Hunter procedures relative to as-built drawing documentation requirements:

- SIP 4.000, "General Requirements for Fabrication and Installation of Safety Related Components," Revision 1, dated May 2, 1978. The procedure contains no as-built documentation requirement.

- SIP 4.000, "Process Control," Revision 2, dated March 31, 1980. This procedure states in Paragraphs:

  9.1 Component supports that cannot be installed per the construction copy drawings, may be installed per the A&E M-916 adjustments tolerances. When the M-916 tolerances are used, the cognizant supervisor must provide as-built data relative to the extent of the changes.

  9.1 As-built data shall be provided on either the face of the construction copy drawing (CCD) (for simple changes) or on the back of the drawing (for complex changes). Changes shall be noted with a contrasting color (perferably red).

  9.1 Changes beyond M-916 tolerances shall be processed in accordance with Section 10.0 (Method for JTP Revision).

- SIP 4.000, "Control of Construction Processes," Revision 9, dated July 26, 1982. This procedure states in Paragraphs:

  9.1 All component support installations shall be performed in accordance with the requirements of the support CCD (relative to configuration details and location details - when pipe line fixed point dimensions are provided in the key plan) and the corresponding line - when the support CCD does not provide fixed point pipe line locations in the key plan.

  9.1 When interferences prevent installation of supports per the CCDs, the A&E support tolerances shall be employed.

9.2 The tolerances used shall be graphically described on a Component Support/CEA Discrepancy Report (Form HC-99), which shall be marked "As-Built" and initiated as specified in the SIP that addresses Design Control.

The inspector audited the same ten hangers discussed in Paragraph 3 above to verify whether or not the SIP 4.000, Revision 9, as-built documentation requirements had been implemented by Hunter Corporation. The review findings are as follows:

S&L Hanger No.	As-Built Drawing No. (HC-99 Form)	As-Built Drawing Date
1CC12004R, Revision C	7586	02/01/82
1AB09003X, Revision C	7135	01/14/82
1AF01011R, Revision C	8913	03/16/82
1CC22006R, Revision C	2426	09/02/81
1FP05002R, Revision B	3792	11/18/81
2SX40007R, Revision A	4153	07/28/81
2FP03075R, Revision B	19232	09/16/82
1SI21007S, Revision D	13281	12/20/82
2SX40014R, Revision B	26966	01/05/83
1SI01006S, Revision D	5911	04/09/82

To summarize the findings: (1) there was an informal as-built data collection requirement during the time frame of Mr. Smith's employment at the site, (2) the first formal site procedural requirement for obtaining as-built drawings was established on March 31, 1980, shortly after Region III inspection conducted on March 25-26, 1980, (3) the present as-built documentation requirement was checked and is being implemented effectively by Hunter Corporation, (4) the inspector substantiated the allegation that the hanger as-built documentation was deficient at the time of his audit, and (5) there was no NCR issued to identify and to resolve the alleger identified problems.

5. Allegation: The report as we wrote it pointed to two areas of concern: production and QC inspection. Somsay (QA Supervisor) changed the report so that it did not necessarily imply that these were problem areas...he did this quite often.

The inspector reviewed the Hunter Corporation audits including hand written notes and manuscripts that were prepared by Mr. Smith, to verify whether or not any parts of audit findings were deleted by the QA Supervisor. The following is the inspectors observation:

. No. 1-01, 1/8-17/79, "Welder Qualification Log," and Second followup report, dated 8/23/79.

No deletion was observed.

. No. 1-03, 2/6/79, "Non-destructive Examination," and followup report dated 3/20/79.

No deletion was observed.

. No. 057-2, 5/22/79, "Authorized Inspector."

No deletion was observed.

. No. 058-2, 6/25-28/79, "QA Organization and Training," and followup report, dated 7/24/79.

The following handwritten statements were deleted:

"In any event, this undoubtedly indicates a lack of indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained."

"This accounts for the fact of recording training to an obsolete SIP, as mentioned above, but it cannot be accepted as an excuse for type of unprofessional act."

"It is also recommended that the Engineering Department is being trained and documented in a uniform manner to facilitate the minimum training requirements provided in Section 1 of the Hunter Corporation QA Manual."

"Due to the quantity of Hunter Corporation personnel who have to be trained to the SIPs or QA Manual or other required codes, documented training will be a recurring problem. Training is conducted on a continuous scheduled basis by the QA Training Coordinator or Division Supervisor, consequently, at any given date, there will be personnel deliquent in documented training."

. No. 061-3, 9/18-10/26/79, "Piping Process Control," and followup report dated 2/12/80.

No deletion was observed.

. No. 062-4, 10/29/79 to 1/4/80, "Procurement Control," and followup report dated 2/12/80.

No deletion was observed.

. No. 059-3, 7/27-8/28/79, "Hanger Process Control," and followup report dated 3/20/80.

The following handwritten statements were deleted:

"For the purpose of this followup audit, only those component supports installed after January 12, 1979 were selected for verification of proper as-built data being supplied on Construction Copy Drawings (CCDs) or Hanger Field Problems (HFPs). This is because it was the first date of authorization for Area Foremen to utilize the S&L M-916 adjustment tolerances without initiating HFPs, if they so elected."

"It was decided that several component supports would be selected that were installed prior to this time period, in order to identify some type of trend in not reporting complete as-built information by the cognizant foreman."

In review of the deleted paragraphs, it is the opinion of the inspector that the deleted statements were mostly the individual auditor's personal convictions and recommendations, and that they could either be endorsed or rejected by the organizations management. The inspector concurs with the alleger's desire "to identify some type of trend in not reporting complete as-built information by the cognizant foreman" however, it would be more appropriate to first establish action requirements so they are a part of the approved site procedures. In conclusion, the inspector stated that he could support the alleger's claim that editorial changes had been made on his report write-ups, however, based on the fact that the report did address the auditor's findings, and that the deleted paragraphs were mostly personal concerns, no additional safety investigation/inspection followup is planned.

6. Allegation: Because the suports are not in the exact locations the engineers had designed, it is questionable how much stress the joints and pipes can take in their present positions.

In conjunction with the discussions documented in Paragraphs 2, 3, 4, and 8 in this report, the inspector concluded that the present hanger QC inspection and documentation programs had been substantially improved since March 1980. These improved program requirements have been implemented in accordance with the approved procedures. As-built components including valve weights, valve operator orientation and locations, and suspension system locations, configurations, and orientation compared with the computer analysis stress isometric models will be a part of the Region III review of IE Bulletin No. 79-14, "Seismic Analyses for As-Built Safety Related Piping Systems" activities. These review items have been incorporated into the overall NRC hanger inspection program, and will be carried out at the A-E's offices at the appropriate time, normally after system turnover for start-up and hot functional testing.

7. Allegation: The followup audit did not satisfy my concern, because the design engineers had not approved the altered locations of the support. I talked with design engineer Bill Wellborn from S&L. He said that this would be handled at a later date and that he didn't think it was serious enough to be dealt with.

- NRC-Region III Inspection Reports No. 50-454/80-05; 50-455/80-05. Inspection was conducted on March 25-26, 1980.

- CECo response letter, dated May 27, 1980.

- NRC-Region III Inspection Reports No. 50-454/81-09; 50-455/81-08. Inspection was conducted on July 29-31, 1981.

- CECo response letter, dated September 24, 1981.

- CECo letter to NRC-Region III, dated March 8, 1982. This letter reported the status of the pipe support inspection effort that was committed in CECo response letter, dated September 24, 1981.

- CECo Byron Site QA Surveillance of Hunter Corporation, Report No. 3200 (QF 2739.03.22.2), dated September 28, 1981, for the week of September 21-25, 1981. This report verified that only the most current approved procedures were used in the field. It also documented hanger inspections conducted in the Unit 1 containment.

- CECo Surveillance of Hunter Report No. 3200 (QF 2739.03.22.2, QA 54.3), dated November 13, 1981. This report documented snubber inspections conducted in the Unit 1 containment and in the Auxiliary Building. The identified deficienies were closed on December 8, 1981.

- CECo Surveillance of Hunter, Report No. 3415 (QF 2739.03.22.1), dated January 29, 1982. This report closed out Audit No. 6-81-358, Finding No. 1, that identified a lack of timely QC inspection of snubber installations in some locations. This resulted in Hunter issuing NCR No. 286 identifying the 55 supports as deficient.

- Hunter NCR No. 286, issued on January 22, 1982 stating that, "11 hangers in the Containment Building and 44 hangers in the Auxiliary Building were installed, but not examined within the intent of timely inspection." These items were inspected, and the NCR was closed on September 13, 1982.

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. The unresolved item disclosed during this inspection is discussed in Paragraph 1.a.

Exit Interview

The inspector met with licensee representatives at the conclusion of the investigation on January 28, 1983. The inspector summarized the scope and findings of the investigation. The licensee acknowledged the findings reported herein.

The inspector interviewed Mr. Wellborn on January 26, 1983 at the site. Mr. Wellborn stated that between 1978 and 1980, he was a Field Engineer employed by S&L and assigned to Hunter Corporation working with the Hunter hanger installation engineering department to supplement the Hunter task force. He stated that he had been given no authority to clarify or interpret design drawing requirements. He had been assigned some responsibility for coordinating field encountered problems during support erection by transmitting the Hanger Field Problems (HFPs) to the S&L office for resolution. In October 1977, at the request of CECo field construction, Mr. Wellborn was assigned the responsibility to establish the HFP system to reduce or to eliminate some of the apparent communication problems that existed relative to the closeout of Hunter requests. Mr. Wellborn is presently assigned to the CECo project management turnover/start-up group and is responsible for coordinating transfer of completed systems from CECo field construciton to the Technical Staff (Operation Department). In regard to Mr. Smith's statement that, "...he didn't think it was serious enought to be dealth with.", Mr. Wellborn stated that he did not recall that he had made such a statement. In view of the fact that Mr. Wellborn has never been a design engineer at the site, and had not been assigned responsibility for determining when and how the altered supports would be reviewed by the design engineers, the inspector concluded that he could not substantiate Mr. Smith's allegation.

8. Piping Suspension System Re-Inspection

The NRC-Region III inspection conducted in March 1980 (Region III Inspection Reports No. 50-453/80-05; 50-454/80-05), identified piping suspension systems that were not QC inspected in concurrence with installation activities. As a result, a licensee re-inspection program was soon initiated based on the revised Hunter Procedures SIP 2.201, SIP 4.201, and SWI No. 2 which included more detailed process control checklists and expanded QC inspection criteria. However, during a NRC-Region III followup inspection conducted in July 1981 (Inspection Reports No. 50-453/81-09; 50/454/81-08), a number of snubbers in Unit 1 containment were again found without timely QC inspections. These snubbers were subsequently inspected and a licensee review was initiated to identify all other supports and restraints that had not been inspected using the current procedures.

During discussions, the licensee staff stated that during December 1981, the re-inspection of supports was not progressing in accordance with the schedule, and that Hunter had been instructed to step up their review of QC inspection records and to document any support assemblies that were without current inspections in NCRs. To January 1982, approximately 8500 supports were reviewed per the current inspection procedural requirements. Fifty-five supports did not have inspections completed, however, they were being re-designed and were documented in NCR No. 286. These 55 supports were revised and inspected in September 1982. The inspector reviewed the following pertinent documentation and considerd the licensee QC hanger re-inspection effort adequate.