

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Reports No. 50-456/80-12; 50-457/80-11

Docket Nos. 50-456; 50-457

Licenses No. CPPR-132; CPPR-133

Licensee: Commonwealth Edison Company
P. O. Box 767
Chicago, IL 60690

Facility Name: Braidwood Station, Units 1 and 2

Inspection At: Braidwood Site, Braidwood, IL

Inspection Conducted: September 22-25, 1980

Inspectors: *D.W. Hayes/K.R.*
K. R. Naidu

10/21/80

J. Schapker
for J. Schapker

10/17/80

Approved By: *D.W. Hayes*
D. W. Hayes, Chief
Engineering Support Section 1

10/21/80

Inspection Summary

Inspection on September 22-25, 1980 (Reports No. 50-456/80-12; 50-457/80-11)

Areas Inspected: Reviewed action taken on previous inspection findings; electrical contractor's procedures; observation of electrical hanger installation activities; storage of cables. Reviewed heating ventilation and air conditioning contractor's QA procedures; observed installation activities; and storage of components. The inspection involved a total of 49 inspector-hours onsite by two NRC inspectors.

Results: Three items of noncompliance were identified in the areas inspected.

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DETAILS

Persons Contacted

Commonwealth Edison Company (CECo)

- *R. Cosaro, Project Superintendent
- *R. Farr, Quality Assurance Engineer
- *C. Gray, Civil Supervisor
- *J. Hawkinson, Mechanical Engineer
- *J. Merwin, Mechanical Supervisor
- *C. Mennecke, Electrical Supervisor
- *T. Sommerfield, Quality Assurance Supervisor
- *E. Wilmere, Senior Quality Assurance Inspector

L.K. Comstock and Company (LKC)

- R. Brown, Quality Control Supervisor
- T. Crate, Foreman, Auxiliary Building
- L. Facchina, Project Manager
- R. Yanketis, Quality Control Welding Inspector
- M. Kast, Quality Control Inspector

*Denotes those present at the exit meeting at the conclusion of the inspection.

Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (456/80-04-01; 457/80-04-01). It was previously reported that: (1) the inspection status of various installed equipment could not be established; (2) inspection checklists were to be revised; and (3) NCR would be generated to document nonconforming conditions. A QC Inspection Checklist (QCIC) was developed and all installed electrical equipment (other than electrical cabletray hanger supports) was reinspected. Provision to generate Nonconformance Reports (NCRs) have been included in the QCIC. It was also previously identified that the mounting channels were incorrect on electrical switchgear 1AP16E; this has been identified on an NCR and suitable corrective action was taken as recommended on FCR-L 635. Corrective action was verified as complete on June 26, 1980.

(Closed) Unresolved Item (456/80-06-01; 457/80-06-01). It was previously reported that the electrical contractor's procedures 4.3.3 and 4.8.3 did not explicitly state that only qualified welders would be used, limit the acceptance undercut criteria to 1/32" and specify the qualification level for inspection personnel. Paragraph 3.3.1 of the revised procedure 4.3.3 now states that welding will be performed by welders qualified to the respective welding procedure. Paragraph 3.6.1.6 of the revised procedure 4.3.3 limits the undercut to 1/32". Procedure 4.8.3 has been revised to clarify the functions of the welding inspector and his level of qualification.

(Closed) Unresolved Item (456/80-06-02; 457/80-06-02). It was previously reported that some cables stored outdoors were not adequately protected. Inspection Correction Reports (ICRs) 419 and 420 were initiated. ICRs 419 and 420 dated June 2, 1980 identified that cable reels BR-3-09146 and 03106 were not tied back to the reel and BR-65 was off cribbing. Corrective action was taken by fastening the cable ends and putting the cable reel on cribbing. The action was verified and determined acceptable by QC. However, corrective action taken to preclude recurrence was inadequate; the licensee failed to determine the cause of the nonconforming situation. On September 22, 1980, a surveillance identified several cables with ends uncovered. It was subsequently determined that contrary to the purchase specification several cable reels were received from the manufacturer with the cable ends uncapped; since the cable reels were wrapped with brown paper and taped, the licensee did not determine the nonconforming condition. The inspector informed the licensee that failure to determine the cause of nonconformance and take adequate corrective action to prevent recurrence was an item of noncompliance contrary to the requirements of Criterion XVI of 10 CFR 50, Appendix B (456/80-12-01; 457/80-11-01).

(Closed) Unresolved Item (456/80-06-03; 457/80-06-03). It was previously reported that requirements in surveillance checklists were inadequate to detect deterioration in cable pans stored outdoors. An inspection report dated August 13, 1980 documents that several cable tray sections were damaged, several heater lights in equipment were not working, ends of several cables found were not sealed, and excessive underbrush in cable reel yard and cabletray laydown area. Cable on reel No. BR-1 QC No. 62233-B was damaged and is documented in NCR 58. The damaged portion of the cable was cut and NCR 58 was closed. Heater lights were replaced. Items which need repair have not been corrected, ICRs are open. Since procedural requirements have been established, this item is closed.

(Closed) Unresolved Item (456/80-06-04; 457/80-06-04). It was previously identified that Nonconformance Report 235 was generated to document unacceptable welds on the Main Control Board Panels (MCBP). During the current inspection, the NRC inspector determined that the licensee's inspection was limited to the MCBPs supplied by Systems Control only. The licensee did not inspect MCBPs supplied by Westinghouse. Both panels contain unacceptable welds which do not meet the equipment specifications. The unresolved item is closed and the matter is escalated to an item of noncompliance since adequate information is available to indicate that the control of purchased material was inadequate, which is contrary to the requirements of Criterion VII of 10 CFR 50, Appendix B.

During the current inspection, the inspector reviewed Westinghouse (W) document Equipment Specification 679 208 dated June 20, 1972, governing the Main Control Board Panels (MCBP) which specifies the welding requirements. Paragraph 3.1 recommends that welders be qualified to the requirements of Appendix A, Part II, of the American Welding Society (AWS) D1.0-69. Paragraph 4.0 permits the use of prequalified procedures for joints identified in D1.0. Paragraph 8.0 furnishes the final inspection requirements.

At the inspector's request, the licensee authorized their independent testing agency, Pittsburgh Testing Laboratory (PTL), to inspect the W MCBPs to determine whether the welds on the panels meet the requirements of W drawing 1190E76, Sheets 1 thru 17, and equipment specification 679208.

The PTL inspectors identified several welds with the following nonconformities:

- Insufficient leg
- Wire in the weld
- Weld spatter
- Undercut
- Weld ripple
- Weld overlap
- Crater in weld
- Lack of fusion
- Valley in the weld

The above examples are contrary to the requirements specified in the paragraphs quoted below of the W equipment specification 679 208:

- 7.10 "Undercutting, valleys, grooves or other irregularities along the edges or at the center of the weld reinforcement are not permitted".
- 7.11 "Upon completion of the weld, remove all flux, weld spatter, etc."
- 8.1.1 "All visible defects such as gas holes, cracks, trapped slag and undercutting shall be removed from any pass before peening, further welding, or final inspection."
- 8.1.2 "Weldments shall not contain any unfilled craters".
- 8.1.3 "Weldments shall be free of temporary bracing scars and accompanying defects having a height or depth of more than 5% of the base metal thickness. Such scars and/or defects that are more than 5% of the material thickness shall be removed, rewelded, and/or ground smoother".

The inspector informed the licensee that the above MCBPs were received and W Quality Releases 39824, 39825, 39826, and 4029 accepted even though several welds do not meet the equipment specification requirements and that this condition indicates inadequate control of purchased material, which is an apparent item of noncompliance contrary to the requirements of Criterion VII of 10 CFR 50, Appendix B. (456/80-12-02; 457/80-11-02).

(Closed) Unresolved Item (456/79-05-01; 457/79-05-01). It was previously identified that the QA implementary procedures for the current electrical contractor were incomplete. The matter has been reviewed and individual procedures have been commented upon under several other unresolved items. This item is considered closed.

(Open) Noncompliance (456/80-04-02; 457/80-04-02). The noncompliance identifies that the carbon steel plates and supports were not painted to the PSAR commitments. The licensee is still reviewing the matter and an Engineering Change Notice is being considered. The licensee stated that the review will be completed prior to the compliance date of October 15, 1980 stated in their letter dated July 11, 1980.

(Closed) Unresolved Item (456/79-14-02; 457/79-14-02). It was previously reported that CECO test personnel were not required to be qualified to ANSI 45.2.6 and that no requirements were established to assure the integrity of insulation resistance of installed power cables. CECO has since qualified all their test personnel to the requirements of ANSI 45.2.6. There are no regulatory requirements to test the insulation resistance of installed power cables; it is only a matter of good construction practice.

Functional or Program Areas Inspected

Details of functional or program areas inspected are discussed in Sections I and II.

SECTION I

Prepared by K. R. Naidu

Reviewed by D. W. Hayes, Chief
Engineering Support Section 1

1. Observation of Electrical Work Activities

The inspector observed the following electrical installation activities:

- a. The inspector observed the installation of electrical hanger supports for hangers H-37 and H-061 at elevation 426' in the Unit 2 side of the auxiliary building between QZ19 lines. The welds appeared acceptable. Weldrod was being stored in portable heated containers.
- b. The installation of hangers identified as H-121, H-150, H-132, H-131, and H-151 at elevation 439' on Unit 1 side of the auxiliary building was verified against the relevant drawings. The size of the plates attaching the hangers to the beams at the ceiling were specified as 3/4" thick 8-1/2" x 15" for hangers H-121 and H-150; the installed plates were measured to be 3/4" x 9-1/2" x 15" and 1-1/4" x 9-1/2" x 9-1/2" respectively on one side. The half of one leg of hanger 131 was welded to the support plate of hanger 132; the other half was welded to its own support plate. Since inspection documents were not available on the hanger installations, the licensee stated that a reinspection will be initiated. The matter is considered unresolved (50-456/80-12-03; 50-457/80-11-03).
- c. The sizes and lengths of shopwelds on hangers identified as H008, H81, H071, H161 and H135 were verified against the relevant drawings. Systems Control supplied hanger supports in question. 1/4" size weld 3" long was specified; two welds were measured to be 1/8" size on hanger H81. The lengths of the welds varied from 3-1/2" to 2-1/2". The inspector informed the licensee that this was another example of inadequate control of purchased material, an item of noncompliance contrary to the requirements of Criterion VII of 10 CFR 50, Appendix B identified in item 456/80-12-02; 457/80-11-02.
- d. The inspector observed the conduit hangers identified as CC89, CC67, CC75, CC76, and CC27 and determined the installation acceptable. The welds on these conduit supports were identified for welding inspection.

- e. The inspector observed the installation of cable pans identified as 1510A, 1510B, 1516B, 1528C, 1531C, and 1531D. The installation appeared acceptable; cable pans 1510A, 1510B, 1516A, and 1516B were rusted and corroded. Review of inspection records indicated that this condition was identified in both the cable pan inspection records and Nonconformance Reports.

One example of an item of noncompliance was identified in the above area.

2. Review of Records

- a. The inspector reviewed the qualification records of three QC inspectors employed by LKC. The records indicated that the individuals met the requirements specified in LKC procedure 4.1.3 titled "Qualified/Classification and Training of QA/QC Personnel".
- b. The inspector reviewed the inspection records on the installation of safety related cable pans 1510A, 1510B, 1516A, 1516B, 1528C, 1531C, and 1531D. Inspection Correction Reports were generated to identify nonconforming installations. ICR 459 indicates that pans 1510A and 1510B are corroded; ICR 461 identifies that cable-pans 1516A and 1516B are corroded.

Corrective action has to be taken prior to closing the ICRs. In some cases a Nonconformance Report is issued; ECE-NC-32 dated November 28, 1978 indicates that at 346'0" elevation, the cable pans are corroding. Corrective action recommended appeared adequate.

No items of noncompliance were identified in the above area.

SECTION II

Prepared by J. Schapker

Reviewed by D. H. Danielson, Chief
Engineering Support Section 2

1. Observation of HVAC Work Activities

- a. The inspector observed welding of auxiliary hanger cradle, identification No. 2858, on elevation 463' which supports safety related Heating, Ventilation, and Air Conditioning (HVAC) system ducting. Welding personnel qualifications, weld procedure specification (WPS), and weld rod control was verified to applicable Pullman Construction Industries (PCI) procedural requirements and determined acceptable.

Welding rod oven identified as PSM No. 1 displayed a current calibration sticker and temperature was maintained at the specified level.

The inspector observed welding in progress and determined that it was in accordance with the PCI WPS requirements and resulting welds were acceptable to PCI procedure titled "Visual Weld Inspection", identified as B10.2.F, Revision 0, dated August 14, 1980.

- b. The inspector observed the painting of the installed welds and determined that the requirements of PCI installation procedure B.10.3.F, Revision 1, dated August 12, 1980, were met. Paragraphs 7.9.3 and 7.9.5 of the procedure state, in part, that..."Shop and field welds....all welds on galvanized material shall be coated with zinc rich paint developing not less than 1 oz. Zn/ft. of coated surface .003 inch checked by Nordson dry film thickness gauge". PCI Quality Control inspection stated that this procedure was intended for shop welds only as they are spray painted; field welds are painted by brush. Therefore, no inspection of the field painting has been performed to date. As corrective action concerning the above, PCI agreed to incorporate in the referenced procedure inspection requirements relative to brush painted field welds, and to provide means to ensure that all welds are painted and inspected accordingly.
- c. The inspector observed the storage of safety related HVAC ducts. Some of the ducts stored outside were exposed to inclement weather. The control of stored ductwork appeared to be inadequate in that six items identified as part Nos. 5622, 5737, 5751, 3634, 3616, and 6155 were observed to be off cribbing and immersed in a pool of water. The storage of the ducts is contrary to PCI

procedure B13.1.F, Revision 0, dated March 31, 1980, titled "Storage and Handling". Paragraphs 4a and 4b state, in part, that "Materials stored outdoors will be blocked up from the base and be stored so that drainage is in effect".

The inspector informed the licensee that the above condition was contrary to the requirements of Criterion XIII of 10 CFR 50, Appendix B. This is an item of noncompliance identified in Appendix A. (456/80-12-03; 457/80-11-03).

- d. The inspector, while performing observation of storage of above material, noted that out of a sample size of 36 units, eight exhibited defective shop welds. Type of weld defects observed were:

<u>Part No.</u>	<u>Defect Observed</u>
5598	Overlap, irregular weld bead profile
5614	Weld broke loose from base metal
6416	Undercut - burned through on sheet metal
6155	Craters not filled in, some exhibit apparent cracks and porosity. (painted over).
5123	Same as 6155
6322	Same as 6155
5695	Same as 6155
6320	Same as 6155

The most common defect noted was failure to fill in craters of the welds. This should have been rejected at the shop as required by PCI procedure B10.2.S, Revision 1, dated May 31, 1980, titled "Visual Weld Inspection". Paragraph IV A.3 of the above states, in part, "Craters...must be filled in to full weld section". Contrary to the above, shop inspection records indicated the above defective welds were acceptable. PCI "Field Receiving Inspection" procedure identified as B10.1.F, Revision 0, dated March 31, 1980, does not address inspection of welds for compliance to applicable procedure requirements and therefore, to assure the quality of welds, shop inspection data is depended upon.

The inspector informed the licensee that the above condition was contrary to the requirements of Criterion VII of 10 CFR 50, Appendix B. This is an item of noncompliance identified in Appendix A. (456/80-12-02; 457/80-11-02).

2. Review of Procedures

The inspector reviewed the following PCI procedures:

<u>Identification</u>	<u>Title</u>
B9.2.F, Revision 0	Control of Filler Metal
B9.4.F, Revision 1	Installation Procedure
B10.1.F, Revision 0	Field Receiving Inspection
B10.2.F, Revision 0	Visual Weld Inspection
B10.3.F, Revision 1	Installation Inspection
B10.4.F, Revision 1	Final Inspection
B.2.1.5, Revision 0	Welder Qualification

The following observations were made by the inspector:

- a. PCI B10.1.F, Revision 0, "Field Receiving Inspection", addresses dimensional inspection of material received to be in accordance with fabrication tickets, drawings, etc. No provision for sampling of dimensional characteristics is made in the procedure, and therefore implies 100% inspection, which is not being performed. A random sample of dimensional characteristics is the method employed by PCI field inspection. This method of sampling inspection should be addressed in the procedure requirements.
- b. PCI "Installation Procedure", identified as B10.3.F, Revision 1. Comments on this procedure are incorporated in Section II paragraph 1.b of this report.
- c. PCI procedure "Welder Qualifications", identified as B2.1.S, Revision 0, states in part, that, "Welders' qualifications will be in accordance with the latest revision of AWS D.1.1 structural welding code"; however, welders' qualifications are performed to AWS D.1.1 '77 Addenda. The latest PCI Corporate Audit identified the above and corrective action taken was to change the referenced procedure requirements to reflect that the welders' qualifications are to be performed to AWS D.1.1 '77 Revision. The procedure had not yet been revised but was in the process of revision by PCI.

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. An unresolved item identified during this inspection is discussed in Section 1, paragraph 1.

Exit Interview

The inspectors met with the licensee representatives (denoted in the Persons Contacted paragraph) at the conclusion of the inspection and outlined the scope of the inspection along with a summarization of the results.