

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-456/84-36(DRS); 50-457/84-34(DRS)

Docket Nos. 50-456; 50-457

License Nos. CPPR-132; CPPR-133

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

Facility Name: Braidwood Station, Units 1 & 2

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: November 20-21, December 5-6, 17-19, 26-27, 1984  
and May 1, 17, June 14, July 16, 25-26, 30, 1985

Inspector: *J. M. Jacobson*  
J. M. Jacobson

*8/10/85*  
Date

Approved By: *D. H. Danielson*  
D. H. Danielson, Chief  
Materials and Processes Section

*8/16/85*  
Date

Inspection Summary

Inspection on November 20-21, December 5-6, 17-19, 26-27, 1984, and May 1, 17, June 14, July 16, 25-26, 30, 1985 (Report Nos. 50-456/84-36(DRS); 50-457/84-34(DRS))

Areas Inspected: Unannounced, routine safety inspection to review the HVAC contractor's welding activities and related procedures to evaluate the technical adequacy of both ongoing and past welding activities; and review of the electrical contractor's welding related procedures. This inspection involved a total of 112 inspector-hours onsite by one NRC inspector.

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

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company (CECo)

- \*L. DelGeorge, Assistant Vice President
- \*C. Schroeder, Licensing and Compliance Superintendent
- \*J. Dierbeck, PCD Engineer
- \*P. Barnes, Licensing Engineer
- \*E. Netzel, QA Supervisor
- \*L. Kline, PLC Supervisor
- \*G. Groth, Assistant Construction Superintendent
- \*J. Gieseke, PCD Engineer

#### Pullman Sheet Metal Works, Inc. (PSM)

- D. Grant, QA Site Supervisor
- P. Weiner, Engineering Manager
- E. Ewald, Welding Engineer

#### L. K. Comstock

- I. DeWald, QC Supervisor
- B. Seltmann, QA Manager
- T. Simile, Level III Welding Supervisor

\*Denotes those attending the exit meeting.

### 2. Review of HVAC Activities

A comprehensive review of Pullman Sheet Metal Works, Inc. (PSM) welding activities and related procedures at the Braidwood Site was performed. The objective of this inspection was to evaluate the technical adequacy of both ongoing and past welding activities.

The following procedures and qualifications, currently in use, were reviewed and found to be acceptable:

- ° D1-1F, Revision 2, and D1-3-F, Revision 1, General Welding Procedures
- ° BF-12F, Revision 2, Flux Cored Arc Welding (E71T-11)
- ° BS-31F, Revision 0, Shielded Metal Arc Welding (E309)
- ° BS-32F, Revision 0, Shielded Metal Arc Welding (E6013)
- ° BF-32F, Revision 3, Flux Cored Arc Welding (E71T-11)
- ° BS-11F, Revision 4, Shielded Metal Arc Welding (E7018)
- ° BG-11, Revision 0, Gas Metal Arc Welding (E70S-2)
- ° BG-32F, Revision 2, Gas Metal Arc Welding (ER308)
- ° BG-33F, Revision 1, Gas Metal Arc Welding (ER309)
- ° BG-34F, Revision 0, Gas Metal Arc Welding (ER309)

- ° BF-31F, Revision 2, Flux Cored Arc Welding (E71T-GS)
- ° B2.1.F, Revision 4, QA/QC Personnel Qualification and Certification
- ° B9.1.F, Revision 5, Welder Qualification

The following procedures, currently in use, were reviewed and found to be deficient:

- ° BG-31F, Revision 1, Gas Metal Arc Welding (ER70S-3). This procedure was qualified in accordance with AWS D1.3-78 which states that a qualification test with a "tee" joint also qualifies a lap joint but not vice versa. Contrary to this requirement, this procedure was qualified utilizing a lap joint while the procedure permitted welding utilizing a "tee" joint. As a result of this NRC inspection finding, BG-31F, Revision 1, was removed from the field to preclude its use. It was concluded that no welding had been performed nor welders qualified to this procedure since issuance. PSM will revise this procedure at some later date should the need arise for its use.
- ° B9.2.F, Revision 2, Control of Welding Filler Metal. This procedure allowed for reconditioning of low hydrogen (E7018) electrodes at a temperature of 250°F when exposed to the atmosphere more than 4 hours. The AWS D1.1 Code requires that these electrodes be reconditioned at a temperature between 450°F and 500°F. A temperature of 250°F may not be sufficient to remove absorbed hydrogen which may cause underbead cracking of welds. As a result of this inspection, the procedure was revised to include the requirements of AWS D1.1. This item requires further review upon the licensee evaluation of work performed using this procedure and is considered an open item (456/84-36-01(DRS)).

The following superseded procedures were reviewed and found to be acceptable:

- ° BPSM-FWP-300, Revision 8, Gas Metal Arc Welding (E70S-2)
- ° BPSM-FWP-300B, Revision 2, Gas Metal Arc Welding (E70S-2)
- ° BPSM-FWP-301C, Revision 4, Shielded Metal Arc Welding (E6013)
- ° BPSM-FWP-304, Revision 5, Gas Metal Arc Welding (E309)
- ° BPSM-FWP-304B, Revision 1, Gas Metal Arc Welding (E309)

Twelve of the 86 welders employed by PSM as of December 17, 1984, were selected by the inspector for welder qualification review. All 12 of the individuals were found to be properly qualified to the applicable codes. In addition to the document review, the inspector selected eight welders to demonstrate their actual welding proficiency. Weld joint configuration, the welding process/procedure, and material thickness selections were made by the inspector. The inspector observed the welding and subsequent bend tests of the weld coupons. The demonstration established that the welders possessed adequate skills and that the selected welding process/procedure was also adequate to perform quality HVAC welding.

Documentation packages for the following hanger and duct installations were reviewed:

S1640	D-2170
S1630	D-2144
S1327	D-2169
S1326	D-2129
S1304	D-2169
S1312	

All documentation for these installations was found to be acceptable. As of August 1983 welding procedures to be used for a specific installation are specified on a Weld Process Sheet. The Weld Process Sheet is also used to document AWS D1.1 Code required preheat. Prior to August 1983, no documentation of preheat exists. PSM has issued NCR No. 747 to document and resolve this deficiency. Technical justification for acceptance of welds installed without evidence of required preheat will be based on the qualification of a welding procedure using both E6013 and E7018 electrodes with no preheat. This is considered an open item pending the inspector's review of the completed qualifications (456/84-36-02(DRS)).

Inspection Report No. 50-456/83-09 identified certain PSM programmatic deficiencies. As a result of a meeting between the licensee and Region III personnel on February 20, 1985, the licensee agreed to develop a weld sample program to aid in the evaluation of previous work. The program consists of the removal and subsequent tensile testing of approximately 70 welds representing approximately 35 installed hangers. In addition, a sample of sheet metal to sheet metal and sheet metal to structure joints will be tested. This is considered an open item pending the inspector's review of the completed testing (456/84-36-03(DRS)).

### 3. Review of Electrical Contractor Welding Procedures

A review of all L. K. Comstock welding procedures used for fabrication and installation of cable trays and supports was performed. The following procedures and qualifications, currently in use, were reviewed and found to be acceptable:

- ° 4.7.1, Revision C, Welder Performance Qualification Tests
- ° 4.3.3, Revision F, Welding Procedure Structural Attachments (7018)
- ° 4.3.3.3, Revision A, Welding of Aluminum
- ° 4.3.3.2, Revision A, Welding of Stainless Steel
- ° 4.3.3.1, Revision D, Welding Procedure (6013)

The following superseded procedures were reviewed and found to be acceptable:

- ° 4.3.14, Revision 9/17/80, Welding of Stainless Steel
- ° 4.8.2, Revision 8/14/83, Welding of Aluminum
- ° 4.3.3.1, Revision A, B, and C, Welding Procedure (6013)

° 4.3.3, Revision A, B, C, D and E, Welding Procedure Structural Attachments (7018)

A deficiency related to a welding practice was identified during this inspection. Per AWS D1.1 Welding Code, welding on galvanized material is not permitted unless a procedure is specifically qualified for that application. While Comstock does weld on galvanized materials, their undocumented actual practice is to remove (by grinding) the galvanize prior to welding. The NRC inspector verified this practice by interviewing several welders in the field. To preclude the possibility of any questionable work arising from a failure to remove the galvanize coating before welding, the licensee has instructed L. K. Comstock to qualify a procedure for welding with the galvanized coating in place. This is considered an open item pending review of the welding procedure qualification test results (456/84-36-04(DRS)).

4. Open Item

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 2 and 3.

5. Exit Interview

The inspector met with representatives (denoted in Persons Contacted paragraph) at the conclusion of the inspection. The inspector summarized the scope and findings of the inspections 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.