U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-440/84-10(DE); 50-441/84-10(DE)

Docket Nos. 50-440; 50-441 Licenses No. CPPR-148; CPPR-149

Licensee: Cleveland ELectric Illuminating Company
Post Office Box 5000
Cleveland, OH 44101

Facility Name: Perry Nuclear Power Units, Units 1 and 2

Inspection At: Perry Site, Perry, OH

Inspection Conducted: May 10-11, 1984

Inspectors: K. D. Ward — Date: 6/1/84

D. S. Jones — Date: 6/1/84

Approved By: D. H. Danielson, Chief for Materials and Processes Section — Date: 6/1/84

Inspection Summary

Inspection on May 10-11, 1984 (Report No. 50-440/84-10(DE); 50-441/82-10(DE))
Areas Inspected: Routine, unannounced inspection of licensee action on previous inspection findings; 10 CFR 50.55(e) items; IE Bulletins; allegations concerning deficiencies in Pullman Power Products pipe spool welds found on other sites; N-5 Data Report review. The inspection involved a total of 28 inspector-hours onsite by two NRC inspectors.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Cleveland Electric Illuminating Company (CEI)

*R. Simmons, QC Supervisor
*K. Kaplan, Senior Engineering Technician
C. Shuster, Manager, QA
E. Riley, General Supervisor
B. Walrath, General Superviser, Engineering
C. Humphries, Administration and Records
E. Kinzer, Records Management

Gilbert Associates, Incorporated (GAI)

*G. Parker, Piping Mechanical Supervisor
*R. Matthys, Lead Piping

Pullman Power Products (PPP)

H. Sinclair, Chief Field Engineer
J. Yount, QC Supervisor
R. Warrell, Quality Engineer
G. Frehafer, Welding Engineer

Schweitzer-Dipple (SD)

W. Brien, Assistant Project Manager
E. McFaul, General Foreman
D. Komzak, General Foreman

Hartford Steam Boiler Engineering and Insurance Company (HSB)

R. Acomb, ANII

The inspector also contacted and interviewed other licensee and contractor employees.

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

a. (Closed) Noncompliance (440/83-31-05; 441/83-30-05): Weld inspection performed for AWS welds were deficient. Fabrication requirements for field installed branch connection, weld-o-lets, and measures to control the welding of stainless steel socket welds, were found to be deficient. Welder qualification radiographs did not conform to appropriate quality standards. The inspector reviewed the response dated January 22, 1984, Corrective Action Notice 8-83-1, Nonconformance Report PBI-981 and others on hangers and welds. Procedures and documentation were also included as part of this review.

Relative to the portion of this item which concerns structural steel erection, CEI's contractor, PBI Industries (PBI), initiated Corrective Action Notice (CAN) 8-83-1 to their subcontractor Kelley Steel together with Nonconformance Report (NR) PBI-981. The eight welds cited in the Construction Appraisal Team report were repaired per the Nonconformance Report. The previous inspections of the inspector in question were re-examined as required by CAN 8-83-1 and reworked as required. The NR and CAN were subsequently dispositioned and closed. The inspector in question is no longer associated with PBI. The Kelley Steel Quality Manager advised all inspectors of the necessity to follow all codes and specifications and informed them of the consequences.

Relative to the portion of this item which concerns HVAC applications, Observation Action Request 702 was written by the Construction Quality Section (CQS) to ensure that the contractor would initiate nonconformance reports to identify unacceptable welds and perform a complete reinspection of welds that had been accepted by the inspector in question. Robert Irsay Company completed their reinspection of work previously inspected and accepted by the individual in question. All areas were reinspected 100% except the Elevation 620' Control Complex. At this location, the detail on Drawings D-936-764 and 765 calling for the welding of gusset plates to existing building wide flange beams was reinspected in 14% of the installations (5 of 36 supports). This sample reinspection revealed no discrepancies and was determined to be adequate verification of the acceptability of the welding and initial inspections. Overall, 55 Nonconformance Reports covering 189 hangers (45 NRs on 73 hangers prior to this NRC inspection and 10 NRs on 116 hangers after this NRC inspection) were written. The inspector in question is no longer associated with RICO. In response to Observation Action Request 702, the Contractor has also retrained QC personnel on use of fillet gauges to determine proper weld profile and fillet sizes. Other measures being taken to identify and properly address recurring deficiencies include an ongoing 100% review of CQS Surveillance/Inspection reports and performance of a monthly detailed trend analysis of RICO Nonconformance Reports. Both of these efforts are performed by the CQS Quality Engineer.

Relative to the fabrication problem, Nonconformance Reports CQC 2916 and CQC 2917 were issued to identify the two occurrences of insufficient reinforcing fillet weld on the field welded branch connections identified by the Construction Appraisal Team inspector. These NRs have been dispositioned by Project Engineering in accordance with the requirements of ASME Section III. In addition, CQS and a representative of the Construction Appraisal Team inspected other existing branch connections during the course of the appraisal and found no other instances of insufficient reinforcement. As a result, this has been determined to be an isolated occurrence.

Relative to the measures to control the welding of stainless steel socket welds, the Project Organization has reviewed the heat input as defined in Pullman Power Products (PPP) Procedure WPS-29 in relation to ASME Code requirements and has determined that it is in full compliance with the Code. In addition, preliminary destructive examination of actual samples indicates

that the actual application of the WPS on CEI piping samples resulted in no detrimental effect on the weld or base material. Photomicrographs were taken and reviewed. A more formal engineering study using selected materials welded under controlled conditions was performed to provide additional assurance that the subject socket welds meet ASME Code requirements. PPP revised their General Welding Standards procedure to address section NX-4244 of ASME Section III concerning reinforcement of branch connection welds.

Relative to General Electric A&ESO, the Project Organization issued Observation Action Request's 714, 715, 716, 717 and 721 to GE A&ESO. In turn, GE A&ESO issued Nonconformance Report GE 38-731 and Corrective Action Request 004 against their own organization. A sensitivity comparison of radiographic techniques has been performed. A documented review has concluded that welders with questionable qualification radiographs have not performed any production welding in the area of question and will be requalified if required to. As appropriate, radiograph reader sheets and reports have been corrected to reflect correct techniques. In addition, an evaluation was performed of welds made by welders whose qualification reports indicate incorrect thickness test coupons. Documentation was reviewed which verified that the welders had not performed welding on items beyond their actual qualified thickness. Retraining sessions have been given to GE A&ESO Quality Control/Nondestructive Examination personnel involved with radiographs. A letter was issued to radiography personnel clarifying penetrameter usage. Welder qualification coupon thickness will be verified by the Welding Supervisor and/or GE QC inspector prior to welder certification. Techniques have been revised to provide for adequate station markers during radiography.

Relative to Pullman Power Products, Project Organization issued Observation AR713 to Pullman Power Products concerning wrong side placement of penetrameters and lack of reader or technique sheets. Pullman Power Products has revised Procedure IX-RT-5 to require the use of "Radiographic Inspection Reports" during interpretation of welder coupons. Additionally, the procedure revision clarifies proper penetrameter placement. Comment resolution is now in process. All PPP radiographic examination personnel were trained to the procedure revision upon its acceptance.

b. (Closed) Unresolved Item (440/82-03-01): Radiography of linear indication. The linear indication area was removed and repaired, liquid penetrant examined and radiographed, and found to be acceptable. The inspector reviewed all documentation relating to the item and resolving the problem.

3. Licensee Action on 10 CFR 50.55(e) Items

a. (Open) 50.55(e) (440/80-08-EE) DAR 37 (441/80-08-EE): Areas of rust on containment steel cladding. CEI consulted with all nine groups involved in providing engineering, design, and construction for this job, and have a date of May 15, 1984, to complete all of the work up to the 599' elevation.

b. (Closed) 50.55(e) (440/81-19-EE) DAR 79 (441/81-19-EE): Standby diesel generators model DSRV16: potential defect in starting air system check valve. The inspector reviewed the final response NCRs and receipt inspection reports. The total number of valves in question at PNPP is eight. Transamerica DeLaval Inc. provided CEI with the necessary information for modification of Wm. Powell check valves. The modified check valves have passed seismic qualification.

c. (Closed) 50.55(e) (440/82-21-EE) DAR/111 (441/82-21-EE): Recirculation and mainsteam pipe whip restraints were welded using an incorrect procedure. The inspector reviewed the final report dated December 15, 1983, Specification 22A2598, Welding Procedure, WPS 1.1.8.1, Rev. 3, and NCRs and other documentation relative to the 50.55(e).

Visual and magnetic particle inspection of the completed welds connecting the pipe whip restraint brackets to the drywell structural steel noted three welds with linear indications. Subsequent investigation into the cause of the indications identified that the bracket material did not meet the requirements of the applicable welding code and the pre-qualified procedure that was followed.

The pipe whip restraint brackets were supplied by the General Electric Company, San Jose (GE NEBO) with the applicable welding code (AWS) specified in their Installation Specification 22A2598. The brackets were installed by General Electric Apparatus and Engineering Services (GE A&ES) in accordance with their welding procedure, WPS 1.1.8.1, Rev. 3. This procedure is a pre-qualified AWS procedure; however, it was not acceptable for use on the welding of the brackets due to the difference in the thickness of the bracket material and the thickness of material that the procedure was qualified for. Additionally, material verification of the bracket identified that the material is ASTM-A105 which is not a pre-approved material by the AWS Code.

All forty-eight recirculation system and thirty-six main steam system pipe whip restraint brackets, a total of eighty-four, were installed prior to the identification of this deficiency.

Nonconformance reports P038-1347, P038-1346, and P038-1103 were initiated to track the problems identified with the bracket welds. GE NEBO addressed the welding problems on Field Deviation Disposition Requests KL1-125, KL1-257, and KL1-294.

GE NEBO and GE A&ES performed extensive metallographic testing on the bracket welds. The testing concentrated on the brackets from heat J-02159, as all failures identified prior to testing related to brackets from this heat. In addition, CEI contracted a local testing lab to perform independent metallographic tests to determine the cause of the weld problem and substantiate the results obtained by GE. The results of the various tests revealed the presence of underbead cracking in the weld heat affected zones of the brackets from heat J-02159.

Brackets which were not from heat J-02159 were also evaluated using a UT procedure developed by GE NEBO to detect the presence of underbead cracking. Most of the welds for these brackets exhibited UT results similar to those from heat J-02159. Further metallographic testing was performed on the welds to confirm the UT reports and to determine the corrective action necessary for the non-J-02159 heat brackets. The results of this testing indicated the presence of underbead cracking in most of the welds made on the brackets.

None of the installed brackets were considered acceptable due to the confirmed existence of weld defects or the likelihood that defects exist. All brackets installed were removed and the structural steel they were welded to reworked to its original condition.

Brackets have now been installed as follows:

The eight brackets not previously installed and two new replacement brackets were welded using approved welding procedure WPS 1.1.4.2. The material was qualified for this procedure using an elevated preheat. The results obtained using the procedure were acceptable. The procedure eliminated the underbead cracking; but the logistics involved in preheating such a large mass of base material to a high temperature were prohibitive. For this reason, a new procedure was qualified.

Eighty-two new brackets were installed at their respective locations using an approved welding procedure, WPS 1.1.9.4, which also eliminated the underbead cracking. WPS 1.1.9.4 was qualified for ASTM-A105 with preheating of the brackets and base material required. Additionally, the brackets received two layers of weld material to decrease the hardness properties in the heat affected zone.

Testing of the completed welds was performed in accordance with the original MT requirements for acceptance. Nondestructive testing of all welds was completed with no rejectable welds encountered.

Additional corrective action taken by GE included a 100% review of their AWS Welding Program in response to Corrective Action Request 82-28. GE A&ES revised all AWS welding procedures for clarity and simplicity to prevent the use of unapproved weld material. The AWS General Welding Procedure GWP-1005 and Nuclear Quality Assurance Manual used by GE A&ES were also revised to address AWS welding in any identified problem areas. In addition, GE reviewed all AWS welds that were previously completed. These actions were taken to insure that no problems similar to those identified in this deficiency existed and to prevent the recurrence of these problems.

d. (Open) 50.55(e) (440/83-21-EE) DAR 143 (441/83-21-EE): PPC placed partial rather than full penetration welds on piping supports. The rework is in process and may be completed June 1984.

e. (Open) 50.55(e) (440/83-25-EE) DAR 149 (441/83-25-EE): Several welds on the containment shell may require post weld heat treatment due to misinterpretation of ASME Code. There is a documentation review being performed to complete an NR on the item.

f. (Closed) 50.55(e) (440/83-27-EE) DAR 152: Anchor Darling globe valve vibration failure. The inspector reviewed the final response dated January 27, 1984 and NCR's and other documentation. The Anchor Darling Globe Valves supplied by GE contained a defect in the anti-rotational setscrew which holds the stem collar in position on the valve stem. During valve operation, the setscrew vibrated loose which allowed the key between the stem and stem collar to be displaced. This displaced key allowed the stem collar to slide down the stem resulting in free flotation of the stem rendering the valve inoperable. This condition was identified to The Cleveland Electric Illuminating Company by General Electric on December 27, 1983.

This deficiency affected the high pressure core spray valves E22-F010 and E22-F011 for Units 1 and 2. The corrective action identified to assure valve operability was to lock the setscrews by staking the stem collar threads with a center punch. This action is completed for Unit 1.

g. (Open) 50.55(e) (441/83-27-EE) DAR 152: Anchor Darling globe valve vibration failure. This item may be completed September 15, 1984.

h. (Closed) 50.55(e) 440/84-03-EE) DAR 155 (441/84-03-EE): Piping installation contractor ASME Code procurement problems. The inspector reviewed the final response dated February 10, 1984, surveillance/inspection reports, NCRs and audits. Documentation associated with random materials procured by Pullman Power Products under the SP44-4549-00 contract was determined to be in violation of ASME Section III, Subarticle NA3700. These discrepancies were identified on Project Organization Corrective Action Request (CAR) 84-01. A Stop Work Notification (SWN) 84-01 halting site procurement by Pullman Power Products was issued concurrently with CAR 84-01.

A complete review of documentation associated with all materials purchased under the SP44-4549-0 contract was conducted by the Contractor and the project Organization Construction Quality Section. All discrepancies detected and corrective action required were identified in Project Organization correspondence to PPP, PY-S/CON 8677 QA, and in the Project Organization evaluation of PPP response to CAR 84-01.

Pullman Power Products has completed correction of all identified procurement and receiving inspection documents. Evidence of chemical analyses performed as a verification measure required by ASME Section III paragraph(s) NX2610 by Pullman Power Products' subvendor has been obtained and found acceptable. Corrected documentation, or verbal commitment to provide corrected documentation, has been obtained from applicable material manufacturers and material suppliers.

In order to preclude recurrence of the subject problems, Pullman Power Products, under Project Organization guidance, has revised their procedures IV-34, "Site Purchasing," VII-1, "Vendor Qualification," and X-5, "Field Receiving Inspection Procedure." These procedure revisions were conditionally approved on February 3, 1984, and will be fully approved upon correction of minor concerns by the contractor.

i. (Open) 50.55(e) (440/84-05-EE) DAR 158 (441/84-05-EE): Shrinkage type surface cracks were found on actuator mounting brackets for 24 motor operated exhaust louvers on the HVAC for the No. 1 and 2 DG rooms and for the ESW pump house HVAC. This item is being worked. One NR is open and one has been closed. This item may be closed June 1984.

4. Licensee Action on IE Bulletin

a. (Open) IE Bulletin 80-08 (440-80-08-BB; 441/80-08-BB): Examination of Containment liner penetration welds. CEI's Project Engineering implemented a design change which directs weld-metal build-up of the joint surface to eliminate the sloped transition caused by the difference in outside diameter of the flued head fitting and the containment sleeve. As a result, the Contractor is able to use a single-transducer technique, as opposed to the dual-transducer technique required by the original design configuration. The latter is relatively complicated and more sensitive to operator error.

This IEB may be closed in the near future.

b. (Closed) IE Bulletin 83-06 (440/83-06-BB; 441/83-06-BB): Nonconforming materials supplied by Tube Line Corp. The inspector reviewed the response dated November 17, 1983. CEI completed a review of Tube-Line Corporation records to determine the end-users of the nonconforming material. After a cross-check between Tube-Line and the potential suppliers, it has been determined that PNPP does not possess any Tube-Line material as described in the Bulletin.

5. Allegation

On December 30, 1983, a welder, employed by Schweitzer-Dipple (subcontractor to Pullman), called the NRC Region III to provide allegations (RIII-83-A-0133) concerning weld rod thickness. His allegations are summarized as follows:

. The head engineer of Schweitzer-Dipple issued a memorandum several months prior to December 1983, which required welders to use 1/8 inch weld rod instead of 3/32 inch rod. The alleger welds safety-related piping hangers.

. The alleger stated that he could not make good welds with the larger size weld rod. During his qualification test he used 3/32 inch rod for the first two passes.

. The alleger gave the names of three Schweitzer-Dipple personnel to contact during the followup: Ed McFaul (Superintendent), Marty Swallow (General Foreman), and Mr. Komzak (General Foreman).

NRC Findings

Pullman personnel could not find a memo from a head engineer of Schweitzer-Dipple, but did have a memo dated November 11, 1983, from Pullman's construction superintendent to general foreman and foreman stating that 3/32" weld rod should not be used on applications where 1/8" and 5/32" rod could be used. The inspector was informed that the first couple of weld passes should be a smaller rod because there isn't much room but as a welder is coming out of the root, the opening is larger and a larger rod should be used.

The inspector reviewed Pullman's Welding Procedure Specification IT1A-III-1-KI-12 for certifying welders for welding safety-related piping hangers. The welders are certified on pipe, for pipe and hangers and the first two passes could be 3/32" weld rod. The remainder of weld was required to be completed with 1/8" weld rod. Every welder was required to be qualified/certified on 1/8" and 3/32" weld rod. They are certified to ASME Section III, 1974 Edition, Winter 1975 Addenda, NF Section. There are approximately 400 Class 1 hangers and 9000 Class 2 and 3. The Class 1 hangers are liquid penetrant examined (PT) and the Class 2 and 3 are visually examined (VT). Pullman NDE personnel perform the PT and the VT. At the end of 1983 there were over 1100 fitters and welders each month welding hangers.

The inspector interviewed E. McFaul, who is a general foreman, and D. Komzak, general foreman. Pullman did not know of a Marty Swallow. The two general foremen stated that welders that are certified on 1/8" and 3/32" have no trouble, but that there are welders that have a hard time being a welder and also it takes longer to weld a hanger with a small rod so the job lasts longer.

This allegation could not be substantiated and the matter is considered closed.

6. Deficiencies in Pullman Power Products Pipe Spool Welds for the Vogtle Plant, Georgia Power Company

The inspector reviewed the applicability to the Perry plants of a deficiency concerning shop welds in spool pieces fabricated by Pullman Power Products for the Vogtle Plant. Pullman at Perry was cognizant of the concerns identified at the Vogtle Project with fabricated sub-assemblies supplied by Pullman-Williamsport Shop. Review of the programmatic requirements of inspection established by CEI (i.e., Final Inspection by the Fabricator, Source Inspection prior to shipment by Gilbert Associates and Receipt Inspection by Pullman) identified no significant problems or trends to date. Additionally, final installation inspection and pressure testing have not revealed any negative results of Pullman-Williamsport fabricated items. The inspector has no further questions concerning this matter.

7. N-5 Data Reports

The inspector reviewed the following N-5 Data Reports to assure that the Stress Analysis Reports and back-up documentation were included:

Emergency Closed Cooling System

I/F OP42-PP-R250A

Local Panels and Racks

I/F OH51-P1310
I/F OH51-P1311

Condensate Transfer and Storage System

I-P11-33
E-22-7A
I-P11-37
I-P11B

Two-Bed Water Demineralizer and Distribution System

I-P47-1P21B
I-P45-1P21B
I-P42-1P21B
I-C41-1P21B

Mixed Bed Demineralizer and Distribution System

I-P22B

Emergency Service Water Screen Wash System

P49-1
P49-2

Standby Diesel Generator Exhaust, Intake and Crankcase System

I-R48-C

The fifteen N-5 data reports constitute the total number to date that have been turned over to the owner. The N-5 data reports were turned over as partial systems to be compiled as each system is completed. Three of the fifteen N-5 Data Reports required a stress analysis report. It was noted on the N-5s that stress analysis report was on file at Gilbert Associates in Reading, PA. The inspector was informed that as each system is completed the stress analysis report would be included in the final compilation. It was noted that the owner had a procedure in preparation entitled "ASME Code Data Reports" which will establish a system for handling N-5 and N-3 Code Data Reports.

This is an unresolved item to be followed up to assure implementation of the procedure (440/84-10-01; 441/84-10-01).

No items of noncompliance or deviations were identified.

8. 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 disclosed during the inspection is discussed in Paragraph 7.

9. Exit Interview

The inspectors met with site representatives (denoted in Paragraph 1) at the conclusion of the inspection. The inspectors summarized the scope and findings of the inspection noted in this report.