

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-546/83-15(DPRP); 50-547/83-15(DPRP)

Docket Nos. 50-546; 50-547

License Nos. CPPR-170; CPPR-171

Licensee: Public Service Indiana
Post Office Box 190
New Washington, IN 47162

Facility Name: Marble Hill Nuclear Generating Station Units 1 and 2

Inspection At: Marble Hill Site, Jefferson County, IN

Inspection Conducted: July 1 - August 31, 1983

Inspector: *P.R. Pelke for*
J. F. Schapker

9/12/83

Date

Approved By: *P.R. Pelke for*
J. E. Konklin, Chief
Reactor Projects Section 1A

9/12/83

Date

Inspection Summary

Inspection during the period of July 1 - August 31, 1983 (Report Nos. 50-546/83-15(DPRP); 50-547/83-15(DPRP))

Areas Inspected: Routine, unannounced inspection by the resident inspector of allegations of improper fabrication/installation of HVAC, licensee actions on previous inspection findings, 10 CFR 50.55(e) reportable items, reactor coolant system piping, nonconformance reports, audit reports, and Seismic Category I Concrete. The inspection involved a total of 195 inspector-hours onsite by one NRC inspector, including 26 inspector-hours onsite during off-shifts.

Results: One item of noncompliance was identified (failure to document a nonconforming condition - Paragraph 5).

DETAILS

1. Persons Contacted

Public Service Indiana (PSI)

*S. Shields, Senior Vice President Nuclear Division
W. Petro, Vice President Nuclear Services
J. Bott, Nuclear Regulation and Affairs Manager
C. Togni, Chief Civil Engineer
*C. Beckham, Quality Engineering Manager
J. Parks, Civil Quality Engineering Manager
F. Carchedi, Mechanical Quality Engineering Manager
S. Sallee, Materials Quality Engineering Manager
M. Mensing, Electrical Resident Engineer
J. Thomas, Construction Manager
S. Quinn, Project Engineering Manager
J. Davenport, Quality Engineering Manager
D. Jones, Senior Quality Engineer
H. Curry, Electrical Quality Engineering Manager
L. Wade, Composite Quality Engineering Manager

Commonwealth Lord Joint Venture (CLJV)

K. Pendergrass, QA Director
J. Hughes, QA Audit Surveillance Supervisor
B. Alvord, Training Manager

Cherne Contracting Corporation (CCC)

D. King, QA Manager

Westinghouse Electric Corporation

C. Markham, Site Manager
B. York, Welding Engineer
D. Williams, Mechanical Engineer

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I. Yin, Senior Mechanical Engineer

*Denotes those present at the exit meeting.

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

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (50-546/83-i0-04) and 10 CFR 50.55(e) Report (50-546/83-04-EE): Steam Generator nozzle cracks in the inconel band.

The inspector reviewed the licensee action of withdrawing the 50.55(e) report which was considered unresolved. The inspector requested the fabrication drawing be furnished for review to ascertain the exact location of the defects in relationship to the inconel band. This drawing was subsequently furnished by Westinghouse who had fabricated the Steam Generators. Using information from the drawing the inspector measured the location of the linear indications and determined that the indications were located in the parent metal-carbon steel casting and not in the inconel band or stainless steel safe end. This verification was confirmed with the aid of a magnetic instrument and the light corrosion evident on the carbon steel nozzle clearly exhibiting the weld interface. The indications were located approximately one inch away from this interface and therefore were not considered to be in the heat affected zone of the weld. The cause of the linear indications appeared to be shrinkage cracks in the casting base material, a common occurrence in cast base metal which is acceptable within designated limits (radiographically acceptable). The inspector reviewed the radiographs of the nozzle safe ends to assure the above linear indications were acceptable to radiographic standards.

Radiographs reviewed:

<u>X-Ray Number</u>	<u>Steam Generator Identification</u>
X-7001-U-T	1RC01BD
X-7001-V-T	1RC01BD
X-6876-U-T	1RC01BC
X-6876-V-T	1RC01BC
X-7235-U-T	1RC01BB
X-7235-V-T	1RC01BB
X-7255-U-T	1RC01BA
X-7255-V-T	1RC01BA

No items of noncompliance or deviations were identified.

3. Evaluation of Items Reported Per 10 CFR 50.55(e)

(Closed) 10 CFR 50.55(e) Report (546/83-07-EE; 547/83-07-EE): Cracking of welds on embedment plates in containment. The inspector reviewed the following documents:

- . PSI final response dated May 31, 1983
- . Newburg NCR 5900, 5891, 5927
- . Newburg Repair Data Record (RDR) 3807
- . Weld Procedure Newburg, WPN 5-10, Revision 3
- . AE Drawing AIF S1001, Revision AA
- . Newburg Weld QC Checklist
- . Newburg Magnetic Particle Examination Reports

These cracks were discovered as a result of the civil contractors improper

attempts to straighten a box beam in Unit 2 Containment. The result of the straightening attempt was the cracking of the embed plate that the box beam was attached to. After removal of the box beam other cracks were discovered in the lug to embedded plate welds. A reinspection of similar lug to embedded plate welds also revealed some cracking. The subject embedded plates and box beams act as part of the structural support network for safety related piping systems.

PSI engineering personnel determined that the weld cracking was due to the welding method being used. Alternative welding methods were investigated and thoroughly tested. One method has been found to be acceptable and the civil contractor has been released to work in accordance with this new method. Another method is currently being tested and if the results are acceptable the contractor will also be allowed to use it. All similar welds on embedded plates in Unit 2 Containment done to the superseded method have been removed and the areas will be rewelded using a PSI approved method, as mentioned above.

The inspector reviewed the licensee/contractors quality documents and weld records associated with the above defects. The licensee/contractor performed extensive reviews and tests to determine the cause and corrective action to assure sound welds for the box beam to embed connections. The primary cause of the cracking was determined to be reduced preheat. Due to spalling of concrete and deformed wire separation which occurred in Unit 1, (caused by box beam to embed welding preheat and weld shrinkage (Ref. 50.55(e) Report 546/82-15-EE)), the preheat was reduced for Unit 2 welding, within limits of the applicable structural welding code, AWS-D1.1. This resulted in the cracking of the box beam to embedded plate welds. A special welding procedure was developed by the licensee/architect engineer to control weld stress and preheat/interpass temperature, prevent cracking of the weld, reduce weld shrinkage and prevent separation of the wire anchors from the embed. The inspector performed in-progress and final visual inspections of the new process. No defects were evident in the areas observed.

No items of noncompliance or deviations were identified.

4. Seismic Category I Concrete

Forming, installation of rebar, prepour inspection, placements and post placement curing were observed in progress in the Auxiliary Building, Fuel Handling Building, and Ultimate Heat Sink. Specific placements included HSB-426-4, ACBW 426-36A, HSW-426-4 and FHW 417-1. During inspection of activities for structural concrete in these areas, conformance with requirements specified in the applicable contractors and licensee procedures were verified by the inspector. Applicable procedures reviewed and observed were:

<u>Procedure</u>	<u>Revision</u>	<u>Title</u>
Newburg, WPN-9	19	Concrete Placement
WPN-9-02	0	Grout Placement
WPN-13	16	Installation of Embedded Items

<u>Procedure</u>	<u>Revision</u>	<u>Title</u>
WPN-41	4	Concrete Curing
WPN-58	2	Field Fabrication of Reinforcing Steel
QCP-10.02	8	Concrete Preplacement Inspection
QCP-10.03	7	Concrete Placement Inspection
QCP-10.04	4	Concrete Curing Inspection
QCP-10.18	2	Inspection of Reinforcing Steel Field Fabrication
PSI, QCP-3	11	Concrete Field/Testing Inspection
TMP-1	1	Slump of Portland Cement Concrete
TMP-2	2	Unit Weight and Yield of Concrete
TMP-3	1	Air Content of Concrete and Grout
TMP-4	2	Molding and Curing of Compressive Strength Specimens

No items of noncompliance or deviations were identified.

5. Allegations of improper repair of an I-beam indication by Pullman Construction Corporation (HVAC).

On June 28, 1983, at 1:38 a.m. (EST), the Headquarters Duty Officer received a call from an allegor concerning the questionable repair of a crack in a structural steel I-beam. The Headquarters Duty Officer provided this information to RIII for followup action. On June 28, 1983, at 8:30 a.m., RIII contacted the allegor for details of the allegation. The allegor stated that he wants to remain anonymous. His allegations are summarized as follows:

- a. "A three foot long mill mark or crack was discovered on a structural I-beam for the containment fan coolers in the Unit 1 containment at the 57 azimuth, 401' level, plenum 4, and zone 1. The allegor had trouble recollecting the exact location. The contractor determined that the indication was a mill mark and tack-welded both ends of the indication. The allegor is concerned that the indication may be a crack and therefore, the repairs are inadequate. The allegor is not aware of any NCRs concerning the deficiency."

This allegation was partially substantiated. The referenced location was incorrect, however, the inspector was able to locate the steel I-beam through contact with a person referenced by the allegor who had kept notes on this item, and by questioning craft personnel who were knowledgeable of the alleged crack.

The I-beam in question was located on the 383' level in containment at azimuth 16 degree 30 minutes. This beam was installed by the structural contractor and not by the HVAC contractor. The HVAC contractor personnel who found the indication reported it to their supervision. A visual

examination was performed by the HVAC contractor who determined it was a mill mark and not detrimental to the function of the column (I-beam). No evidence of tack welding the ends of the indication was found. Subsequent to this inspection the structural contractor issued a non-conformance report to evaluate the condition in accordance with their Quality Assurance program. The inspector reviewed the completed NCR for adequate disposition and corrective action. The indication was removed with minor surface grinding and Magnetic Particle examined.

The HVAC contractor did not issue a NCR or inform the licensee of the existence of the indication. This is contrary to the licensee's QA program requirements stated in Section 17.1.15 (a) of the Marble Hill SAR. The licensee was informed that failure of the contractor to document the nonconforming condition in accordance with procedure requirements was a violation of Criterion XV of 10 CFR 50 Appendix B. (546/83-15-01)

- b. "Embed plates are not traceable due to welding over the identification when attaching structural steel.

This allegation was not substantiated. Although the allegor was factual as to welding over embed identification numbers the embeds remain traceable to quality documents maintained by the contractor who installed the embeds. In addition the contractor who installed the embeds, purchases all embeds to Category 1 (safety related) requirements to assure compliance.

- c. Five additional allegations were made by the person who the inspector contacted for information as to the location of the cracked I-beam referenced above.

- (1) "Hanger 1186 was cut off without documentation (4" was cut off, hanger was too long)."

This allegation was not substantiated. Pullman hanger 1186, S&L Drawing 1281-03-1335 had not been installed and no process sheet had been issued. The allegor was not sure of the hanger numbers being Pullman identification numbers or Sargent & Lundy designer hanger numbers and therefore both identifications were researched.

- (2) "Hanger 1735 in the Auxiliary Building was also cut 4" without documentation."

This allegation was substantiated with no detrimental effect to the function of the hanger. This hanger was cut in the field as permitted by the applicable installation procedure, Pullman 9.4.F, applicable drawing S&L M-1287-01, Revision E and alternate drawings S&L M-1390. This hanger had been inspected for fit-up and final weld inspection but not for final configuration. Subsequent inspection of the configuration was made and found acceptable.

- (3) "Hanger 1701 had bad welds, which were accepted by Quality Control and was moved 4 times without documentation".

This allegation was partially substantiated. On February 15, 1983, the licensee issued a Stop Work Order to the HVAC contractor. The licensee, thru their QA audit program, had determined that the HVAC contractor had not adequately implemented their Quality Assurance program. Subsequently, the HVAC contractor was required to revise procedures, implement additional training, and reinspect all hanger installations. This reverification is currently in progress and approximately 20 percent complete. Those items which are found nonconforming are documented on nonconformance reports and dispositioned in accordance with applicable requirements. The Stop Work Order was lifted by the licensee on April 18, 1983, however, the licensee QC surveillance inspection and QA Audit program has been closely monitoring construction activities to assure compliance. The licensee reported the above construction deficiencies (10 CFR 50.55(e)) on February 28, 1983, with interim reports on March 25 and July 22, 1983. A final report will be issued upon completion of the reverification program.

The hanger 1701 was reinspected under the reverification program and found to have defective welds. The deficiencies are documented on NCR-MH-388. There are no records or physical evidence to substantiate the alleged moving of the hanger. It is apparent that the licensee had identified the above deficiency as well as many others and taken appropriate corrective action to assure the HVAC contractor will conform to the requirements of 10 CFR 50, Appendix B and applicable specification requirements.

- (4) "Steam Generators on Unit 1 top side, are rusty and dirty inside, sand blast material and other debris."

This allegation was not substantiated. The alleged stated that he had worked installing air conditioning ducts in the upper portion of the steam generators. Although a fine film of rust exists, this is normal for bare carbon steel surfaces and does not pose a safety concern. The Steam Generator secondary side (steam side) is primarily carbon steel and deterioration was controlled by a nitrogen purge before installation. After installation the secondary side was opened and air conditioning units were installed to control the atmospheric conditions to prevent corrosion. Personnel entry into these units is controlled. This is to prevent unauthorized entry and control of tools and material taken in and out of the steam generators. The inspector inspected the the units and did not find any debris, sand blast material or excessive dirt. This area of the generator is not part of the primary side and therefore cleanliness is not as critical. However, excessive corrosion could be detrimental and therefore is controlled by the air conditioning units. It is possible the alleged may have thought he was in the primary side of the generators where dirt and rust deposits of this type would be a concern.

6. Independent Inspection Effort

The resident inspector made five surveillance tours during which the status of project work was noted, and construction activities were inspected on nuclear safety related structures and components. Observations of reactor coolant piping recirculation system welding and nondestructive examination were performed. Welding was inspected for proper technique, heat input control, welder qualification, and qualified weld procedures. Liquid penetrant examination of the welds was performed by qualified Level II inspectors to SNT-TC-1A requirements and administered in accordance with code and applicable procedure requirements. In addition the inspector observed rigging, handling and fit-up of large bore reactor coolant cross over piping. Rigging and handling of piping was performed in accordance with approved work procedures. Fit-up was in compliance with applicable drawings and weld procedure requirements.

Open Items Control: The inspector reviewed licensee/contractors Nonconformance Reports and Audit Reports and findings and corrective action measures for technical adequacy and compliance to the approved QA Program and regulatory requirements. The following documents were reviewed:

- Newburg - NCR - 6250
- Newburg - NCR - 5900
- Newburg - NCR - 5900 redisposition #1
- Newburg - NCR - 5900 redisposition #2
- CLJV - NCR - 564 MO-5424 *
- CLJV - NCR - 651 MO *
- CLJV - NCR - 726 MI *
- CLJV - NCR - 862 MO *
- CLJV - NCR - 921 MO *
- CLJV - NCR - 1009 MO
- CLJV - NCR - 1087 MO
- CLJV - NCR - 1170 MO
- CLJV - NCR - 1510 MO
- CLJV QA Audit 83-26
- CLJV QA Audit 83-29
- CLJV QA Audit 83-30

* Inspector performed field inspection of corrective action.

No items of noncompliance or deviations were identified.

7. Exit Interview

The inspector met with the licensee representatives denoted in Paragraph 1 and summarized the scope and findings of the inspection activities.