

THE CINCINNATI GAS & ELECTRIC COMPANY



CINCINNATI, OHIO 45201

February 23, 1982
QA-1636

E. A. BORGMANN
SENIOR VICE PRESIDENT

U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Attention: Mr. J. G. Keppler, Director

RE: WM. H. ZIMMER NUCLEAR POWER STATION UNIT 1
I. E. INSPECTION REPORT #81-27 - DOCKET NO.
50-358, CONSTRUCTION PERMIT CPPR-88, W.O.
#57300, JOB E-5590, FILE NO. NRC-1

Gentlemen:

This letter constitutes our response to the above referenced inspection report which in paragraph 2.d identified certain items which potentially did not fully meet Code requirements in piping welds and adjacent base materials.

ITEM 1

NRC Findings:

The visual examinations that were conducted revealed the following six welds which exceeded the ASME Code allowable reinforcement height on the outside surface of the weld.

HP-8	Excessive crown height 3/16", max. allowable 5/32"
HP-9	Excessive crown height 3/16", max. allowable 5/32"
LP-12	Excessive crown height 3/16", max. allowable 5/32"
LP-31	Excessive crown height 3/16", max. allowable 5/32"
LP-59A	Excessive crown height 3/16", max. allowable 5/32"
HP-43	Excessive crown height at one local spot 3/16", max. allowable 5/32"

A. Corrective Action Taken and Results Achieved

Weld LP-59A - .216" Nominal Wall. Using chart from ASME Section III, Summer 1971 Addenda, a 5/32" max. reinforcement is allowed. The highest reinforcement found was .140" which is .016" less than allowed by code.

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Weld LP-12 - 3/8" Nominal Wall. Using chart from ASME Section III, Summer 1971 Addenda, a 5/32" max. reinforcement is allowed. The highest reinforcement found was .152" which is .004" less than allowed by code.

Weld HP-9 - 3/8" Nominal Wall. ASME Section III, Summer 1971 Addenda, NB-4426.2 states: "The reinforcement shall be determined from the higher of the abutting surfaces involved." Using the chart from the above code addenda no portion of the reinforcement is excessive.

Weld LP-31 - 3/8" Nominal Wall. Using the chart from ASME Section III, Summer 1971 Addenda, there is .044" excessive reinforcement. This weld will be ground down for the PSI program.

Weld HP-43 - This weld is a fillet weld on a thermowell and the ASME Code does not address unequal fillet legs.

Weld HP-8 - 3/8" Nominal Wall. Using chart from ASME Section III, Summer 1971 Addenda, there is .044" excessive reinforcement. This weld will be ground down for PSI program.

All measurements were taken with a calibrated dial indicator.

On February 13, 1982, a walkdown of the RHR System was conducted to verify the concern of excessive reinforcement on pipe welds. A sample of 18% of all shop and field welds were inspected and all were found to have less than the maximum reinforcement allowed by the Code, therefore, the excessive reinforcement of welds LP-31 and HP-8 are apparent isolated conditions and do not indicate a trend.

B. Corrective Action Taken to Prevent Recurrence

No further corrective action is required.

C. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

ITEM 2

NRC Findings:

Liquid penetrant examinations that were performed revealed what appeared to be lack of penetration in the full penetration weld for hanger LP-K-114.

A. Corrective Action Taken and Results Achieved

This Lug, identified as LP-011-HV, was inspected during PSI and found to have a rejectable Linear indication. (NES PT Report 1178-172.) A Nonconformance Report was written based on the PSI rejection. The corrective action and disposition of the NR had not been completed at the time of the NRC inspection. The weld has been blend ground, Liquid Penetrant inspected, and accepted. The indication proved to be a result of inadequate surface preparation. Since the indication identified by the NRC was previously detected during the normal course of PSI, this is not considered to be a generic problem and no further investigation is required.

B. Corrective Action Taken to Avoid Further Noncompliance

No further corrective action is required.

C. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

ITEM 3

NRC Findings:

The ultrasonic thickness measurements of welds and adjacent base material revealed a wall thickness of .758 inches in the base material adjacent to weld HP-12A. The minimum wall thickness in accordance with commercial design tables is .862 inches thick.

A. Corrective Action Taken and Results Achieved

Weld HP-12A was identified by the NRC as violating the minimum wall requirements using the mil tolerance requirement of 12.5% of nominal. The actual S&L design minimum wall is based upon a formula contained in S&L specification H-2256. This formula is repeated below:

$$T_m = \frac{PD_o + A}{2(S + YP)}$$

Where T_m = minimum wall thickness (inches)

P = Design Pressure (PSI)

D_o = Diameter of Pipe (OD inches)

S = Allowable stress intensities taken from the stress tables contained in ANSI B31.1.

Y = 0.4 (Constant from ASME)

A = corrosion/erosion allowance
.065 for SS
.125 for CS

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Using this equation, the minimum wall requirement for HP-12A is .699" and is acceptable.

See attachment 1 for computation.

It should be pointed out that the weld identified by the NRC as HP-12A is actually HP-12.

B. Corrective Action Taken to Prevent Recurrence

No further investigation or action is required.

C. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

ITEM 4

NRC Findings:

When reviewing the film of the safety related welds that were radiographed (47 carbon steel and 5 stainless steel) the following was noted:

- (1) On several films, the inside of the pipe contained foreign particles. The particles appeared to be a combination of dirt, rust and loose scales.

A. Corrective Action Taken and Results Achieved

The radiographs of 72 welds from a list supplied by the NRC were reviewed for the problem identified above (foreign material in pipe). The following was noted:

- (1) No trash or foreign material was observed on the radiographs;
- (2) Slight corrosion, base metal conditions.

B. Corrective Action Taken to Prevent Recurrence

Since no trash or foreign material was noted during the CG&E film review, this is not considered to be a generic problem. All Zimmer site film reviewers have been instructed to be on the alert for this condition and to report to CG&E QA any such conditions noted. Any loose foreign material will be removed during flushing prior to pre-op testing.

C. Date When Full Compliance Will Be Achieved

Full compliance will be achieved on a system basis prior to pre-op testing.

ITEM 5

NRC Findings:

"A slag inclusion 1 1/2 inches long in the radiographic film for weld HP-20."

A. Corrective Action Taken and Results Achieved

The specific slag inclusion, which was identified by the NRC, was not visible on the CG&E radiograph due to masking by weld surface irregularities. The NRC radiograph was produced after the weld was prepared for PSI which removed the surface irregularities thus rendering the slag inclusion visible. The ASME code requires that the surfaces of welds be sufficiently free from surface irregularities which might mask an indication or cause confusion during interpretation. Experience has shown that radiographic examination in the as welded condition is normally acceptable when the cover passes are not made using the stringer bead technique. The weave bead technique for the cover pass is much less likely to cause confusion in interpretation or mask an indication. This problem may be limited to those welds employing stringer beads for the cover pass. Nonconformance Report C-QAD-82-285E was issued for the 1 1/2 inch slag indication in weld HP-20.

B. Corrective Action Taken to Prevent Recurrence

This investigation is continuing on selected welds that were radiographed in the as welded condition to determine if this represents a generic problem.

C. Date When Full Compliance Will Be Achieved

The investigation will be completed by May 31, 1982, at which time a follow-up report will be submitted.

ITEM 6

NRC Findings:

On several films (LP-29B, LP-SW53, LP-30, FC-160, HP-6A) a condition that appears as a straight line (one side being darker than the other) on the radiographic film. The most severe condition involved carbon steel weld HP-6A and stainless steel weld FC-100 which were cut out and sent to Franklin Research Center to characterize and document the potential defects found in the root of these welds.

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A. Corrective Action Taken and Results Achieved

Laboratory analysis of welds HP-6A and FC-100 were made independently by Franklin Research Center (NRC) and by Metcut Research Associates (CG&E). The two independent analyses were essentially identical. These reports have been evaluated by CG&E with the conclusion that the discontinuities identified in micrographs are not detectable by normal radiography.

The remaining 3 welds (LP-29B, LP-SW53, and LP-30) have been inspected ultrasonically to produce a cross section profile in four quadrants of each weld. These profiles do not indicate that there is a mismatch in these three welds. They do, however, show counterbores and root concavity which may have been interpreted as mismatch on the radiographs.

Three samples of mismatch were fabricated for testing. These samples were tested ultrasonically to produce a profile of each weld with the same technique which was used on the three NRC identified welds. The purpose of these profiles was to test the validity of the profile techniques. The technique was proven to be valid.

B. Corrective Action Taken to Prevent Recurrence

Since mismatch or misalignment is not a Code requirement of radiographic review but rather a visual inspection requirement, it is not CG&E's intention to specifically identify mismatch by radiography, as this attribute was previously accepted during fitup inspection.

C. Date When Full Compliance Will Be Achieved

Full compliance has been achieved and no further action is required.

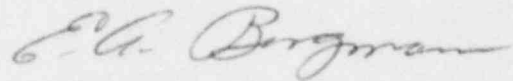
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We trust the above will be found as an acceptable response to the
Subject Inspection Report.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By



E. A. BORGMANN
Senior Vice President

JRV:cak
Attachment
cc: Office of Inspection and Enforcement
Washington, D.C. 20555
NRC Resident Inspector
Attn: W. F. Christianson

ATTACHMENT 1

Minimum wall calculations for weld HP-12 using the equation

$$T_m = \frac{PD}{2(S + YP)} + A$$

From the piping Line List the following information is obtained:

Design Pressure (P) = 1400 PSIG
Design Temperature = 212°F
Piping Design Table = 607 WZ

The piping design table dictates the material specification (ASTM A106 Grade B) which is necessary information to obtain the allowable stresses from ANSI B31.1.

The outside diameter of the pipe (D_o) is obtained from any commercial pipe manual. HP-12 is 12.75" OD.

The allowable stress (S), from ANSI B31.1, for ASTM A106 Grade B with temperature less than 650°F is 15000 PSI.

The valve of (T), which is taken from ASME, Section III, Table NC-3641.1(a)-2, is 0.4 for both ferritic and austenitic steels if design temperature is 900°F or less.

(A) is a corrosion/erosion allowance contained in S&L specification H-2256. The valves of (A) are .065" for SS and .125" for CS.

With the information, the equation can now be solved as follows:

$$T_m = \frac{(1400)(12.75)}{2(15000 + (0.4)(1400)) + .125}$$

$$T_m = \frac{17850 + .125}{31120}$$

$$T_m = 0.699"$$

0.699 is less than the measured thickness of .758, therefore, HP-12 is acceptable.