

Stephen H. Howell
Vice President

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Consumers
Power
Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201

November 21, 1977
Howe-197-77

Mr J. G. Keppler, Regional Director
Office of Inspection and Enforcement
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND NUCLEAR PLANT -
UNIT NO. 1, DOCKET NO. 50-329
UNIT NO. 2, DOCKET NO. 50-330
PIPE SUPPORT FILLET WELDS

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

In accordance with the requirements of 10 CFR 50.55(e), this letter constitutes an interim report of the status of shop and field fillet welds on pipe supports designed and fabricated by ITT Grinnell, Warren, Ohio. Fillet welds on linear pipe supports have been found undersized. The following Table provides a brief description of the conditions:

<u>Item</u>	<u>Condition</u>	<u>Nonconformance Reporting Documents</u>
1.	Grinnell designs appear to specify welds which do not meet minimum size requirements as called for in NA 2452.1 of Appendix XVII of the ASME Boiler and Pressure Vessel Code.	MCAR-18
2.	Site inspection of a sample of 112 hanger shop fillet welds revealed that 27 of the welds are, in the worst case, up to 1/8" smaller than required by the Grinnell design drawings and sketches.	Interim Report #1 (in response to MCAR-18) MCAR-19
3.	Site inspection of a sample of 44 field (installation) fillet welds revealed that 4 such welds were smaller (by up to 1/16") than required by the Grinnell design drawings and sketches.	NCR QF-201

The corrective action plans, for the above conditions, are documented in the attachments to this letter. The timing of this report precluded including the specific corrective action for NCR QF-201 which is presently being evaluated.

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Howe-197-77

The defects reported in NCR QF-201 represent at most a condition equal in seriousness to the defects reported in MCAR-19 and the final hardware disposition for MCAR-19 will be applicable to NCR QF-201. It is anticipated that the final result of analysis and testing will be that rework will not be required.

Another report, either interim or final, will be sent on or before December 30, 1977.

Stephen D. Dowell

- Attachments:
- 1) Quality Assurance Program, Management Corrective Action Report, MCAR-1, Report No. 18
 - 2) Interim Report #1, dated November 14, 1977, MCAR-18.
 - 3) Letter (WRB 47-77), W. R. Bird to Secretary ASME B&PV Committee, Subject - Code Inquiries on Applicable Paragraphs for Subsection NF Fillet Weld Sizing, dated October 28, 1977.
 - 4) Letter, R. E. Weber to W. R. Bird, Subject - ASME File #NI-77-406, dated November 11, 1977.
 - 5) Quality Assurance Program, Management Corrective Action Report, MCAR-1, Report No. 19.
 - 6) Statement of Corrective Action Progress, MCAR-19, dated November 16, 1977.
 - 7) Consumers Power Company Nonconformance Report, NCR QF-201.

CC: ✓ Dr Ernst Volgenau, USNRC (15)

Director, Office of Management
Information and Program Control, USNRC (1)

QUALITY ASSURANCE PROGRAM
MANAGEMENT CORRECTIVE ACTION REPORT
MCAR-1

JOB NO. 7220

P.O. 7220-M-106
Q NO. VariousREPORT NO. 18
DATE October 28, 1977

I *DESCRIPTION (Including references):

NQAM Section III, Number 9, paragraph 3.1.1 states in part, "Engineering procedures shall provide for review and acceptance criteria to determine completeness and adequacy of supplier documents forwarded to Project Engineering." Contrary to this requirement, designs prepared by the hanger design and fabrication vendor appear to specify welds which do not meet ASME Section III Code minimum size requirement. The apparent code violation is in the design of fillet welds joining linear members of hangers and seismic restraints as specified in ASME Section III-WF 3392 and Appendix XVII - NA 2452.1.

*RECOMMENDED ACTION (Optional)

1. Obtain formal justification of vendor position on Code interpretation.
2. Seek Code clarification from ASME Code Committee.
3. Prepare a detailed analysis of a 1% sample of hangers not meeting Table 2452.1-1 of Code Appendix XVII-NA 2452.1.
4. QA/QC to reinspect a sample of 25 installed hangers and 15 hangers in the warehouse. Tabulate actual weld size vs. size specified on the drawings.
5. Prepare an interim report and issue to the Project Manager within 15 days containing all available information, together with a statement as to when a complete report will be issued.

REFERRED TO ☒ ENGINEERING ☐ CONSTRUCTION ☐ QA MANAGEMENT ☐

*Potentially Reportable Pending
Results of Investigation

ISSUED BY

Project QA Engineer

Date

II REPORTABLE DISCREPANCY

☐ NO☐ YES

NOTIFIED CLIENT

10/27/77

Date

Project Manager

Date

III CAUSE

CORRECTIVE ACTION TAKEN

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OCT 31 1977

QUALITY ASSURANCE

AUTHORIZED BY

Date

DISTRIBUTION:

Project Manager J. B. Violette
Construction Manager T. M. Leverette
Engineering Manager G. L. Richardson
Project Engineer J. Amaral (Gaithersburg)
Proj. Supt. / Proj. Const. Mgr. J. E. Bashore (Norwalk)
or P & I Procurement Mgr.
Chief Field QC Engineer
or Procurement Insp. Mgr.
QA Supervisor
Client

FORMAL REPORT TO CLIENT
(If Section II Applies)

Date

CORRECTIVE ACTION IMPLEMENTED

VERIFIED BY

Project QA Engineer

Date

*Describe in space provided and attach reference document.

SUBJECT: MCAR 18 (Issued 10-28-77)

INTERIM REPORT 1
DATE: 11-14-77

PROJECT: Consumers Power Company
Midland Plant Units 1 & 2
Bechtel Job No. 7220

Description of Discrepancy

There is an apparent ASME Section III Code violation involving design of fillet welds joining linear type welded supports and component standard supports as specified by the hanger supplier. These welds do not meet the minimum size specified in ASME Section III-NF 3392, NF-3400, and Appendix XVII-NA 2452.1.

Potential Safety Implication

A potential safety problem could exist if a structural failure should occur in a Q-listed hanger due to an undersized weld. A sample of the questionable welds was analytically checked, and results show that welds as designed will carry the design loads. Based on the samples analyzed, there is no safety problem due to underspecified weld size.

Corrective Action and Investigation

Bechtel requested an informal code interpretation at the ASME Code committee meeting November 1, 1977. The code committee chairman stated, if a formal inquiry were presented, he would support a Code interpretation that minimum fillet weld size must be at least the thickness of the thinnest member joined where the Code minimum weld size table calls for a weld equal to or greater than the thickness of the thinner member.

Grinnell has been requested to clarify their position on code compliance. We anticipate their reply to be that, even though they didn't meet the above exact interpretation of the Code, they met the intent.

Grinnell has committed to conducting a program to substantiate weld integrity, including an analytical approach and destructive testing, and to submit a report justifying the adequacy of the questioned welds.

Grinnell has been requested to submit for review an outline of the investigation test procedure including:

1. Purpose of proof test report and how results will be used
2. Justification of sample size used in proof test, indicating how the samples are sufficiently large and representative to support any conclusion to the satisfaction of the jurisdictional authorities
3. Detail steps of proof test
4. Verification of test equipment calibration
5. Schedule

It is anticipated that Bechtel and CPCo will review test procedures prior to start of test, and will witness test.

It is also anticipated that results of the investigation will have to be accepted by both the owner and the ASME Code jurisdiction.

Bechtel checking of a random sample of 650 earlier sketches indicates 110 of these sketches have linear welds that do not meet minimum size specified by the Code as follows:

- 41 welds were specified as 3/16 when the Code requires 1/4
- 41 welds were specified as 3/16 when the Code requires 5/16
- 2 welds were specified as 3/16 when the Code requires 3/8
- 24 welds were specified as 1/4 when the Code requires 5/16
- 2 welds were specified as 1/4 when the Code requires 3/8

A detailed analysis of 80 of the random sample sketches not meeting minimum weld size indicates that all welds on the sketches are theoretically of adequate size for the specified loading. Emergency loading conditions were utilized in calculating weld stresses. Allowable stresses on the weld were determined from ASME Code material allowable stress for normal conditions. Results show that allowable stress equals 18 KSI, and calculated maximum stresses in samples analyzed ranged from less than 0.1 to 12.3 KSI.

Grinnell has stated that they have been following the Code table for minimum size weld since April 1977. A sample check by Bechtel of 95 recently submitted hanger sketches, including 73 hangers with linear welds, shows that 4 hangers do not meet Code.

Random measurement at the jobsite of actual weld size was conducted by Bechtel QA/QC on 112 shop welds selected from various stages of installation and from the warehouse. This inspection resulted in the following findings:

- 85 welds meet or exceed drawing requirements.
- 27 welds did not meet drawing requirements.
 - Of these, 17 welds were undersized by 1/16 inch or less over less than 15% of the weld length, 6 welds were undersized by 1/16 inch or less for more than 15% of the weld length, and 4 welds were undersized by 1/8 inch for more than 15% of the weld length.

Resolution of these undersized welds will be addressed in MCAR 19; however, Grinnell has stated that they have been inspecting 100% of shop welds since July 1977.

Forecast Date on Corrective Action

It is expected that the results of the test program will not be received until January or February 1978. Program results will then have to be accepted by the Owner and the Code jurisdictional authority. A final report would then follow.

Submitted by: T. Vanwick
Approved by: M. R. Grinnell
Concurrence by: R. Wiedner
BECHTEL POWER CORPORATION



Consumers
Power
Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

October 28, 1977

WRB 47-77

American Society of Mechanical Engineers
Att: Secretary, ASME B&PV Committee
United Engineering Center
345 East 47th Street
New York, NY 10017

SUBJECT: CODE INQUIRIES, ASME CODE SECTION III, SUBSECTION NF

Please provide an interpretation of the following questions to the writer:

1. Table NF-3132.1(b)-1 and Paragraph NF-3292.

If Class 1 linear supports are designed by "experimental stress analysis" or by "load rating," does paragraph NF-3292 apply?

2. Paragraph NF-3292 and Paragraph XVII-2450.

When paragraph NF-3292 applies, must all fillet welds comply with the minimum size requirements of paragraph XVII-2452 and Table XVII 2452.1-1 when the analysis shows a smaller weld size to be satisfactory?

We are of the opinion that a clear definition of requirements is needed in the Code with respect to the above inquiries.

W R Bird

W. R. Bird
Section Head
Quality Assurance Engineering



The American Society of Mechanical Engineers

United Engineering Center/345 E. 47th St., New York, N.Y. 10017/212 644-7722

Attachment 4
Howe-197-77

Consumers Power Company
212 West Michigan Avenue
Jackson, MI 49201

DATE: November 11, 1977

ATTENTION: W. R. Bird

SUBJECT: ASME File # NI-77-406

Gentlemen:

We have your letter of October 28, 1977, and we are referring it to
the Chairman of the Subcommittee concerned.

We will advise you when we have heard from him.

If you have any cause to contact this office on this inquiry please be sure
to reference the ASME file number given above.

Yours truly,

Ray E. Weber/K.C.

Ray E. Weber

Nuclear Engineering Administrator

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QUALITY ASSURANCE



QUALITY ASSURANCE PROGRAM
MANAGEMENT CORRECTIVE ACTION REPORT
MCAR-1

JOB NO. 7220

P.O. 7220-M-106

REPORT NO. 19

Q NO. Various

DATE November 4, 1977

I *DESCRIPTION (Including references):

A weld size inspection using a weld fillet gauge was conducted of a representative sample of pipe hangers to determine the actual weld size compared to Grinnell design drawings and sketches. This was done to fully assess all conditions associated with MCAR #18 involving the lack of Grinnell use of weld sizes from Table 2452.1-1 of Code Appendix XVII - NA 2552.1. It was discovered that from a sample of 23 hangers installed and 9 hangers from the warehouse, representing 112 welds, 22% of the welds were under the specified size required by Grinnell drawings. Contrary to Purchase Specification M-106, paragraph 10.1, Grinnell has not assured the compliance with drawing requirements.

*RECOMMENDED ACTION (Optional)

1. Establish how the deviation occurred at Grinnell.
 - a. Determine the cause of the deviation.
 - b. Determine the inspection technique and acceptance criteria utilized by Grinnell. Specifically, determine the percentage of welds measured for dimensional compliance.
2. Qualify existing weld size.
 - a. Provide for undersize variance in the scope of the worst case condition by using calculations and proof-testing by Grinnell to preclude rework of undersize welds from Grinnell drawings.

REFERRED TO

☒ ENGINEERING☐ CONSTRUCTION☐ QA MANAGEMENT

*Potentially Reportable Pending
Results of Investigation

ISSUED BY

Project QA Engineer

Date

II REPORTABLE DISCREPANCY

☐ NO☐ YES

NOTIFIED CLIENT November 3, 1977

Date

Project Manager

Date

III CAUSE

CORRECTIVE ACTION TAKEN

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QUALITY ASSURANCE

AUTHORIZED BY

Date

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Project Manager
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or P & I Procurement Mgr.
Chief Field QC Engineer
or Procurement Insp. Mgr.
QA Supervisor
Client

J. B. Violette
T. M. Leverette
G. L. Richardson
J. Amaral (Gaithersburg)
J. E. Bashore (Norwalk)
A. G. Horner

FORMAL REPORT TO CLIENT
(If Section II Applies)

Date

CORRECTIVE ACTION IMPLEMENTED

VERIFIED BY

Project QA Engineer

Date

*Describe in space provided and attach reference document.

Management Corrective Action Request
Page 2

Report No. 19

Date November 4, 1977

I. RECOMMENDED ACTION (Cont'd.)

- b. Review the above proof-test procedure for Grinnell's test-to-failure tests including sample size and scope of investigation.
- c. Obtain schedule for completing tests and date of submittal of test and analytical results.
- 3. Establish controls for hangers not installed or in manufacture.
 - a. Perform an inspection of the lot of hangers shipped 10/31/77.
 - b. Based on the above, if the lot is acceptable:
 - (1) establish a PSQR monitoring program to assure that the current weld quality is maintained,
 - (2) verify that Grinnell's inspection procedures provide and document sufficient inspection to assure that all welds comply with contractual requirements.
 - c. If the lot is not acceptable:
 - (1) inspect all new hangers at the Site based on an AQL of 1% of the lot size until controls are established at the source,
 - (2) tighten procedures with Grinnell to assure acceptability.
 - d. Identify the quality status with respect to welding on all hangers.
- 4. Inspect an additional sample of installed hangers to determine if there are any welds with dimensions less than the worse case condition. Identify discrepant welds and coordinate further corrective action with Grinnell.
- 5. Have PSQR increase surveillance and reject undersized welds prior to shipment.
- 6. Determine reportability under 10 CFR 50, Section 50.55(e). Prepare an interim report and issue to the Project Manager within 15 days containing all available information, together with a statement as to when a complete report will be issued.

November 16, 1977

Attachment 6
Howe-197-77


STATEMENT OF CORRECTIVE ACTION PROGRESS

MCAR-19

1. Bechtel has communicated all the items on MCAR-19 to Grinnell where Grinnell has specific action to perform.
2. A meeting was held at Midland on November 16, 1977 with Bechtel, Consumers Power, and Grinnell in attendance at which Grinnell committed to revise their inspection procedure (O2A006 - Visual and Dimensional Acceptance Criteria for Welds) to provide maximum and minimum tolerances and other specifics. A target date for a released revision is mid-December.
3. Bechtel has implemented an inspection of weld size for all new hangers received at the Midland site based on an AQJ of 1% (Mil Q 195D).

WRB/lb

Route To	This Copy For		File
✓ W Bird	W Barclay	JF ewgen	16.3.6
BW Marguglio	TC Cooke		Issue Date November 15, 1977
DA Taggart	R Hermeston		Project Midland 1 & 2
	SH Howell		
	DR Johnson		File Title NCR's on Bechtel
	GS Keeley		Quality Control
	JM Klacking		
	PA Martinez		
	JM Landin		


Consumers Power
Nonconformance
Report No OE-201

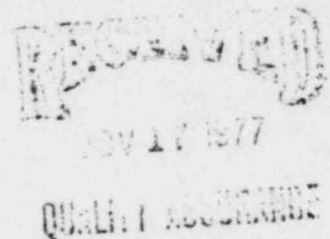
This Nonconformance Report is Issued To:
G. L. Richardson
Bechtel Lead Quality Assurance Engineer

Prepared By W. C. Starn Date 11-15-77
Approved By W. C. Starn Date 11/15/77
Written Reply Requested By Date 11-30-77
Corrective Action Requested By Date 12-16-77

who is responsible for corrective action.

Nonconformance Description and Supporting Details:

See Attachment.



AEC Reportable Yes ☐ No ☒ See Procedure 9 (For Nuclear Projects Only)

Stop Work Necessary Yes ☐ No ☒ See Procedure 16 - Stop Work No _____
"No Hold Tags Applied"

Recommended Corrective Action:

1. Repair welds to meet required drawing specifications or justify existing condition.
2. Determine why undersize and visual condition was not identified during Bechtel QC inspection and take corrective action to preclude repetition.
3. Provide assurance that all existing field welds are satisfactory.

Corrective Action Taken:

Verification of Corrective Action Required Yes ☐ No ☐

Method of Verification:

Nonconformance Closure Confirmed By _____
Date _____

To be completed at time of closure by Consumers Power QA Services.

File 16.3.6
Issue Date November 15, 1977
Project Midland 1 & 2
File Title NCR's on Bechtel
Quality Control

Attachment to Report No QF-201

Nonconformance Description and Supporting Details:

As a result of dimensional and visual inspection of hanger fillet welds, the following nonconforming conditions were documented:

Item #1 - Auxiliary Building, Room 28, Hanger 4-2HCB-20-H1, Sketch 2-613-3-6, weld attaching Item #2 (sway strut assembly) to existing W 21 x 55 beam at Elevation 582'-3" requires a 1/4" fillet weld.

Contrary to the above one area of the fillet weld is undersize.

Item #2 - Auxiliary Building, Room 25, Hanger 6-1CCB-18-H7, Sketch 1-612-4-16, weld attaching Item #1 (sway strut assembly) to Item #2 (4" M-beam) at Elevation 570'9" requires a 5/16" fillet weld.

Contrary to the above one area of the fillet weld is undersize.

Item #3 - Auxiliary Building, Room 217, Hanger 2 1/2-2CCB-12-H3, Sketch 2-604-7-3, weld attaching Item #1 (3/8" x 10" x 10" carbon steel plate) to wall embedment at Elevation 605'9" requires a 3/16" fillet weld.

Contrary to the above the following condition exists. Item #1 is bowed away from the embedment with a resulting gap of approximately .075 in. (1.88mm). This results in an effective fillet leg of approximately 1/8 in. on the plate, which is below the required 3/16" fillet.

Item #4 - Auxiliary Building, Room 28, Hanger 8-2GBC-16-H2, Sketch 2-613-3-13, weld attaching Item #1 (4" M-beam) to existing W 21 x 82 beam at Elevation 582'3" requires a 1/4" fillet weld.

Contrary to the above the weld fails to meet acceptable visual requirements. Excessive overlap results in most of the weld material being deposited on the hanger (Item #1) and very little weld deposition on the existing beam.

All of the above discrepancies are on field welds. Bechtel has subsequently issued NCR's on the above items.

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

10-355330
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TO: Mr. J. G. Keppler		FROM: Consumers Power Company Jackson, Michigan Stephen H. Howell		DATE OF DOCUMENT 11/21/77	
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DESCRIPTION

ENCLOSURE

Consists of an interim report of the status of shop and field fillet welds on pipe supports designed and fabricated by ITT Grinnell, Warren Ohio.....

PLANT NAME : Midland Units 1 & 2
RJL 11/29/77

(2-P)

(1-P)+(10-P)

10 ENCL *

SAFETY		FOR ACTION/INFORMATION		ENVIRONMENTAL	
ASSIGNED AD:	VASSALLO	ASSIGNED AD:	V. MOORE (LTR)		
BRANCH CHIEF:	VARGA	BRANCH CHIEF:			
PROJECT MANAGER:	HOOB	PROJECT MANAGER:			
LIC. ASST:	SERUICE	LIC. ASST:			
			B. HARLESS		

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FIELD		LATNAS	CRUTCHFIELD
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HANAUER	KNIGHT	E. ROSA	ENVIRON TECH
MIRC	BOSNAK		ERNST
CASE	SIHWEIL	OPERATING REACTORS	BALLARD
BOYD	PAWLICKI	STELLO	YOUNGBLOOD
De Young		EISENHUT	
PROJECT MANAGEMENT	REACTOR SAFETY	SHAO	SITE TECH
SKOVHOLT	ROSS	BAER	GAMMILL (2)
P. COLLINS	NOVAK	BUTLER	
HOUSTON	ROSZTOCZY	GRIMES	SITE ANALYSIS
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