RELATED CORRESPONDENCE

Consumers Power Company

Stephen H. Howell
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August 1, 1979
Howe-215-79

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

MIDLAND NUCLEAR PLANT
UNIT NO 1, DOCKET NO 50-329
UNIT NO 2, DOCKET NO 50-330
IMPACT TESTED - ITT GRINNELL SUPPLIED MAIN FEED PIPE

Reference: S H Howell letter to J G Keppler; Midland Nuclear Plant; Unit No 1, Docket No 50-329; Unit No 2, Docket No 50-330; Impact Tested - ITT Grinnell Supplied Main Feed Pipe;

The referenced letter and this letter are interim 50.55(e) reports on the status of Main Feed Pipe Spools which have questionable impact test results. Attachment (1) is Consumers Power Company's statement of the status of activities associated with the spools which was derived from the referenced letter and from the additional basic data given in Bechtel's MCAR Interim Report, provided as Attachment (2).

Another report, either interim or final, will be provided by September 7, 1979.

Attachments: (1) Consumers Power Company's Statement of the Status of Action Associated With ITT-Grinnell Supplied Main Feedwater Pipe Spools

(2) MCAR-29, Interim Report No 2, dated July 26, 1979

CC: Director of Office of Inspection & Enforcement
Att: Mr Victor Stello, USNRC (15)

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

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Code Acceptance Criteria for Charpy Impact Results in Accordance with ASME Code, Section III, 1971 Edition Through Summer 1973 Addenda

1) Acceptance tests consist of a set of three full-size specimens.

2) Specimens shall have a minimum of 25 mil lateral expansion.

3) Retests (Summer Addenda, 1973)

One retest permitted at the same temperature provided:

a) Average values of the test results meet the minimum requirements

b) Not more than one specimen per test is below the minimum requirement

c) Specimen not meeting the minimum requirements is not lower than 10 ft/lbs or 5 mils lateral below specified requirement

d) A retest consists of two additional specimens taken as close as practical to the failed specimens. For acceptance of the retest, both specimens shall meet the minimum requirements.

Charpy Test Results
Heat L-20479

Spools	Register	CMTR	Heat-Treated[1]
1ELB1S638134	MP44	P142	Yes
1ELB1S638136	MP46	P142	Yes
2ELB1S639135	MR418	P142	Yes
2ELB2S639135	MR426	P142	Yes
2ELBS639136	MR427	P142	Yes

Test Results +30F As-Received Condition		Stress-Relieved 1175F
1st	2nd	1st Test
32	31	30
14	43	29
13	23	29
Passed No	No	Yes

1. Heat treatment verification was based on review of actual documentation at the jobsite. Heat treatment consisted of post weld stress-relieving.

In accordance with code regulations material, this heat is considered acceptable in the stress-relieved condition. However, because of inconsistent results with other heats after stress-relieving, Grinnell considers these results questionable. Disposition of this material is considered undetermined at this time.

Spools Consisting of a Combination of Heats N-32762 and L-20479

Spools	Register	CMTR	Heat-Treated
1ELB1S638133	MP43	P142	Yes
1ELB2S638133	MP412	P142	Yes
1ELB2S638136	MP414	P142	Yes

Because these spools are combinations of unacceptable heats, they are not acceptable.

APPENDIX

SUMMARY OF FIELD DOCUMENTATION SURVEY FOR HEATS N-32762 AND L-20479

Charpy Test Results
Heat N-32762

Spools	Register	CMTR	Heat-Treated[1]
1ELB2S638134	MP413	P142	No[2]
2ELB1S639133	MR416	P142	Yes
2ELB1S639133A	MR416AX	P142	Yes
2ELB2S639133	MR424	P142	Yes
2ELB2S639134	MR425	P142	Yes

Test Result @ +30F
As-Received Condition

	1st	2nd	3rd
	21	25	29
	40	18	30
	45		32
Passed	No	No	Yes

1. Heat treatment verification was based on review of actual documentation at the jobsite. Heat treatment consisted of post weld stress-relieving.

2. This spool is currently on hold at Grinnell Shop.

Because the third test at 30F is considered invalid, disposition of material is undetermined at this time. (See Code Acceptance Criteria for Charpy Impact Test Results.)

Forecast Data for Investigation and Corrective Action

The next interim report is scheduled for August 23, 1979.

Submitted by:

Approved by:

Concurrence by:

FMM/js
7/12/9

Grinnell concedes that its rationale, as demonstrated by the results of Heat N-32762 is not 100% consistent, and as a result, it believes that other stress-relieved heats may also be suspect in relation to the repeatability of the impact properties on each piece of equipment.

Grinnell has rationalized that because it did not obtain improved Charpy test results for Heat N-32762 stress-relieving, Heat L-20479 cannot be considered to have the desired impact properties (+30F).

2) In May 1979, Grinnell tested three samples of Heat N-32762. These samples were from a fabricated spool which consisted of a straight piece of pipe which was hot-bent, air-cooled, and then full furnace stress-relieved. These samples yielded results of 9, 6, and 17 mil lateral expansion. Because the samples were taken near the area of the bend, it was thought that they may have been from a heat-affected zone (an area which had received an intermediate heating and cooling cycle because of its proximity to the hot bend area).

Grinnell has indicated that measurement of the actual sample location relative to the area which was heated and bent, shows that it was not significantly heated during the bending cycle. Grinnell is preparing a graph of the temperature versus distance to show what these samples would have been subject to during the bending cycle. The graph will be used to determine whether the samples could have been affected by the bending operation.

Grinnell concluded that because the samples were far enough from the furnace not to be affected by its heat, the poor results are because of the material inconsistency associated with this particular heat.

3) Bechtel has performed a documentation survey at the jobsite to identify all spools Charpy test qualified in heat treatment condition and to confirm that those spools identified were in fact heat-treated. The results of this survey, as related to Heats N-32762 and L-20479, are tabulated in the attached appendix.

Bechtel is still pursuing the acceptability of material associated with Heats N-32762 and L-20479 as well as any spools with hot bend sections. Therefore, the reportable condition of the pipe remains uncertain at this time.

Bechtel Associates Professional Corporation

Attachment to BLC-7942

SUBJECT: MCAR 29 (issued 7/13/79)

Impact Testing of Main Feedwater Pipe

INTERIM REPORT 2

DATE: July 26, 1979

PROJECT: Consumers Power Company
Midland Plant Units 1 & 2
Bechtel Job 7220

Status of Corrective Action and Investiga ion

The status of actions in progress for resolution of the subject MCAR is as follows.

1) Bechtel has reviewed, at Grinnell, 70 spool data packages for impact test properties on certified material test reports in the following size range: 14-inch, 18-inch, 26-inch, and 36-inch diameter pipe. This review covered all material requiring Charpy impact testing. This action was taken to determine whether additional material, other than that identified in MCAR 29, met specification and ASME Section III, Class 2 code requirements.

   The spools were fabricated from a total of 16 heats. Of these heats, two material test reports for Heats N-32762 and L-20479 contained questionable data. Heat N-32762 was considered questionable because Grinnell performed more than one retest, which is not allowed by ASME Section III, Class 2 code.

   Grinnell has agreed that the original Charpy test results (+30F) submitted for Heat N-32762 are not valid under ASME III, Class 2 requirements in the as-received condition. Grinnell had performed a Charpy test (+30F) for the material of this heat in the stress-relieved condition but it had failed.

   Grinnell was requested to furnish its rationale for acceptance of the impact test results on Heat L-20479 in the stress-relieved condition. Grinnell's rationale was based on its experience that a subcritical (1100-1200F) heat treatment has the effect of reducing the spread of toughness values (smaller variances) and slightly improving lateral expansion values through a softening mechanism (a slightly reduced yield point). The retest of Heat L-20479, after stress-relieving, met the code impact test requirements. However,

4. An investigation is being made to identify piping spools, from heats other than N-32762 and L-20479, which were hot bent and stress-relieved.

This attachment attempts to present the raw data presently available and is not meant to offer any conclusions at this time.

5. One spool of material from this heat later required hot bending and was subsequently stress-relieved. Charpy-impact specimens obtained from this spool were 6, 9, and 17 mils lateral expansion, which is unacceptable.

B. Heat L-20479

1. An initial set of Charpy impact specimens were tested to the same ASME acceptance criteria given in A.2. The test results were 13, 14 and 32 mils lateral expansion and the test was unacceptable.

2. Based on the test results of B.1 and the criteria given in A.3, no retest should have been allowed because the original specimens failed to meet all three criteria needed to allow a retest. ITT performed a second Charpy impact test (with three specimens similar to an initial test versus two specimens required in a retest). The results of the second set of tests were 23, 31 and 43 mils lateral expansion and this test was also unacceptable.

3. This heat was subsequently stress-relieved to improve fracture properties of the as-rolled material and retested with a new set of three Charpy impact specimens. The test results after stress-relieving were 29, 29 and 30 mils lateral expansion. These test results were above the minimum requirement and the heat was then considered acceptable in the stress-relieved condition.

4. The results of the post stress relief tests described in A.5 indicates that stress-relieving does not always improve the Charpy impact results. Because of this, ITT Grinnell no longer believes that material stress-relieved and tested per B.3 can be considered acceptable.

C. Other Pipe Spools With Hot Bent Sections

Because of the unacceptable results obtained from hot bent and stress-relieved spool described in A.5, the acceptability of all other spools which were hot bent and stress-relieved is being investigated.

D. Status of Identification of Material Under Investigation

1. Five piping spools with material from heat N-32762 have been identified.

2. Five piping spools with material from heat L-20479 have been identified.

3. Three additional piping spools with material from both heat N-32762 and L-20479 have been identified.

CONSUMERS POWER COMPANY'S STATEMENT OF THE STATUS OF ACTION ASSOCIATED WITH ITT-GRINNELL SUPPLIED MAIN FEEDWATER PIPE SPOOLS

The purpose of this attachment is to provide a summary of the sequence of events that are associated with each of the heats of piping spools. This data is taken from Attachment No 2 and Consumers Power Company's previously referenced letter.

A. Heat N-32762

1. One set of Charpy impact specimens were taken, but were not valid because they were obtained from an incorrect location.

2. The first set of valid test specimens were obtained. For the material under consideration, the ASME acceptance criteria required three full-sized specimens be tested and that each specimen have a minimum test result of 25 mils lateral expansion. The test results were 21, 40 and 45 mils lateral expansion (at the required +30°F temperature) and the test was unacceptable.

3. The ASME Code allows one retest at the same test temperature to be performed, if the initial test results met the following criteria:

   a. the average result of all three initial test specimens meets the minimum requirement

   b. not more than one of the original specimens was below the minimum requirement

   c. the specimen which failed, was not more than 5 mils below the specified requirement.

   Based on the results of the original test (see A.2) one retest, consisting of two additional specimens taken as near as possible to the failed specimen, was allowed. To be acceptable, both of the additional specimens must meet the original minimum requirement. The retest results were 18 and 25; therefore, the retest was unacceptable.

4. Subsequent to the tests described in A.2 and A.3, ITT Grinnell performed Charpy impact testing on another set of specimens at its own laboratory. The results obtained were 29, 30 and 32 mils lateral expansion and the heat of material was accepted by ITT Grinnell on the basis of this test. The ASME Code does not allow this third test and the material is still unacceptable to Code requirements. It is Consumers Power Company's interpretation that a third set of impact specimens would be acceptable (per SA-106/ SA-530) if a thermal heat treatment was first performed to improve the fracture properties of the as-rolled material.

BCC: JLBacon, M-1085A
RCBauman, P14-412
WRBird, JSC-216B
AJBirkle, P24-511
RLCastleberry, Bechtel AA
JLCorley, Midland
LADreisbach, Bechtel-Midland
GSKeeley, P14-408B
BWMarguglio, JSC-220A
DLMiller, Midland
WGMoring, Bechtel AA
JFNevgen, Bechtel-Midland
RLTeuteberg, P14-418
MEGibbs, ILLB
File: 0.4.9.27

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