

Bechtel Associates Professional Corporation

Attachment to BLC-7942
MCAR 29
Interim Report 2
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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.

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Forecast Data for Investigation and Corrective Action

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

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APPENDIX

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

Charpy Test Results
Heat N-32762

<u>Spools</u>	<u>Register</u>	<u>CMTR</u>	<u>Heat-Treated¹</u>
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

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
	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.)

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Charpy Test Results
Heat L-20479

<u>Spools</u>	<u>Register</u>	<u>CMTR</u>	<u>Heat-Treated¹</u>
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

	<u>1st</u>	<u>2nd</u>	<u>1st Test</u>
	32	31	30
	14	43	29
	13	23	-29
Passed	No	No	Yes

- 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

<u>Spools</u>	<u>Register</u>	<u>CMTR</u>	<u>Heat-Treated</u>
1ELB1S638133	MP43	P142	Yes
1ELB2S638133	MP412	P142	Yes
1ELB2S638136	MP414	P142	Yes

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

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.

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