

# NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY  
THE HARTFORD ELEC. TRIC LIGHT COMPANY  
WESTERN MASSACHUSETTS ELECTRIC COMPANY  
NEW YORK WATERWORKS COMPANY  
NORTHEAST LIGHTS & POWER COMPANY  
NORTHEAST NUCLEAR ENERGY COMPANY

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November 5, 1979

Docket No. 50-336

Director of Nuclear Reactor Regulation  
Attn: Mr. R. Reid, Chief  
Operating Reactors Branch #4  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

References: (1) R. Reid letter to W. G. Council dated August 25, 1979.  
(2) W. G. Council letter to R. Reid dated September 28, 1979.  
(3) W. G. Council letter to R. Reid dated August 22, 1979.  
(4) W. G. Council letter to R. Reid dated October 22, 1979.  
(5) W. G. Council letter to R. Reid dated October 24, 1979.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2  
Feedwater System Piping

In Reference (1), the NRC issued a Safety Evaluation documenting the acceptability of continued operation of Millstone Unit No. 2 until October 31, 1979, with feedwater piping crack indications. In Reference (2), Northeast Nuclear Energy Company (NNECO) submitted a detailed weld repair program with the intention of affecting the repair during the 1980 refueling outage. Plant operation after October 31, 1979 is contingent upon the issuance of a Safety Evaluation by the Staff after reexamination of the crack indications identified during examinations of the feedwater system piping required by I&E Bulletin No. 79-13.

Reference (2) documented NNECO's acceptance criterion for the results of the re-examination of the feedwater crack indications. This acceptance criterion is that no confirmed crack growth in the through-thickness direction (depth) is permissible. This criterion has been fulfilled in response to Item (5) of Reference (1) as described below.

The safe-end to pipe welds AC-G-1 and BC-G-1 have been reinspected using both radiographic and ultrasonic examination techniques. The ultrasonic examination was performed using the same methods, techniques, and conditions as was used to previously characterize the indications.

The RT results for two selected circumferential areas of Weld AC-G-1, comparing the data from the August, 1979 inspection to the data from the November, 1979 inspection, are provided in Figures 1 and 2. Similar data for three selected circumferential areas of Weld BC-G-1 are presented in Figures 3, 4, and 5. Based upon a comparison of the RT data of the two inspections, NNECO has con-

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cluded that no measurable change in the size of the indications on either side of the safe-end to pipe welds has occurred.

Subsequent to completion of the RT inspection, selected linear indications were ultrasonically examined. These UT results are presented in Figures 6 and 7. Based upon a comparison of the UT data from the August, 1979 and November, 1979 examinations, NNECC has concluded that no measurable change in the length of the originally mapped reflectors has occurred. Furthermore, comparison of the amplitude profiles confirms that no measurable increase in indication depth has occurred. However, in the nine o'clock position of the number two reflector on the safe-end side of Weld BC-G-1, the amplitude has decreased as a result of a one-inch long parallel indication shadowing the original reflector.

Regarding the pipe to elbow welds, AC-G-2 and BC-G-2, the following information is provided:

- (1) The larger indications at the safe-end to pipe welds, which are located in more critical temperature and stress regions, were determined to not propagate since the August, 1979 inspection.
- (2) As documented in Reference (3), the pipe to elbow welds were confirmed by UT to be so small as to be non-reportable as per the inspection procedure. Consequently, these smaller indications were not mapped for the purposes of establishing baseline data. Ultrasonic examination of these welds at this time would, therefore, not be relevant in the absence of baseline data.
- (3) Ultrasonic examination of the pipe to elbow welds would require the dismantling of sophisticated, calibrated acoustic leak detection instrumentation without sufficient justification.


In light of the above considerations, the pipe to elbow welds were not re-examined using UT techniques during the current outage.

Based upon the information presented above and the attached Figures, NNECCO has fulfilled the previously established acceptance criterion documented in Reference (2). Confirmation that no growth has occurred during the interval between examinations lends additional credence and emphatically supports the applicability of the fracture mechanics analyses and supporting documentation docketed in References (3), (4), and (5). The 1980 refueling outage repair program is, therefore, concluded to be technically defensible and appropriate. An interim ultrasonic examination, prior to March 1, 1980, will be conducted to verify the continued absence of crack growth. The leak detection equipment will remain functional and be monitored without change from the current program until the issue is permanently resolved.

We trust you find the above information sufficient to serve as the basis for a safety evaluation authorizing continued, safe plant operation of Millstone Unit No. 2.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

  
\_\_\_\_\_  
W. G. Council  
Vice President

Attachment

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(-----)

(-----) (-----) (-----)

12

14

16

18

20

22

24

26

POOR ORIGINAL

NE UTILITIES  
STEAM GEN. 1  
WELD AC-G-1  
PTM 11-3-79

FIGURE 1

(-----) (-----)

(-----) (-----)

12

14

16

18

20

22

24

26

NE UTILITIES  
ST. GEN. 1  
WELD AC-G-1

1443 344

66/2/11

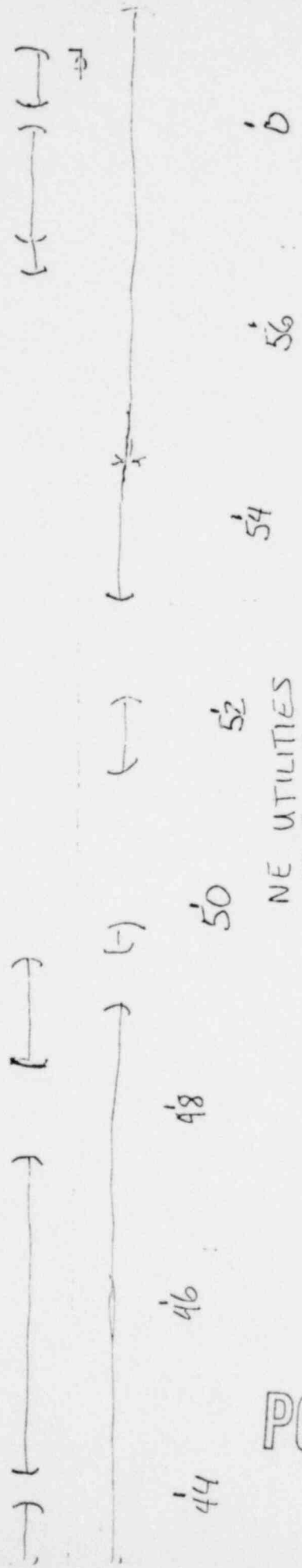
FIGURE 2

NE UTILITE  
STEAM GENI  
WELD AC-B-1  
PTM 11-3-79

POOR ORIGINAL

NE ATLANTICS  
ST. GEN. )  
WELD AC-6-1  
PTM 8 11 79

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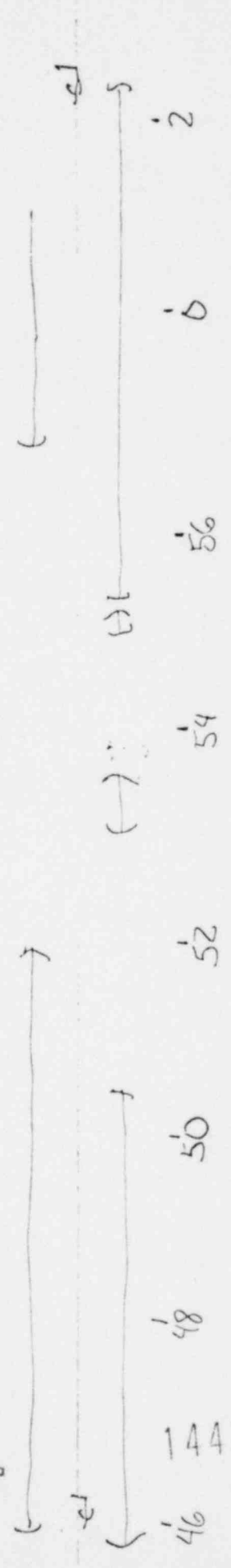


POOR ORIGINAL

FIGURE 3

NE UTILITIES  
ST. GEN. 2  
WELD BC-G-1  
PTM 11-3-79

NE UTILITIES  
ST. GEN. 2  
WELD BC-G-1  
PTM 8-11-79



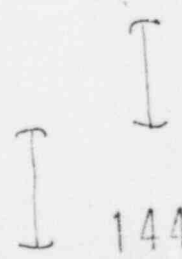
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1 2 4

N.E. UTILITIES  
ST. Gen 2  
WELD BC-6-1  
PTM 11-3-79

POOR ORIGINAL

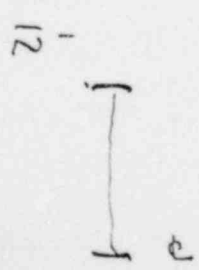


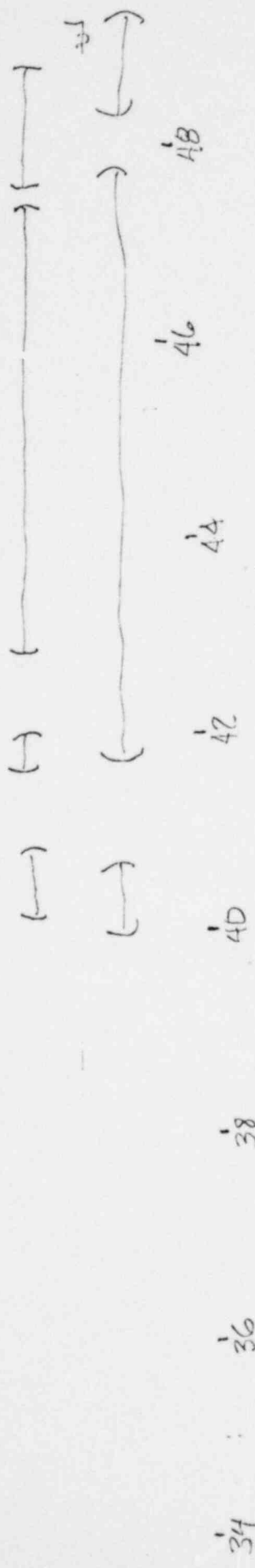
1443 347

FIGURE 4



N.E. UTILITIES  
ST. Gen. 2  
WELD BC-6-1  
PTM 8-11-79

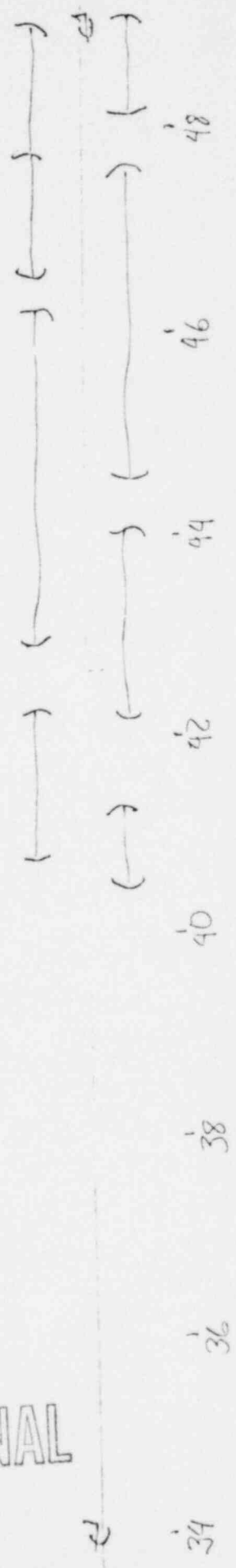




N.E. UTILITIES  
ST. Gen. 2  
WELD BC-G-1  
PTM 11-2-79

FIGURE (5)

POOR ORIGINAL

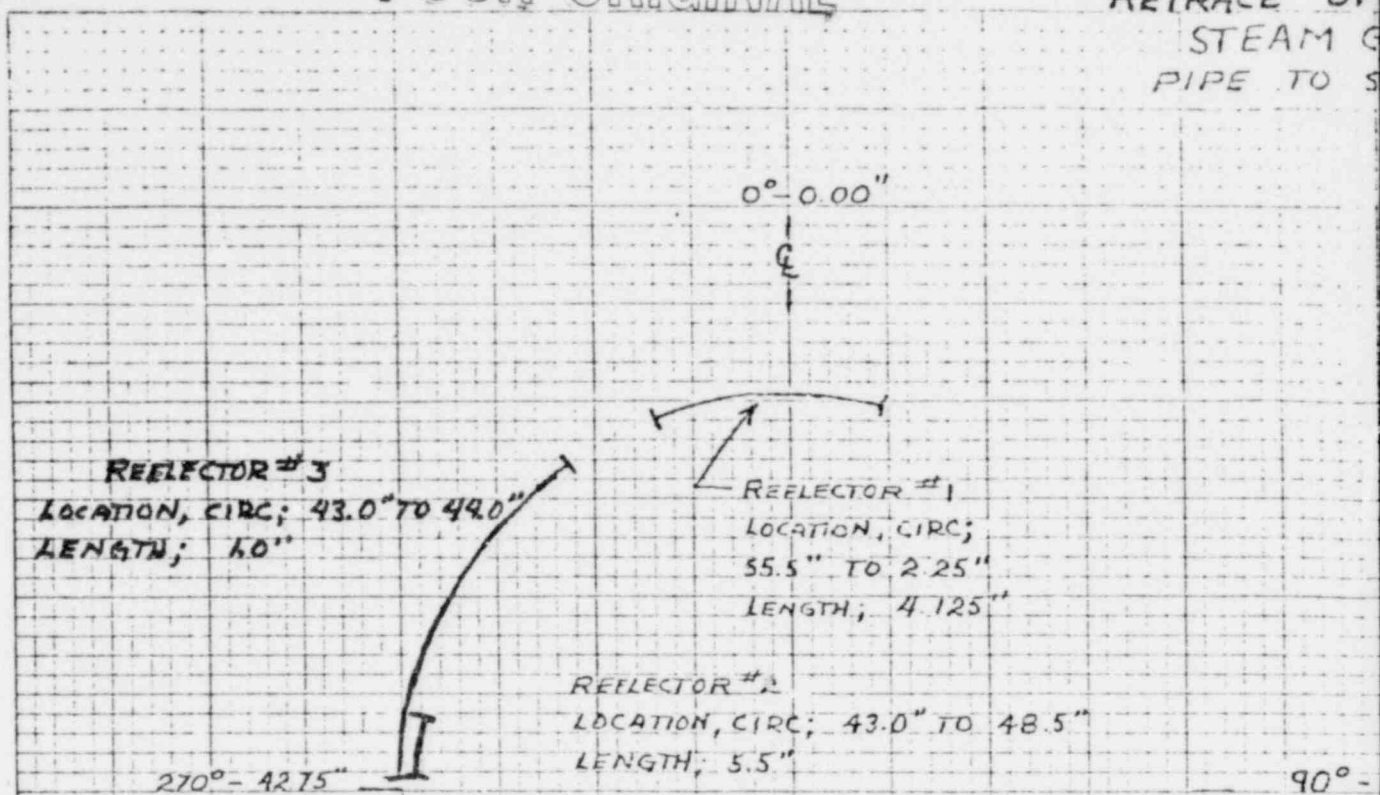


N.E. UTILITIES  
ST. Gen. 2  
WELD BC-G-1  
PTM 8-11-79



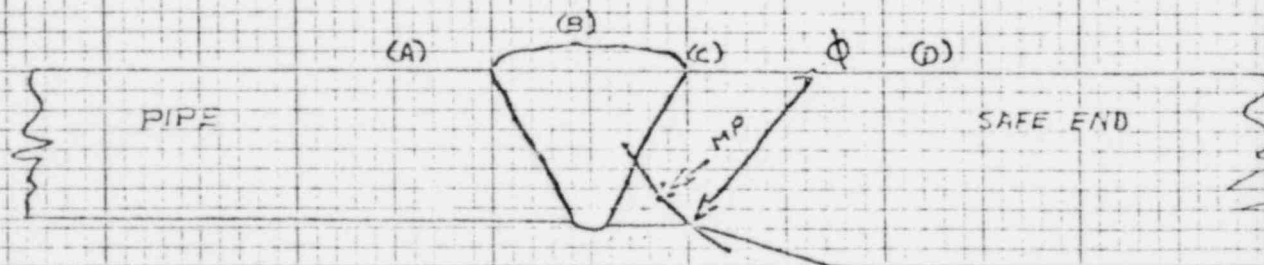
# POOR ORIGINAL

RETRACE OF  
STEAM  
PIPE TO S



REFLECTOR #1 @ 0.0"

← 1.125 →



$$MP = (0.04939 \text{ PER DIV.}) \cdot 0.9878"$$

$$20 \text{ DIV.} = 0.9878"$$

$$X\text{-DOLER } \phi = 51^\circ$$

THICKNESS MEASURED

A. .760"

B. .800"

C. .640" TO .550"

D. .960"

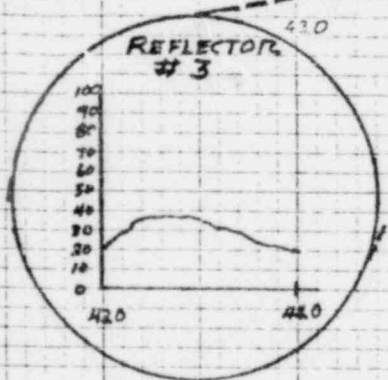
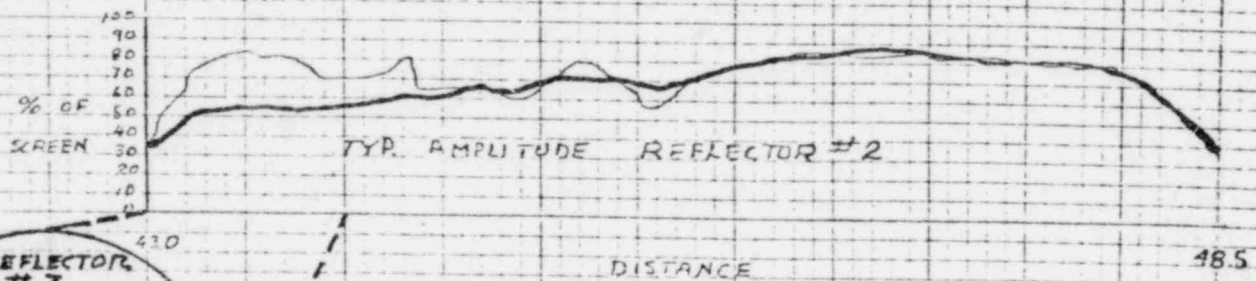
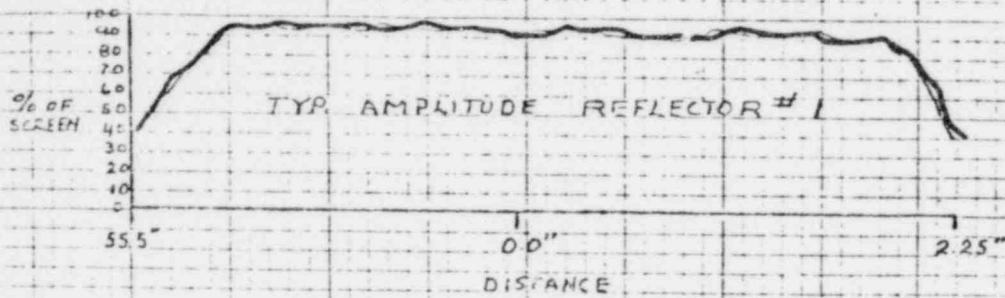
$$\tan 52^\circ = 1.2799$$

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POOR ORIGINAL

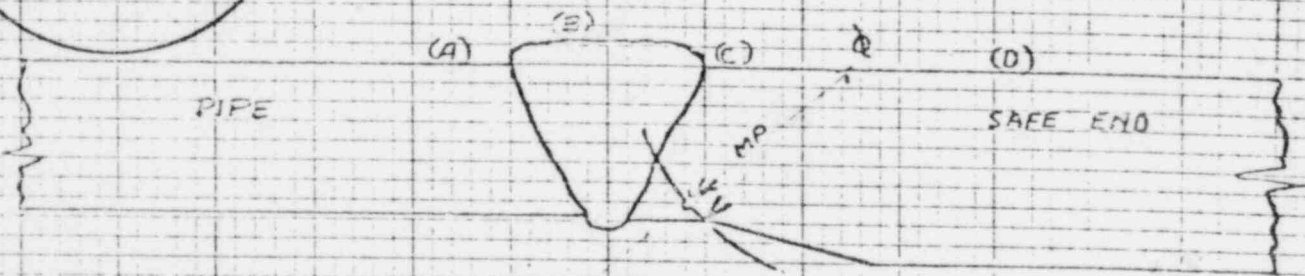
DATA.  
EN. B  
AFF END WELD

11-4-79 / RDBurleigh/JH



REFLECTOR #2 @ 46 1/2"

← 1.25" →



TS #1 + #2

MP = (0.04939 PER. DIV.) 1.0373"

21 DIV. = 1.0373"

X-DUCER @ 52°

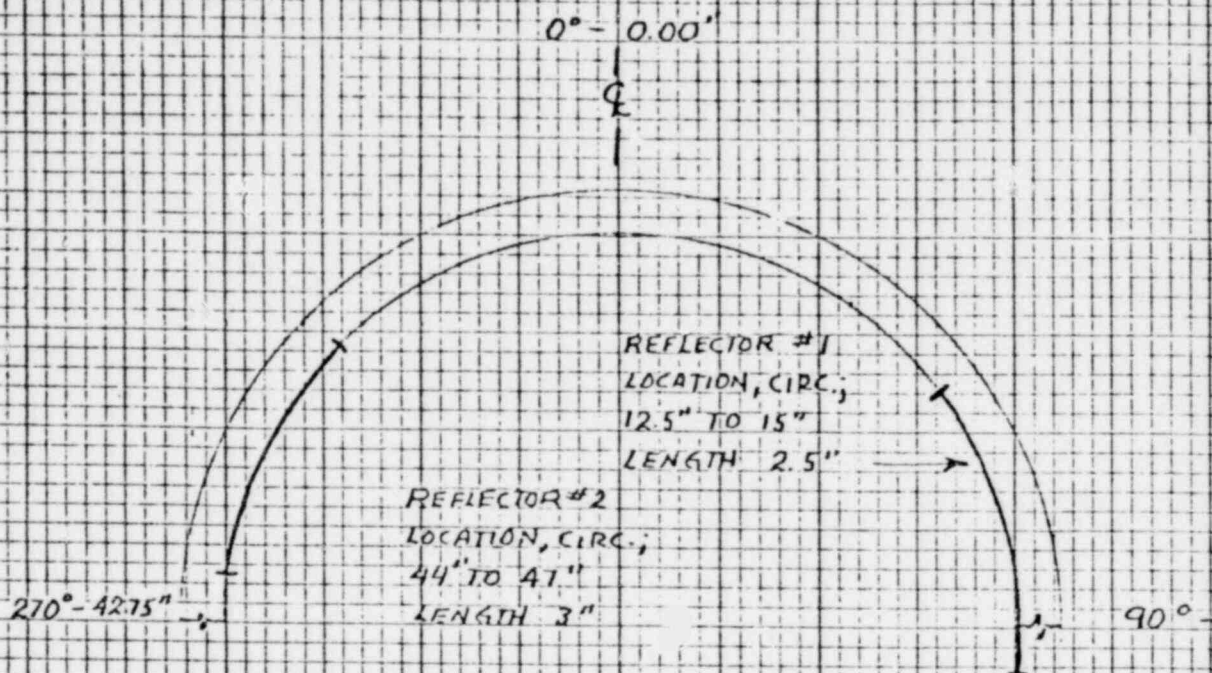
FIGURE 6

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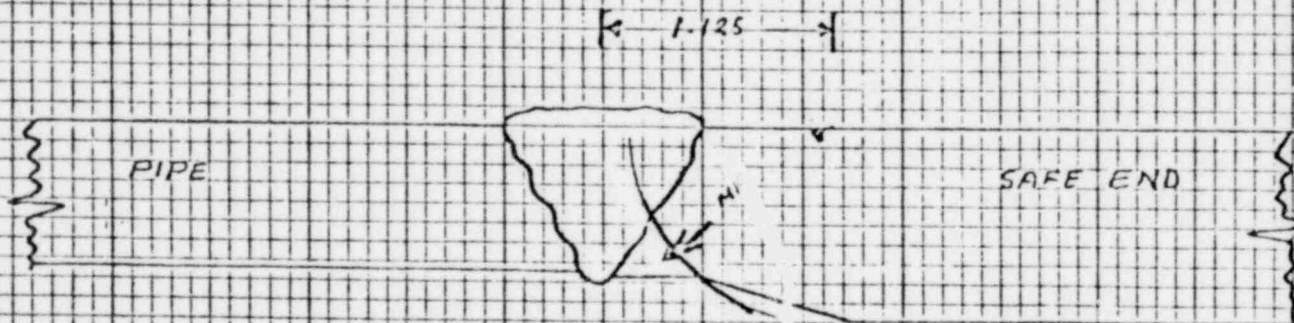
Burleigh/JH

# POOR ORIGINAL

RETRACE  
STEAM  
PIPE TO SA



REFLECTOR #1 @ 14.5"



X-DUCER  $\phi = 51^\circ$   
 MP = (0.04939 PER DIV) 0.9878"  
 30 DIV = 0.9878"  
 TYP BOTH REFLECTORS

DIETZGEN CORPORATION  
MADE IN U.S.A.

NO. 3410-10 DIETZGEN GRAPH PAPER  
10 X 10 PER INCH

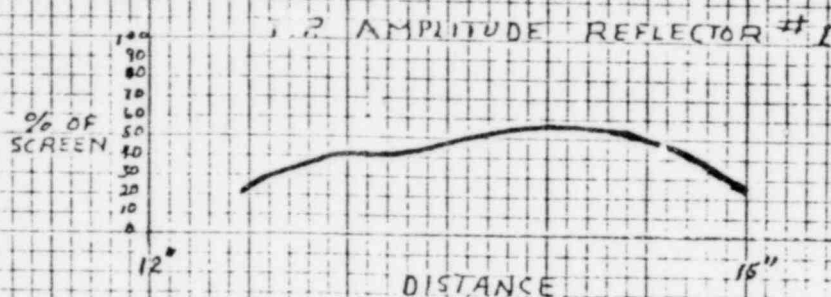
11423 3511



OF DATA  
GEN. (A) #1  
EE END WELD

11-4-79 / RDBurkingame/II

POOR ORIGINAL



"NOTE" A APPROX. INCREASE OF 3 TO 4 dB WAS NOTED BETWEEN 44" TO 46"

REFLECTOR #2 @ 46"

1.375



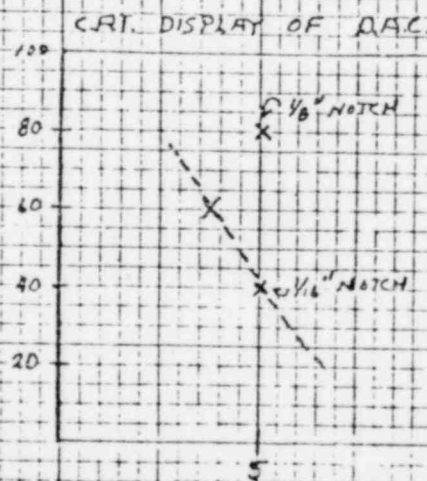
CRACKNESS #1 & #2

A .780  
B .800  
C 1.000

DAC TYP. ALL  
ALL EXAMS

7

Figure



Burkingame/II

RETEST

11-4-79

STEAM GEN. B (2)  
PIPE TO SAFE END

WELD #

BC-G-1 and AC-6-1

PEAK AMPLITUDE

AXIAL DIST.

CIRC. LOCATION

1/2 AMPL. CW

1/2 AMPL. CCW

TMD

\* ADJUSTED TO

95%

0"

2 1/4"

55 1/2"

4

85%

4 1/2"

48 1/2"

43"

4.2

# 37%

43 1/4"

43"

44"

4.2

\* "NOTE" FREQ. WAS ADJUSTED TO W.B. AND INCREASED 3db.  
THE CHANGE TO W.B. WAS CHECKED ON CAL. BLOCK  
AFTER EXAM.

# "NOTE" NEW REFLECTOR NOTED BEHIND AND SHADOWING  
REFLECTOR # 2

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WELD #

BC-G-1 and AC-6-1

PEAK AMPLITUDEAXIAL DIST.CIRC. LOCATION1/2 AMPL. CW1/2 AMPL. CCW

TMD

54%		14.5"	15"	12.5"	4
40%		13.25"	15"	12.5"	4
* 50%		46"	44"	47"	4

\* "NOTE" A PORTION OF THIS REFLECTOR WAS NOTED TO HAVE A INCREASE OF FROM 3 TO 4 db IN GAIN. THIS REFLECTOR HAD BEEN INCREASED 4db IN THE FIRST EXAM TO MAKE IT OF MEASURABLE AMPLITUDE. — A 7 TO 8 db INCREASE

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