North Atlantic

North Atlantic Energy Service Corporation
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(603) 474-9521, Fax (603) 474-2987

The Northeast Utilities System

Ted C. Feigenbaum
Senior Vice President &
Chief Nuclear Officer

NYN-95081

October 16, 1995

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

References: (a) Facility Operating License No. NPF-86, Docket No. 50-443

(b) NRC Generic Letter 90-05 "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping," June 15, 1990

Subject: Relief Request From ASME Code Section XI Requirements

Gentlemen:

North Atlantic Energy Service Corporation (North Atlantic) hereby requests, pursuant to NRC Generic Letter 90-05, relief from the ASME Boiler and Pressure Vessel Code Section XI requirements pursuant to 10CFR50.55a(g)(6)(i). The Enclosure provides a description of actions taken by North Atlantic to make temporary non-code repairs to a leak in the Service Water (SW) System line 1802-14-153-24". The SW System is a Class 3, moderate energy system. The non-code repair, a soft rubber gasket secured with a mechanical clamp, was completed at approximately 1530 on October 15, 1995. This repair successfully isolated the leak.

The leak is located in a cement lined 24-inch bypass line for Strainer SW-S-11, which is downstream of the ocean and cooling tower SW pumps and upstream of the Primary Component Cooling Water (PCCW), Secondary Component Cooling Water (SCCW), and Emergency Diesel Generator Water Jacket heat exchangers. Attachment 2 of the Enclosure depicts the leak location. Specifically, the leak is a 1/32-inch diameter through-wall flaw at a field weld connecting a straight section of 24-inch diameter pipe to a 24-inch diameter Tee fitting. The leak is approximately one gallon per hour. Ultrasonic examination has identified no additional degradation of this field weld. However, it must be noted that approximately 25% of this weld was not examined since weld preparation for ultrasonic examination was stopped immediately upon discovery of the through-wall leak. Preliminary augmented ultrasonic examinations performed to date on other welds with similar configurations and service environments were found to be acceptable.

It is not practical to isolate the leaking SW line to perform a code repair. A code repair on this line would require partial draindown of SW Train B, resulting in the inoperability of the two ocean SW pumps

200013

A047 1/1

and the cooling tower SW pump within this train. Inoperability of an entire SW loop is allowed by the requirements of Technical Specification 3/4.7.4 "Service Water System/Ultimate Heat Sink" for up to 72 hours. However, due to system configuration, both trains of SW are needed to dissipate normal plant heat loads. Additionally, the allowed outage time may not be sufficient to perform a code repair, thus entry into Technical Specification 3.0.3 would be required and a plant shutdown would ensue.

Consistent with the provisions of Generic Letter 90-05, North Atlantic is submitting this relief request for a temporary non-code repair. Code repair of the degraded piping will be completed during the upcoming refueling outage, which is scheduled to begin on November 4, 1995. The Resident Inspector for Seabrook Station, Mr. David Mannai, was notified of this repair.

This letter and its Enclosure have been reviewed and approved by the Station Operation Review Committee (SORC). A supplement to this letter will be submitted by October 31, 1995 to provide the results of augmented examinations of SW welds with similar configuration, fabrication, and service environment.

Should you have any questions regarding this letter, please contact Mr. James M. Peschel, Regulatory Compliance Manager, at (603) 474-9521 extension 3772.

Very truly yours,

Ted C. Feigenbaum

TCF/JES:jes
Enclosure

cc: Mr. Thomas T. Martin
Regional Administrator
U.S. Nuclear Regulatory Commission
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King of Prussia, PA 19406

Mr. Albert W. De Agazio, Sr. Project Manager
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Washington, DC 20555

Mr. John B. Macdonald
NRC Senior Resident Inspector
P.O. Box 1149
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North Atlantic
October 16, 1995

ENCLOSURE TO NYN-95081

SEABROOK STATION
FORM FOR RELIEF REQUEST FROM ASME SECTION XI REQUIREMENTS

ACR # 95-316 **DATE:** 10/14/95 **TIME:** Approx. 1625

1.0 ORIGINATOR

1.1 DESCRIPTION OF FLAW

There is a thru wall flaw causing leakage on line 1802-14-153-24". The leak is at the field weld which connects line 1802-14 to line 1802-5-153-24" and is downstream of the normally closed "B" train strainer bypass valve SW-V66. (Refer to Attachment 1)

This leak is located in the Service Water Strainer Room at elevation 53' in the PAB. Since routine strainer basket cleaning is performed in this room, the area is very well drained. The flaw has an approximate dimension of 1/32" diameter. The leak rate is estimated to be less than one gallon per hour.

Piping/Component Drawing No.:

The piping is carbon steel with 3/8" thick cement lining as detailed on sketch 804998 of specification 248-2 (Refer to Attachment 2).

P&ID No.:

1-SW-B/D20795

1.2 IMPRACTICALITY OF CODE REPAIR

It was determined not practical to perform a code repair of the leaking SW line at this time. A code repair on this line would require partial draindown of SW Train "B", resulting in the inoperability of the two ocean SW pumps and the cooling tower pump within this train.

Inoperability of an entire SW Loop is allowed by Technical Specification 3/4.7.4a "Service Water System/Ultimate Heat Sink" for up to a 72 hour period. However, due to system configuration, both trains are needed to disipate normal plant heat loads. Furthermore, the allowed outage time may not be sufficient to perform a code repair, thus entry into Technical Specification 3.0.3 would be required and a plant shutdown would ensue.

1.3 DESCRIPTION OF PROPOSED TEMPORARY REPAIR

A soft rubber gasket with mechanical clamp has been installed.

1.4 SAFETY SIGNIFICANCE System Interaction Evaluation

Flooding:

There is a leak of less than one gallon per hour coming from the 1/32" diameter thru wall flaw in this 24" diameter field weld. Ultrasonic Examination has confirmed that there is no additional degradation at this field weld.

The leakage is well contained within the Service Water Strainer Room, elevation 53' of the PAB. More than adequate drainage exists to preclude flooding.

Jet Spray:

There are no safety related power supplies that could be disabled as a result of the jet spray from this flaw. Motor operated valves SW-V4 and V5, located in this room, have an active safety related function. The valves are at least 20 feet from the location of the leak and are well shielded by large pipe and grating from any spray, should it develop.

Loss of Flow:

Loss of SW thru this flaw is insignificant to the Service Water Pump or Cooling Tower Pump capacity to supply design flow during an accident combined with LOP. One Service Water Pump must supply 8,339 gpm or 11,360 gpm from one Cooling Tower Pump to satisfy design heat loads from ECCS and the Emergency Diesel Generator.

Other Interactions:

None

Failure Consequences

Total failure of this weld could result in SW "B" train inoperability. Because of system configuration, both trains of SW are needed to disipate normal plant heat loads. Thus, a forced shutdown would commence.

System pressure loss via the postulated break would most likely cause a tower actuation signal to occur. Since this line is within the pressure boundary of the SW system when on the tower, cooling tower pump flow would degrade sufficiently to necessitate a shutdown of SW-P-110B.

There is no interaction with the SW "A" train which alone can accommodate design base heat loads.

Impact to Safe Shutdown Capability

As described above, the SW "A" train would be unaffected by total failure of this "B" train weld. The "A" train alone is sufficient for safe shutdown decay heat removal heat loads or heat loads during a design base event with LOP.

1.5 ROOT CAUSE INVESTIGATION

Root Cause Description:

Localized flaw in the cement lining caused accelerated corrosion at this field weld.

Other Systems Affected:

None

1.6 AUGMENTED INSPECTION

Assessment of overall degradation of the affected system:

The leak is typical of localized cement lining flaws at field welds in the carbon steel SW piping. These leaks do not result from large areas of damage but from very localized wall loss.

An ultrasonic examination of the weld circumference was performed. The only wall loss reported is local to the flaw location. It should be noted that approximately 25% of this weld could not be examined because the weld preparation needed for UT was stopped upon discovery of the thru wall leak.

Additional examinations required (based on root cause) - specify number of inspection locations - also specify frequency of inspections: (ten most susceptible and accessible locations for high energy systems and five for moderate energy piping systems)

Preliminary Ultrasonic Examinations have been performed at five additional locations in the SW "B" train (Attachment 3):

24" shop weld at the strainer bypass Tee (upstream side)
24" shop weld at the strainer bypass Tee (downstream side)
24" shop weld in the strainer bypass (elbow below flaw location)
16" field weld at the 24"x16" Tee to the DG Heat Exchanger
24" field weld at an elbow downstream of SW-V-67

All additional locations evaluated were found acceptible. At least three additional field weld locations will be included in the augmented inspection plan. These locations and finalized UT results will be submitted in a supplement to this Relief Request.

Description of areas selected for augmented inspection:

These locations will be of similar fabrication, configuration, and service environment.

2.0 STRESS ANALYSIS

2.1 DESIGN DETAILS

System: Service Water "B" train. In the bypass line for Strainer SW-S-11 and Downstream of valve SW-V-66.

Component: Field weld connecting a straight section of 24" diameter pipe and a 24 " diameter Tee fitting.

Component Size: 24" diameter cement lined carbon steel pipe.
24"X24"x24" cement lined carbon steel Tee.

Nominal Wall Thickness: 0.375"

Safety Code Class: Class 3

Material: SA-105

Design Pressure: 150 psig

Design/Operating Temperature: 200/34-90 degrees F

Code Minimum Wall Thickness: 0.171"

2.2 FLAW CHARACTERIZATION

Flaw Description/Size: (i.e., flaw size, adjacent wall thickness, single/multiple flaw, total area examined, etc.)

The flaw is highly localized. The through wall portion of the flaw is approximately 1/32" diameter and the minimum adjacent wall thickness is 0.174".

Flaw Location: The flaw is located downstream of SW-V-66.

Method Examination: UT
Note: Approximately 25% of this weld could not be examined since weld prep. for UT was stopped immediately upon discovery of the thru wall leak)

Flaw Type: Through wall flaw due to erosion/corrosion

Referenced UT Measurements: Attachment 3

2.3 FLAW EVALUATION SUMMARY

Method Used:

"Through-Wall Flaw" Approach (GL 90-05). This method considers a through wall flaw and evaluates the flaw stability by a linear elastic fracture mechanics methodology.

Results of Evaluation:

Loading conditions included dead weight, pressure, thermal, and seismic. All code stress equations were considered and determined to be acceptable. Stability of flaw was evaluated for all loading conditions and determined to be acceptable. Results of this evaluation are summarized below:

ASME III, SUBSECTION ND, STRESS EVALUATION			
DESIGN CONDITION	ACTUAL STRESS (PSI)	ALLOWABLE STRESS (PSI)	ACTUAL / ALLOWABLE
Normal	2,932.	15,000.	0.20
Upset	8,223.	18,000.	0.46
Faulted	11,052.	27,000.	0.41

FLAW STABILITY CHECK		
STRESS INTENSITY FACTOR (KSI(IN)$^{1/2}$)		FACTOR OF SAFETY
ACTUAL	CRITICAL	CRITICAL/ACTUAL
5.24	35.0	6.68

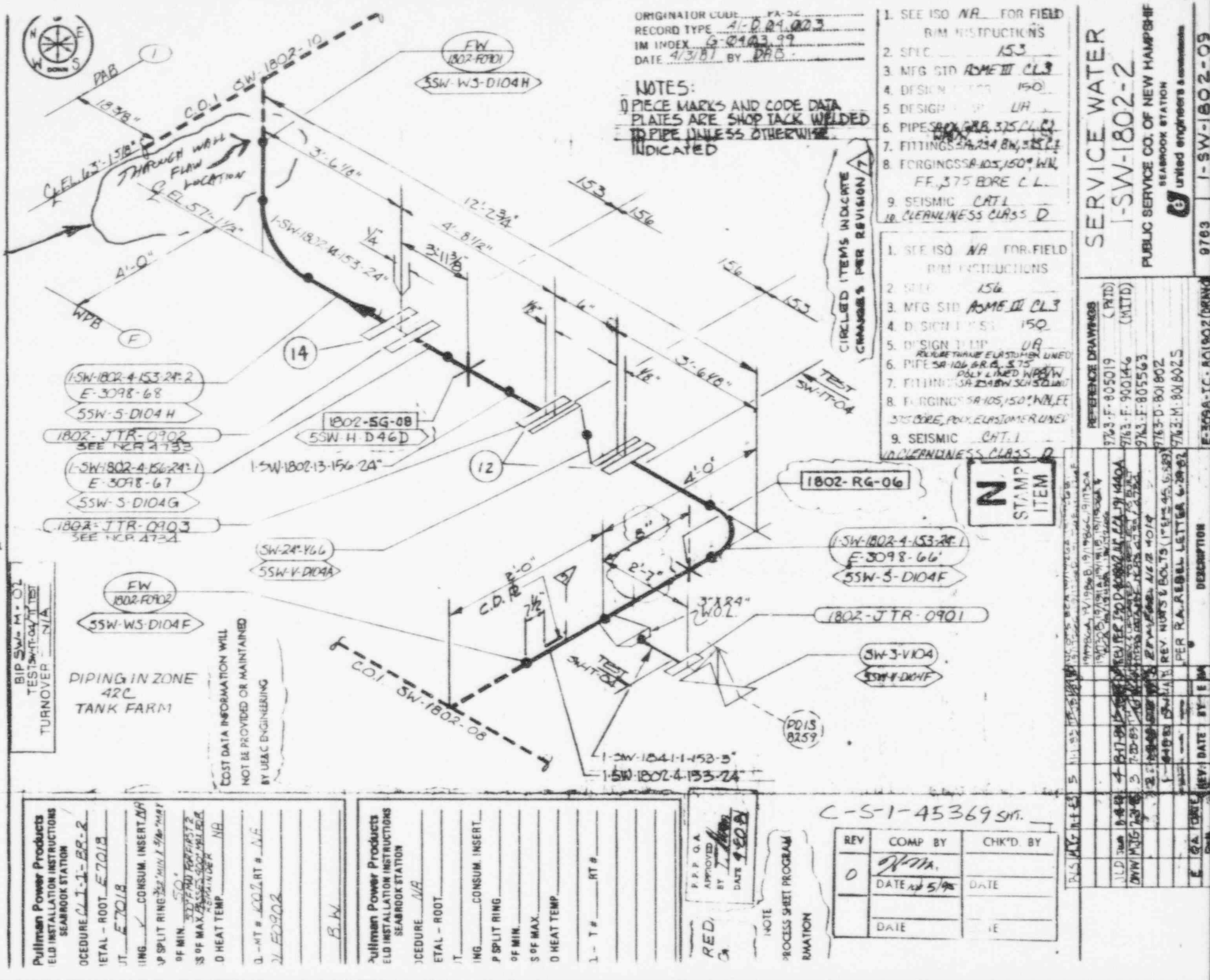
2.4 FLAW MONITORING

Walkdown Frequency: (for leak monitoring)

At least once per week.

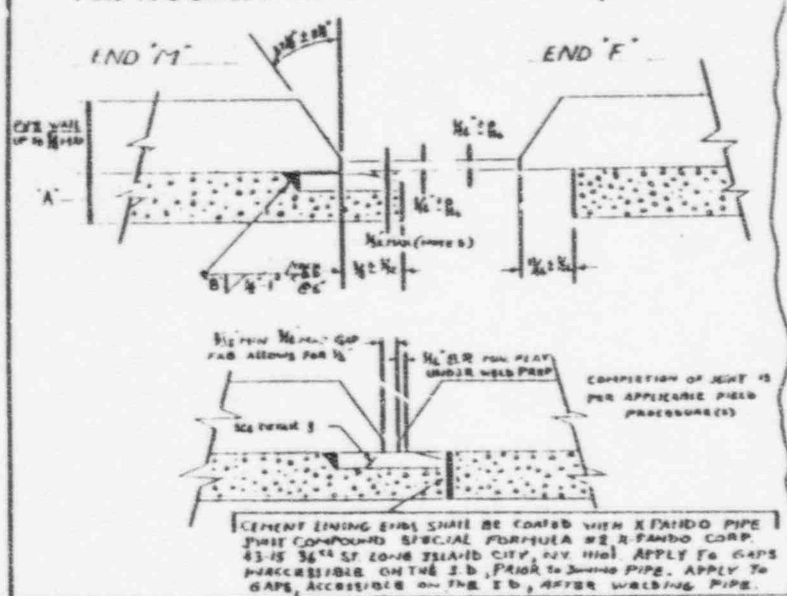
Frequency of Follow-up NDE: (for erosion rate assessment)

At least once every three months.

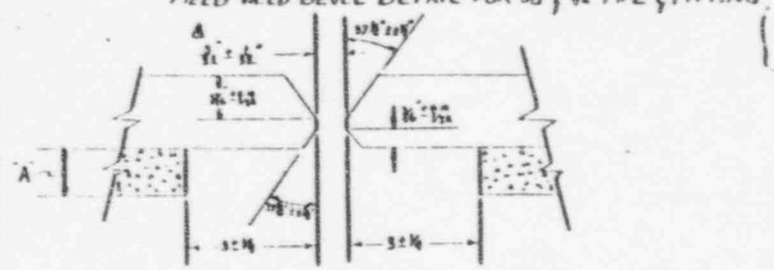


ORIGINATOR CODE PA-52
RECORD TYPE A1-D24.003
IM INDEX G-0403.99
DATE 4/3/87 BY DAB
NOTES:
1) PIECE MARKS AND CODE DATA PLATES ARE SHOP TACK WELDED TO PIPE UNLESS OTHERWISE INDICATED
1. SEE ISO NA FOR FIELD B/M INSTRUCTIONS
2. SPEC 153
3. MFG STD ASME III CL.3
4. DESIGN PRESS 150
5. DESIGN TEMP UA
8. FORGINGS SA-105, 150# WN, FF, .375 BORE C.L.
9. SEISMIC CAT.I
10. CLEANLINESS CLASS D
1. SEE ISO NA FOR FIELD B/M INSTRUCTIONS
2. SPEC 156
3. MFG STD ASME III CL.3
4. DESIGN PRESS 150
5. DESIGN TEMP UA
9. SEISMIC CAT.I
10. CLEANLINESS CLASS D
CIRCLED ITEMS INDICATE CHANGES PER REVISION 7
SERVICE WATER
1-SW-1802-2
PUBLIC SERVICE CO. OF NEW HAMPSHIRE
SEABROOK STATION
united engineers & constructors
9763
1-SW-1802-09
REFERENCE DRAWINGS
9763-F-805019
9763-F-900146
9763-F-805563
9763-D-801802
9763-M-801802S
REV. NUTS & BOLTS
PER R.A. REBEL LETTER 6-28-82
DESCRIPTION
REV. DATE BY
N STAMP ITEM
C.O.I. SW-1802-10
FW 1802-F0901
5SW-WS-D104H
PAB
WPB
THROUGH WALL FLAW LOCATION
C EL. 63'-1 5/8"
C EL. 57'-1 1/2"
18 3/8"
3'-6 1/8"
12'-2 3/4"
4'-8 1/2"
3'-11 3/8"
4'-0"
153
156
1-SW-1802-14-153-24"
14
1-SW-1802-4-153-24"-2
E-3098-68
5SW-S-D104H
1802-JTR-0902
SEE NCR 4733
1-SW-1802-4-156-24"-1
E-3098-67
5SW-S-D104G
1802-JTR-0903
SEE NCR 4734
1802-SG-08
5SW-H-D46D
1-SW-1802-13-156-24"
12
3'-6 1/8"
TEST SW-IT-04
4'-0"
1802-RG-06
1-SW-1802-4-153-24"-1
E-3098-66
5SW-S-D104F
SW-24"-V66
5SW-V-D104A
FW 1802-F0902
5SW-WS-D104F
C.O. 2'-0"
2'-7"
3"x24" W.O.L.
1802-JTR-0901
SW-3-V104
5SW-V-D104F
TEST SW-IT-04
PDIS 8259
C.O.I. SW-1802-08
1-SW-1841-1-153-3"
1-SW-1802-4-153-24"
ATTACHMENT #1
BIP SW-M-02
TEST SW-IT-04/IT TEST
TURNOVER N/A
PIPING IN ZONE 42C TANK FARM
COST DATA INFORMATION WILL NOT BE PROVIDED OR MAINTAINED BY UE&C ENGINEERING
Pullman Power Products
FIELD INSTALLATION INSTRUCTIONS
SEABROOK STATION
PROCEDURE CL1-1-BR-2
C-S-1-45369 SHT.
REV 0
COMP BY
CHK'D. BY
DATE

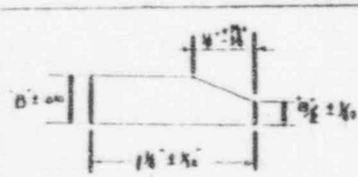
FIELD WELD BEVEL DETAIL FOR 4" THROUGH 32" PIPE & FITTINGS



FIELD WELD BEVEL DETAIL FOR 38" & 42" PIPE & FITTING



COMPLETION OF JOINT IS PER APPLICABLE FIELD PROCEDURE(S)



DETAIL 1

FIELD WELD BEVEL FOR NON FERROUS PIPE AND FITTINGS 2½" THRU 3¼"

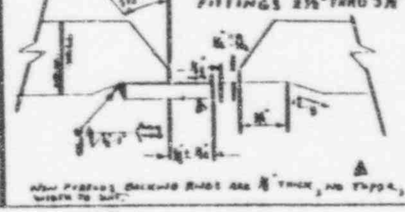
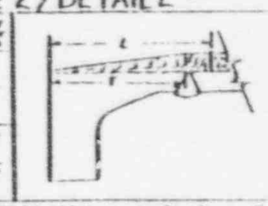


TABLE 1

O.D.	I.D.	C-weld C-Bore	t_{min}	t_{nom}	"A"	"B"
42"	41.000	—	—	.500"	½"	0.250
38"	37.000"	—	—	.500"	⅜"	0.250
32"	31.000	30.959"	—	.500"	⅜"	0.250
24"	23.250"	23.303"	.375"	—	⅜"	0.250
20"	19.250	19.303"	.375"	—	5/16"	0.187
16"	15.250	15.303	.375"	—	5/16"	0.187
12"	12.000	12.053	.375"	—	5/16"	0.187
10"	10.020"	10.070	.365"	—	¼"	0.125
8"	7.981"	8.030"	.322"	—	¼"	0.125
6"	6.065	6.094"	.280"	—	⅛"	0.125
4"	4.026"	4.048"	.237"	—	¼"	0.125

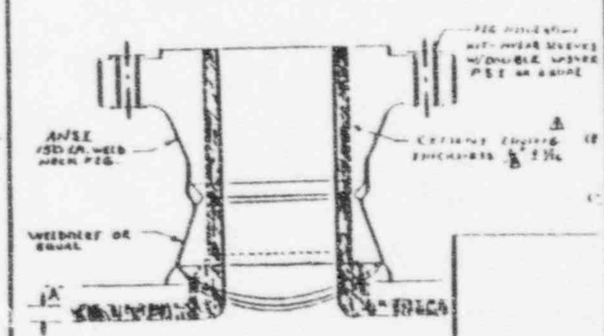
TABLE 2 / DETAIL 2

PIPE SIZE	TAPER LENGTH L±D	EPOXY CEMENT L±⅛"
4"	3"	3½"
6"	3½"	4"
8"	4"	4½"
10"	4"	4½"



1. A COATING OF GREGG'S SEAL COAT SHALL BE APPLIED TO THE I.D. OF THE CEMENT LINING PRIOR TO THE CEMENT CURE.
2. ACCESSIBLE I.D. THE ID SHOP WELDS CAN BE OPEN JOINT WITH TIG ROOT PROVIDED THE DEFECTIVE AREAS [illegible] WELD ARE BACK CHIPPED TO SOUND METAL AND REWELDED FROM THE I.D. (COUNTERBORE AS NEEDED)
3. INACCESSIBLE TO THE ID SHOP WELDS WILL REQUIRE A "Y" TYPE CONSUMABLE INSERT. (COUNTERBORE AS NEEDED)
4. THE SELLER SHALL SET CRITERIA (APPROVED BY PURCHASER) FOR DETERMINING WHEN COUNTERBORING/BUILD UP OF PIPE ENDS IS REQUIRED FOR PIPING 4" NPS THROUGH 32" NPS.
5. PRIOR TO CEMENT LINING APPLICABLE SPOOLS SHALL HAVE BACKING RINGS HAND FIT TO PIPE ENDS. AFTER TACK WELDING OF RING THE MAXIMUM GAP BETWEEN RING AND PIPE I.D. SHALL BE 1/32 INCH. SPLIT RINGS SHALL HAVE SPLIT WELDED DURING OR PRIOR TO FIT UP TO FORM A SOLID RING. THE SPLIT RING WELD SHALL MEET THE SAME QUALITY REQUIREMENTS AS THE WELD JOINT.
6. 4", 6", 8" AND 10" NPS FLANGE END SPOOLS WHICH ARE NOT RECEIVING POLYURETHANE INSERTS PER D-80[illegible] AND ARE ABUTTING TO BUTTERFLY VALVES SHALL HAVE SIKA DUR [illegible] GEL EPOXY CEMENT TAPER LININGS AS SHOWN ON TABLE 2/DETAIL 2 (SEE FIELD PROCEDURES AND SPECIFICATION 9763-006-248-[illegible] FOR FURTHER DETAILS)

2" THROUGH 3¼" INSTRUMENT CONNECTIONS TO CEMENT LINED PIPE



NOTES: THIS DWG. SUPERCEDES 9763-[illegible]-804778 REV 2
THIS DWG. NOT TO SCALE
THIS DWG. IS PART OF SPEC 9763-006-248-2.

REV	DATE	DESCRIPTION				
3	[illegible]	UPDATE TO SPECIFICATION [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible] UPDATE SPEC 248-2	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	UPDATE TO SPEC 248-2	[illegible]	[illegible]	[illegible]	[illegible]
0	[illegible]	ISSUED FOR CONSTRUCTION	[illegible]	[illegible]	[illegible]	[illegible]

PIPE END JOINT DESIGN FOR CEMENT LINED AND NON FERROUS PIPING

PUBLIC SERVICE CO. OF NEW HAMPSHIRE

SEABROOK STATION

United Engineers

9763-D-804778

1

SPEC 9763-006-248-2
PAGE NO. 39

ATTACHMENT #2

ULTRASONIC THICKNESS EXAMINATION REPORT

LOCATION LINE 1802 SW-B-TRAIN SYSTEM SW WORK REQUEST N/A

EXAMINATION AREA/RESULTS

DESCRIPTION OF EXAMINATION AREA AND RESULTS

CARBON STEEL, FITTINGS AND PIPE, SEE ATTACHED SHEETS FOR SPECIFIC RESULTS.

SW-S-11 BYPASS LINE.

UT PERFORMED PER DIRECTION OF ES AND LOCATION SPECIFIED BY K. SATZ.

SKETCH (Include obstructions, components, extensions, etc.)

☑ ATTACHED

EXAMINED [signature] LEVEL II DATE 10-11-95

EXAMINED N/A LEVEL N/A DATE N/A

EXAMINATION RESULTS

☐ ACCEPTABLE ☑ EVALUATION REQ'D

REVIEWED _____ LEVEL ___ DATE ____

REVIEWED [signature] DATE 10/15/95

Responsible Engineer

INSTRUMENT DATA

INSTRUMENT: MFG/MODEL STRESSTEL CRIDMIKE GTE/SN GTE 2644

☐ CRT ☐ CRT/DIGITAL ☒ DIGITAL ☐ HORIZONTAL LINEARITY PERFORMED

COMP SURFACE TEMP >125° ☒ NO ☐ YES FLS No. _____ CAL DUE DATE _____

CAL BLOCK MAT'L ___	THICKNESS	.1004	.8004		TIME CHECKED
	FLS NO.	FLS 6321	FLS 6321		
	Cal. Due Date	11-1-96	11-1-96		
CALIBRATION CHECK	INITIAL	.100	.800		2235
	INTERIM	.101	.799		2300
	INTERIM	.101	.800		2322
	INTERIM				
	FINAL	.099	.799		2345

TRANSDUCER

☒ PITCH / CATCH Same 10-15-95

☒ PULSE / ECHO

MFG. STRESSTEL

SER# 10229

SIZE .250 FREQ. 5 MHz

COUPLANT

MFG. ULTRAGEL II

BATCH # 092121

ENGINEERING EVALUATION ☐ N/A ☐ ATTACHED ☐ SEE BELOW

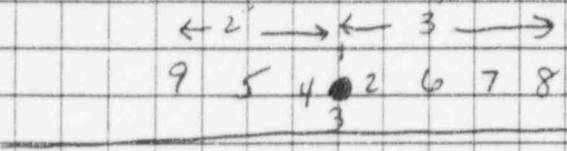
EVALUATION/COMMENTS

☐ ACCEPT ☐ REPAIR/REPLACE Responsible Engineer _____ Date ____

ATTACHMENT "A" TO C-S-1-45369 REV. 0
SHT. 1 OF 7

ULTRASONIC THICKNESS EXAMINATION SKETCH

LOCATION B Train SW By Pass Line at Tee SYSTEM SW WORK REQUEST _____



180° from weld thickness is in ech .350 and above

1	.450
2	.174
3	.352
4	.188
5	.200
6	.175
7	.184
8	.191
9	.316

6" from hole .345 on weld Pipe show no indications

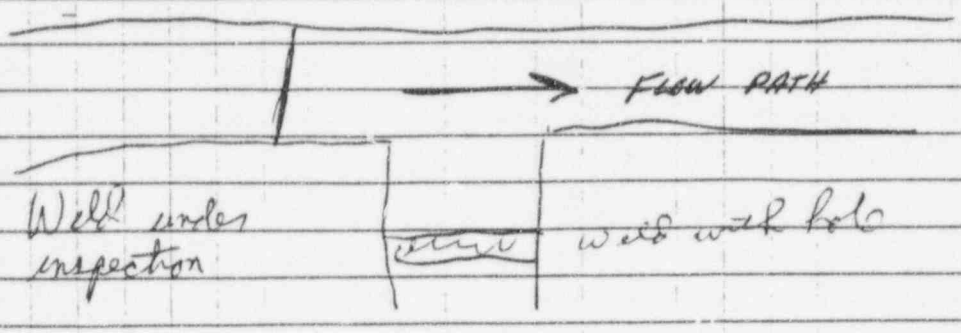
SMF 10-15-95

Page 1 of 1
ES1807.012B
Rev. 1

ATTACHMENT "A" TO C-S-1-45369 REV. 0
SHT. 2 OF 7

ULTRASONIC THICKNESS EXAMINATION SKETCH

LOCATION See Below SYSTEM SW WORK REQUEST _____



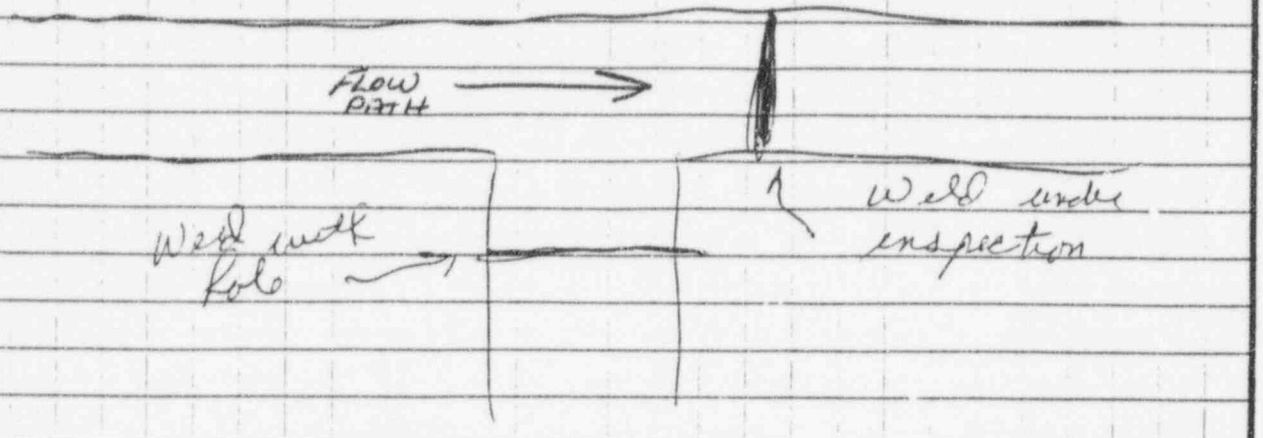
Scan show low point as .407 on pipe and .548 on weld. Tee is .600
No deteration found

SWR 10-15-95

ATTACHMENT "A" TO C-S-1-45369 REV-0
SHT. 3 OF 7

ULTRASONIC THICKNESS EXAMINATION SKETCH

LOCATION _____ SYSTEM ___ WORK REQUEST _____



Note
Weld is painted

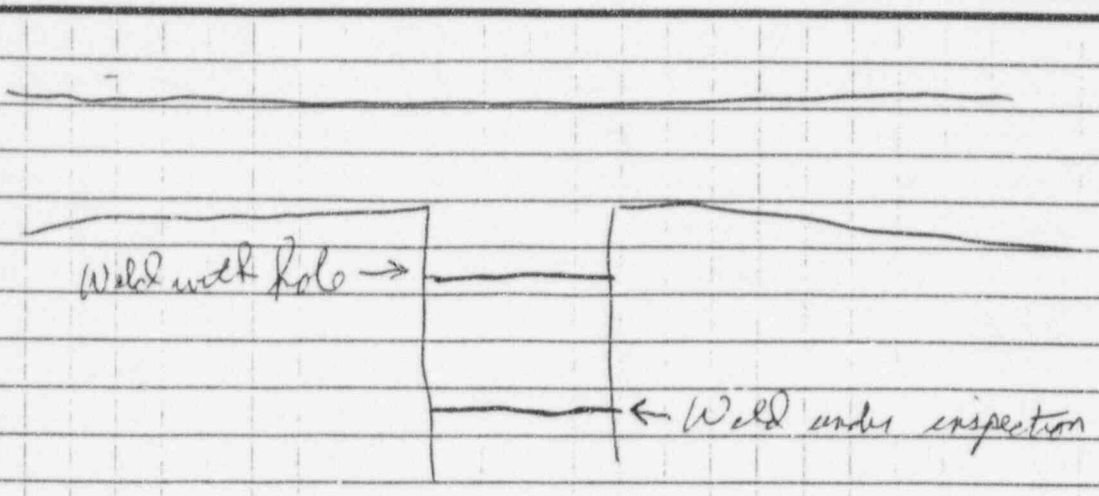
.511 is the thickness over weld. No deterioration found

SMF 10-15-95

ATTACHMENT 'A' TO C-S-1-45369 REV. 0
SHT. 4 OF 7

ULTRASONIC THICKNESS EXAMINATION SKETCH

LOCATION Sea Below SYSTEM SW WORK REQUEST _____



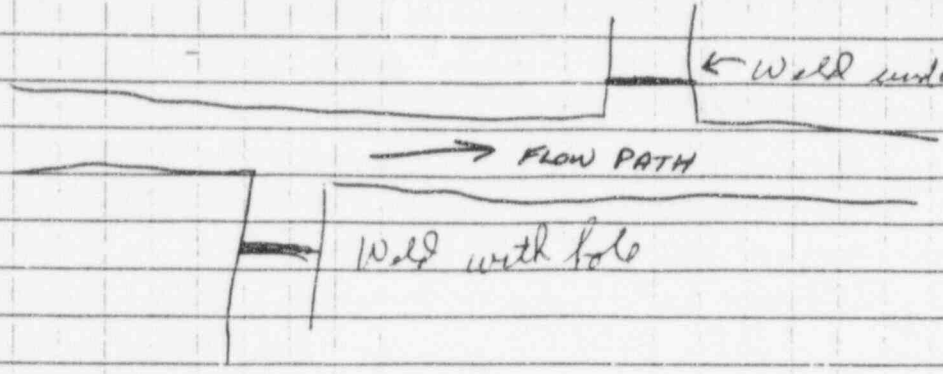
Low point on Pipe is .403 and
weld is is .442 No detection found.

10-15-95

ATTACHMENT "A" TO C-S-1-45369 REV. 0
SH. 5 OF 7

ULTRASONIC THICKNESS EXAMINATION SKETCH

LOCATION 1802-1001 SYSTEM SW WORK REQUEST _____



General area lowest points
Pipe .362
Weld .313
toe = .500

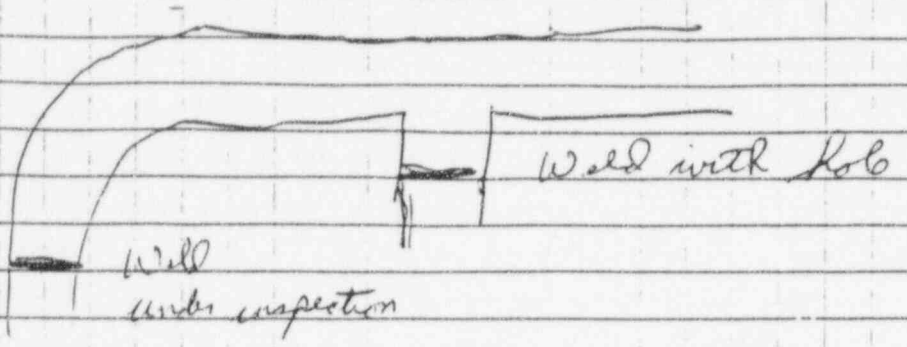
No deformation found

SMF 10-15-95

ATTACHMENT "A" TO C-S-1-45369 REV. 0
SHT. 6 OF 7

ULTRASONIC THICKNESS EXAMINATION SKETCH

LOCATION 1802-F0301 SYSTEM SLD WORK REQUEST _____



General area readings
elbows .330
weld .290

No deformation noted

Note
Subsurface indication interfering with UT weld general reading is .097, Indication most likely due to lack of fusion Area ≈ 1 1/2" location is on upper elbow lower joint outside radius

SMK 10-15-95

ATTACHMENT "A" TO C-S-1-45269

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