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February 19, 1988
ST-HL-AE-2530
File No.: G02
10CFR50.

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Unit 1
Docket No. STN 50-498
Main Feedwater Hydraulic Transients
-Additional Information-

Reference 1) Letter from M. R. Wisenburg to Document Control Desk, dated January 18, 1988 (ST-HL-AE-2483)

Reference 2) Letter from S. L. Rosen to Document Control Desk, dated February 5, 1988 (ST-HL-AE-2498)

By Reference 1 HL&P submitted a report on the hydraulic transients that occurred on January 11, 1988 in the STP Unit 1 main feedwater system while filling the steam generators. By Reference 2 HL&P submitted a supplemental report documenting the results of the confirmatory tests to verify that the procedural changes that have been made will preclude recurrence of hydraulic transients of this type. This letter addresses additional data and information requested by NRC during our meeting on February 10, 1988.

NRC Request #1 - Provide the process parameters for the Mode 3 confirmatory test.

Response - Attachment 1 lists the range of the process parameters during additional confirmatory tests, which were performed successfully in Mode 3. As in previous tests, the results of the Mode 3 tests confirmed that the procedural changes that have been made will prevent the type of main feedwater hydraulic transients that occurred on January 11, 1988.

A001
1/1

NRC Request #2 - Provide Test, Analysis and Measurement Unit (TAMU) data on Mode 3 and 4 tests while feeding through the upper nozzle.

Response - Attachment 2 (Pages 1 through 8) provides data of pressure readings that were taken during Mode 3 and Mode 4 tests at the drain valves downstream of the tie-in points of the preheater bypass line to the auxiliary feedwater line when flow was initiated through the upper steam generator nozzles. These pressure readings do not reveal any abnormal transients.

NRC Request # 3 - Review the Emergency Operating Procedures to ensure that the use of main feedwater during an emergency situation will not create conditions which could cause the observed hydraulic transients to occur.

Response - We have reviewed the Emergency Operating Procedures (EOP's) to determine if they prescribe the use of main feedwater during emergency conditions and if this use could establish the conditions necessary for the observed feedwater hydraulic transient. The only instance where the EOP's do prescribe the use of main feedwater is in the procedure titled, "Response to Loss of Secondary Heat Sink". Steps exist in this procedure which direct the operator to attempt to establish main feedwater. However, since this procedure is employed on a loss of secondary heat sink it is highly improbable that main feedwater will be used when steam generator temperature is below 340°F. In addition, during power operations main or extraction steam is used to provide deaerator heating instead of auxiliary steam so it is not possible to raise feedwater temperature higher than the steam generator temperature.

NRC Request #4 - Consider making physical changes to the piping in AFW trains A, B, and D to eliminate the vertical run at the tie-in point of the preheater bypass line to the auxiliary feedwater line.

Response - On the basis of the changes to the operating procedures, results of the confirmatory tests and the extremely low probability of inducing water hammer during an emergency, no physical changes to piping at the tie-in point of the preheater bypass line to the auxiliary feedwater line (vertical to horizontal) in Trains A, B, and D are required.

If you should have any questions on this matter, please contact Mr. S. M. Head at (512) 972-8392.

M. A. McBurnett
Manager
Operations Support Licensing

SLR/SMH/ae

Attachment 1: Process Parameters - Mode 3 tests

Attachment 2: Data of Pressure Readings - Mode 3 and Mode 4 tests

NL.88.047.02

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ATTACHMENT 1

The range of the process parameters during the Mode 3 confirmatory tests was as follows:

Feeding through the upper nozzle:

S/G Level 54 to 64 % NR

S/G Press. 1068 to 1174 psig

S/G Temp. 566 to 568 ^{o}F

FW Press. 1550 to 1575 psig

FW Temp. 270 to 273 ^{o}F

Deaerator Press. 25 to 30 psig

Deaerator Temp. 282 to 286 ^{o}F

Feeding through the lower nozzle:

S/G Level 54 to 63 % NR

S/G Press. 1068 to 1172 psig

S/G Temp. 566 to 568 ^{o}F

FW Press. 1560 to 1580 ^{o}F

FW Temp. 270 to 273 ^{o}F

Deaerator Press. 25 to 27 psig

Deaerator Temp. 282 to 285 ^{o}F

Attachment 2

2/12/88
TRAIN A

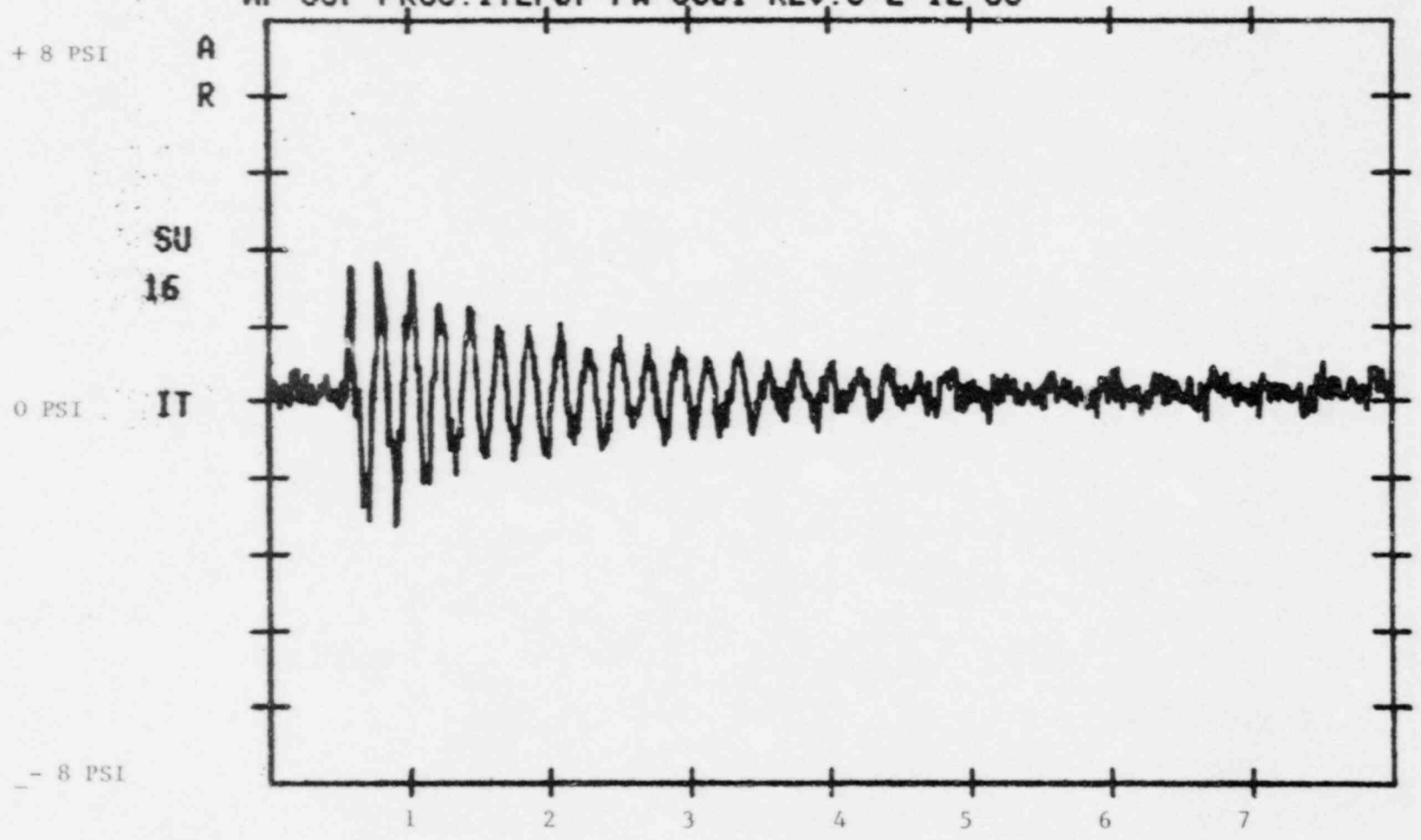
ANAERI94.,120

TGX-AFH-19 1705FT MAIN FEEDWATER MODE 3

1.66-03 V/EA 8.00+00 E VLN

1.00+00 V/EB C

AF-337 PROC.1TEP07-FW-0001 REV.0 2-12-88



Train A

Mode 3 Test

2/12/88
Train B

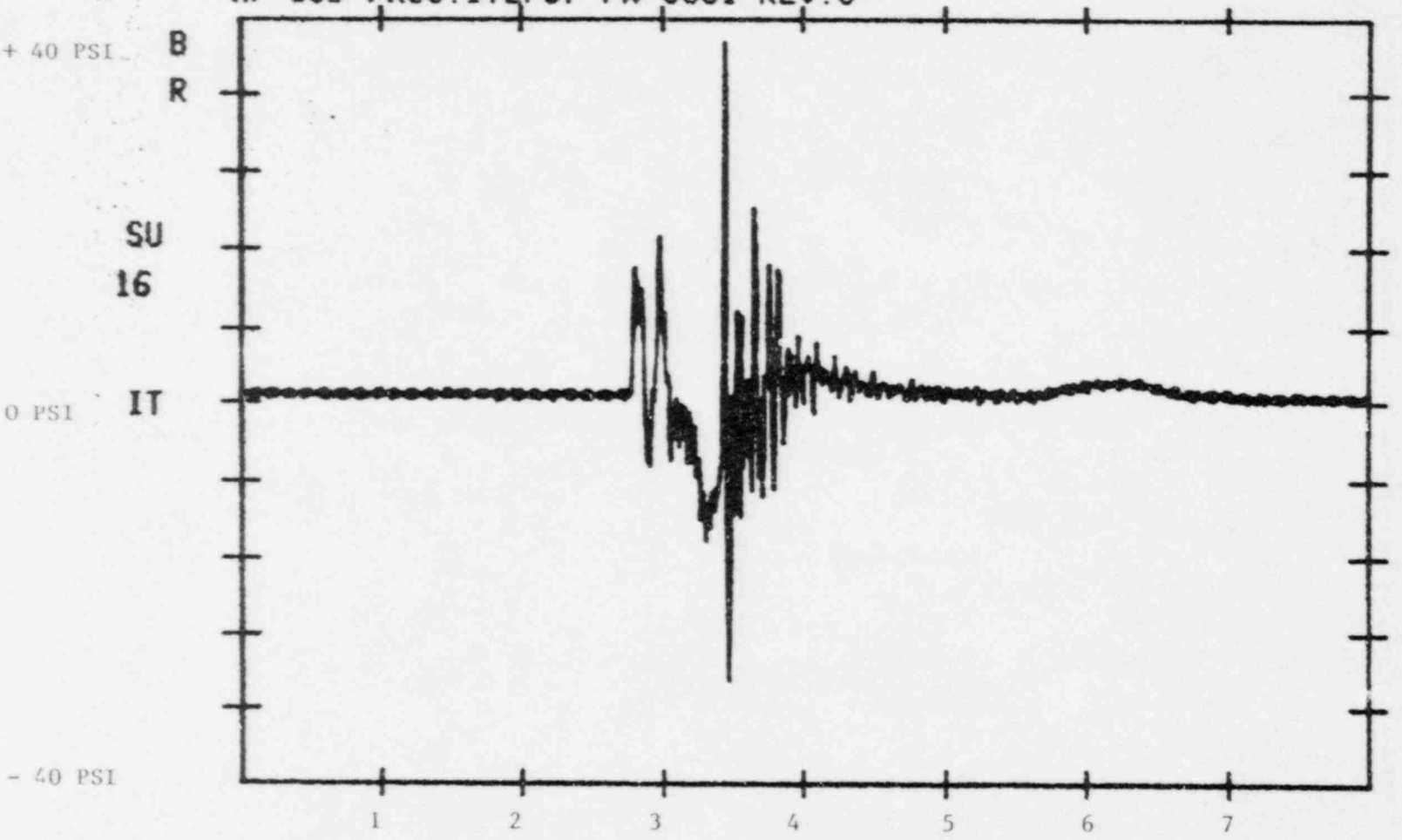
ANAEA194..120

T TGX-AFW MAIN FEEDWATER MODE 3 TEST

1.66-03 V/EA 40.0+00 E VLN

1.66-03 V/EB C

AF-339 PROC.1TEP07-FW-0001 REV.0



Train B
Mode 3 Test

Train C

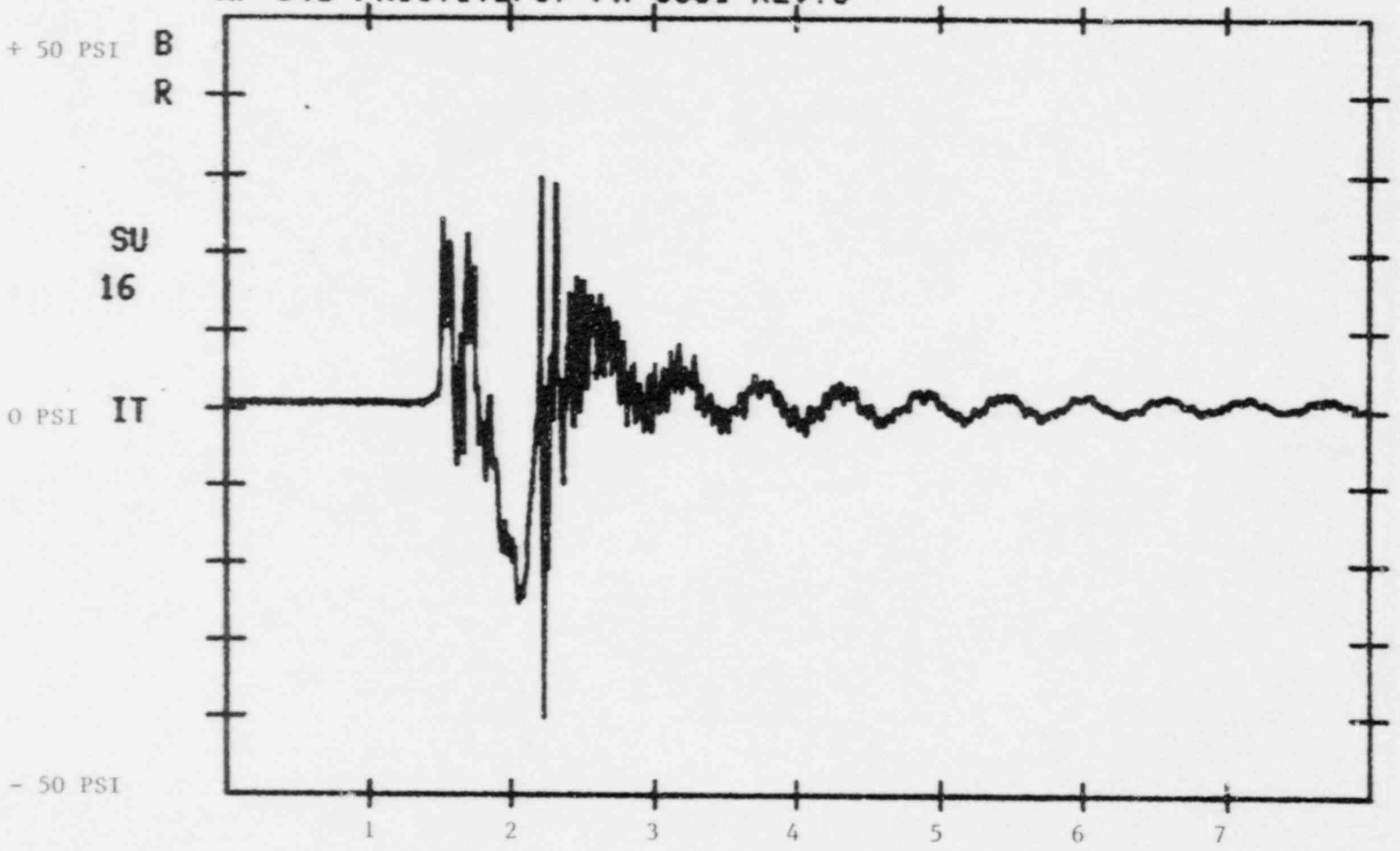
ANAEAI94..120

T TGX-AFW MAIN FEEDWATER MODE 3 TEST

1.66-03 V/EA 50.0+00 E VLN

1.66-03 V/EB C

AF-340 PROC.1TEP07-FW-0001 REV.0



Train C

Mode 3 Test

Train D

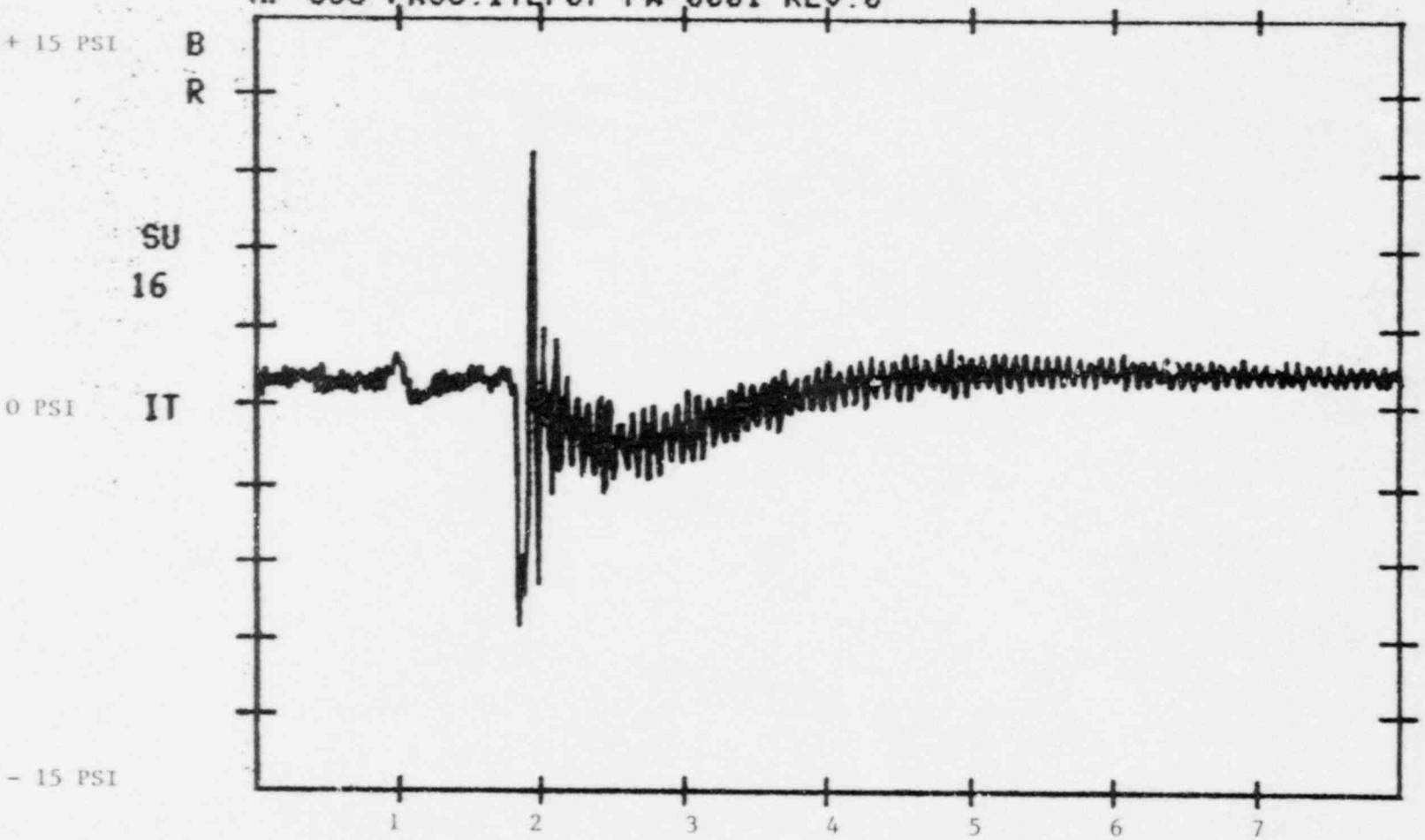
ANAEA194..120

T TGX-AFW MAIN FEEDWATER MODE 3 TEST

1.66-03 V/EA 15.0+00 E VLN

1.66-03 V/EB C

AF-335 PROC.1TEP07-FW-0001 REV.0



Train D
Mode 3 Test

Train A

1/29/08
8:34 02sec
Tape C130

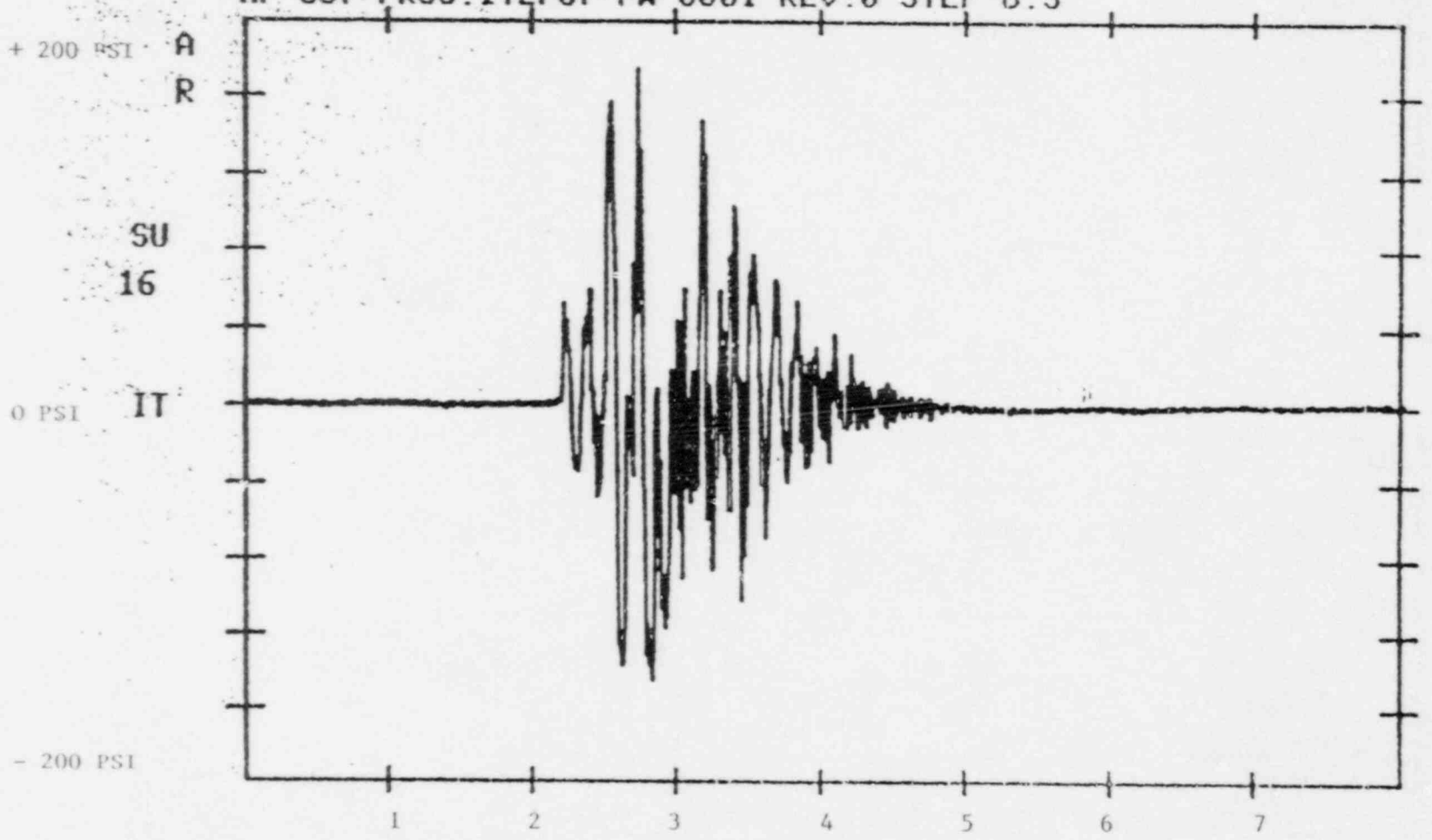
ANAEAI94.;12t

TGX-AFW-17 ;000FT MAIN FEEDWATER TEST

1.66-03 V/EA 200.+00 E VLN

1.00+00 V/EB C

AF-337 PROC.1TEP07-FW-0001 REV.0 STEP 6.3



Train A

Mode 4 Test

Train B

1/29/88
9:07 pm
Tape 6365

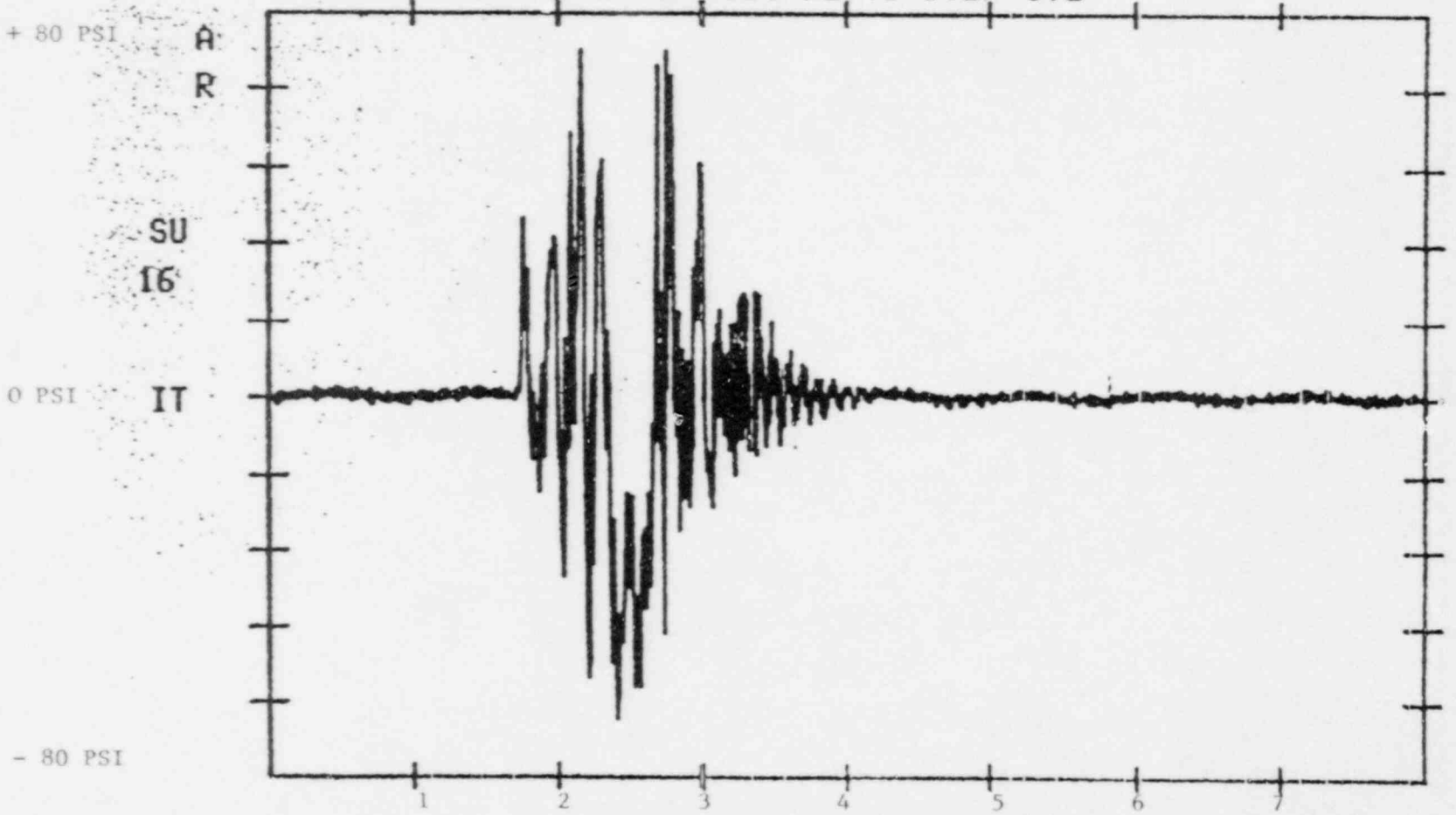
ANAEAI94 ,120

TGX-AFW-17 4000FT MAIN FEEDWATER TEST

DATA STORED 80.0+00 E VLN

1.00+00 V/EB C

AF-339 PROC.1TEP07-FW-0001 REV.0 STEP 6.2



SECONDS

Train B

Mode 4 Test

Train C

Valve Opening

7:00 pm.
43 sec.
Tape 4528

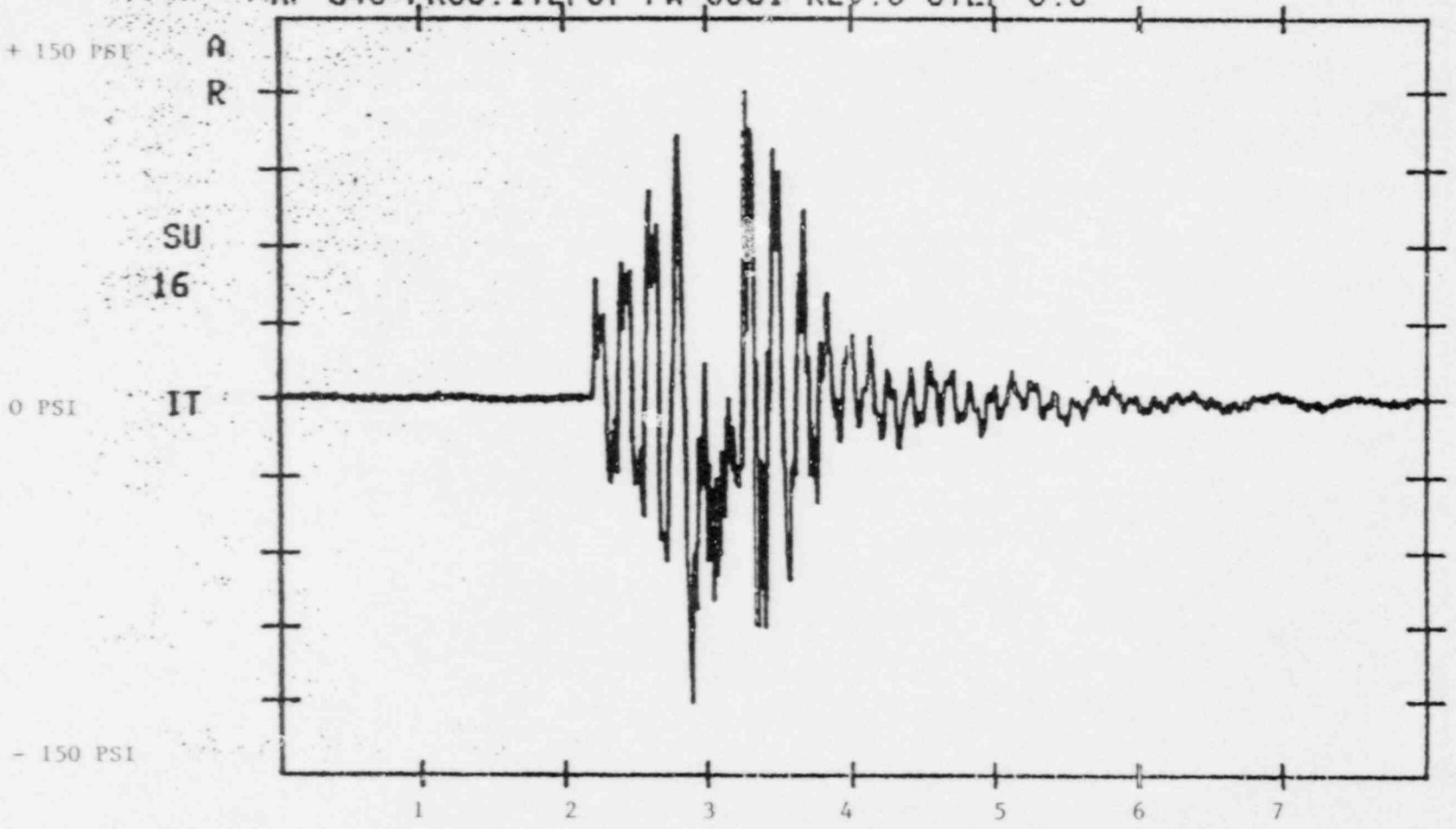
ANAEAI94 .120

TGX-AFW-17.4000FT MAIN FEEDWATER TEST

1.66-03 V/EA 150.+00 E VLN

1.00+00 V/EB C

AF-340 PROC.1TEP07-FW-0001 REV.0 STEP 6.3



Train C

Mode 4 Test

Train D

1/29/86
7:47 34sec
Tape 526)

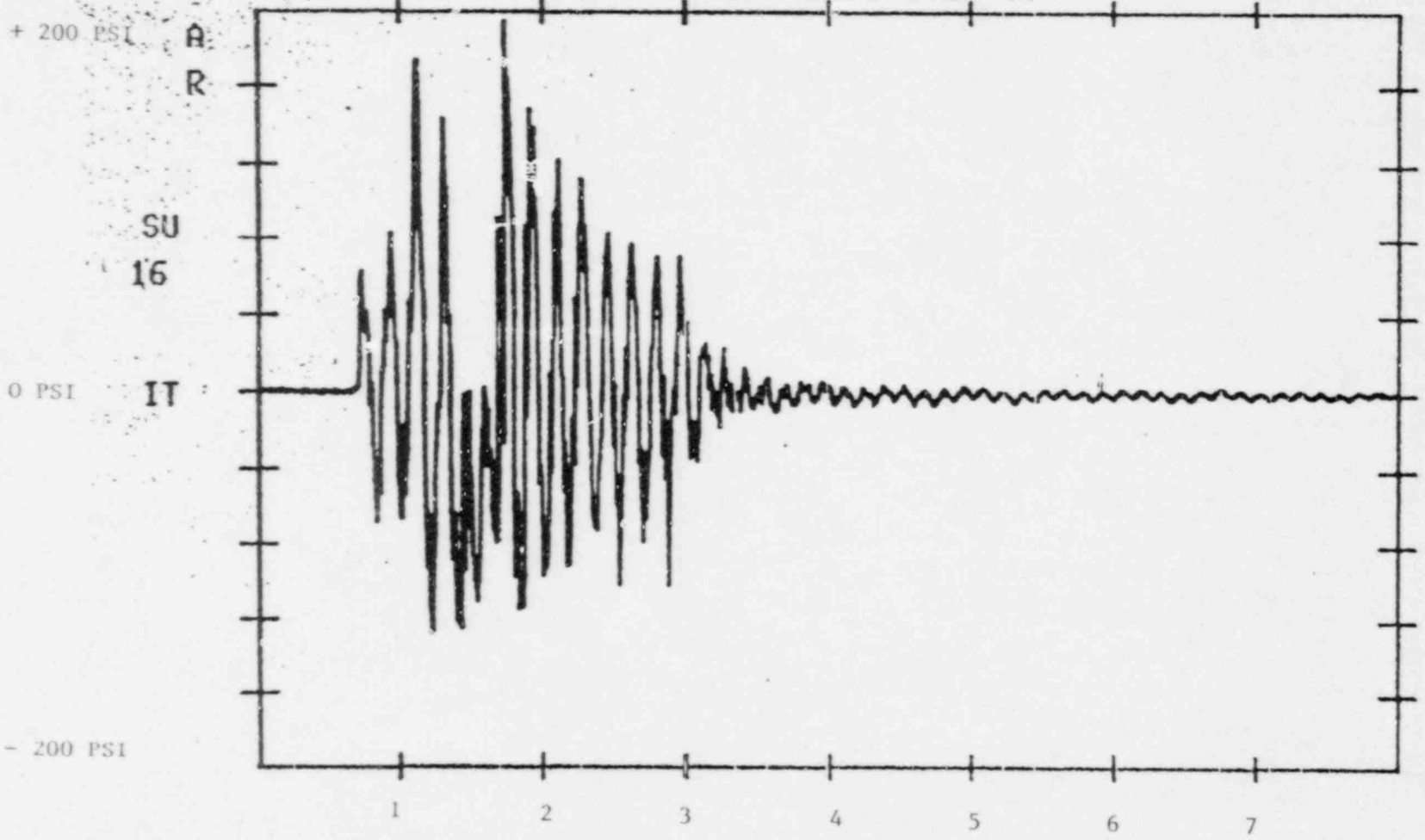
ANAEA194 ,128

TGX-AFW-17 4000FT MAIN FEEDWATER TEST

2.55-03 V/EA 200.+00 E VLN

C

AF-335 PROC.1TEP07-FW-0001 REV.0 STEP 6.4



Train D

Mode 4 Test