

ENERGY  
SERVICES

101 California Street, Suite 1000, San Francisco, CA 94111-5894

415 397-5600

June 20, 1984  
84042.019

Mrs. Juanita Ellis  
President, CASE  
1426 S. Polk  
Dallas, Texas 75224

Subject: Gibbs & Hill Responses to Pipe Stress Questions  
Comanche Peak Steam Electric Station  
Independent Assessment Program - Phase 3  
Texas Utilities Generating Company  
Job. No. 84042

Dear Mrs. Ellis:

Enclosed please find four more Gibbs & Hill responses to Cygna pipe stress questions.

Feel free to call me if you have any questions or wish to discuss the enclosed documents.

Very truly yours,

N. H. Williams  
Project Manager

NHW:jw  
Attachments

cc: Mr. S. Treby, U.S.N.R.C., w/attachments  
Mr. D. Wade, TUGCO, w/o attachments  
Mr. G. Grace, TUGCO, w/o attachments  
Mr. D. Pigott, Orrick, Herrington & Sutcliffe, w/o attachments

54-445, 446

2222 - Per S. Bunnell  
1/1 See Attached

San Francisco Boston Chicago Richland

8411060406 840620  
PDR AD0CK 05000445  
A PDR



Mrs. Juanita Ellis  
President, CASE

June 20, 1984  
Page 2

#### ATTACHMENTS

Gibbs & Hill letter from R. E. Ballard to J. B. George, GTN-69116, June 14, 1984; Texas Utilities Generating Company, Comanche Peak Steam Electric Station, G&H Project No. 2323, Follow-up Information from G&H, Ref.: Cygna Communications Report of 5/24/84.

Gibbs & Hill letter from R. E. Ballard to J. B. George, GTN-69071, June 5, 1984; Texas Utilities Generating Company, Comanche Peak Steam Electric Station, G&H Project No. 2323, Follow-up Information from G&H, Ref.: Cygna Communications Report of 5/24/84.

Gibbs & Hill letter from R. E. Ballard to J. B. George, GTN-69105, June 12, 1984; Texas Utilities Generating Company, Comanche Peak Steam Electric Station, G&H Project No. 2323, Follow-up Information from G&H, Ref.: Cygna Communications Report of 5/24/84.

Gibbs & Hill letter from R. E. Ballard to J. B. George, GTN-69087, June 6, 1984; Texas Utilities Generating Company, Comanche Peak Steam Electric Station, G&H Project No. 2323, Follow-up Information from G&H, Ref.: Cygna Communications Report of 5/24/84.

**Gibbs & Hill, Inc.**

11 Penn Plaza  
New York, New York 10001  
212 760-  
Telex: 4438  
Domestic: 127636/968694  
International: 428813/234475  
A Dravo Company

June 12, 1984

GTN- 69105

Texas Utilities Generating Company  
Post Office Box 1002  
Glen Rose, Texas 76043

Attention: Mr. J. B. George  
Vice President/Project Gen. Manager

Gentlemen:

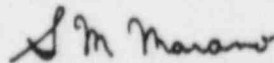
TEXAS UTILITIES GENERATING COMPANY  
COMANCHE PEAK STEAM ELECTRIC STATION  
G&H PROJECT NO. 2323  
FOLLOWUP INFORMATION FROM G&H  
REF: CYGNA COMMUNICATIONS OF 5/24/84

By copy of this letter to Nancy Williams of CYGNA enclosed please find the supplemental response to Item 1 of their Communications Report, Job No. 84042 of May 24, 1984, transmitting a copy of the "office copy signoff sheet" for Qualification Report FQP-5A-1.


Should you have any questions contact Henry W. Mentel

Very truly yours,

GIBBS & HILL, INC.



Robert E. Ballard, Jr.  
Project Manager

  
REBa-HWMe:sce  
1 Letter

cc: ARMS (B&R Site) OL  
N. Williams (CYGNA, Calif.) 1L, 1A  
L. Weingart (CYGNA, Calif.) 1L  
G. Grace (CPPE Site) 1L, 1A  
D. Wade (TUSI Site) 1L

FISHER CONTROL CO.

REPORT # FQP-1

APPROVED  
FOR ARRANGEMENT ONLY  
PROCEED WITH FABRICATION  
SUBJECT TO COMPLIANCE WITH  
ALL CONTRACT REQUIREMENTS,  
DRAWINGS, AND SPECIFICATIONS.

JAN 29 1980

Report is Approved  
based on the Attached  
Gibbs & Hill, Inc. Fisher Letter CVN98M  
ENGINEERS, DESIGNERS, CONSTRUCTORS  
NEW YORK 12-6-79.

TEXAS UTILITIES SERVICES, INC.  
COMANCHE PEAK STEAM ELECTRIC STATION  
G & H JOB NO. 2323A

UNIT # 182

OFFICE COPY CD-0078

UNIT NO.	DRAWING NUMBER	REV. NO.	TITLE																																																																																															
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52																																																																																																		
X	FQP-SA-1	(G&H)	SEISMIC QUALIFICATION REPORT																																																																																															
STATUS OF PREVIOUS ISSUE REVIEWED BY G&H		<table border="1"> <tr> <th rowspan="2">DEPARTMENT</th> <th colspan="3">MECHANICAL</th> <th colspan="2">NUCLEAR</th> <th rowspan="2">ELECT</th> <th colspan="2">STRUCTURAL</th> <th rowspan="2">ARCH</th> <th rowspan="2">SOFF STRESS</th> </tr> <tr> <th>CHEN</th> <th>HYAC</th> <th>I &amp; C</th> <th>NECH</th> <th>P &amp; D</th> <th>GENC</th> <th>SHIELD</th> </tr> <tr> <td>DATE</td> <td></td> <td></td> <td></td> <td>1-18</td> <td></td> <td></td> <td>1-17</td> <td></td> <td></td> <td></td> </tr> <tr> <td>RETURNED FOR CORRECTION DO NOT FABRICATE</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>APPROVED EXCEPT AS NOTED PROCEED WITH FABRICATION</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>APPROVED PROCEED WITH FABRICATION</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FOR INFORMATION ONLY</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SPECIALIST ENGINEER</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DEPARTMENT ENGINEER</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		DEPARTMENT	MECHANICAL			NUCLEAR		ELECT	STRUCTURAL		ARCH	SOFF STRESS	CHEN	HYAC	I & C	NECH	P & D	GENC	SHIELD	DATE				1-18			1-17				RETURNED FOR CORRECTION DO NOT FABRICATE											APPROVED EXCEPT AS NOTED PROCEED WITH FABRICATION											APPROVED PROCEED WITH FABRICATION											FOR INFORMATION ONLY											SPECIALIST ENGINEER											DEPARTMENT ENGINEER										
DEPARTMENT	MECHANICAL				NUCLEAR		ELECT	STRUCTURAL			ARCH	SOFF STRESS																																																																																						
	CHEN	HYAC	I & C	NECH	P & D	GENC		SHIELD																																																																																										
DATE				1-18			1-17																																																																																											
RETURNED FOR CORRECTION DO NOT FABRICATE																																																																																																		
APPROVED EXCEPT AS NOTED PROCEED WITH FABRICATION																																																																																																		
APPROVED PROCEED WITH FABRICATION																																																																																																		
FOR INFORMATION ONLY																																																																																																		
SPECIALIST ENGINEER																																																																																																		
DEPARTMENT ENGINEER																																																																																																		

AEN 11-19-79

REC'D BY EXPEDITOR

NO. OF APERTURE CARDS  
REQUIRED

JAN 21 1980

PROJECT SIGNOFF D. M. M... DATE 1/21/80



**Gibbs & Hill, Inc.**

11 Penn Plaza  
New York, New York 10001  
212 760- 4438  
Telex:  
Domestic: 127636/968694  
International: 428813/234475  
A Dravo Company

June 6, 1984

GTN-69087

Texas Utilities Generating Company  
Post Office Box 1002  
Glen Rose, Texas 76043

Attention: Mr. J. B. George  
Vice President/Project Gen. Mgr.

Gentlemen:

TEXAS UTILITIES GENERATING COMPANY  
COMANCHE PEAK STEAM ELECTRIC STATION  
G&H PROJECT NO. 2323  
FOLLOWUP INFORMATION FROM G&H  
REF: CYGNA COMMUNICATIONS OF 5/24/84

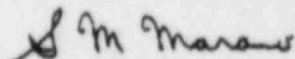
By copy of this letter to Nancy Williams of CYGNA enclosed please find the response to Item 8 of their Communications Report, Job No. 84042 of May 24, 1984.

In addition find a copy of the welded attachment calculation log to facilitate CYGNA in their further reviews. This item was requested verbally by Mr. Lee Weingart of CYGNA in a telephone call on June 4, 1984.

Should you have any questions contact Henry W. Mentel.

Very truly yours,

GIBBS & HILL, Inc.



Robert E. Ballard, Jr.  
Project Manager

REBa-HWMe:lc  
1 Letter

CC: ARMS (B&R Site) OL  
N. Williams (CYGNA, Calif.) 1L 1A  
~~L. Weingart~~ (CYGNA, Calif.) 1L  
G. Grace (CPPE Site) 1L 1A  
D. Wade (TUSI Site) 1L

Dravo

WELDED ATTACHME. LOG BOOK

[illegible]

# WELDED ATTACHMENT LOG BOOK

FILE NO. AM-WA-?	PROB NO. AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS <sup>2</sup>	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
16	64A	CC-1-148-004-S41A " OOR "	PBB/SG		3-22-82	3679	SANDBAR	4"	.237	4 LUGS	3" x 1" LUGS	
17	95	DD-1-008-003-Y43K 006-7533	PBB/SG		3-28-82			100% INITIAL AM-WA-16				
18A	95 NCA	DD-1-006-131-Y45A	PBB/SG		3-25-82	N/A	SINGLE TRUNN PAD ANCHOR	4"	.237		PAD 7/4 x 5"	
19	068Y	SW-1-132-024-S43R	PBB/SG		3-22-82	1687	SNOBBE12	10"	.365	2 LUGS	6" DIA LUG	
20A	082 1-68Y	SW-H12-721-Y33A	PBB/SG		4-1-82	N/A	DOUBLE SYM TRUNN ANCHOR	6"	.365	2 TRUN WITH PEE	9.31 x 1.31	
21	67T	SW-1-173-042-41R	PBB/SG		4-2-82	1326	ELBOW STRAIT	10"	.237	1 TRUNN 6"		
22	97A	DD-1-012-066-Y43R	PBB/CEM		4-8-82	3703	ELBOW SNOBBE12	4.5" O.D.	.237	1 TRUNN 3.5" O.D.	3.5" O.D.	
23	97A	DD-1-012-042-Y33R DD-1-012-034-Y43R	PBB/CEM		4-8-82	3679	RIGID w/ LUGS	4.5" O.D.	.237	8 LUGS	3/4" x 1" LUGS	FOR COMPUTER PRINTOUT SEE AM-WA-KCWA
24A	97A 1-97B	DD-1-012-033-Y33A	PBB/CEM		4-8-82	N/A	ANCHOR	4.5" O.D.	.237	1 TRUNN w/ PAD	4.5 x 7.4 PAD	
25	150 G	CS-1-299-700-A53K	PBB/SG		4-9-82	2315 <sup>2</sup> 4532.5	RIGID 4 LUGS	3.5" O.D.	0.216	8 LUGS	LUG SIZE 3/4" x 1" x 1"	
26	150 H	CS-1-300-001-A53K	PBB/SG		4-9-82	1313 <sup>2</sup> 1965.5					LUG SIZE 3/4" x 1" x 1"	
27	150F	CS-1-298-001-A53K	PBB		4-15-82							FOR PRINT-OUT SEE AM-WA-26 BY CORRELATION TO 150G
28	150J	CS-1-302-700-A53K	PBB		4-15-82							BY CORRELATION TO 150G FOR PRINT-OUT SEE AM-WA-26
29A	167T	SW-1-173-720-S43B	SG/POB		4-20-82	N/A	ANCHOR 670/67T	10"	.365	2 TRUNN WITH PAD		

# WELDED ATTACHMENT LOG BOOK

NODE

LE NO. WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
31	67U	SW-1-100-001-S33R	S.G.		4-20-81	656 1326	ELBOW TRUNN.			ELBOW TRUNN. 6"		BY CORREL TO 1-67T, WA-A-21 SW-1-173-042-A33R WA-A-31 SEE AM-WA-21 FOR PRINT-OUT
32	65	CC-X-006-002-A43R	S.G.		4-22-82	1400 3037	ELBOW -TRUNN.	6"	0.28"	3" DIA. TRUNN.		
33	65	CC-X-013-003-A43R	S.G.		4-22-82	1400 3037	ELBOW -TRUNN.	6"	0.28"			
34	65	CC-X-025-003-A43S	S.G.		4-21-82	1054 2115	ELBOW -TRUNN.	6"	0.28"	5" DIA. TRUNN.		FOR PRINT-OUT SEE AM-WA-32
35	65	CC-X-005-002-A43S	S.G.		4-22-82	1965 4176	ELBOW -TRUNN.	4"	0.237"	2 1/2" DIA.		FOR PRINT-OUT SEE AM-WA-32
36	65	CC-X-005-004-A43R	S.G.		4-22-82	1965 4176	ELBOW -TRUNN.	4"	0.237"	3" DIA.		
37	65	CC-1-123-001-A43R	S.G.		4-22-82	1429 3007	8 LUGS	6"	0.28"	1 1/4" x 1 1/4" x 1"		FOR PRINT-OUT SEE AM-WA-32
38	65	CC-1-120-001-A43R	S.G.		4-22-82	1429 3007	8 LUGS	6"	0.28"	1 1/4" x 1 1/4" x 1 1/4"		
39	65	CC-X-024-003-A43S	P.B.		4-21-82	3803	ELBOW 2 LUGS.	4"	0.237"	3 1/2" x 1 1/2" x 1 1/2"		
40	68X	SW-1-132-061-A43R	CEM		4-27-82	1326	ELBOW TRUNN.	10"	.365	6" DIA. TRUNN.		BY CORRELATION 1-67T, WA-A-21 SW-1-173-042-A33R
11	68X	SW-1-132-723-A33R	CEM		4-27-82	578 1543	2 TRUNN.	10"	.365	4" DIA		
12	68X	SW-1-132-046-A43R	CEM		4-27-82	877 2184	2 TRUNN.	10"	.365	5" DIA		
13A	1-68T 1-68T	SW-1-132-720-S43R	CEM	1857	4-27-82		2 TRUNN.					
41	10V	AF-1-035-026-S33R	S.G.		4-28-82	739 1949	2 TRUNN.	8"	0.322	6" DIA	6" SCH. 40	



# WELDED ATTACHMENT LOG BOOK

FILE NO.	PROB NO	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS <sup>2</sup>	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
46	062A	CC-1-030-010-533R	S.G.			574/977	SHUB.	18"	0.375"	1 TRUNN.	12" x H 40	FOR PRINT-OUT SEE AM-AW-48
47	062A	CC-1-030-009-533R	S.G.			568/1199	SHUB.	18"	0.375"	1 TRUNN. ON BLOW	8" SCH 40	FOR PRINT-OUT SEE AM-AW-48
48	062A	CC-1-033-007-533K	S.G.			1785/5191	SHUB.	18"	0.375"	2 TRUNN.	6" SCH 40	
49	021	SW-2-026-001-J03R	S.G.			1965/4176	SHUB.	4"	0.237"	ELB/TRUNN.	2 1/2" x H 40	
50	021	SW-1-026-007-J03R	S.G.			1751/3674	SHUB.	4"	0.237"	ELB/TRUNN.	3" SCH 40	FOR PRINT-OUT SEE AM-AW.
51A	1-6A	CC-1-202-001-553A	CEM		5-5-82	144 psi	SQ. TUBING TO CONCRETE WALL	8"	0.322	3 TRUNN. w/PAD	2-6"x6"x1/2 1-8"x8"x1/2	SPECIAL LU ON HAND. WATERPROOF.
SUPER SEDED (52)	1-56A	FW-1-017-700-CH2K -017-709-CH2K -020-700-CH2K	AM-WIA-6652 ASD VIB AM-WIA-6682 AM-WIA-652	12-21-82	5-5-82	72 67	SHUB ON BEAMS	18"	.937	4 LUGS	4X2X1 1/2	
53A	1-62C	CC-1-035-D18-A33A	CEM		5-6-82	675/1749	RIGID	6"	0.28	1 TRUNN. w/PAD	5" SCH 40 4 3/4" LONG	
54	64F	CC-1-116-010-F33R	VIB		5-6-82	788/1784	STRUT	12"	.375	1 TRUNN, CIRC	6" SCH 40 3.63" LONG	
55	64F	CC-1-116-011-F43R	VIB		5-6-82	954/14053	STRUT	12"	.375	1 TRUNN, CIRC	8" SCH 40 3.63" LONG	
56	64F	CC-1-116-002-F33R -007-F33R	VIB		5-6-82	762/1909	STRUT	12"	.375	4 LUGS	1 1/4" x 1 3/4" x 1 3/4"	
57	64F	CC-1-116-023-F43R	VIB		5-6-82		SQ. TUBING TO CONCRETE WALL	4"	.237	1 STANCHION	3" SCH 40	
58A	021	SW-2-005-003-J03R	CEM	736	5-11-82		TRUNNION TO CONCRETE WALL	4"	.237	1 STANCHION	4" SCH. 40	
		SW-1-001-J03R	CEM	136	5-11-82		TRUNN. TO	4"	.237	1 STANCH.	3" SCH 40	

# WELDED ATTACHMENT LOG BOOK

DATA POINT

FILE NO. WA-?	PROB NO. AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THCK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
61A	021	SW-2-026-002-032	CEM	400	5-11-82	N/A	TRUNN. TO CONC. WALL	4"	.237	1 STANCH.	3" SCH. 40	
62A	167A	DO-1-021-007-552A	SC	115	5-11-82	N/A	ANCHOR	24"	0.375	UNDERCUT LUGS ANCHOR TRUNNION PIVOT	8" SCH 40	STRUDL RUN
63A	167B	DO-1-022-008-553A	SC	115	5-11-82	N/A	"	"	"	"	"	STRUDL RUN
64	072	RH-1-013-003-532E	CEM		5-12-82	2488/ 6284		3"	.216	2 LUGS	3/4" x 1 1/2" x 1" LUGS	
65	68U	SW-1-129-021-542E	ATBH		5-12-82	342/702	RK610	10"	.365	4 LUGS	2X1 1/2X4" LUGS	
66A	167B	DO-1-022-006-553A	SAM.	115	5-13-82	—	—	24"	0.375			STRUDL RUN
67A	167A	DO-1-021-007-553A	SAM.	1042	5-13-82	—	—	24"	0.375			STRUDL RUN
68A	1640	CC-1-320-001- 553A	VAL	1812	5-14-82	—	—	4"	0.531			
69	167F	DO-1-090-002-565	CEM		5-14-82	642/1323	—	42"	0.135	1 TRUNNION	16" TRUNNION	✓
70	167F	DO-1-071-008-553K	CEM/VB		5-14-82	398/570	—	42"	0.375	1 TRUNNION	24" TRUNNION	
71	167F	DO-1-071-001-563K	CEM/VB		5-14-82	145/617	—	42"	0.375	2 TRUNNION	24" TRUNNION	
72	167F	DO-1-071-003-563K	CEM/VB		5-14-82	108/368	—	42"	0.375	1 TRUNNION	24" TRUNNION	
73	167F	DO-1-090-001-565K	CEM/VB		5-14-82	254/962	—	42"	0.375	2 TRUNNION	16" TRUNNION	
74	167F	DO-1-090-003-563K	CEM/VB		5-14-82	123/320	—	42"	0.375	2 TRUNNION	24" TRUNNION	



# WELDED ATTACHMENT LOG BOOK

LE NO. -WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE + NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
76	167F	DO-1-058-001-953K DO-1-058-002-553R	CEM		5-17-82			26"	.375	2 TRUNN	16"φ	COMMON ATTACH
77	167F	DO-1-070-001-553K DO-1-070-002-553K	CEM/SG		5-17-82			26"	.375	2 TRUNN	16"φ	COMMON ATTACH
78	167F	DO-1-071-005-553K DO-1-071-006-553K	CEM/SG		5-17-82			42"	.375	2 TRUNN		COMMON ATTACH OVERSTRESS
79	158A	CC-2-144-709-AAR V.C			5/18/82	2869/ 13293		4.5"	0.237	4 LUGS	3/4 x 1 x 15	
80	150I	CC-1-301-700-A3R V.C			5/17/82	2815/ 3408	-	3.5"	0.216	4 LUGS	1 1/4" x 1" Anchor	
81	158A	CC-2-144-724-A3R V.C			5/19/82	281/826	-	4.5"	.237	2 TRUNN + P.S.C.	8' x 2.25" Rod	
82	061A	CC-1-028-113-A3R V.C			5/17/82	121/302	-	24"	.325	2 TRUNN	16" TRUNN	
83	061A	CC-1-028-004-A3R V.C			5/17/82	121/302	-	24"	.325	2 TRUNN	14" TRUNN	
84	097D	DD-1-12-712-A3R SAM			5/19/82	1997/ 8539	-	4"	0.237"	4 LUGS	4" x 1"	FICTITIOUS RAD. USED = 6.7"
85A	1-97C 1-97D	DD-1-012-707-A3A SAM		1160	5/20/82	-	-	4"	0.237"		RECT. TRUNN 3.75" x 6"	FICTITIOUS RAD USED = 6"
86A	1-97C 1-97B	DD-1-012-767-53A SAM		G501	5/10/82	-	-	4"	0.237"		RECT. TRUNN 2.25" x 3"	FICTITIOUS RAD USED = 6.35"
87	157B	CC-1-139-701-E6R V.C			5/21/82	289/ 15511	-	4.5"	0.237"	4 LUGS	3/4 x 1 1/2	
88	11B	AF-1-002-033-13K AJB			5/24/82	202/ 605	SNUBBER	10"	0.365	2 TRUNN WITH PROS	8 x 9.3 1/4" Rod	FICTITIOUS R <sub>m</sub> = 10.8"
89	64B	CC-1-156-004-A63R CEM/VB			5/24/82			10"	.365	LUGS	1 1/2 x 1 3/4 x 3 1/2	LUGS

# WELDED ATTACHMENT LOG BOOK

NOTE:

FILE NO. I-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
91A REV. 2	156 1-157B	CC-1-116-037-F43A	CEM/VB	1016	5-24-82		ANCHOR	12"	.375"	1 TRUNN W/PAD	12"	AD PIPE LOADS WAS REDUCED. STRESSES O.K.
92A	156 1-157B	CC-X-104-029-A65A W/ NONDEGRAPH	CEM/VB	256	5-24-82		VOID - SEE		AM-W	A-762		NEW Q ANALYST NOT FOR ANALYSIS DISPERSED - PROGN PAC NO NO NOT ONE PISANO - PARTIAL PACKING KROG
93A	156 1-157B	CO-1-042-072- Y35A	VC	1480	5-24-82							
94A	157C 1-157B	CC-1-139-716-A63A	VC	4871	5-25-82		ANCHOR	4.5"	.237	DOUBLE TRUNNION W/PAD	2.18 x 8" MD	
95A	167D	DO-1-053-007-S53A	VC		5-25-82		ANCHOR	24"	0.375	2 ABACH.		SEE PROB. AS-1-167B
96	167D	DO-1-053-001-S53R	VC		5-25-82	635/ 1605	ATTACH	24"	0.375	GLBOW TRUNNION	8"	
97A	167E 1-167B	DO-1-056-006-S53A	VC	2157	5-25-82		ANCHOR	24"	0.375	2 ABACH.		SEE PROB. AS-1-167B
(98)	567A 1-567B	FW-1-17-023-C72K -18-03-C52K -14-WA-G57	AY-WA-G64/KSAD AY-WA-G57		5-25-82	212 73	SUB (ATTACH)	18"	.937	8 LUGS 2 LUGS	1 1/2 x 1 1/2 x 3 1 x 1 1/2 x 1 1/2	
99A	168V 1-168V	SW-1-129-721-Y83A	CEM/VB	1340	5-27-82		RIGID	10"	.365	2 TRUNN. W/PAD	6" φ. TRUNN.	
100	172	FW-1-112-001-S62S	SG			N/A 1665 psi	PLATE LUG	3"	0.438	1 R LUG 3" WIDE		USED PAPER BY EMERA VROGOW
101	172	FW-1-103-011-S62R	SG			952/ 2142	ELBOW TRUNN	3"	0.438	1 TRUNN	2" ?	
102	170	FW-1-114-011-S62R	SG			752/ 2142	ELBOW TRUNN	3"	0.438	1 TRUNN	2"	
103	170	FW-1-105-012-S62R	SG			1142/ 1142	SUB.	3"	0.438	4 LUGS.	2 1/2 x 1 1/2"	AS-1" XX 3/4"
104	169	FW-1-106-011-S62R	VC		5-27-82	1584/ 3693	ELBOW TRUNN	3"	0.3	1 TRUNN	2"	

# WELDED ATTACHMENT LOG BOOK

NOTE

FILE NO. 1-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
106	169	FW-1-111-001-S625	UC		5-27-82	1696/2259	LUGS	3"	0.3	LUGS	2x 3/4	
107	071B	SI-1-038-010-S22R	UC		5-27-82	1182/2422	ELBOW/ TRUNK	6"	4	TRUNK	Ø 4	
108	170	FW-1-114-001-S625	SG		5-27-82	2905	SNUB	3"	0.3	1 PL LUG	-	
109	171	FW-1-104-007-S62R	ATB		5-27-82	955/2169	ELBOW/ TRUNK	3	.438	TRUNK	2" SCH 40	
110	171	FW-1-113-001-S625	ATB		5-27-82	N/A/2905	ELBOW/ID	3	.3	Ø	1" x 3" 2" (ASSEMBLED)	COILINGS' 17918 NO CYLIND
111A	071B	SI-1-038-012-S22A	CEM		6-2-82		TRUNK TO CONCRETE WALL	6"	.28	(1) 6" Ø TRUNK	Ø 9" x 6.625"	N-LINE ANCHOR
112	62X	CC-1-041-727-A63A	VIB		6-2-82		ANCHOR	8"	.322	2 PADS 5 1/2" x 8"		
113	62X	CC-1-41-724-E63R CC-1-41-712-E63R	VIB		6-2-82	2869/13293		4"	.237			COLLAPSE AT 1-WA-79
114	68T	SW-1-129-001-1138P UC	UC		6-3-82	693/1446	ELBOW	10"	0.365	1 ATTACH.	3.312	
115	68T	SW-1-129-736-A43R UC	UC		6-3-82	532/2416	LUGS	10"	0.365	4 LUGS	1.25/3.25	
116	68T	SW-1-129-045-A43R UC	UC		6-3-82	1790/4782	ATTACH	10"	0.365	2 TRUNK	5"	
117	68T	SW-1-129-043-A43R UC	UC		6-3-82	664/1654	TRUNK	10"	0.365	2 TRUNK	5"	
118A	68T	SW-1-129-720-S63A UC	UC	1272	6-4-82		2 TRUNK	10"	0.365	2 TRUNK	9.187/19	
119A	68T	CS-1-242-700-S12A	SG	2599	6-4-82		ANCHOR	3"	0.216	1 TRUNK	C1=1.75" C2=4"	FICTITIOUS PAD=8"



# WELDED ATTACHMENT LOG BOOK

NODE

LE NO. WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
12/A	92A 92B	DR-1-016-005-553A	S.C.	1573	6-4-82		ANCHOR	1"		1 TRUNN.		NOT ANALYZED DUE TO LACK OF INFO.
22	66C	CC-2-011-005-A7ER CEM	CEM		6-8-82			6"	.28	1 TRUN	3	
23	12A	AF-1-030-005-S33R	AJB		6-8-82			3"	.438	ELBOW	1.5"	
24	12A	AF-1-009-027-S33R AF-1-036-017-S33R	AJB		6-8-82			6"	.562	ELBOW	3.5"	
25	52U	CS-1-158-023-S43R CS-1-158-037-S43R CS-1-160-011-S52R	CEM		6-8-82			3"	.216	ELBOW	2"	
26	154 155 156 155	FW-1-097-705-C62K FW-1-098-703 FW-1-099-704 FW-1-101-705								8 LUGS 8 LUGS TR-N/A TR-YO		
	152 153 153 153	FW-1-095-710 FW-1-098-813 FW-1-096-013 FW-1-100-808	JB		6-10-82			6"	.732	8 LUGS TR-N/A TR-YO 8 LUGS		
	152 153 152	FW-1-099-704 FW-1-098-813 FW-1-095-702								8 LUGS PAD-N/A TR-6"OD		
27	46B3	CS-1-014-027-S52K	AJB		6-10-82			3"	.216	FLANGE	2"	
28	11C	AF-1-052-001-S33R AF-1-012-003-S33R AF-1-008-001-S33S	VC		6-10-82	1183/2425	ATTACH	6"	0.280	ELBOW	5"	
29	11C	AF-1-012-001-S33S	VC		6-10-82	1429/3602	ATTACH	6"	0.280	TRUNN	1.25/1.25	
30A	11C	AF-1-084-001-S33A	VC	181	6-11-82		ANCHOR	10"	0.365	3 TRUNN		STRUCTURAL CYLIND
31	51C	CS-1-074-043-S42R CS-1-074-043-S42R	CEM		6-11-82	1482/1573	ATTACH	3"	.438	LUGS	3/4 x 3/4 x 1 1 x 1 x 3/4	ANALYSIS
32A	64C 64C	CC-1-173-012-S53A CC-1-173-012-S53S	VC	2835	6-11-82		ANCHOR	4.5"	0.232	TRUNN	8.5/4.5	

## WELDED ATTACHMENT LOG BOOK

FILE NO. WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGR	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
134	61C	CC-1-057-019-S33R	J C		6/16/82	479/2065	ATTACH	24"	0.375	27 RUNN	10"	INCLUDES 3 VOID & REV.1
135	61C	CC-1-018-003-153R	J C		6/16/82	112/334	ATTACH	18"	0.375	27 RUN	15x12	
136	61C	CC-1-078-003-S53R	J C		6/16/82	356/479	ATTACH	18"	0.375	4 LOGS	1 1/8 x 3 3/4 x 4	
137	61C	CC-1-078-005-33R	J C		6/16/82	333/601	ATTACH	18"	0.375	- 11 -	1 1/2 x 4	
138	61C	CC-1-065-005-S33R	J. C		6/16/82	533/870	ATTACH	18	0.375	- 11 -	- 11 -	
139	61C	CC-1-057-014-A33R	J C		6/16/82	975/4861	ATTACH	24	- 11 -	- 11 -	45 x 48 x 6	
140	61C	CC-1-065-003-S33R	J. C		6/16/82	239/673	ATTACH	18	- 11 -	27 RUNN	8 5/8 x 48	
141	61C	CC-1-065-002-S33R	J C		6/16/82	1022/1771	ATTACH	18	- 11 -	17 RUNN		
142A	158A 158B	CC-2-144-721-A63A	S.G.	2813				4"	0.237	2 TRUNN.	C1 = 2.11" C2 = 4"	FIXED END COND. FICTITIOUS RAD = 8"
143A	158C 158B	CC-1-144-704-A63A	S.G.	3761				4"	0.237	"	"	CORRELATED TO THE ABOVE ONE
144	80B	MS-1-027-030-S33K	CEM		6/18/82	742/1051	ATTACH	4"	.337	4 LOGS	3 1/4 x 1 x 2"	IF PROB. COMES BACK FOR REM. WORK USE 1/8" TO 1/6"
145	88	MS-1-024-004-S33K	CEM		4/18/82	1249/4980	- 1 -	4"	.337	- 1 -	1 1/4 x 1 x 2"	
146	158B	CC-1-144-702-E63R	S.G.		6/16/82	1976 19219	ATTACH	4"	0.237	4 LOGS.	ACTUAL C1 = 0.375 C2 = 2"	USED C2 = 1.4" FICTITIOUS RAD = 3.5" IN ORDER TO CLOSE WORK.
147	158B	CC-2-144-703-E63R	S.G.		6/16/82	"	"	"	"	"	"	CORRELATED TO ABOVE ONE

# WELDED ATTACHMENT LOG BOOK

NODE

FILE NO. 1-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
149	153 154	FW-1-096-75-662K FW-1-097-701-5621	VB		6/21/82		ATTC	6"	.432"		3/4"x3/4"x4" in 3/4"x2"	CORRELATION
150A	1-11C 1-11B	AF-1-004-005-553A	J.H.C.	1623	6/22/82		ANCH.	6"	0.280"		3/8"x9/16" RAD	
151	66A	CC-1-012-702A43R	J.H.C.		6/22/82	685/1065	ATTC	10"	0.365"	LUGS	1"x2 1/2"x2"	
152	66A	CC-1-031-005-A43R	J.H.C.		6/22/82	2110/5172	ATTC	4"	0.237"	LUGS	3/4"x3/4"x1"	
153 154	66A	CC-1-008-001-A43R	J.H.C.		6/22/82	1733/3621	ATTC	4"	0.237"	ELBOW	OD=3.5"	
154	81	MS-1-415-001-533S	J.H.C.		6/23/82	1192/2917	ATTC	8"	0.327"	FL BOW	3.5	
155	81	MS-1-416-012-543P	J.H.C.		6/23/82	150/550	ATTC	16"	0.375"	27 RUNN	5.375	
156	67Y	SW-1-101-102-538R	J.H.C.		6/24/82	804/2038	ATTC	10"	0.365"	LUGS	3/4"x4"x5"	
157A	1-67Y 1-67Z	SW-1-102-721-533A	J.H.C.	449	6/24/82	—	ANCH	10"	0.365"	2 TRUNN		
158A	1-67Y 1-11C	SW-1-101-751-533A	J.H.C.	2177 1111	6/23/82	—	ANCH	10"	0.365"	2 TRUNN		
159	80C	MS-1-028-002-533K	J.H.C.		6/24/82	2347/6327	ATTC	4"	0.237"	17 RUNN	2"	
160	64B	CC-1-116-030-A43R	VB		6-29-82	757/1265	ATTCH	6"	.375"	TRUNNION ECC. LOADS	4"	
161	FW	VOID per VB	VB		6-29-82	640/1403	ATTACH	6"	.432"	TRUNNION	4"	
162	62Z	CC-2-035-709-1955	S.G.			8241/23492	ATTACH	6"	0.28	2-TRUNN.	2" SCH 80	



# WELDED ATTACHMENT LOG BOOK

NOTE

LE NO. WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGR	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
164	2-674	SW-2-102-020-M38	Jch		7/1/82	650/1324	ELBOW	10"	0.365	1 TRUNK	6	
165	1-808	MS-1-029-004-S33R	Jch		7/1/82	495/1115	ATTCH	4"	0.337	LUGS	1 1/2" x 1 1/4" x 1/2"	
166	1-808	MS-1-029-030-S33K	Jch		7/1/82	742/1242	ATTCH	4"	0.337	LUGS	3/4" x 1" x 2"	
167	1-012B	AF-1-088-002-S33R	AJB		7/6/82	712/946	ATTCH	6"	0.562	LUGS	1" x 1 1/4" x 1/2"	
168	1-012B	AF-1-097-022-S33R	AJB		7/6/82	825/1663	ATTCH	4"	0.438	ELBOW	2.5" OD	
169A	1-808 1-808	MS-1-028-045-S33A	Jch	1659	7/6/82		ANCHOR	4.5"	0.337	1 TRUNK		
170	1-11A	AF-1-006-004-S33S AF-1-006-009-S33R	Jch		7/7/82	981/2093	ATTCH	8"	0.322	ELBOW	4.5 OD	
171	1-11A	AF-1-001-021-J33A	Jch		7/7/82	346/884	ATTCH	10	0.365	2 TRUNK	3.312	
172	1-11A	AF-1-001-017-S33K	Jch		7/7/82	299/784	ATTCH	10	0.365	2 TRUNK	3.312	
173	1-11A	AF-1-001-020-J33A	Jch		7/7/82	807/1786	ATTCH	10	0.365	1 TRUNK	3.312	
74A	1-11C 1-11A	AF-1-006-013-S33A	Jch	1122	7/8/82		ANCH.	8	0.322	2 TRUNK	3.73/632	
75A	1-80D 1-80C	MS-1-028-043-S33A	Jch	1629	7/13/82		ANCH.	4.5	0.337	2 TRUNK	4.08/11	
76	1-23B 1-23A	MS-1-146-700-571R MS-1-147-700-571R	Jch		7/13/82	526/1403	ATTCH	8"	0.322	2 TRUNK		
77	7-24	SI-029-048-J321R	Jch		7/13/82	222/222	ATTCH	24	0.375	1 TRUNK		

# WELDED ATTACHMENT LOG BOOK

NOTE

FILE NO. 1-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
179	AB-1-24	SI-1-029-054-S32R	vd		7/13/82	265/839	ATTACH	24	0.375	2 TRUNN		
180	AB-1-24	SI-1-029-052-J32R	vd		7/13/82	259/1055	- " -	11	"	"		
181	AB-1-24	SI-1-029-050-J32R	vd		7/13/82	258/1056	- " -	- " -	- " -	- " -		
182	AB-1-24	SI-1-029-700-S32R	vd		7/13/82	510/794	- " -	- " -	- " -	1 TRUNN		
183	AB-1-24	SI-1-029-053-J32R	vd		7/13/82	204/310	- " -	- " -	- " -	2 TRUNN		
183-1	AB-1-23A	MS-1-001-005-S72R — 003 — — 004 —	vd		7/15/82	97/335	ATTACH	32	1.265	PAD		
184	AB-1-23A	MSI-257-001-S72R	vd		7/15/82	456/1247	ATTACH	8	0.500	2 TRUNN	2.25	
185	AB-1-23A	MSI-257-002-S72R	vd		7/15/82	540/1542	ATTACH	8	0.500	1 TRUNN	2.25	
186A	1-80A 1-80B	MS-1-027-051-S53A	vd	5565	7/20/82		ANCH.	4.5	0.337	1 TRUNN		
187	AB-1-570	CC-1-217-013-CS3K	S.G.		7/21/82	964/2482	WELD ATT.	3"	0.438	ELBOW TRUNN.	2" SCH. 80	Fictitious rad. = 3"
188	MS-1-52X	CC-1-215-035-CS3S CC-1-217-001-CS3S	S.G.		7/21/82	634/847	WELD ATT.	3"	0.438	C1=0.25" C2=1"	4 LUGS. 1" x 1/2" x 2"	Fictitious rad. = 5"
189A	1-67Y 1-67X	SW-1-102-770-543A	S.G.	520	7/21/82		ANCHOR					
190	MS-1-67X	SW-1-102-735-A43R	S.G.		7/21/82	369/847	WELD ATT.	10"	0.365	C1=1.25 C2=1.88	4 LUGS. 1 1/4" x 2 1/2" x 3 1/4"	No. FICTITIOUS RAD.
191	AB-1-81A	CC-1-031-013-543S CC-1-077-013-543S	S.G.		7/21/82	667/1334	WELD ATT.	18"	0.375	C1=1" C2=1"	4 LUGS. 1 1/2" x 2" x 0-2"	
192	220	MS-1-002-001-S72R	S.G.		7/21/82	941						

# WELDED ATTACHMENT LOG BOOK

NOTE

FILE NO. -WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGR	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
193	23B	MS-1-240-004-SGR	Jch		7/22/82	563/1541	ATTACH	8"	0.500	27 RUNN		
194	23B	MS-1-240-002-SGR	Jch		7/22/82	540/1548	ATTACH	8"	0.500	17 RUNN		
195	57	CC-1-195-017-C53R			7/24/82	2110/5325	"	4"	0.237	4 LUGS		
196	57	CC-1-197-030-C42R	AJBL		7/24/82	2110/5219	"	4"	0.237	"		
197	157A	CC-1-195-006-C42R			7/24/82	2110/5219	"	4"	0.237	"		
198	157A	CC-1-197-010-C42R	AJBL		7/24/82	2110/5219	"	4"	0.237	"		
199	157A	CC-2-139-705-A43R	Jch	3938	7/27/82	2315/4532	ATTACH	4	0.237	4 LUGS		
200	2-150I	CC-2-139-711-A61A	Jch		7/27/82	1323/1966	ANCH	4	0.237	17 RUNN		
201	2-62D	CS-2-301-001-A55R	S.G.		7/27/82	1323/1966		3"				CORRELATED TO PROB. OF MEMO # 15
202	2-62D	CS-2-302-001-A55R	S.G.		7/27/82	1323/1966		3"				CORRELATED TO PROB. OF MEMO # 16
203	1-76B	CC-2-007-004-1731	Jch		7/27/82	1572/336		6	0.280	17 BOW		
204	1-76B	CC-2-007-010-A34R	Jch		7/27/82	1192/1364		6	0.280	27 RUNN		
205	1-76B	MS-1-151-046-C51P	Jch		7/27/82	1101/3082		4	0.339	27 RUNN		
206	1-76B	MS-1-151-031-C52R	Jch		7/27/82	1202/3706		4	0.339	27 RUNN		27 RUNN. IN CROSS
207	1-76B	MS-1-151-055-C51P	Jch		7/27/82	1112/1644		4	0.339	17 BOW		
208	1-76B	MS-1-151-057-C52P	Jch		7/27/82	697/3782		4	0.339	27 RUNN		
209	1-76B	MS-1-151-007-C51P	J		7/27/82	1202/3706		4	0.339	27 RUNN		



# WELDED ATTACHMENT LOG BOOK

1006

FILE NO. 1-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
208	1-76B	MS-1-151-008-052R MS-1-151-034-052R MS-1-151-008-051R	J.C.		7/29/82	1202/3706		4	0.365	2 TRUNN		2 TRUNN 10" CROSS
209A	1-76B	MS-1-417-001-533A	DMJ		7/29	N/A	ANCH	4	0.365	172 180° PAO		CONCRETE 1-4712 ARM-24-240
210	2-68X	SW2-132-006-43R	ALBK.		7/30	783/1003		10"	0.365	Aug.		
211	2-68X	SW-2-132-021-M3R	S.G.		8-9-82	636/1569	ATTCH.	10"	0.365	2 TRUNN	6"	Fictional Pgm WCD = 5.89
212	1-65											
213	1-65A	CC-1-109-005-A43A	J.C.	1750	8-05-82		ANCH	10"	0.365	2 TRUNN		INCREASED THICK
214	1-76A	AF-1-009-015-533A	S.G.	1355	8-4-82		ANCH	6"	0.562	2 TRUNN	C1=3.315" C2=6"	FLECTIONAL Rm = 12"
215	1-76A	AF-1-010-004-533A	S.G.	3771	8-4-82		ANCH	6"	0.562	2 TRUNN	C1=2.87" C2=6"	FLECTIONAL Rm = 12"
216	1-63A	CCY-070-008-A62	J.C.		8-9-82	457/1071	ATTACH	10"	0.365	2 LICS	C1=0.025" C2=1.5"	
217	1-63A	CCY-066-014-A71A	J.C.		8-09-82	2565/685	ATTACH	10"	0.365	2 TRUNN	6.0.25	
218	1-63A	CCY-066-014-A71A	J.C.		8-09-82	922/2493	ATTACH	10"	0.365	-	-	
219	1-63A	CCY-066-014-A71A	J.C.		8-09-82	2167/5707	ATTACH	10"	0.365	17 TRUNN	-	
220	1-63A	CCY-066-014-A71A	J.C.		8-09-82	457/1071	ATTACH	10"	0.365	2 LICS	C1=0.025" C2=1.5"	
221	1-70	RH-1-016-700-522K	ASAD		8-11-82	322/800	ATTACH	10"	0.365	2 TRUNN	6"	FLECTIONAL Rm = 5.85"

# WELDED ATTACHMENT LOG BOOK

INDEX

FILE NO. AM-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS <sup>2</sup>	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
223	070	SM-1-065-009-522R	J. d.		8-12-82	1328/3929	ATTCH	8"	0.322"	1 TRUNN	3"	
224	070	RH-1-010-002-522S	J. d.		8-12-82	911/2093	ELBOW	8"	0.522"	1 TRUNN	4"	
225	070	AM-1-063-004-522A	J. d.		8-12-82	962/1510	- 11 -	10"	- 11 -	- 11 -	6"	
226	070	RH-1-016-001-522R	J. d.		8-12-82	618/1503	- 11 -	8"	0.365"	- 11 -	6"	
227	070	BL-1-032-003-521A	J. d.		8-12-82	1455/5838	ATTCH	2"	0.322"	2 TRUNN	6"	
228	059B	MCC-1-003-003-001 MCC-1-003-003-002 MCC-1-003-003-003	J. d.		8-12-82	2707/4776	ATTCH	3"				
229	46A	CS-1-010-001-521S	J. d.		8-12-82	2500/5382	ELBOW	3"				STRUD
230	46A	CS-1-011-003-521K	J. d.		8-12-82		ANCH	6"	0.28	2 TRUNN		
231A	46A	SI-1-070-002-522A	J. d.		9-6-82		ANCH	6"	- 11 -	1 TRUNN		
232A	46A	SI-1-038-003-522A	J. d.		8-13-82		ANCH	8"				
233A	46A	SI-1-037-005-522A	J. d.		8-13-82			12"				
234	47B	SI-1-031-009-032R	J. d.		8-16-82			12"				
235	47B	SI-1-031-000-522R	J. d.		8-16-82			12"				
236	47B	SI-1-031-071-522A	J. d.		8-16-82			12"				

# WELDED ATTACHMENT LOG BOOK

NOTE

FILE NO. A-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
238	2	MS-1-02-004-C72K -006- -013-	VIB	8-16-82	8-17-82			32"	1.25"			
239	3	MS-1-03-005-C72K -007- -009- -010- -014-	VIB	8-16-82	8-17-82			32"	1.25"			
240	23C 23D	MS-1-274-001-572K MS-1-223-001-572K	S.G.	8-17-82				8"				CORRELATED TO MEMO # 193
241	23C 23D	MS-1-145-700-575R MS-1-MB-700-575R	S.G.	8-17-82				8"				CORRELATED TO MEMO # 176
242	2	MS-1-02-008-C72K MS-1-02-009-C72K	VIB	8-16-82	8-18-82			32"	1.25"			
243A	59B 59C	CC-1-215-034-C53A	ASAN <sub>6</sub>	152	8-19-82		ANCHOR	3"	0.438"	1-TRUN.	RET. PAD	FICTITIOUS RM
244A	70A 46A	H-RH-1-SB-000052	vd	1376	8-19-82		- 11 -	2.375"	0.154	- 11 -		
245A	46A 46B	CS-1-014-030-S62A	vd	871	8-19-82		- 11 -					
246A	62Y 62Z	CC-2-041-708-A63A	S.G.	1666	8-19-82		ANCHOR	4"		2-TRUN. WITH TAPS		CORRELATED TO CC-1-041-727-A63A OF PROB. # AB-1-62K MEMO # 112A
247	-23D -23C	MS-1-274-002-572K MS-1-223-002-572K	S.G.		8-20-82	540 psi 1548 psi		8"				CORRELATED TO MS-1-257-002-572K OF PROB. # 1-23A MEMO # 185
248	AB-1-23D AB-1-23C	MS-1-004-001-572R -003- -004- -005- MS-1-003-002-572R -003- -004- -005-	S.G.		8-20-82	97 psi member total 335 psi		32"				CORRELATED TO MS-1-001-003-572F OF PROB. AB-1-23A REFER. TO MEMO. # 183



# WELDED ATTACHMENT LOG BOOK

FILE NO. -WA-?	PROB NO. AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE + NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
249	69	RH-1-007-001-522R	ASAD <sub>7</sub>		8-24-82	255/ 611	ATTACH.	16"	0.5"	CIRC TRUP 2	10"	FICTITIOUS R <sub>H</sub> =9.5"
250	69	RH-1-004-001-512S	ASAD <sub>8</sub>		8-25-82	788/ 1784	ATTACH	12"	0.375	CIRC TRUP 1	6"	
251	69	SI-1-011-002-532K	ASAD <sub>9</sub>		8-25-82	432/ 949	ATTACH	14	0.5	CIRC TRUP 1	8"	FICTITIOUS R <sub>H</sub> =7.6
252	69	SI-1-072-003-532K	ASAD <sub>15</sub>		8-25-82	432/ 949	ATTACH	14	0.5	CIRC TRUP 1	8"	FICT. R <sub>H</sub> =7.6 [SAME AS: AM-WA-25]
253	55D	CC-1-271-004-532R	UCL		8-25-82	2500/ 5382	ELBOW	3.5"	0.216			
254	55D	H-CC-1-1-RB-009-004S	UCL		8-25-82	4329/ 13945	LUCS	2"	0.154	4 LUCS	5 1/2" x 1 1/2"	
255	55D	CC-1-247-00C-532R	UCL		8-25-82	703/ 1496	LUCS	4.5"	0.237	4 LUCS	1 1/2" x 1/2"	
256	55D	CC-1-231-016-532R CC-1-224-008-532R CC-1-206-006-532R	UCL		8-25-82	2315/ 8899	LUCS	3.5"	0.216	4 LUCS	1 1/2" x 1"	
257	69	SI-1-146-004-532R	ASAD <sub>10</sub>		8-26-82	762/ 1566	ATTACH.	14"	0.375	2 LUCS	C <sub>1</sub> =1.5" C <sub>2</sub> =0.815"	
258	69	RH-1-003-002-542R	ASAD <sub>11</sub>		8-26-82	333/ 824	ATTACH	12"	0.375	2 LUCS	C <sub>1</sub> =1.0 C <sub>2</sub> =2.0	
259	69	RH-1-004-002-542R	ASAD <sub>11L</sub>		8-26-82	381/ 1255	ATTACH	12"	0.375	2 LUCS	C <sub>1</sub> =0.625 C <sub>2</sub> =1.75	
260	69	RH-1-003-004-532S	ASAD <sub>12</sub>		8-27-82	526/ 1025	ELBOW	12"	0.375	CIRC TRUP 1	8"	FICTITIOUS R <sub>H</sub> =7.6
261	69	RH-1-004-004-532S	ASAD <sub>12L</sub>		do	do	do	do	do	do	do	FICTITIOUS R <sub>H</sub> =7.6 [SAME AS: AM-WA-26]
262	69	SI-1-071-001-532S	ASAD <sub>13</sub>		8-27-82	349/ 697	ELBOW	14"	0.5	CIRC TRUP 1	8"	FICTITIOUS R <sub>H</sub> =7.6
263	69											FICTITIOUS R <sub>H</sub> =7.6

# WELDED ATTACHMENT LOG BOOK

FILE NO. 1-WA-?	PROB NO. AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
264	058	CC-1-191-013-C42K	API		8-27-82	2110/5326	NON. ANCH.	4"	0.237"	8 LUGS C1=0.25" C2=0.5"	LUGS 1" x 2" x 1"	
265	66B	CC-2-15-701A13	V.D.		8/21/82	333/1049	LUGS	2"	0.375"			
266	66B	CC-2-08-711A13	V.D.		8/21/82	257/643	- " -	- " -	- " -			
267	66B	CC-2-46-701A13	V.D.		8/31/82	448/1290	TRUNN	"	"			
268	66B	CC-2-156-701A13	V.D.		8/31/82	211/935	TRUNN	10"	0.365"			
269	66B	CC-2-08-702A13	V.D.		8/31/82	809/2101	11 TRUNN	24"	0.375"			
270	66B	CC-2-10-705A13	V.D.		8/31/82	505/969	PAD	24"	0.375"			
271	66B	CC-2-08-709A13	V.D.		8/31/82	563/568	ELBOW	24"	0.375"			
272	66B	CC-2-012-703A13	V.D.		8/31/82	53/164	2 TRUNN	24"	0.375"			
273	55C	CC-1-272-011-C53K	ASAP 14		8-31-82	2232/4738	ELBOW	3"	0.216	CIRC. TRUNN. 1	2 1/2"	FICTITIOUS RM=2.55"
274		CC-1-218-005-C53K	ASAP 15a			754/2363	ATTACH	3"	0.438	CIRC. TRUNN. 1	2 1/2"	FICTITIOUS RM=2.55"
275		CC-1-218-007-C53K	ASAP 15b			do	do	do	do	do	do	SAME AS AM-WA-274
276		CC-1-218-016-C53K	ASAP 15c			do	do	do	do	do	do	SAME AS AM-WA-274
277		CC-1-208-011-C53R	ASAP 16a			1543/3132	ATTACH	3"	0.216	2 LUGS	C1=0.375 C2=0.75	LUGS 3/4" x 2" x 1/2" SAME AS

# WELDED ATTACHMENT LOG BOOK

FILE NO. 1-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THCK.	ATT. TYPE + NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
279	55C	CC-1-211-004-C53K	ASAD <sub>17a</sub>		8-31-82	2315/2967	ATTACH	3"	0.216	2 LUGS	C <sub>1</sub> =0.25 C <sub>2</sub> =0.5	LUGS 1/2 x 1/2 x 1
280	55C	CC-1-272-003-C53R	ASAD <sub>17b</sub>		8-31-82	do	do	do	do	do	do	SAME AS AM-WA-279
281	55C	CC-1-245-025-C53R	ASAD <sub>18</sub>		8-31-82	3256/12,894	ATTACH	4"	0.237	2 LUGS	C <sub>1</sub> =0.5 C <sub>2</sub> =0.5	LUGS 1 x 1 x 2 1/2
282	52V	CS-1-155-042-S42R			8-31-82	2315/6437	4	3"	0.216	4 LUGS	C <sub>1</sub> =1.25 C <sub>2</sub> =0.5	LUGS 1/4 x 1/4 x 1
283	10A	AF-1-078-002-S33R	Jch		8/01/82	833/1910	- " -	3"	0.438	ELBOW		
284	10A	AF-1-076-002-S33R	Jch		9/4/82	581/1573	- " -	3"	- " -	2 TRUNN		
285	10A	AF-1-092-020-S33R	Jch		9/1/82	1089/3371	- " -	3"	- " -	- " -		
286	10A	AF-1-041-041-S33R	Jch		9-1-82	197/414	- " -	8"	0.718"	2 TRUNN		
287	10A	AF-1-076-003-S33R	Jch		9-1-82	257/2495	- " -	3"	0.438"	1 TRUNN		
288	79E	SB-1-060-020-S55K	ASAD <sub>19a</sub>		9-1-82	667/1566	ATTACH.	8"	0.5	2 LUGS	C <sub>1</sub> =0.5 C <sub>2</sub> =0.75	LUGS 1 x 1 1/2 x 1 1/2
289	79E	SB-1-060-028-S55K	ASAD <sub>19b</sub>		9-1-82	do	do	do	do	do	do	SAME AS AM-WA-288
290	79E	SB-1-060-041-T55R	ASAD <sub>20</sub>		9-1-82	630/2594	do	8"	0.5	1 LUG	C <sub>1</sub> =1.0 C <sub>2</sub> =1.5	LUG 3/4 x 3 x 2
291	52Y	N-CS-1-SB-050B-W02	AJBL		9-1-82	972/1557	do	2"	0.343	4 LUGS	C <sub>1</sub> =3.75 C <sub>2</sub> =7.5	
292	92B	BR-X-106-064-S43R	AJBL		9-1-82	2346/6324	cbv.	4"	0.237			
293	55B	CC-1-239-006-C53R	S.G.		9-2-82	1944/1191	ATTCH.	4"	0.237	ELBOW	2 1/2" SCH. 40	



# WELDED ATTACHMENT LOG BOOK

NODE

FILE NO. M-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE + NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
294	55B	CC-1-246-005-553K	S.G.		9-2-82	525/813	ATTACH.	6"	0.28"	8 LUGS.	C1=0.5" C2=1.5"	
295	55B	CC-1-246-015-653R	S.G.		9-2-82	1191/2393	"	6"	0.28"	8 LUGS.	C1=0.375" C2=0.75"	
296	55B	CC-1-237-008-653R	S.G.		9-2-82	2315/5933	"	3"	0.216"	8 LUGS.	C1=0.25" C2=0.5"	
297A	10A 10D	AF-1-085-023-533A	vd	1654	9/3/82	—	ANCH	8"	0.522	2 TRUNN		STRUDL
298A	10A 12A	AF-1-085-029-533A	vd	1611	9/3/82	—	ANCH	4"	0.287	2 TRUNN		
299A	92B IN LINE	BR-X-106-059-553A	SYG	599	9/3/82	—	ANCH	4"	0.237	1 TRUNN		
300A	92B 92A	BR-1-016-005-553A	SYG	1573	9/3/82	—	ANCH.	4"	0.237	1 TRUNN		
302	93A	BR-X-044-705-A33R -046-	CEM/VIB				ATTACH	4"	.237	8 LUGS	3/4 x 1 x 1	
301	93A	BR-X-046-706-A33R	CEM/VIB					4"	.237	4 LUGS	3/4 x 1/2 x 2	
303A	52V 52U	CS-1-159-004-542A	vd	3039	9/9/82	—	ANCH.	3"	0.216	2 TRUNN		
304	90	BR-X-044-706-A33R	ATBL		9/13/82	11184/10768	Trunn	4"	0.237	Trunn		
305	19B	SI-I-039-042-542R	ATBL		9/14/82	1050/2306	"	4"	.337	.		
306	19B	SI-I-039-012-542R SI-E-039-026-532R SI-I-039-013-542R	"		9/14/82	14511/2019	Lugs	4"	.337	Lug	3/4 x 1 x 1	
307	19B 55B	SI-I-045-021-522R	"		9/15/82	1171/2703	Trunn	4"	.337	Trunn		

# WELDED ATTACHMENT LOG BOOK

NOTE

FILE NO. 1-WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
309A	93A 90	DE-X-044-719-A33A	CEM/	1772	9-17-82		RIGID SUPPORT	4.5" OD	.237	SQUARE TUBE/PAD	4.347" x 10" PAD	
10	4	MS-1-04-005-C72K	VIB/ ASAD		9-17-82		ATTACH.	32"	FICTIT. 1.419"	1 TRUSS	PAD 22" x 22"	C1 = 9.77 FICTIT. C2 = 11" Rm = 5.6
311	1	MS-1-004-007-C72K	1		1		ATTACH.	1	FICTIT. 1.483"	1	PAD 27" x 26"	FICTIT. Rm = 30.2" C1 = 11.54" C2 = 13"
312	do	MS-1-04-008-C72K	do		do		ATTACH.	do	FICTIT. 1.391"	do	PAD 24" x 48"	FICTIT. Rm = 23.8" C1 = 10.6" C2 = 24"
313	4	MS-1-04-009-C72K	VIB/ ASAD		9-17-82		ATTACH.	32"	FICTIT. 1.483"	1 TRUSS	PAD 26" x 26"	FICTIT. Rm = 30.2" C1 = 11.54" C2 = 13"
314A	2b 69	SI-1-030-003-S32N	S.G.	549			ANCHOR	18"	0.375"			STRUT WAS RUN. FICTITIOUS PAD. USED = 20" INCHES
315	151C	SF-X-001-011-F53S	AKM		9/20/82		RIGID SUPPORT	12"	.375"	RECT. LUGS	1 1/4" x 1 3/4" x 1/4" (4)	C1 = .824 C2 = .825
316	37Y	CT-1-053-422-C52R	ASAD 22		9-21-82	1418 3856	ATTACH	3"	0.216	RECT. LUGS.	(A) 1" x 1 1/2" x 2"	FICT. Rm = 2.0"
317	1	-429-	23		1	1447 4300	1	1	1	RECT. LUGS.	(B) 1 1/2" x 1" x 2"	FICT. Rm = 2.0" FICT. C2 = 0.8"
318	1	-435-	24a		1	2563 6163	1	1	1	1 TRUSS	2 1/2" φ	FICT. Rm = 2.55"
319	do	do -437- do	do 24b		do	2563 6163	do	do	do	do	do	SAME AS AM-WA-318
320	37Y	CFI-053-436-C52R	ASAD 25		9-21-82	2756 6929	ATTACH	3"	0.216	1 TRUSS	2" φ	FICT. Rm = 2.1"
321	79F	SB-1-060-042-T5ER	ASAD 26		9-22-82	477 1137	ATTACH.	8"	0.5"	1 TRUSS	6" φ	FICTITIOUS Rm = 5.8"
322	79F	SB-1-060-051-T45R	ASAD 27		9-22-82	667 700	ATTACH.	8"	0.5"	RECT. LUGS.	(B) 1 1/2" x 1 1/2"	

# WELDED ATTACHMENT LOG BOOK

NOTE

FILE NO. -WA-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS $\sigma_{max}$	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
324	2-68T	SW-2-129-004-A33K	AJBL		9-22-82		ATTACH	10"	0.365"			
325	1-62B	CC-1-008-001-A43R CC-1-043-030-A33R	SG.		9-23-82	559/ 1856	R	24"	0.375"	ATTCH. 8 LUGS	13" x 4" x 5"	C <sub>1</sub> = 0.875" C <sub>2</sub> = 2.5"
326	1-62B	CC-1-008-018-A33R	SG		9-23-82	564/ 2309	R	24"	0.375"	ATTCH. 2-TRUNN.	12" $\phi$	R <sub>m</sub> = 11.82"
327	1-62B	CC-1-008-022-A33R	SG.		9-23-82	481/ 1379	R	24"	0.375"	ATTCH. 2-TRUNN.	6" $\phi$	R <sub>m</sub> = 11.82"
328	1-62B	CC-1-008-026-A33R	SG		9-23-82	180/ 546	R	24"	0.375"	ATTCH. 2-TRUNN.	10" $\phi$	R <sub>m</sub> = 11.82"
329	1-62B	CC-1-043-016-A43R CC-1-043-019-A43R	SG		9-23-82	809/ 2102	R	24"	0.375"	ATTCH. 1-TRUNN.	8" $\phi$	R <sub>m</sub> = 11.82"
330	1-62B	CC-1-043-039-A43R	SG		9-23-82	121/ 306	K	24"	0.375"	ATTCH. 2-TRUNN.	14" $\phi$	Fictitious R <sub>m</sub> = 12.25"
331	1-62B	CC-1-066-013-S33K	SG		9-23-82	297/ 874	K	18"	0.375"	ATTCH. 2-TRUNN.	8" $\phi$	R <sub>m</sub> = 8.82"
332	1-62B	CC-X-079-001-A43S	SG		9-23-82	395/ 668	S	24"	0.375"	ATTCH. ELBOW- 1-TRUNN.	14" $\phi$	Fictitious R <sub>m</sub> = 12.25"
333	1-62B	CC-1-043-024-A33K	SG		9-23-82	790/ 2131	K	24"	0.375"	ATTCH. ELBOW. 1-TRUNN.	10" $\phi$	R <sub>m</sub> = 11.82" SKEW NUMBER
334	1-62B	CC-1-047-001-A43S CC-1-016-700-A43S	SG.		9-23-82	416/ 704	S	24" / 20"	0.375"	ATTCH. REDUCER ELBOW 1-TRUNN.	14" $\phi$	FICTITIOUS R <sub>m</sub> = 12.25"
335A	79F	SB-1-060-033-T55A	ASAD <sub>28</sub>	683	9-23-82	—	ANCHOR	8"	0.5	2-TRUN.	RECT. PAD	FICTIT. R <sub>m</sub> = 14.0
336A	79F	SB-1-060-057-T55A	ASAD <sub>29</sub>	714	9-24-82	—	ANCHOR	8"	0.5	1-TRUN.	RECT. PAD	FICTIT. R <sub>m</sub> = 14.0
337A	79F	CC-1-008-029-S33A	SG.	178			ANCHOR	24"	0.375"	2-TRUNN.		NO STRAPLE GEN. CONSERVATIVE CASE
338	1-151D	SF-X-23-021-F43R	AKM		9/24/82	1055/ 1100	R	4"	0.37	RECT.	8-3/4" x 2"	



# WELDED ATTACHMENT LOG BOOK

NO. A-?	PROB NO AB-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED TOTAL	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE + NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
339	1-151 D	SF-X-23-027-F43K	AKM		9/24/82	1557/4039	K	4"	.237	2-TRUNN	2"φ	R <sub>m</sub> = 2.132
40A	1-151 F	CC-1-009-016-A43A	ASAD 30	149	9-27-82	—	ANCHOR	10"	0.365	1-TRUNN	CIRC. PAD R <sub>0</sub> = 6.313	FICT. R <sub>m</sub> = 11.1"
41	1-71A	RH-1-009-003-S225	ASAD 31a		9-29-82	982/2094	ATTACH.	8"	0.322	ELBOW CIRC TRUN	4"φ	
42		RH-1-027-002-S32K	31b			982/2094		do	do		do	SAME AM-WA-341
43		RH-1-024-006-S22K	32			549/1062		10"	0.365		8"φ	FICT. R <sub>m</sub> = 7.6
44		RH-1-028-004-S32K	33a			762/1510		8"	0.322		6"φ	FICT. R <sub>m</sub> = 5.8
45		RH-1-063-006-S22K	33b			762/1510		do	do		do	do SAME AM-WA-344
46		SI-1-078-004-S425	34a			641/1282		10"	0.365	ELBOW CIRC TRUN	6"φ	FICT. R <sub>m</sub> = 5.8
47		SI-1-078-009-S325	34b			641/1282		do	do		do	do SAME AM-WA-346
48		SI-1-211-002-S22K	35			1035/2070		6"	0.280	ELBOW CIRC TRUN	5"φ	FICT. R <sub>m</sub> = 4.9
49		RH-1-015-001-S32R	36			365/591		10"	0.365		(4) 1" x 1/2" x 1/2"	
50		SI-1-093-002-S22R	37			783/2036		10"	0.365	LUGS	(4) 1" x 1/2" x 1/2"	
51	90	SI-1-095-003-S42R	38		do	167/167		10"	1.0	LUGS	(4) 1" x 1/2" x 3"	FICT. R <sub>m</sub> = 5.0
52	1-71A	RH-1-024-012-S22K	ASAD 39		9-29-82	496/2540	ATTACH.	10"	0.365	2-TRUNN	4"φ	
53A	1-151 F	CC-1-012-006-A43A	50	647			ANCHOR	9 1/4"	0.375	2-TRUNN	22"φ	STRUPL. Fictitious

# WELDED ATTACHMENT LOG BOOK

NO. 1-?	PROB NO AB 1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
54	04SS	H-65-1-RB-040- 005-2	AKM		9/29/82	2165/4857	RIGID	2"	.154	4-RECT LUGS	3/4"x1x1/2"	INCREASED R <sub>m</sub> =1.5
55	2-067T	SH-2-173-001- A33 K	AKM		9/29/82	472/1175	SN.	10"	.365	CIRC. TRUNNION	5"φ	
56	2-067T	SH-2-173-022- A43 R	AKM		9/29/82	732/1824	RIGID	10"	.365	CIRC TRUNNION	5"φ	
57	55A	H-CC-1-RB-001-003 H-CC-1-RB-033-008	VB		9-29-82	972/ 2279	SNUBBER	2"	0.343	RECT. TRN.	C <sub>1</sub> =0.375 C <sub>2</sub> =0.75	
58	55A	CC-1-264-008-C53S	VB		9-29-82	3202/ 12802	S	3"	0.216	PLATE	C <sub>1</sub> =0.575" C <sub>2</sub> =0.8"	
59	55A	CC-1-264-007-C53K	VB		9-29-82	2525/ 4509	K	3"	0.216	ELBOW TRUNN.	2"φ	
60	55A	CC-1-260-004-C53R	VB		9-29-82	2315/ 8802	R	3"	0.216	RECT. TRUNN.	C <sub>1</sub> =0.25 C <sub>2</sub> =0.5	
61	55A	CC-1-257-004-C53R	VB		9-29-82	1055/ 2567	R	4"	0.237	RECT. TRUNN.	C <sub>1</sub> =0.5 C <sub>2</sub> =1.5	
62	1-155	FW-1-098-010-C62K	NJPB		9-30-82	692/ 1817		6"	.432			
63	1-155	FW-1-098-017-C62S	NJPB		9-30-82	413/ 428		6"	.432			
64	1-155	FW-1-098-003-C62R FW-1-098-013-C62K	NJPB		9-30-82	772/ 958		6"	.432			
65	1-155	FW-1-102-004-C62S FW-1-102-005-C62K	NJPB		9-30-82	731/ 2197		6"	.432			
66	1-155	FW-1-098-006-C62S	NJPB		9-30-82	691/ 1814		6"	.432			
67	1-155	FW-1-098-015-C62R	NJPB		9-30-82	651/ 1803		6"	.432			
668	1-155	FW-1-098-007-C52R	CEM		9-30-82	783/ 2107		6"	.432	PLATE		

# WELDED ATTACHMENT LOG BOOK

NOTE

NO. A-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS #	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
69	155	FW-1-98-098-C625	P88			468	ELBOW RUNNER SUNBUR	6	.432	.432	ELB P	3 1/2" P	
70	155	FW-1-98-11-C625	P80			512	SUNBUR	6	.432	.432	ELB P	3" P	
71A	110	RH-1-024-011-522A	ASAP 40	1501	10-6-82	—	ANCHOR	10"	0.365	0.365	1-TRUP	RECT. PAD	FICTIT. RM = 13.0"
72A	110	SI-I-041-003-522A	ASAP 41	1703	10-6-82	—	ANCHOR	6"	0.280	0.280	1-TRUP	RECT. PAD	FICTIT. RM = 12.0"
73	1-152	FW-1-095-013-C625	ASAP 42		10-6-82	386 582	ATTACH.	6"	0.432	0.432	2-LUGS	1" x 1" x 3"	FICTIT. RM = 3.4
74		FW-1-095-700-C62K	ASAP 43			579 1102					2-LUGS	1" x 1" x 2"	
75		FW-1-099-701-C62K	ASAP 44			579 721					2-LUGS	3" x 3" x 2"	
76		FW-1-095-011-C62K	ASAP 45A			731 2198					1-TRUP	3" P	
77		FW-1-099-004-C62K	ASAP 45B			731 2198					do	do	SAME AM-WA-376
78		FW-1-095-005-C625	ASAP 46A			N/A 468					LUG ELBOW	L = 3.5"	SPECIAL CALC.
79	00	FW-1-095-008-C625	ASAP 46B		00	N/A 468	do	do	do	do	do	do	SAME AM-WA-378
80	1-152	FW-1-095-004-C62K	ASAP 47		10-6-82	907 4809	ATTACH	6"	0.432	0.432	STIFF. WT	2RS 2 1/2" x 3 1/2" x 8 1/2"	FICTITIOUS C1, C2, RM
81	1-42A	CS-1-002-700-C525	ASAP 48		10-6-82	571 P 571 P	LUGS	3"	0.438	0.438	1/2" x 1" x 2"	1/2" x 1" x 2"	
82	1-175	VD-1-053-013-C462	ASAP 49		10-6-82	2110 5325	n	4	0.237	0.237	1" x 1" x 1"	1" x 1" x 1"	
83A	371	VD-1-053-013-C462	ASAP 49	367		—							



NOTE

NO. A-?	PROB NO AB-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK. K.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
384A	55A 55B	66-1-246-022-653A	S.G.	34			ANCHOR	6"	0.28			
385	1-1	MS-1-01-003-C72K	VIB / KSAH		10-8-82	50 127	ATTACH	32"	1.25	1-TR.	PAD	FIELD R.N. 22.7
386	1-1	MS-1-01-005-C72K	VIB / KSAH		10-8-82	33 77	ATTACH	32"	1.25	TRUP / ELBOW	24"φ	FIELD R.N. 31.9
387	154	FW-1-097-042-662S	S.G.		10-8-82		ATTACH	6"				
388												
389												
390												
391												
392												
393												
394												
395		FW-1-097-020-662R				262 714						
396	154	FW-1-97-034-662R	S.G.		10-8-82		ATTACH.	6"				
397	57A	CT-1-135-417-C72R CT-1-135-418-C72R CT-1-135-419-C72K	S.O.		10/12/82	595 735	ATTACH	6"	0.28	2UGS	141x3	

# WELDED ATTACHMENT LOG BOOK

NODE

NO.	PROB NO	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS $\frac{W}{A}$	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
398	60	CC-1-050-004-A43K	SG			276/1073	R	24"	0.375"			
399		CC-1-050-001-A43S				333/676	S					
400		CC-2-050-001-A43S				267/402	S					
401		CC-1-019-009-A43R				667/1176	R					
402		CC-1-019-003-A33R				421/622	R					
403		CC-1-050-700-A43K CC-1-050-007-A43K				416/704	K K					
404		CC-1-019-010-A43K				395/668	K					
405		CC-2-050-702-A43K CC-2-019-710-A43K CC-2-050-701-A43S				395/668	K K S					
406		CC-2-019-705-A41R				689/1467	R					
407		CC-2-019-706-A43R				180/546	R					
408		CC-2-050-700-A43K				197/467	K					
409	60	CC-2-019-713-A43S	SG			270/819	S	24"	0.375"			
410A	63A 64B	CC-X-07B-016-A75A	A.SAN <sub>29</sub>	38885 38888	10-15-82	—	ANCHOR	10"	0.365	2-TURN PAD		FIG 17. RM-15.3
411A	64B 63A	CC-X-07B-007-A65A	A.SAN <sub>50</sub>	8875 38875	10-15-82	—	ANCHOR	10"	0.365	1-TURN PAD		FIG 17. RM-15.3
412A	63A 64B			1831		—	ANCHOR	10"				

# WELDED ATTACHMENT LOG BOOK

NODE

E NO.	PROB NO	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
13	1-19A	SI-I-044-039-542R	AJBL		10-14-82	11.84 ksi 2019 psi	Lugs	4"	0.337		3/4" x 1/2"	
14	1-19A	SI-I-044-034-542R	AJBL		10-14-82	1171 2703	Truss	4"	0.337		2"	
15	1-19A/B	H-SI-1-SB-023A-005-2	CEM		10-14-82			1 1/2"	.2			
16	1-151A	SV-X-003-006-F43K SV-X-004-006-F43K SV-X-007-011-F43K	AJBL		10-15-82	641 1282	Truss	10"	.365		6"	
17	1-61B	CC-1-087-001-A33R	ASAD 21		10-18-82	346 544	ATTACH.	24"	0.375	CIRC. TRUSS ELBOW	20"	FICTIT. RM=17.6
18	1-61B	CC-1-017-010-A33K	ASAD 52		10-18-82	208 668	ATTACH	24"	0.375	2-CIRC. TRUSS	18"	FICTIT. RM=15.0
19	1-61B	CC-1-070-002-A33R	ASAD 53		10-18-82	275 908	ATTACH	24"	0.375	2 LUGS	2x2 1/2x5	
Rev 2 20A	64F 66B	CC-2-116-006-F43A	VMC	1608 5809			ANCH					
21A	62B 66B	CC-X-079-006-A43A	VMC	6272			ANCH					
22A	66B 66A	CC-2-109-004-A43A	VMC	1000			ANCH					
23A	61B 61A	CC-1-087-004-A33A	VMC	114			ANCHOR					
24A	61B 66B	CC-2-045-007-A43A	ASAD 51	193	10-20-82	—	ANCHOR	10"	0.365	FIXED 2-TRUSS	PAD	FICTIT. RM=15.4"
25A	61B 63B	CC-1-070-006-A43A	VMC	312	10/21/82	—	ANCH	24"	0.375			STRUDL
26A	61B 62B	CC-1-045-005-A43A		153								
27A	1-35B	CC-1-045-005-A43A		3611		—		2"				FICTIT. RM=11.4"



# WELDED ATTACHMENT LOG BOOK

NO. 1-7	PROB NO. AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THCK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
27	1-035B	CT-1-038-424-C62R	AVB		10-20-82	2315 2966	Lugs	3"	.216	Lugs	1/2 x 1/2 x 1/4	
28	"	CT-1-038-425-C52R	"	"	"	2548 6066	Transition	3"	.216			
29	"	CT-1-038-427-C62R	"	"	"	2752 6909	"	3"	.216			
30	1-167C	DO-1-038-004-S63S	SG				S	42"	0.375"			
31	↑	DO-1-038-003-S63K	↑				K	42"				
32		DO-1-089-003-S65S					S	42"				
33		DO-1-089-004-S65K					K	42"				
34		DO-1-038-005-S53K					K	42"				
35		DO-1-033-002-S43R					R	26"				
36	↓	DO-1-033-001-S53K	↓				K	26"				
37	1-167C	DO-1-029-001-S53K	S.G.				K	26"	0.375"			
38	1-151B	SF-X-031-011-F53K SF-X-002-002-F53S	NJC				Lugs	12"	0.375		1 1/2 x 1 1/4 x 1 3/4	
39	1-135D	SA-X-18-731-A5K	JHC		10/21/82	5235 12933	TRUNN	6	0.283		Ø 3.5	
40	1-135H	SA-X-077-039-E33P	J.H.C.		7/21/80	175 564	LUGS	10	0.365	4 LUGS		
41	1-135A	CA-X-077-039-E33P	J.H.C.		10/21/82	271 6272	+ TRUNN	1	0.365	2 LUGS	2 x 2 x 1/2	

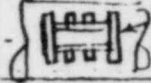
# WELDED ATTACHMENT LOG BOOK

NOTE

NO. A-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
12	1-135A	SA-X-019 024-ASTP 042-E35T 047-E31P	J.M.C.		10/21/81	807/1789	TRUNK	10	0.865		3.312	
43A	35D IN LINE	CT-1-039-423C42A	J.M.C.	2851	10/21/82							
44	029K	CT-1-029-014-C923	J.M.C.		10/25/82	455/3250	TRUNK	6	0.28		3	
45	029K	CT-1-029-015-C923	J.M.C.		10/25/82	1200/2175	TRUNK	6	0.28		3	
46	029K	CT-1-029-017-C923	AJBL		10-25-82	3111/7733	TRUNK	6	0.28		3	
47	029K	CT-1-029-023-C923	AJBL		10-25-82	4980/14174	TRUNK	6	0.28		2	
48	1-31	CT-1-007-007-S22K	ASAD 58		10-26-82	635/1313	TRUNK ELBOW	12"	0.375	1-CIRC.	6" $\phi$	
49		CT-1-121-001-S225	59			526/1037	TRUNK ELBOW	16"	0.375	1-CIRC.	8" $\phi$	
50		CT-1-002-001-S325				590/1414	LUGS	16"	0.375	LUGS.	1 1/2 x 2 x 3/4	
51		CT-1-002-003-S32K	61			444/1266		16"	0.375	LUGS	1 x 1 1/4 x 3	
52		CT-1-007-004-S225	62			444/1248		12"	0.375	LUGS	3/4 x 1 1/4 x 3	
53	CO	CT-1-008-001-S225	63		20	889/2502	20	12"	0.375	LUGS	1 1/4 x 1 1/2 x 1 1/2	
54	1-31	CT-1-008-003-S22K	ASAD 62		10-26-82	889/2506	LUGS		0.375	LUGS.	1 1/2 x 1 1/4 x 1 1/2	
55	1-35B	CT-1-038-426-C52R	AJBL		"	2458/1066						Co-related to Hanger No. 428
56	1-35B	CT-1-124-412-C72K	AJBL		"	893/1066	LUGS	16"	0.375	1-CIRC.	3/4 x 1 1/4 x 3	

# WELDED ATTACHMENT LOG BOOK

NODE

NO.	PROB NO	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
1-7	AB-1-7											
57A	1-350	SA-X-018-735-E33A	NYC	3913	10/28/82		TRUNK	6	0.28	2 TRUNK		
		RH-1-005-007-C42R										
58	1-4293	RH-1-005-008-C42R	ATP		10/28/82		LUGS	3"	"216"	2 LUGS	2"x1"x4"	
59A	1-31	CT-1-004-009-S32A	VAL.	1464	10/19/82		ANCHOR					
	1-24											
60	1-8711	SF-X-006-025-F43R	ATP		10/29/82		TRUNK	10"	"365"	6" TRUNK		
61A	37X IN LINE	CT-1-135-401-C72A	S.G.	555	10/19/82		ANCHOR	6"	0.28			 T-SHAPED (PLAN)
62	1-37Z	CT-1-054-413-C42R	ASAD		11-1-82	770 / 1938	LUGS	4"	0.237	LUGS	1"x1"x3"	
63	1-37Z	CT-1-054-424-C42R	ASAD		11-1-82	770 / 1938	LUGS	4"	0.237	LUGS	1"x1"x3"	SAME AS AH-WA-46Z
		CT-1-054-433-C42R										
64	1-29L	CT-1-044-014-C92S	ATP		11-1-82			6"	0.28			
65	1-29L	CT-1-044-015-C92S	"		"			6"	0.28			
66	1-29L	CT-1-044-022-C92S	"		"			6"	0.28			
67	1-29L	CT-1-044-023-C92S	"		"			6"	0.28			
68	1-10B	AF-1-102-035-553R	ASAD		11-2-82	726 / 1675	ELBOW	4"	0.438	CIRC. TRUN	3" φ	
69		AF-1-103-030-553K			11-2-82	951 / 2184	ELBOW	4"	0.438	CIRC. TRUN	2" φ	
70	DU	AF-1-102-002-543K			11-2-82	813 / 2737	TRUN.	4"	0.438	CIRC.	2" φ	
71						731		"			2" φ	



# WELDED ATTACHMENT LOG BOOK

NO. A-7	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS #	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
172	1-10B	AF-1-103-022-533R	ASHW10		11-2-82	1142 4072	LUGS	4"	0.438	LUGS	1x1 1/2"	
173	1-12D	AF-1-096-707-562K	ASPB		11-2-82	579 724	"	6"	0.432	"	3/4 x 1 1/2"	
174	1-12D	AF-1-099-032-543R	"		11-2-82	808 2637	Transmission	4"	0.438	Transmission	2"	
175	1-35A	CT-1-076-409-C82R	VDH		11-2-82	1157 2009	"	8"	0.322	"	4"	
176	1-35A	CT-1-076-403-C82R	VDH		11-2-82	1054 2342	"	8"	"	"	5"	
177	1-35A	CT-1-013-406-C82R	VDH		11-2-82	685 1407	"	16"	0.375	"	9 1/2"/10	
178	1-35A	CT-1-013-421-C51R	VDH		11-2-82	684 1463	"	"	"	"	9 1/2"/10	
179	1-35A	CT-1-076-404-C82R	VDH		11-2-82	776 7598	LUGS	8"	0.322	LUGS	1x2x2	
180	1-35A	CT-1-013-419-C82R	VDH		11-2-82	587 1291	TRUNN	16"	0.375	TRUNN	9.95"/14	
181	1-35A	CT-1-013-414-C82R	VDH		11-2-82	444 937	LUGS	16"	0.375	LUGS	1 1/2 x 1 1/2 x 3	
182	1-35A	CT-1-013-415-C62R	VDH		11-2-82	333 550	"	11"	"	"	1 1/2 x 1 1/2 x 4	
183	1-35A	CT-1-013-416-C51R	VDH		11-2-82	667 1305	"	"	"	"	1 1/2 x 1 1/2 x 2	
184	1-35A	CT-1-013-405-C82R	VDH		11-2-82	889 1640	"	"	"	"	1 x 3/4 x 1 1/2	
185	1-35A	CT-1-039-443-C82R	VDH		11-2-82	2110 3243	"	4"	0.237	"	3/4 x 5/8 x 1	
186	1-35A	CT-1-076-402-C82R	VDH		11-2-82	776 1295	"	2"	0.322	"	1 x 1 x 2	

# WELDED ATTACHMENT LOG BOOK

NO. A-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
187	1-35A	CT-1-076-402-C62R		Uch	11-2-82	1553/3384	LUGS	8	0.322	LUGS	1x1/2x1	
188	1-35A	CT-1-077-404-C62R CT-1-077-404-C62R		Uch	11-2-82	1786/4260	"	6	0.28	"	-11-	
189	1-35A	CT-1-078-407-C62R OFF	K	Uch	11-2-82	1786/4273	"	11	"	"	3/4x3/4x1	IN ORIGINAL O.K.
190	1-35A	CT-1-086-405-C62R		Uch	11-2-82	595/813	"	11	"	"	1x1x3	
191	1-35A	CT-1-093-404-C62R		Uch	11-2-82	2110/5328	"	4	0.237	"	1x1/2x1	
192	1-35A	CT-1-088-441-C62R CF-1-088-441-C62R CT-1-088-441-C62R		Uch	11-2-82	2115/5933	"	3	0.216	"		
193	1-153	FW-1-096-034-C62R		ASAP	11-3-82	738/1700	ELBOW	6"	0.432	CIRC. TRUMP	3"	
194		FW-1-096-034-C62R				731/2198	TRUMP			ONE CIRC.	3"	
195		FW-1-096-004-C62R				731/2198	do			do	do	SAME AS AM-WA-494 FIC7.
196		FW-1-096-022-C62R				1023/3101	LUGS			2 LUGS	3x1x3	RM=3.40
197		FW-1-100-003-C62R				1023/3101	LUGS			do	do	SAME AS AM-WA-496 FIC7.
198		FW-1-096-001-C62R				386/581	LUGS			4 LUGS	1x1x3	RM=3.40
199		FW-1-100-006-C52R				386/581	do			do	do	SAME AS AM-WA-498
200	do	FW-1-096-015-C62R		do	do	907/4809	TRUMP	do	do	STIFF. TS&T	WT4x8.5	FIC7. RH=3.4
201	1-153	FW-1-096-015-C62R		ASAP	11-2-82	907/4809	do	do	do	do	do	SAME AS AM-WA-498

# WELDED ATTACHMENT LOG BOOK

NOPE

NO. 1A-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
502	1-153	FW-1-096-020-C62R	ASAD <sub>75C</sub>		11-3-82	907 4809	TRUNN.	6"	0.432	STIFF T-SECT.	WT4x8.5	SAKE AS AM-WA-500
503	do	FW-1-096-021-C62R	do <sub>75C</sub>		do	907 4809	do	do	do	do	do	do
504	1-153	FW-1-100-002-C62R	ASAD <sub>75C</sub>		11-3-82		do	6"	0.432	do	do	do
505	1-153	FW-1-096-700-C62k	DHF		11-3-82	511 1310	TRUNN.	6"	0.432			fictitious R <sub>m</sub> = 3.91
506	1-153	FW-1-096-701-C62k	DHF		11-3-82	1205 3086	TRUNN.	6"	0.432			" "
507	1-153	FW-1-096-702-C62k	DHF		11-3-82	579 734	Lugs	6"	0.432			identical to FW-1-096-705- C62k of same spec.
508	1-153	FW-1-096-704-C62k	DHF		11-3-82	719 1842	TRUNN.	6"	.432			fictitious R <sub>m</sub> = 3.94"
509	1-153	FW-1-096-705-C62k	DHF		11/3/82	579 734	Lugs	6"	.432			
510	1-153	FW-1-096-706-C62k	DHF		11/3/82	579 579	Lugs	6"	.432			
511	1-153	FW-1-100-701-C52k	DHF		11/3/82	636 1393	ELbow	6"	.432			fictitious R <sub>m</sub> = 3.94"
512	1-153	FW-1-100-702-C52k	DHF		11/3/82	305 305	Lugs	6"	.432			fictitious R <sub>m</sub> = 4.4"
513	1-10C	AF-1-096-049-553K	NJPB		11/4/82	1112 1278	Lug	4"	.438			
514	1-10C	AF-1-096-052-563R	NJPB		11/4/82	668 1301	Lug	4"	.438			Thickness of pipe used is 3/4"
515A	372 INLINE	CT-1-054-431-C42A	ASAD <sub>76</sub>	276	11-4-82	—	ANCHOR	4"	0.237	TRUNN	C1 = 2.1 C2 = 2688	Fict. R <sub>m</sub> = 5.9
516	1-035A	CT-1-038-446C62R	UCL		11-04-82	685 876	Lugs	3"	0.216	LUGS	1/2 x 1/2 x 1	



# WELDED ATTACHMENT LOG BOOK

NOTE

E NO.	PROB NO	HANGER MARK	RESP	DATE	DATE	MAXIMUM	SUPPORT	PIPE	PIPE	ATT. TYPE	ATTACHMENT	COMMENTS
1A-7	AB-1-7	NO.	ENGR	RECEIVED	RELEASED	UNIT LOAD STRESS*	TYPE	SIZE	THICK.	# NUMBER OF ATTACHMENTS	SIZE	
517A	10B 1-12B	AF-1-103-024-S33A	vch	151	11-05-81	—	ANCHOR	4	0.438	TRUNN	4.5" x 4"	
518A	10A 1-10B	AF-1-102-024-S33A	vch	3319	11-05	—	"	4	"	"	1.5" x 24"	
519	1-297	CT-1-031-012-C92S	vch		11-08	3639/9278	ATTACH	6	0.28	"	1.75"	PIPE ELBOW
520	1-297	CT-1-031-011-C92B	vch		11-08	1259/2605	"	"	"	"	"	"
521	1-297	CT-1-031-019-C92C	vch		11-08	1215/2176	"	"	"	"	"	"
522	1-297	CT-1-031-010-C92S	vch		11-08	1490/3510	"	"	"	"	"	"
523A	35C 35A	CT-1-124-410-CT2A ASAW 77			11-5-82	—	ANCHOR	6"	0.28	SPECIAL GRILLAGE	Box R's 4 STIFF.	SAKE AS AM-WA-461
524	1-297	CT-1-031-018-C92K	vch		11-08	3805/9705	ATTACH	6	0.28	TRUNN	1.75	PIPE ELBOW
525	1-10C	AF-1-17-002-S62R	DHF		11-8-82		TRUNN.	4"	0.337			
526	1-10C	AF-1-96-13-S33K	DHF		11-8-82		Lugs	4"	0.438			fictitious Rm = 6.7"
527	1-10C	AF-1-96-32-S43S	DHF		11-8-82		Lugs	4"	0.438			fictitious Rm = 2.2"
528	1-10C	AF-1-96-41-S43K	DHF		11-8-82		TRUNN.	4"	0.438			fictitious Rm = 3.07"
529	1-10C	AF-1-97-43-S63K	DHF		11-8-82		"	"	"			"
530	1-10C	AF-1-97-44-S53K	DHF		11-8-82		"	"	"			fictitious Rm = 3.94"
531	1-10C	AF-1-97-45-S63K	DHF		11-8-82		"	"	"			fictitious Rm = 3.94"

# WELDED ATTACHMENT LOG BOOK

NO.	PROB NO	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS #	SUPPORT TYPE	PIPE SIZE	PIPE THCK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
32A	AB-1-7	AF-1-100-021-533A	ASAD 70	525	11-7-82	—	Anchor	4"φ	0.438	1 Turn	Plat Rect	Fct. Rm
33A	1-12E	AF-1-101-023-533A	ASAD 71	2709	11-15-82	—	Anchor	4"φ	0.438	2 Turn		STRUDEL
34	1-165B	HA-1-206-0030-0030	ASAD 72		11-9-82	$\frac{9165}{5003}$	Lugs	2"	0.150		$3\frac{1}{4} \times 1\frac{1}{2}$	
35	1-180	VA-1-005-002-0725	ASAD 73		11-10-82	$\frac{1553}{2684}$	Lugs	8"	0.322		1" x 1 x 2"	
36	1-180	VA-1-005-004-0005	ASAD 74		"	$\frac{776}{1299}$	Lugs	8"	0.322		1" x 1 x 3"	
37	1-180	VA-1-005-030-072K	ASAD 75		"	$\frac{514}{661}$	Lugs	8"	0.322		1" x 1 x 3"	
38	1-180	VA-1-006-011-002R	ASAD 76		"	$\frac{344}{751}$	Lugs	10"	0.365		2" x 1" x 4"	
39	1-180	VA-1-06-021-052R	ASAD 77		"	$\frac{457}{1168}$	Lugs	10"	0.365		1" x 2" x 3"	
40	1-180	VA-1-06-023-062R	ASAD 78		"	$\frac{457}{731}$	Lugs	10"	0.365		1" x 1 1/4 x 3"	
41	1-428	HCS-1-003-060	ASAD 79		11-10-82	—	TRUNK	2"	0.154	17 Turn		
42	1-12D	AF-1-098-039-533A	DHF		11-11-82	—	Anchor	4"	0.438	1 Turn	Plat Rect	f.d. Rm
43	1-36	CT-1-034-005-002R	ASAD 80		11-11-82	$\frac{1814}{4542}$	Lugs	4"	0.322	2 "		
44	1-36	CT-1-034-016-002R	ASAD 81		"	$\frac{887}{3140}$	Lugs	8"	0.322		2 1/2 x 1 x 2 1/2	
45	1-36	CT-1-034-019-002K	ASAD 82		"	$\frac{1242}{1975}$	"	8"	0.322		1" x 1 1/4 x 1 1/4	
46	1-36	CT-1-034-016-002R	ASAD 83		"	$\frac{1157}{407}$	Lugs	8"	0.322	1 Turn		MTA.

# WELDED ATTACHMENT LOG BOOK

E NO. NA-?	PROB NO AB-?	HANGER MARK NO.	RESP ENGR	DATE RELEASED TO ANALYST	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE + NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
547	1-12D	AF-1-061-001-S33A	DHF		11-12-82	—	Anchor	4"	0.438	2 TRUNN	PAD ALL AROUND PIPE	fict. em
548A	10A 10C	AF-1-096-030-S34	rdh	1150	11-12-82	—	" "	" "	" "	" "		
549A	12B 10C	AF-1-097-007-S35	rdh	247 647	11-12-82	—	" "	" "	" "	" "		
550A	36 29Y	CT-1-034-444-C92A	rdh	989	11-12-82	—	" "	8"	0.372	" "		
551A	36 29M	CT-1-031-403-C92A	rdh	1093	11-12-82	—	" "	6"	0.28	" "		
552A	36 29K	CT-1-029-403-C92A	rdh	1058	11-12-82	—	" "	" "	" "	" "		
553A	29M 29U	CT-1-031-444-C92A	VIB-	989	11-12-82	—	" "	" "	" "	1 TRUNN		
554	1-180	VA-1-005-005-C925	DHF		11-16-82		TRUNNION	8"	0.322	1 TRUNN.		
555	1-180	VA-1-005-006-C925	DHF		11-16-82		" "	" "	" "	" "		
556	1-180	VA-1-005-007-C925	DHF		11-16-82		" "	" "	" "	" "		
557	1-180	VA-1-005-009-C92R	DHF		11-16-82		" "	" "	" "	" "		
558	1-180	VA-1-06-003-C52R	DHF		11-16-82		" "	10"	0.365	" "		
559A	29K 29S	CT-1-029-415-C92A	S.G.	989	11-16-82		ANCHOR	6"	0.28"	2 TRUNN	RECT. PAD C1 = 2.6" C2 = 3.0"	FICTITIOUS PAD. REQD = 8.5"
560	1-86A	SF-X-005-006-F53K	ASBL		11-16-82	891 727 1122	Lugs	10"	0.365	8 Lugs	2"x1 3/4"x3 1/2"	



# WELDED ATTACHMENT LOG BOOK

NAME

NO.	PROB NO - ?	HANGER MARK N.O.	RESP ENGR	DATE RELEASED TO A-10-1982	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
62	1-86A	SF-X-005-015-F435 SF-X-005-019-F438	BAB		11-16-82	348 858 790	TRUNN	10"	.365	TRUNN	6"	
63	1-87C	SF-X-034-14-F524	DMF		11-16-82	1714	"	10"	.365	"	6"	
64	1-89D	CC-1-057-021-A33A	UD	1328	11-18-82	+	ANCH	24	.037	27 RUNN	12x11	
65	1-51A	CS-1-346-702-A425 CS-1-076-703-A425	MI	12-14-82	11-18-82	511/1593	TRUNN	4"	.531	"		
66	1-51A	CS-1-085-004-A42C	MI		11-18-82	581/2199	TRUNN	4"	.531	"		
67	1-51A	SI-1-001-017-542E	MI		11-18-82	550/1792	TRUNN	4"	.531	"		
68	1-29N	CT-1-044-V12-C94A	DF	989	11-18-82		ANCH	6"		TRUNN		
69	1-29N	CT-1-046-010-C95B	ATBL	12-14-82	11-18-82	1482 3308	TRUNN	6"	.28			
70	1-29N	CT-1-046-011-C95S				1231 2431	"	6"	.28			
71	1-29N	CT-1-046-012-C92S				3862 95H1	"	6"	.28			
72	1-29N	CT-1-046-016-C82K				1129 2101	Lug	6"	.28		1" x 1/4 x 1/2"	
73	1-29N	CT-1-046-019-C92K				1527 3908	TRUNN	6"	.28			
74	1-167F	DO-1-058-003-S53K	TJK	12-15-82	11-18-82	510.1 744.4	Lug	26.0	.375		16"	
75	1-61E	CC-1-040-019-E33S	TJK		11-18-82	1478.17 2138.34	2 Lug	6"	.78			
76	1-61E	CC-1-048-005-A33P	TJK		11-18-82	3882 866.20	2 Lug	9.0	.322			

# WELDED ATTACHMENT LOG BOOK

NO. A-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGIN	DATE RELEASED TO ANALYST	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
77	1-378	CT-1-046-006-001	TJK	12-15-82	11/15/82	$\frac{1,017.68}{3,456.00}$	circ. lug	6.0"	0.18	pipe	5.5"	
78	1-378	CT-1-046-006-001	TJK		11/15/82	$\frac{1,218.73}{5,560.00}$	7 lugs	6.0"	0.28	lugs	2" x 6" x 1/2"	
79	1-378	CT-1-046-006-001	TJK		11/15/82	$\frac{1,785.21}{8,447.8}$	4 lugs	6.0"	0.28	lugs	3" x 1 1/4"	
80	1-378	CT-1-046-006-001	TJK		11/15/82	$\frac{1,401.55}{3,456.00}$	circ. lug	6.0"	0.18		0.25	
81	1-178B	VA-X-02-711-A127	ASPL		11/22/82	$\frac{82.1}{135.3}$	4 lugs	12"	0.06	lugs	1 1/4 x 1 1/2 x 1/4"	
82	1-087B	SF-X-006-007-F32	TJK	12-15-82	11/22/82	$\frac{790.0}{1,714.17}$	circular	10"	0.305		6.0" Wx	
83	1-165A	N78-1-06-001A-0043	ASPL		11/22/82	$\frac{916.5}{2,003}$	lug	2"	0.1571	4 lugs	1 1/2 x 1 1/2 x 1/4"	
84	1-86B	SF-X-005-030-F32	TJK		11/23/82	$\frac{776.09}{2,242.4}$	lugs	4.0"	0.365	2 lugs	1" x 3" x 6"	
85	1-178A	VA-X-05-716-A731	TJK		11/23/82	$\frac{94.58}{2,333.1}$	lug	12.0"	0.375	2 lugs	5" x 1 1/4 x 1 1/2"	
86	1-088E	H-SF-X-AB-044A-005-5	RJB	12-15-82	11/23/82	$\frac{8450}{21050}$	lugs	3/4"	0.13	2 lugs	1/4" x 1/2" x 1/2"	
87	1-088E	H-SF-X-AB-044A-003-5	RJB	12-15-82	11/23/82	$\frac{2164}{4856}$	lugs	2"	0.154	2 lugs	3/4" x 1" x 1 1/2"	
88	1-33	CT-1-014-003-S425	DHF		11-23-82	$\frac{414}{1644}$	lugs	16"	0.375	4 lugs	1 1/2 x 2 1/2 x 3/4"	
89	1-33	CT-1-014-005-S325	DHF		11-23-82	$\frac{417}{726}$	TEW	16"	0.375	Pipe	10"	
90	1-33	CT-1-014-008-S42K	DHF		11-23-82	$\frac{667}{667}$	lugs	16"	0.375	4 lugs	3/4" x 1 1/2" x 1"	
91	1-33	CT-1-014-010-S42K	DHF		11-23-82	$\frac{356}{763}$	lugs	16"	0.375	4 lugs	1 1/4" x 1 3/4" x 3/4"	

UNIT LOAD STRESS ONLY APPLIES NO NON-UNIFORM ATTACHMENT C FOR ANALYSIS THIS CONTAINS OF THE ATTACHMENT MAXIMUM STRESS

# WELDED ATTACHMENT LOG BOOK

NODE

NO. 1-?	PROB NO AB-1-?	HANGER MARK NO.	RESP ENGN	DATE RELEASED TR ANALYST	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
12	1-33	CT-1-014-016-S32k			11-23-82	611/1764	TRUNN	16"	.375	2 TRUNN	6"	
593	1-33	CT-1-014-018-S32R			11-23-82	462/822	TRUNN	16"	.375	Pipe	10"	
94	1-33	CT-1-014-025-S32k			11-23-82	133/357	TRUNN	16"	.375	20' pipe	12"	
35A	37B 29N	CT-1-048-403-C82A	vdh	1092	11-24-82	-	ANCH	6	0.28	2 TRUNN	3	
36A	37B 29P	CT-1-048-403-C82B	vdh	1132	11-24-82	-	"	6	0.28	"	3	
37A	37B 29L	CT-1-044-403-C82A	vdh	60	11-24-82	-	"	6	0.28	"	3	
598	1-61D	CC-2-009-007-A33B	NJBK		11-24-82	365/412	Lugs	10"	.365	1/4x2 1/2x3/4		
599	1-94	BR-X-178-706-R33B	NJBK		11-30-82	1055/1055	Lugs	4"	.237	8 Lugs	3/4x1 1/2x2"	
600	1-94	BR-X-178-720-R33B	NJBK		1-30-82	1055/1273	Lugs	4"	.237	8 Lugs	3/4x3/4x2"	
601												
602	1-165A	410-126-006-0003	NTPA	12-17-82	12-1-82	2165/4857	Lugs	2"	.154	4 Lugs	1 1/2x1 1/2x3/4	
603A	29P 29T	CT-1-048-411-C82A	vdh	989	12-1-82	-	ANCH	6	0.28	1 TRUNN		
604A	35A IN LINE	CT-1-039-404-C82A	ASAD	2333	12-2-82	-	ANCHOR	4"	0.237	1 TRUNN	1/2x8x8 1/2	FICTITIOUS RM = 8.2
605A	35A 35B	CT-1-038-447-C82A	ASAD	1324	12-2-82	-	ANCHOR	3"	0.216	1 TRUNN	1/2x5 1/2x8	FICTITIOUS RM = 8.2
606A	35A 35C	CT-1-124-401-C72A	ASAD/RIB	515	12-3-82	-	ANCHOR	6"	0.280	1 TRUNN	1/2x8x10	FICTITIOUS RM = 10.5

UNIT LOAD STRESS ONLY APPLIES TO NON-ANCHOR ATTACHMENTS FOR ANCHORS. THIS COLUMN REPRESENTS ACTUAL MAXIMUM STRESS



# WELDED ATTACHMENT LOG BOOK

NO. 1

NO. 1-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGN	DATE TO RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
07A	05A/05B	CT-1-029-413-C42A	ASAP/JMC	12-2-82	—	ANCHOR	4"	0.237	Circ TRUNN	R=4.125	FITTINGS RM=7.5
08A	05A/05B	CT-1-026-401-C82A	ASAP/JMC	12-3-82	—	ANCHOR	12"	0.315	FIXED 2 TRUNN	R=4.125	FITTINGS RM=16.2
09	1-290	CT-1-033-032-C925	VIB	12-2-82	7925/3245	OW SP	6"	.28	1 TR	3"	
10	1-290	CT-1-033-032-C925	VIB	12-2-82	3811/1745	SP	6"	.28	2 TR	3"	
11	1-290	CT-1-048-038-C925	PBB	12-2-82	7925/3245	SP	6"	.28	1 TR	3"	
12	1-290	CT-1-048-038-C925	PBB	12-2-82	3811/1745	SP	6"	.28	2 TR	3"	
13	19C	SI-1-045-048-542R	RJB	12-3-82	1196/2792	TRUNN	4"	.337	1 PIPE	2 1/2"	
14A	05A/05B	CT-1-046-510-C92A	UCL	12-3-82	—	ANCHOR	6"	0.28			
15	19C	SI-1-045-044-542K	RJB	12-3-82	1334/3087	TRUNN	4"	.337	1 PIPE	2"	
16	19C	SI-1-060-009-542S	RJB	12-3-82	741/1809	TRUNN	4"	.531	1 PIPE	2"	
17A	05A/05B	CF-X-021-704-A55A	RJB	12-6-82	ANCHOR	* SEE NEW PROF. SA	CALC		FOR NORM	CTING	
18A	6/B	CC-2-045-007-A43A	M. NYER	12-7-82	ANCHOR						
19A	5/A	H-25-1-AB-D06B-008-2	ASAP	1585	—	ANCHOR	2"	0.344	(FIXED) 2 TRUNN	1 1/2"	FITTINGS RM=2.35
20A	1-52A	H-25-1-5B-030-013-2	ASAP	1782	—	ANCHOR	2"	0.154	SPECIAL 1 TRUNN	1 1/2"	FITTINGS RM=2.4
21A	1-89	ER-1-544-715-A00	UCL	128	—	ANCHOR					

# WELDED ATTACHMENT LOG BOOK

NOTE

NO. 1-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGIN	DATE TO RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
22	1-61D	CC-2-009-007-A33R	ARBL		12-8-82	365 / 112	Lug	10"	.365	8 Lug	1 1/4 x 2 1/4	
23	1-57A	CC-1-215-010-C53R	ARBL		12-8-82	582 / 937	Lug	8"	.438	1 Lug	1 1/2 x 2"	
24	1-135C	SA-X-019-703-N35K	ARBL		12-8-82	190 / 1714	TRUNN	10"	.365	3 TRUNN		
25	32	SA-Y-039-011-A31R	RJB	12-23-82	12-8-82	526 / 1037	TRUNN	16"	.375	1 TRUNN	8"	
26	32	CT-1-013-013-S42K	RJB	12-23-82	12-8-82	158 / 463	TRUNN	16"	.375	2 TRUNN	10"	
27	32	CT-1-013-004-S32S	RJB	12-23-82	12-8-82	455 / 1299	TRUNN	16"	.375	2 TRUNN	8"	
28	30A	SI-1-045-030-S24	TJE	1161	12-8-82	3570 / 9506	TRUNN	4.5"	0.337	1 TRUNN	4.5 x 10	
29	30A	SI-1-300-003-S72A	TJE	1194	12-8-82	4157 / 15,517	TRUNN	4.5"	0.337	2 TRUNN	8.5 x 4.5	
30	30A	SA-X-019-701-E35A	RJB	4147	12-9-82	—	ANCHOR	10"	0.365	2 TRON	SADDLE PL	
31	31A	CC-1-215-006-C53A	TJE	41	12-9-82	11,869 / 26,260	TRUNN	3.5"	0.438	PIPE	2.5 x 4.0	
32	32A	CC-1-198-002-C53A	TJE	42	11-9-82	13,731 / 19,196	TRUNN	4.5"	0.531	TRUNN	2.5 x 6	
33	33A	CC-2-007-005-A33A	UCL	150	12-10-82	—	ANCH					
34	34A	CC-2-009-708-B33A	ASAD BE	12-14-82	12-13-82	—	ADGETOR	10"	0.365	2 TRUNN	FULL PL	"STUD"
35	1-86C	SF-X-033-010-F53R	NIBL		12-11-82	976 / 2254	Lug	10"	.365	8 Lug	1 1/2 x 2"	
36	1-165A	N-D-0-I-DG-001A-001-3	ARBL		12-11-82	2165 / 5003	Lug	2"	.154	1 Lug	1 1/2 x 1 1/2	

# WELDED ATTACHMENT LOG BOOK

NO. 2

NO. 1-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGN	DATE RELEASED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
137	163	CT-1-128-001-142E	SP	12/15/82	12-15-82	348/858	TRUNNION	10"	.365"	6" TRUNNION		
138	1-30	CT-1-006-006-S22H	TJF	12/14/82	12-15-82	525/1020	PIPE	12.75"	0.375	PIPE	O.D. = 8.625"	
139	1-30	CT-1-001-003-S22E	TJF	12/15/82	12-15-82	345/1194.0	LUGS	16.0"	0.375	LUG	2" x 1 1/2"	
140	1-30	CT-1-006-700-S22S	TJF	12/15/82	12-15-82	4145.0/1098	LUGS	12.75"	0.375	LUG	1" x 3" x 1"	SUPPLT ECLIPSE ANALYSIS HAS BEEN ADVISED
141	1-30	CT-1-005-700-S22S	TJF	12/15/82	12-15-82	257/392	PIPE	12.75"	0.375	PIPE	O.D. 8.625"	
142	1-135E	SA-1-003-001-T34S	VNC	12-14-82	12-15-82	2185/3689	ATTACH	6"	0.28	ELBOW LUG	L = 2.5	HAND CALCULATED ENERGY ALLOW
143	1-135E	ELIMINATE SA-X-019-055-T35R	VNC	12-14-82	12-15-82	396/997	- " -	10"	0.365	2 TRUNN	X = 3.312"	
144	1-135E	SA-1-001-001-T34S	VNC	12-14-82	12-15-82	1387/2805	- " -	3"	0.300	ELBOW	X = 1.437"	
145	1-135E	SA-1-003-002-T34S	VNC	12-14-82	12-15-82	1441/3319	- " -	6"	0.28	1 TRUNN	X = 2.152"	
146	1-135E	ELIMINATE SA-X-019-055-T35R	VNC	12-14-82	12-15-82	478/1954	- " -	10"	0.365	2 TRUNN	G = 5.395" C = 5.5"	
147	1-135E	MS-1-034-002-T44S MS-1-034-008-T34S	VNC	12-14-82	12-15-82	1667/1978	- " -	3"	0.300	4 LUGS	3" x 1" x 1"	
148	1-135E	SA-X-002-001-T38S	VNC	12-14-82	12-15-82	1067/2025	- " -	14"	0.375	- " -	1" x 1 1/2" x 1 1/4"	
149	1-135E	SA-X-011-001-T35S	VNC	12-14-82	12-15-82	1035/1522	- " -	8"	0.322	- " -	1" x 1 1/2" x 1 1/2"	
150	1-135E	SA-1-009-001-T35S	VNC	12-14-82	12-15-82	1096/1560	- " -	10"	0.365	- " -	1" x 1 1/2" x 1 1/4"	
151	1-135E	SA-X-094-001-T35S	VNC	12-14-82	12-15-82	1429/2401	- " -	6"	0.28	- " -	1" x 1 1/2" x 1 1/4"	



# WELDED ATTACHMENT LOG BOOK

NOTE

E NO.	PROB NO	HANGER MARK NO.	RESP ENGN	DATE TO <del>RECEIVED</del> ANALYST	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS.
652	1-8	FW-1-020-700-701-C42K	ASAD 89	12-17-82	12-17-82	92 97 99 105	ATTACH.	18"	0.937	4 LUGS	1 1/2 x 1 1/2 x 9	NORMAL/PAIR OF ENDBUCKS
653	1-8	FW-1-020-701-C42K	90a	12-17-82	12-17-82	114 237				ELBOW CIRC. TR.	12" d	FICTITIOUS R <sub>M</sub> = 11.2"
654	1-8	FW-1-020-705-C42K	91a	12-17-82	12-17-82	91 223				TWO CIRC. TR.	12" d	FICTITIOUS R <sub>M</sub> = 11.2"
655	1-6	FW-1-018-003-C62S	92a	12-23-82	12-20-82	133 67				4 LUGS	1 1/2 x 1 1/2 x 4	
656		FW-1-018-009-C72S	92b			133 167				do	do	SAME AS AM-WA-655
657		FW-1-018-016-C52K	96			40 146				2 TUBES	1 1/2 x 1 1/2 x 1/2	FICTITIOUS R <sub>M</sub> = 17.5
658		FW-1-018-703-C52R	91b	00		91 223				TWO CIRC. TR.	12" d	SAME AS AM-WA-654
659		FW-1-018-704-C72K	90b	12-23-82		114 237				ELBOW CIRC. TR.	12" d	SAME AS AM-WA-653
660		FW-1-018-706-C72K	91c	12-29-82		73 178				TWO CIRC. TR.	12" d	FICTITIOUS R <sub>M</sub> = 12.1"
661	00	FW-1-018-708-C72K	91d	12-29-82	00	65 158				TWO CIRC. TR.	12" d	FICTITIOUS R <sub>M</sub> = 12.1"
662	1-6	FW-1-018-709-C72K	91e	12-23-82	12-20-82	91 223				TWO CIRC. TR.	12" d	SAME AS AM-WA-654
663	1-7	FW-1-017-008-C72S	92c	12-27-82	12-20-82	133 167				4 LUGS	1 1/2 x 1 1/2 x 4	SAME AS AM-WA-655
664		FW-1-017-023-C72K	93			178 254				4 LUGS	1 1/2 x 1 1/2 x 3	
665	00	FW-1-017-700-C42K	00 94	00	00	108 124	00	00	00	4 LUGS	1 1/2 x 1 1/4 x 5	
666	1-7					114				ELBOW		SAME AS

# WELDED ATTACHMENTS LOG BOOK

NOTE

NO. 1-?	PROB NO AB-?	HANGER MARK NO.	RESP ENGR	DATE TO RELEASED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
67	1-7	FW-1-017-107-C72K	ASAD	12-27-82	12-20-82	91	ATTACH.	13"	0.937	TWO CIRC TR	12"φ	SAME AS AM-WA-654
68		FW-1-017-109-C73K				107				4 LUGS	12x14x5	
69	do	FW-1-017-112-C72K	do	do	do	91	do	do	do	TWO CIRC.	12"φ	SAME AS AM-WA-654
70	1-7	FW-1-017-117-C52S	ASAD	12-27-82	12-20-82	133	ATTACH.	18"	0.937	4 LUGS	12x12x4 WT 4x8x5	SAME AS AM-WA-654
71	1-16H	MS-1-101-002-C52R	ASAD		12-16-82	1137	LUG	4"	0.327		42"	SAME AS AM-WA-654
72A	2-23	CT-1-002-0103-C82K	TRK	1132	11-75-82	15.170	TWO MINIMUM	6.64	0.78		226x8	
73	1-93B	AS-1-206-700-AS2R	ASAD		12-21-82	1055	LUG	4"	0.237		1 1/2x3/4x2	
74	1-5	FW-1-019-701-C42K	ASAD	12-30-82	12-21-82	65.76	ATTACH.	18"	0.937	2 CIRC. TRUSS	12"φ	FICTITIOUS RM=11.2
75	1-165F	DO-1-047-012-C80	TRK		12-1-82	9520	LUG	3.5"	0.916	1 REJONG LUG	1/2x1x1/2	
76												
77	1-078	MS-1-73-013-C52R	ASAD		12-27-82	1842	PLATE	3"	0.3			
78	1-078	MS-1-345-003-C52K MS-1-345-002-C52S	ASAD		12/27/82	1822	PLATE	3"	0.3			
79	1-28	CT-1-012-004-S22K	ASAD	12-30-82	12-29-82	865	ATTACH.	10"	0.365	ELBOW CIRC TRUP	4"φ	
80	do	CT-1-012-005-S22K	do	do	do	641	do	10"	0.365	ELBOW CIRC TRUP	6"φ	FICTITIOUS RM=5.8
						2182				ELBOW	6"φ	

# WELDED ATTACHMENT LOG BOOK

NOTE

E NO.	PROB NO	HANGER MARK NO.	RESP ENGN	DATE TO RECEIVED ANALYST	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE + NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS	
582	1-28	CT-1-021-003-S22R	ASAD	101	12-30-82	12-29-82	1735 3621	ATTACH.	4"	0.237	ELBOW CIRC TRUD	3"φ	FICTITIOUS RM=3.1"
583		CT-1-056-008-S35S		102			1379 2958		6"	0.280	ELBOW CIRC TRUD	3"φ	
584		CT-1-012-006-S22R		103			490 2021		10"	0.365	TWO CIRC TRUD	6"φ	FICTITIOUS RM=5.9"
585		CT-1-012-007-S22K		104			442 1108		10"	0.365	TWO CIRC TRUD	6"φ	FICTITIOUS RM=5.9"
586		CT-1-021-004-S22K		105			2634 6559		4"	0.237	TWO CIRC TRUD	3"φ	FICTITIOUS RM=3.2"
587		CT-1-025-007-S22K		106			318 919		16"	0.375	TWO CIRC TRUD	6"φ	
588	CO	CT-1-056-014-S35K	CO	107	CO	CO	1759 5302	CO	6"	0.280	ONE CIRC. TR.	2 1/2"φ	
589	1-28	CT-1-020-006-S22R	ASAD	108	12-30-82	12-29-82	2446 6935	ATTACH.	4"	0.237	TWO LUGS	1"=1"x2"	
690A	91 94	BR-X-001-720-A53A	RJB		1405			ANCHOR					
691A	928 91	BR-X-056-726-A53A	RJE		1536			ANCHOR					
692A	938 928	BR-X-056-723-A53A	MI		5270			ANCHOR	4"	0.237	1	PAD	
693	1-27	CT-1-22-003-S35S	AJBL			12-29-82	2183 3689	PLATE	6"	0.28	1		
694	1-27	CT-1-009-004-S22K	AJBL			12-29-82	602 1500	TRUSS	10"	0.365	2	4" TRUSS	
695	1-27	CT-1-019-008-S32K	AJBL			12-29-82	2031 H716 942	"	4"	0.237	1	3" "	



# WELDED ATTACHMENT LOG BOOK

NO. 1-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
97	1-27	CT-1024-004-522K	AKH		12-29-82	574/977	T <sub>4</sub> ...	16"	.375	1	12"	
98	1-27	CT-1-057-13-535R	Ajal		"	1557/3749	"	6"	.280	1	3"	
99	1-75	MS-1-74-010-054K	Ajal		"	1492/5120		3"	.3	1		
00	2-67B	CC-2-158-407-A43K	TJE		12-29-82	173.0/924.0	T <sub>4</sub> ...	16"	0.375	2	8x8x1/2	
01	2-63B	CC-2-176-404-A43K	TJE		12-29-82	1034.0/2681.0	1165	12"	0.375	2	6.0 PIPE	
02	2-66B	CC-2-164-103-A43K	TJE		12-29-82	901.0/2776.0	T <sub>4</sub> ...	10"	0.365	1	1x1x1	
03	2-63B	CC-2-158-408-A43K	TJE		12-29-82	355.0/1018.0	T <sub>4</sub> ...	16"	0.375	2	8x10x3/4	
04	2-63B	CC-2-158-411-A43K	TJE		12-29-82	603.0/1735.0	T <sub>4</sub> ...	16"	0.375	1	1/2x16x11"	
705	1-76A	MS-1-151-048-C50A	FA		12-30-82	ANCHOR		4"	0.337	Two TRUN	8x6x1/2	FICTITIOUS Rm = 12.5
706	37W	CT-1-014-415-C72R CT-1-014-416-C72R	vd		12-29-82	833/2211	ATCH	16	0.375	1 TRUNN		
707	37W	CT-1-014-413-C82R CT-1-014-414-C82R	vdh		12-29-82	670/1454	- 11 -	"	"			
708	37W	CT-1-097-411-C42S	vdh		12-29-82	2185/4865	- 11 -	4	0.237			
709	37W	CT-1-014-412-C72R	vdh		12-29-82	113/335	- 11 -	16	0.328			
710	37W	CT-1-019-008-C82K CT-1-019-413-C82K	vdh		12-29-82	113/2801	- 11 -	8	0.322			
711	37W	CT-1-016-001-C82K	vdh		12-29-82	625/...	- 11 -	"	"			

# WELDED ATTACHMENT LOG BOOK

NO. 1-7	PROB NO AB-1-9	HANGER MARK NO.	RESP ENGN	DATE RECEIVED	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
712	37W	CT-1-049-006-035	vdh		12-29-81	1958/4301	ANCH	8	.322			
713	"	CT-1-014-407-025	vdh		12-29-81	288/288	"	16	.375	LUCS		
714	"	CT-1-014-431-0512	vdh		12-29-81	288/502	"	"	"	"		
715	"	CT-1-014-402-0822 -403-0815 -404-0812 -405-0815	vdh		12-29-81	296/481	"	"	"	"		
716	"	CT-1-049-132-0825 -407-0815 -408-0812	vdh		12-29-81	418/458	"	8	.0322	"		
717	"	CT-1-049-417-0822	vdh		12-29-81	636/1719	"	"	"	"		
718	"	CT-1-049-010-0822	vdh		12-29-81	731/1593	"	"	"	"		
719	"	CT-1-074-410-0822	vdh		12-29-81	956/1556	"	"	"	"		
720	"	CT-1-051-415-0822 -417	vdh		12-29-81	714/667	"	6	.020	"		
721	"	CT-1-051-415-0822 -419	vdh		12-29-81	1300/1582	"	"	"	"		
722	"	CT-1-075-406-0822 -403-0812	vdh		12-29-81	514/572	"	"	"	"		
723	"	CT-1-094-415-0815	vdh		12-29-81	603/734	"	4	.0232	"		
724	"	CT-1-097-403-0812	vdh		12-29-81	603/603	"	"	"	"		
725	"	CT-1-014-414-0812	vdh		12-29-81	889/175	"	"	"	"		
726	"	CT-1-077-415-0812 CT-1-077-412-0812 CT-1-077-415-0812	vdh		12-29-81	1635/1635	"	3	.0216	"		

# WELDED ATTACHMENT LOG BOOK

NO. 1A-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGN	DATE TO RECEIVED AUG 1987	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
727A	34B 34A	CT-1-088-700-S33H	77E	780	1-5-83	1484	TRUN	3.5"	0.216	1	3/4 x 3/4 x 9"	ANCH 110P
728A	151D 88C	SF-X-021-705-A55L	RJB	394	1-5-83	—	ANCHOR					
729	1-77	MS-1-150-002-C52S MS-1-150-004-C52S MS-1-150-002-C52K MS-1-044-005-C52K	SP		1-3-83	1484 2832	ATTACH	4"	0.337	RECT LUGS	(4) 1 1/2" x 1"	
730	1-77	MS-1-150-031-C52R	SP		1-3-83	1625 4492	ATTACH	4"	0.337	RECT LUGS	(2) 1 x 4 x 6	
731	1-77	MS-1-150-003-C52R MS-1-150-009-C52S MS-1-150-014-C52R MS-1-150-015-C52R	RJB		1-3-83	1437 7194		4"	0.337	WT.	WT 4" x 8.5 x 12" & 2 RS 2 1/4 x 3/8 x 4 1/8	
732	1-77	MS-1-150-029-C52K	RJB		1-3-83	1204 3536	TRUN	4"	0.337	2 TRUN	2 1/2" φ	
733	1-77	MS-1-150-056-C52K	RJB		12-30-83	2501 13,267	CIRC TRUN	4"	0.337	2 TRUN	2 1/2" φ	
734	1-77	MS-1-150-005-C52R	RJB	1-6-83	1-6-83	1437 7194	ATTACH.	4"	0.337	STIFF. WT	2 x 1 1/2 x 3" WT 4 x 8.5	FICTITIOUS RM = 3.5
735		MS-1-150-010-C52S	RJB	1-6-83	1-6-83	1437 7194		do	do	do	do	do
736		MS-1-150-013-C52R	RJB	1-6-83	1-6-83	1437 7194		4"	0.337	STIFF. WT	2 x 1 1/2 x 3" WT 4 x 8.5	FICTITIOUS RM = 3.5
737		MS-1-150-039-C52K	ASAD 109	1-11-83	1-11-83	2505 10,438				1 CIRC. TRUN	2 1/2" φ	FICTITIOUS RM = 2.6"
738		MS-1-150-040-C52K	110			2533 10,582				1 CIRC. TRUN	2 1/2" φ	FICTITIOUS RM = 2.6"
739		MS-1-150-020-C52R	111			1482 6499				STIFF. SEAT	RS 1 1/2" x 3" R 1/2" x 12"	
740	∞	MS-1-150-054-C52K	do 112a	do	do	742 1022		do	do	4 LUGS	3/4 x 1 x 2	FICTITIOUS RM = 2.2"
741	1-77	MS-1-150-051-C52K	AC 111 111	1-11-83	1-11-83	989 1387	ATTACH	4"	0.337	1 LUGS	1 x 1 x 1	



# WELDED ATTACHMENT LOG BOOK

1100P

NO. 1-7	PROB NO AB-1-7	HANGER MARK NO.	RESP ENGN	DATE TO RELEASE	DATE RELEASED	MAXIMUM UNIT LOAD STRESS	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
742	1-77	MS-1-150-035-052K	ASAD 114	1-11-83	1-11-83	989 1231	ATTACH	4"	0.337	1 LOGS	3/4 x 1 x 1	
743	1-77	MS-1-150-033-052K	ASAD 116	do	do	742 1022	ATTACH	do	do	do	do	SAME AS AM-WA-740
744	1-77	MS-1-150-067-052K	ASAD 115	1-11-83	1-11-83	668 2078	ATTACH	4"	0.337	4 LOGS	3/4 x 1	SKINNED SPOONERS
745A	1-77	CT-1-009-700-533A	V.C.L.	680	1-6-83	/	ANCH	3	0.216	1 ATTACH		
746A	1-77	CT-1-054-447-072A	ASAD 116	226	1-14-83	—	ANCHOR	4"	0.237	1 TRUNK	PAD 1/2 x 6 x 6	FICTITIOUS RM = 10.2"
747A	1-77	CT-1-053-404-062A	ASAD 117	345	1-14-83	—	ANCHOR	3"	0.216	1 TRUNK	PAD 1/2 x 4"	FICTITIOUS RM = 8.2"
748A	1-77	CT-1-042-401-081A	V.C.L.	1036	1-14-83	—	" - "	10"	0.365	2 TRUNK	4.58" 5.25"	
749A	1-77	CT-1-127-103-072A	V.C.L.	525	1-14-83	—	" - "	8"	0.322	2 TRUNK	4.20" 5.25"	
750A	1-77	CT-1-049-415-072A	V.C.L.	889	1-14-83	—	" - "	8"	0.322	1 TRUNK	3.262" 4.812"	
751A	1-77	SA-1-008-736-051A	V.C.L.	1144	1-21-83	—	" - "	6"	0.280	2 TRUNK	3.057" 5.187"	
752A	1-77	SA-1-007-023-134A	V.C.L.	1305	1-21-83	—	" - "	4"	" - "	1 TRUNK	3.312" 4.5"	
753	1-30	CT-1-120-002-521A	T.J.K.	2-8-83	2-8-83	—	" - "	" - "	" - "	" - "		
754A	1-30	CC-1-040-700-175A	V.C.L.	22,870	1-24-83	—	" - "	10"	0.365	2 TRUNK		
755	1-45	H-1-003-1-28-004-042	V.C.L.	3-1-83	3-1-83	4507/1117	ATTACH	3/4"	0.218	4 LOGS	1/4 x 1/2 x 1/2	
756A	1-30	CT-1-003-015-531A	T.J.K.	1406	3-1-83	—		1"	0.371			

# WELDED ATTACHMENT LOG BOOK

HODP.

IE NO. VIA-?	PROB NO AB-I-?	HANGER MARK NO.	RESP ENGN	DATE TO RECEIVED ANALYST	DATE RELEASED	MAXIMUM UNIT LOAD STRESS*	SUPPORT TYPE	PIPE SIZE	PIPE THICK.	ATT. TYPE & NUMBER OF ATTACHMENTS	ATTACHMENT SIZE	COMMENTS
757A	B2B AST	H-CS-1-RB-009- 001-2	VTC	523	3/10/83	—	ANCHOR	2 3/8"	0.154	2 TRUNN	—	
758A	1-45T 1-45B	H-CS-1-RB-003B- 003-2	VTC	1406	3/10/83	—	" "	" "	" "	" "		
759A	1-51A 1-51B	H-CS-1-RB-118-003-2	VTC	1203 8050	3/22/83	—	" "	" "	0.866"	" "		
760A	1-86A NCA	SF-X-011-02B-F45A	ASAD 118	410	5-6-83	5-2-83	ANCHOR	4"	0.237	1 TRUNN	C1=2.25 C2=3.75	FICTITIOUS RM=7.6
761A	1-87A NCA	SF-X-010-031-F45A	ASAD 119	34	5-6-83	5-2-83	ANCHOR	4"	0.237	1 TRUNN	C1=2.25 C2=5.0	FICTITIOUS RM=10.2
762A	1-64B NCA	CC-X-109-029-A65A	ASAD 120	256	5-17-83	5-11-83	ANCHOR	4"	0.237	1 TRUNN	C1=2.25 C2=3.75	FICTITIOUS RM=7.6
763A	1-52U NO-17	CS-1-454-012-552A	ASAD 121	1200	5-16-83	5-11-83	ANCHOR	3.5"	0.216	1 TRUNN	C1=1.75 C2=4.0	FICTITIOUS RM=8.2
764A	1-90 NO-17	BR-X-075-712-A53A	ASAD 122	1749 675	5-16-83	5-12-83	ANCHOR	3.5"	0.216	1 TRUNN	C1=1.75 C2=4.0	FICTITIOUS RM=8.2
765A	1-45T NO-120	CS-1-597-006-C47A	ASAD 123	3961	5-20-83	5-18-83	ANCHOR	3.5"	0.216	1 TRUNN	C1=1.69 C2=3.5	FICTITIOUS RM=7.2
766A	1-88B NCA	SF-1-016-016-C56A	ASAD 124	10	5-20-83	5-19-83	ANCHOR	4"	0.237	1 TRUNN	C1=2.24 C2=5.0	FICTITIOUS RM=10.2
767A	2-63B 2-63C	CC-2-159-413-A43A	SG	1803	—	—	ANCHOR	12"	0.375"	2 TRUNN	C1=5.15 C2=8 RM=6.19	FICTITIOUS RM=20
768	1-6,7	17-707-C72K 17-712-C72K 18-703-C72K 18-706-C72K	VIB	—	5-27-83	—	ATTCH	18"	—	2 TRUNN 17" H: 1 VL	—	ANSYS ANALYSIS
769A	1-65D NO-30B	DO-1-023-011-Y33A	S.G	—	5-27-83	—	ANCHOR	3"	.216	2 TRUNN	C1=1.72 C2=2.00	FICTITIOUS RM=5.0
770A	1-165H 1-165I	DO-1-067-023-1-1-1	ASAD	122	5-21-83	—	ANCHOR	3"	0.216	2 TRUNN	C1=1.97 C2=3.0	FICTITIOUS RM=6.2
771A	1-165C HANG 165A	DO-1-024-011-Y33A	SG	—	5-24-83	—	ANCHOR	3"	—	2 TRUNN	C1=1.723 C2=2.75	FICTITIOUS RM=5.5

## WELDED ATTACHMENT LOG BOOK

[illegible]



UNIT # 2

## HODÉ

[illegible]

٢٢

1



SMITH L BORE

[illegible]

WELDED ATTACHMENT LOG BOOK

[illegible]

**Gibbs & Hill, Inc.**

11 Penn Plaza  
New York, New York 10001  
212 760- 4438  
Telex:  
Domestic: 127636/968694  
International: 428813/234475  
A Dravo Company

June 14, 1984

GTN- 69116

Texas Utilities Generating Company  
Post Office Box 1002  
Glen Rose, Texas 76043

Attention: Mr. J. B. George  
Vice President/Project Gen. Manager

Gentlemen:

TEXAS UTILITIES GENERATING COMPANY  
COMANCHE PEAK STEAM ELECTRIC STATION  
G&H PROJECT NO. 2323  
FOLLOWUP INFORMATION FROM G&H  
REF: CYGNA COMMUNICATIONS REPORT OF 5-24-84

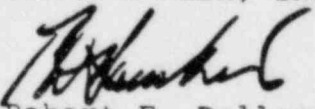
By copy of this letter to Nancy Williams of CYGNA enclosed please find the responses to the following items:

<u>Item</u>	<u>Description</u>
32	Plot regarding G&H mass point study
34	Plot regarding Relap/Ansys match-up.

Should you have any questions, please contact Henry W. Mentel.

Very truly yours,

GIBBS & HILL, INC.

  
Robert E. Ballard, Jr.  
Project Manager

~~435~~  
REBa-HWMe:sce  
1 Letter

cc: ARMS (B&R Site) OL  
N. Williams (CYGNA, Calif) 1L, 1A (Response to Item 34 only)  
L. Weingart (CYGNA, Calif) 1L 1A  
G. Grace (CPPE Site) 1L, 1A 1A (Response to Item 34 only)  
D. Wade (TUSI Site) 1L

Dravo



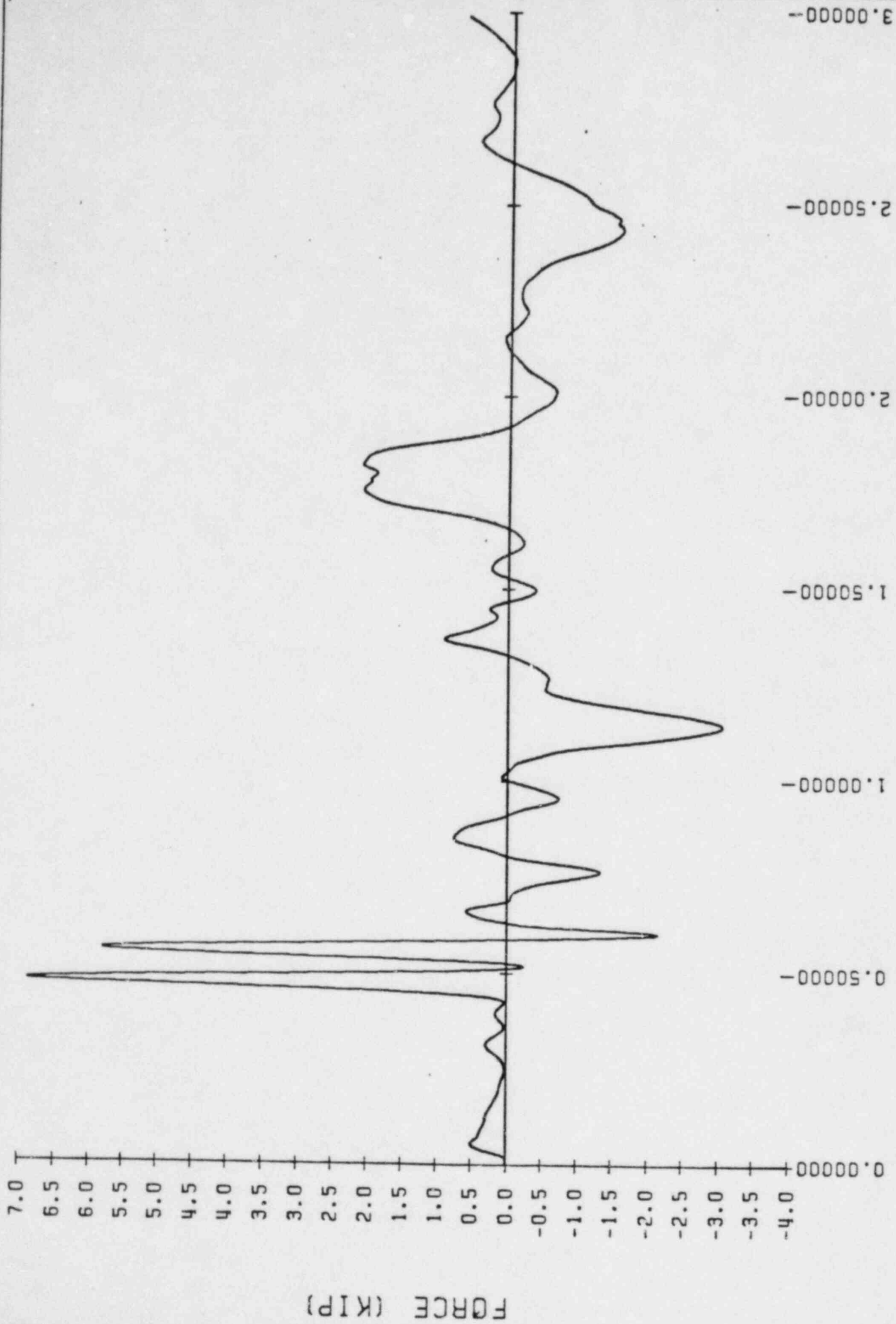
Attachment to GTN- 69116

Item 32 -

Attached is a geometry plot of the main steam loop for which a time step and mass point sensitivity study was performed. The additional degrees of freedom are marked in red.

Item 34 - Plots of axial forces on supports.

Attached are plots of steamhammer forces on axial restraints for main steam loops 1 thru 4. Also included are the plots of the net unbalanced forces for the associated legs.

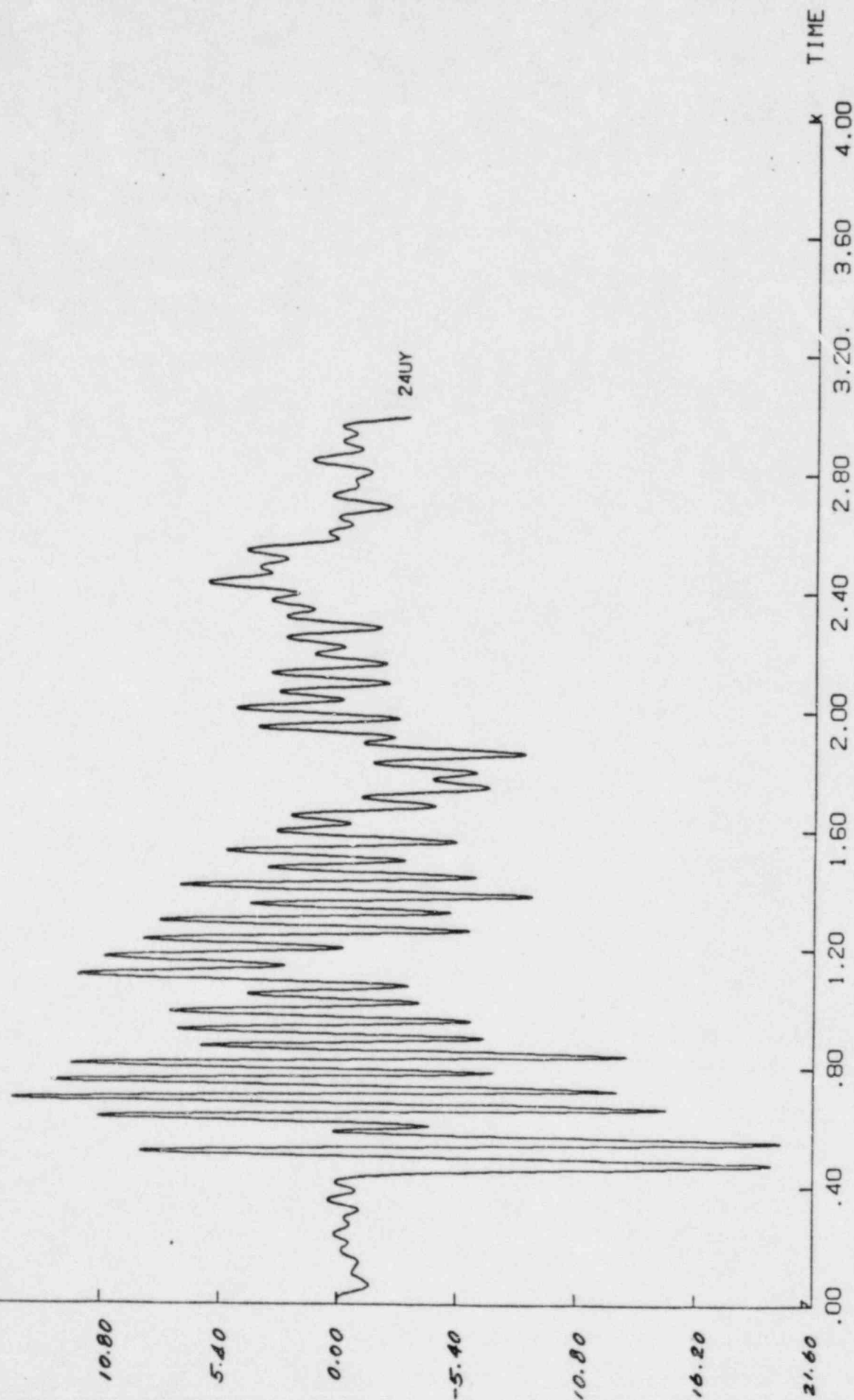


FOR NG FUNCTION = 4

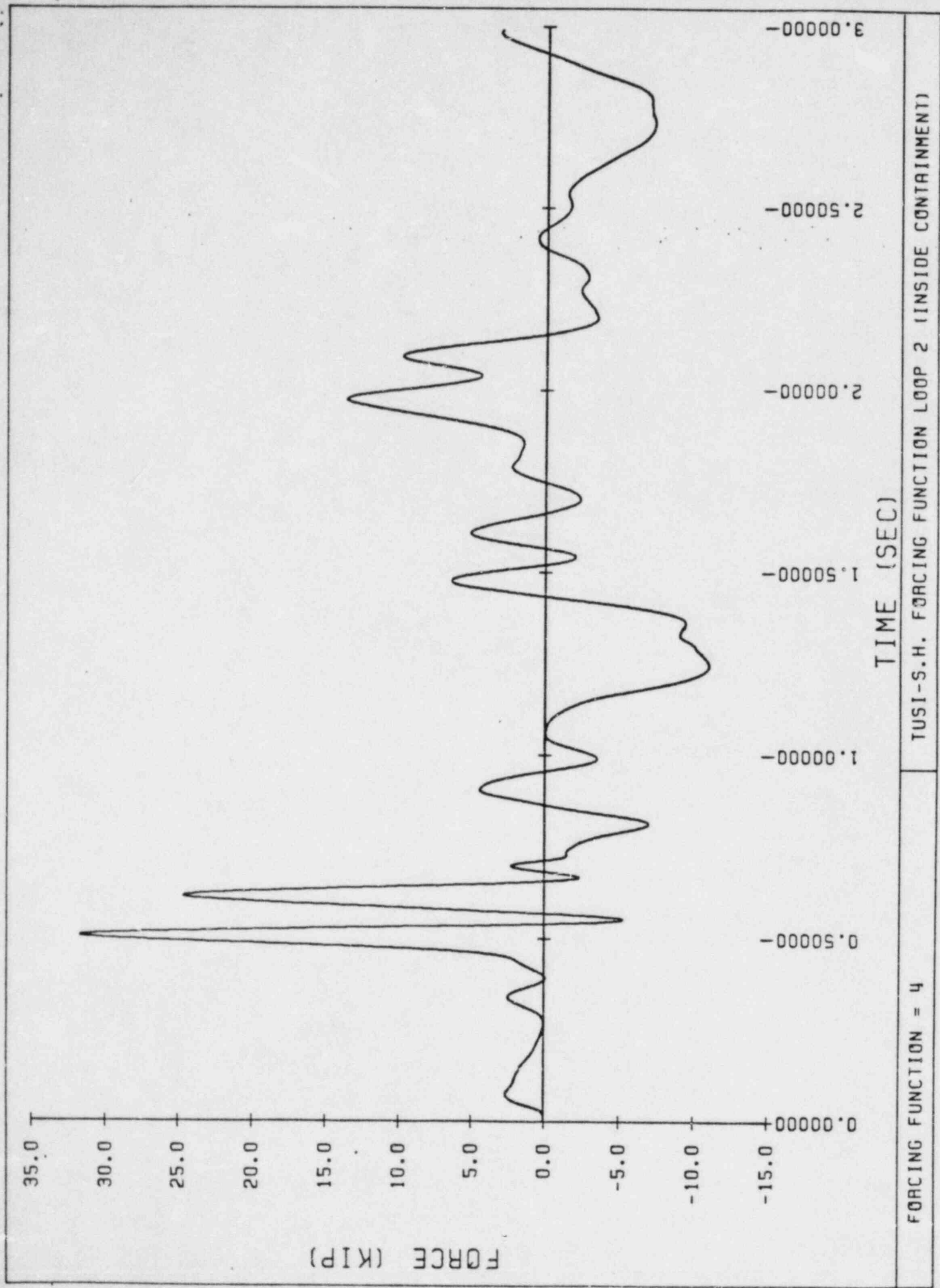
TUSI-S .FORCING FUNCTION LOOP 1 (INSIDE CONTAIN 'T)

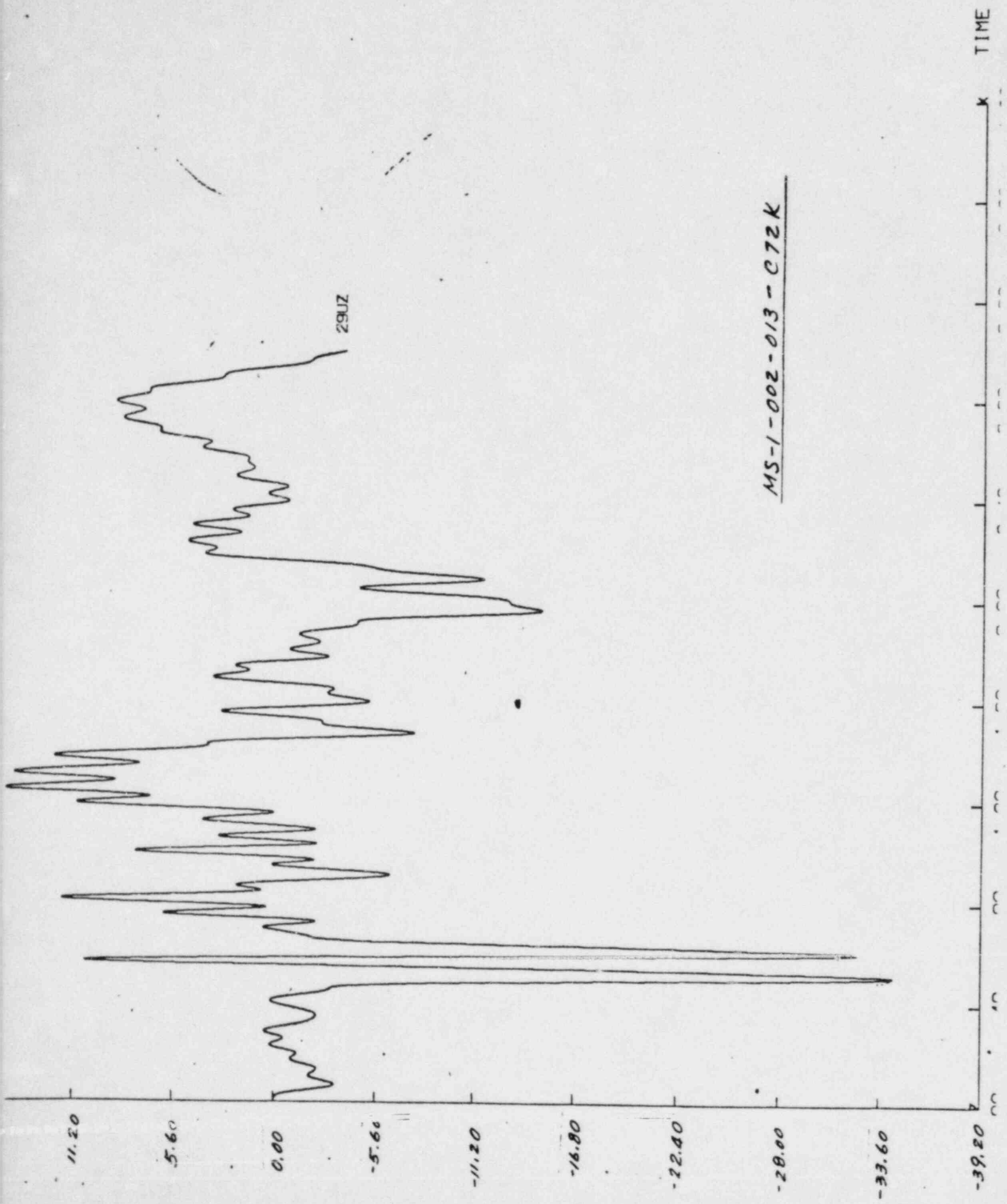
Item 34

MS-1-001-005 - C72K

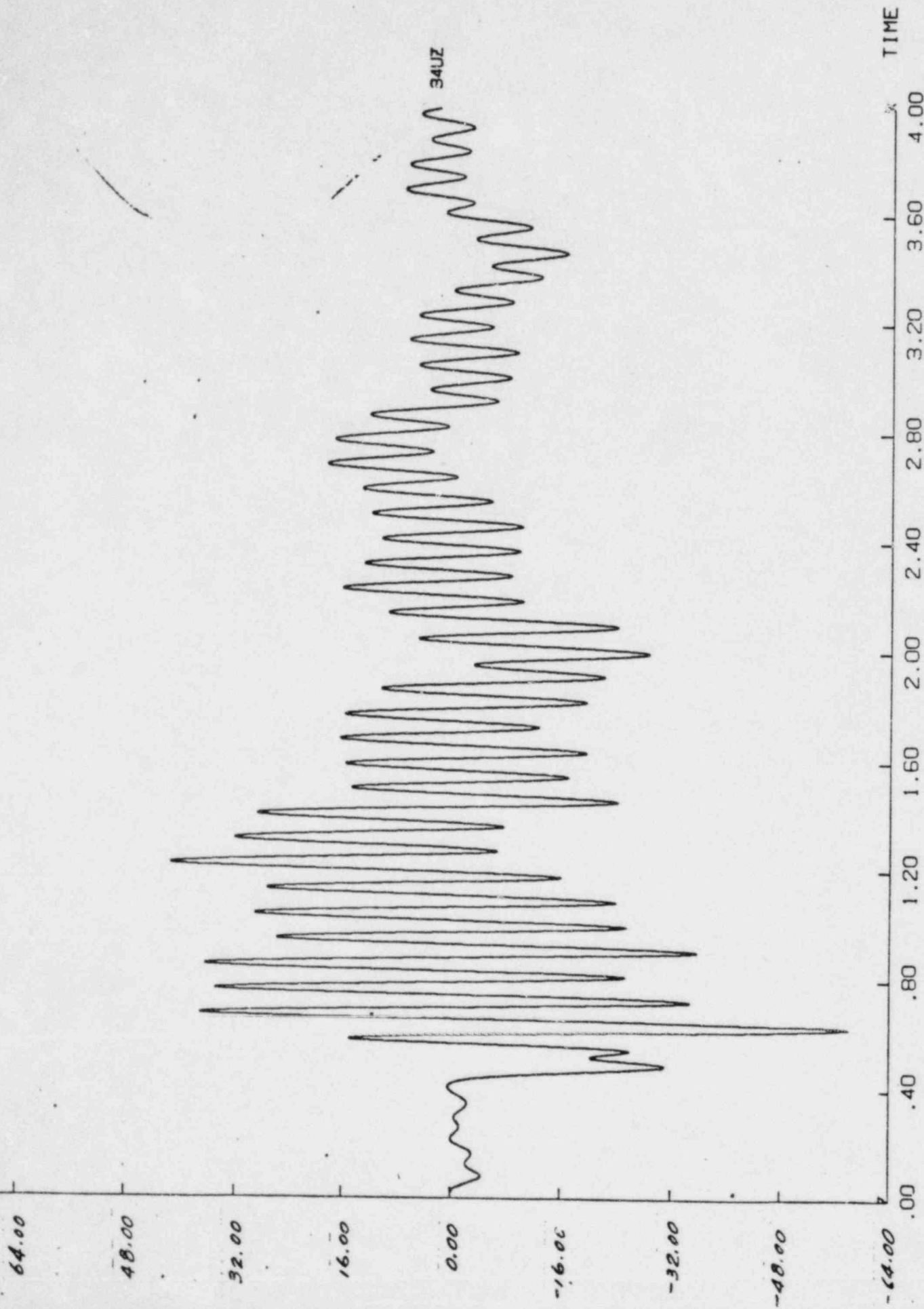






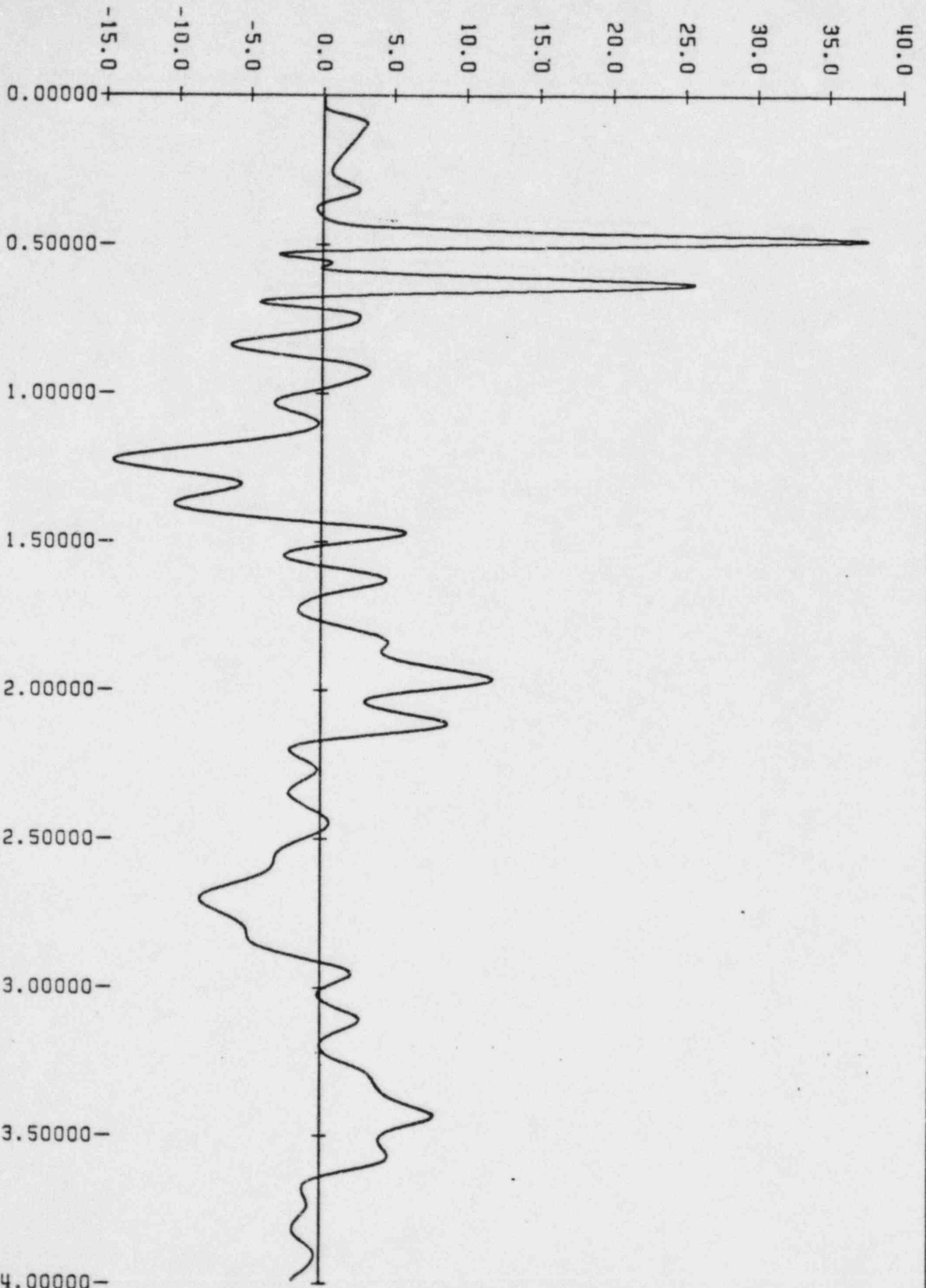


M3-1-003-010-C72K





FORCE (KIP)



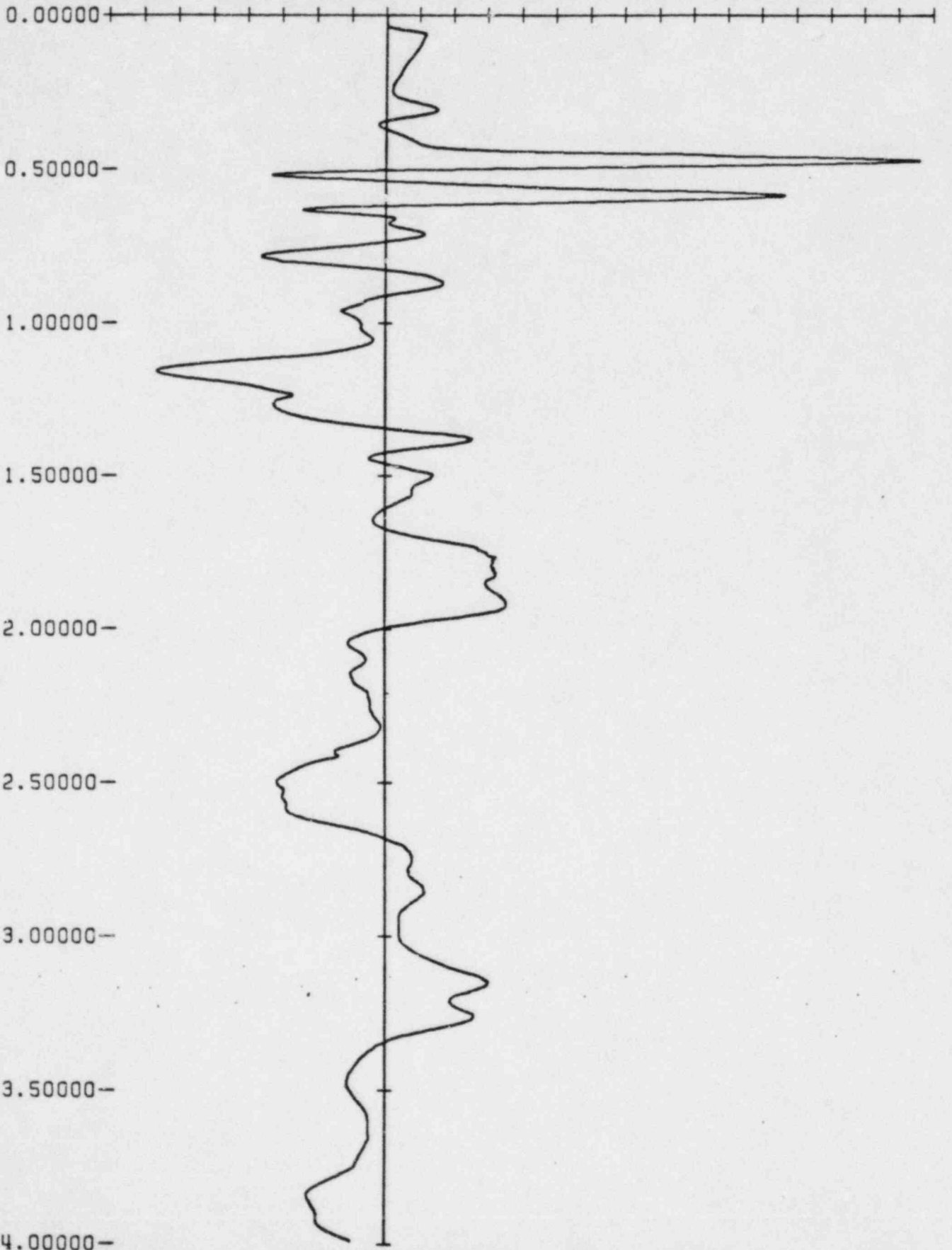
FORCING FUNCTION = 6

TUSI-S.H.FORCING FUNCTION LOOP 3 (INSIDE CONTAINMENT)

TIME (SEC)

FORCE (KIP)

8.0  
7.5  
7.0  
6.5  
6.0  
5.5  
5.0  
4.5  
4.0  
3.5  
3.0  
2.5  
2.0  
1.5  
1.0  
0.5  
0.0  
-0.5  
-1.0  
-1.5  
-2.0  
-2.5  
-3.0  
-3.5  
-4.0

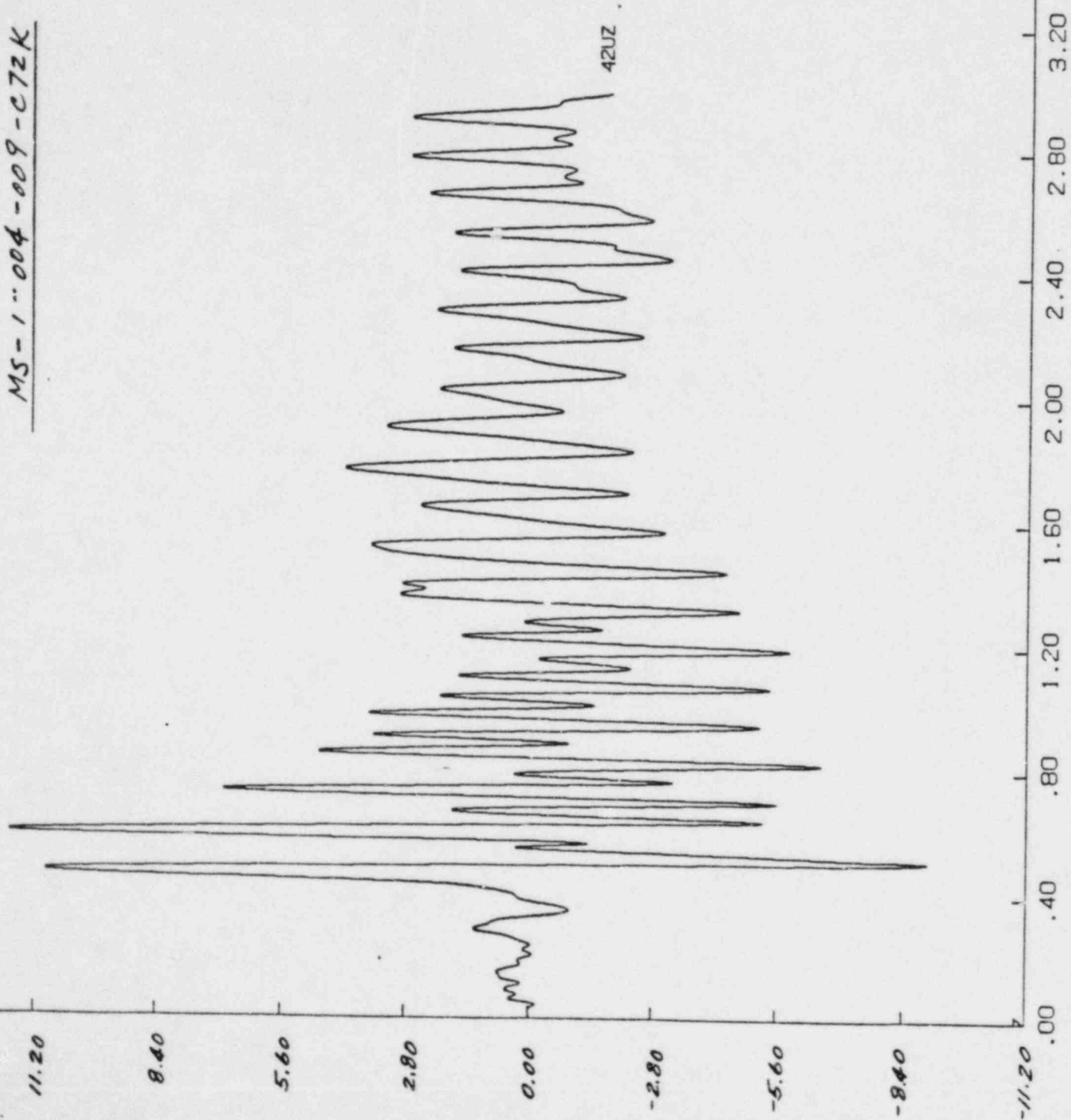


FORCING FUNCTION = 6

TUSI-S.H. FORCING FUNCTION LOOP 4 (INSIDE CONTAINMENT)

TIME (SEC)

MS-1-004-009-C72K





**Gibbs & Hill, Inc.**

11 Penn Plaza  
New York, New York 10001  
212 760- 4438  
Telex:  
Domestic: 127636/968694  
International: 428813/234475  
A Dravo Company

NOTED JUN 14 1984 N. WILLIAMS

June 5, 1984

GTN-69071

Texas Utilities Generating Company  
Post Office Box 1002  
Glen Rose, Texas 76043

Attention: Mr. J. B. George  
Vice President/Project Gen. Mgr.

Gentlemen:

TEXAS UTILITIES GENERATING COMPANY  
COMANCHE PEAK STEAM ELECTRIC STATION  
G&H PROJECT NO. 2323  
FOLLOWUP INFORMATION FROM G&H  
REF: CYGNA COMMUNICATIONS OF 5/24/84

By copy of this letter to Nancy Williams of CYGNA enclosed please find responses to Items 1, 2, 6, 10, 14, 19, 21, 23, 29 and 33 of their Communications Report, Job No. 84042 of May 24, 1984.

Should you have any questions contact Henry W. Mentel.

Very truly yours,

GIBBS & HILL, Inc.

*S. M. Mariano*

Robert E. Ballard, Jr.  
Project Manager

*J. B. George*  
REBa-HWMe:lc  
1 Letter

CC: ARMS (B&R Site) OL  
N. Williams (CYGNA, Calif.) 1L  
G. Grace (CPPE Site) 1L 1A 1L 1A  
D. Wade (TUSI Site) 1L

Attachments in 84042  
Tech. F. etc.

**Dravo**

# ITEM 1.

CYGNA	
LOG NO.:	84042
DATE LOGGED:	6/7/84
LOG NO.:	#112
FILE:	111 Sub. files
CROSS REF. FILE	111 Sub. files log (111 Mc. 6/10/84)

RECEIVED

JUN 7 1984

CYGNA - SAN FRANCISCO

AUG 25, 1978

105201420

FISHER CONTROLS COMPANY

MARSHALL TOWN, IOWA

GTT-2633

ATT: LARRY BOHNSACK/ROY BRODIN

SUB: TUGCO PURCHASE ORDER CP-0078

RESTRAINT LOADS

CONFIRMING A PREVIOUS TELECON, THE FOLLOWING ARE THE LOADS  
AND DIRECTION OF LOADS IMPOSED ON THE MAIN STEAM RELIEF VALVES  
BY RESTRAINTS:

FX=212 LBS. (PARALLEL TO THE PIPE)

FZ=45 LBS. (LATERAL TO THE PIPE)

IF YOU HAVE ANY FURTHER QUESTIONS, PLEASE DO NOT  
HESITATE TO CONTACT US.

H R ROCK/EH/DMK/MG/WRH

GIBBSHILL NY

CC: BY TELEX TUSI JOBSITE ATT: R T WOTANTEJUS

" " CONTROL ASSOCIATES - ATT: MR JOHN DINZIK

CC - Roy Brodin

1-63800

DESK

FISH CON MT

# FISHER CONTROLS COMPANY

MARSHALLTOWN, IOWA 50158

AUTOMATIC CONTROL EQUIPMENT  
SINCE 1880

Reply to: FISHER CONTROLS COMPANY, R. A. Engel Technical Center, P.O. Box 11, Marshalltown, Iowa 50158

September 15, 1978

Gibbs & Hill, Inc.  
393 7th Avenue  
New York, New York 10001

Attn: Mr. H. R. Rock  
Project Manager

Ref: Texas Utilities/Comanche Peak <sup>0</sup>  
Project 2323, P. O. CP-0600 & CP-0678

Subject: Snubber Loads

Dear Mr. Rock:

We have some questions regarding the snubber loads that G & H has furnished. The loads given are:

<u>Specimen</u>	<u>Load</u>
II*	580 lb. (parallel & perpendicular to pipe)
III*	950 lb. " " " "
V*	2350 lb. " " " "
XIA	212 lb. (parallel to pipe)
	425 lb. (perpendicular to pipe)
XII*	3600 lb. (parallel & perpendicular to pipe)

\*Telecon with Ed DeFlorio (9/11/78)  
A G & H Telex GTT-2633 (8/25/78)

We would like confirmation as to the meaning of these loads. Are they due to relative motion between the wall and valve assembly, seismic motion of the valve assembly, or both?

In our seismic analysis we input the snubber loads due to relative motion between the wall and valve assembly as a constant force. The snubber loads due to seismic inputs are determined by the computer program. Then, the resultant loads are determined and snubber size selected accordingly.



Gibbs & Holl, Inc.

Attn: Mr. E. R. Rock

Subject: Snubber Loads (continued)

Please confirm the meaning of these loads. If they are not due only to relative motion then please furnish such values.

We are at a standstill on Specimen's II, III, V, and XII until we receive the information.

Yours truly,

FISHER CONTROLS COMPANY

*Roy R. Brodin*

Roy R. Brodin  
Sr. Engineer

RRB/sa

cc: Larry Bohnsack

Pin Chang

Herb Rich

# FISHER CONTROLS COMPANY

MARSHALLTOWN, IOWA 50601

AUTOMATIC CONTROL EQUIPMENT  
SINCE 1890

October 11, 1978

(CVN 58M)

Gibbs & Hill, Inc.  
393 Seventh Avenue  
New York, N. Y. 10001

Attn: Mr. H. R. Rock  
Project Manager

SUBJECT: Submittal of September 25 and 26, 1978 Meeting Minutes for  
Your Approval.

REFERENCE: Texas Utilities Services, Inc.  
Comanche Peak Units 1 & 2  
Gibbs & Hill Specification 2323-MS-600 & 2323-MS-78  
Nuclear Safety Related Control Valves  
Fisher Order Series 1-63900; 1-63902 & 1-63500

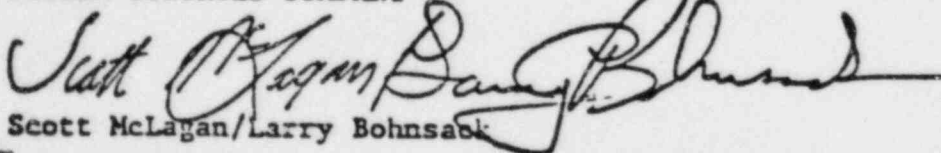
Gentlemen:

Attached is a copy of the meeting minutes from the September 25th and 26th meeting at Fisher - Marshalltown. Also attached is a copy of Herb Rich's September 25th letter that was intended to be submitted at the meeting.

If there are any comments or questions as to the contents of these minutes, please do not hesitate to contact us.

Sincerely,

FISHER CONTROLS COMPANY

  
Scott McLagan/Larry Bohnsack

SL/LB:nr

Encl.

cc - Control Associates

Attn: John Dinzik (1L)

Fisher Controls Co.

Attn: Chuck Colwell (1L)

Herb Rich (1L, 1E)

Dan Dombrosky (1L, 1E)

Roy Brodin (1L, 1E)

Dick Baumann (1L, 1E)

Larry Fleetwood (1L, 1E)

Jim Coulter (1L, 1E)

Jim Ricks (1L, 1E)

Ron Schwarz (1L, 1E)

Addressee (4L, 4E)

Texas Utilities Services, Inc. (3L, 4E)

Attn: Mr. J. B. George

Project Manager - Nuclear Plants

Brown & Root Inc. (2L)

Attn: Mr. L. A. Ashley

Texas Utilities Services, Inc. (2L, 1E)

Attn: Mr. J. T. Merritt

Carroll Graves (1L, 1E)

Ed Gibson (1L, 1E)

Richard Wolantejus (1L, 1E)

B. J. Murray (1L, 1E)

Texas Utilities Generating Company (1L, 1E)

Attn: Mr. J. C. Kuykendall

Gibbs & Hill, Inc.

Attn: Ed Deflorio (1L, 1E)

Arnaldo Adorno (1L, 1E)

S. T. Cheu (1L, 1E)

Fisher Continental

Attn: Nick Lagios (1L, 1E)

Minutes of meeting held at Fisher Controls in Marshalltown, Iowa between representatives of Fisher Controls, Texas Utilities, and Gibbs & Hill on September 25th and 26th.

ATTENDEES:

September 25

Dan Dombrosky - Fisher  
Scott McLagan - Fisher  
Roy Brodin - Fisher  
Larry Bohnsack - Fisher  
Dick Baumann - Fisher  
Larry Fleetwood - Fisher  
Carroll Graves - TUSI  
Ed Gibson - TUSI  
Richard Wolantejus - TUSI  
Ed Deflorio - G & H  
Arnaldo Adorno - G & H  
John Dinzik - Control Assoc.

September 26

Dan Dombrosky - Fisher  
Scott McLagan - Fisher  
Larry Bohnsack - Fisher  
Jim Coulter - Fisher  
Jim Ricks - Fisher  
Ron Schwarz - Fisher  
Carroll Graves - TUSI  
Ed Gibson - TUSI  
Richard Wolantejus - TUSI  
Ed Deflorio - G & H  
Arnaldo Adorno - G & H  
John Dinzik - Control Assoc.

September 25

A. Roy Brodin requested clarification of the snubber loads given to him previously by Gibbs & Hill. Roy and Ed Deflorio took this up with the applied mechanics people in New York and came up with an answer sufficient for Roy to proceed. Roy will follow-up with a letter confirming the decisions arrived at on the phone. Ltr 10/4

B. The use of 10 Mrad also prompted a discussion of the appropriate design life of elastomeric components on control valves. It was stated by Rich that Fisher's understanding of the location of all valves outside containment were either in the safeguards or auxiliary buildings other than in one high radiation zone and, therefore, the 40 Mrad normal and accident specification was an integrated dose. G & H indicated that this was not previously made clear and that, presumably, 40 Mrad could be accumulated rapidly. It was decided that Fisher would request a deviation to clarify the issue suggesting that 10 Mrad is the maximum recommended for most elastomers. Ltr 11/10/78

Footnote - A letter is attached clarifying the separation of the above issue from the NAMCO-ASCO qualification.

C. Herb Rich explained the problem of sealing of conduit in the NAMCO test program. This was the last open item before acceptance of the ASCO-NAMCO reports. Arnaldo stated that this seemed to be a generic problem with electrical conduit and he felt Gibbs & Hill had a tentative solution. He agreed that this problem was not Fisher's and therefore the ASCO-NAMCO reports were acceptable. Fisher requested written acknowledgment of the acceptance of the ASCO-NAMCO reports.

See G & H Minutes,  
Item 2.A.8 on  
page 3.



D. Fisher questioned the required action of the passive valves inside containment with Limitorque operators in case of an accident. Gibbs & Hill stated that any valve with a required function in an accident would be active and therefore passive valves had no required function during or after an accident.

E. Gibbs & Hill expressed concern over the variability of the snubber attachments Fisher might come up with. The concern stemmed from the fact that the snubber designed for may not be the one used in actuality.

Fisher agreed to attempt to design attachment with the capability of adapting to both the design size snubber and the next size smaller. Fisher will also try to design the attachment hardware such that snubber attachment points exist on all four sides of the actuator. TUSI indicated that the snubber attachment on the valve would not fall under ASME Section III, subsection NF.

F. TUSI expressed concern over the orientation of the actuator on top of the valve. Fisher explained that the only thing that might change if the actuator was rotated in the axis of orientation. It was agreed that Fisher would define the y & x axis as thru the yoke legs and perpendicular to the yoke legs respectively, rather than parallel and perpendicular to the pipe.

G. TUSI agreed to procure the snubbers for use in the test program. Fisher will inform TUSI of the requirements as quickly as possible to expedite the procurement time. TWX 10/12/7

H. Dan Dombrosky clarified Fisher's Quality Assurance Program indicating that Fisher had recently had some isolated problems in this area. TUSI agreed that this was a very legitimate concern and proceeded to setup a QA-audit for mid-October. Fisher reiterated that this was merely a clarification and should not be a concern and should be viewed that way.

September 26

Gibbs & Hill and TUSI stated that because delivery is very critical, Fisher should ship valves regardless of whether seismic testing is complete or not. They also stated that they would assume any financial risk arising from the shipment of valves before testing is complete.

Carroll Graves stressed that the control valves were now in the critical path in the construction of the plant. This being the case, any delivery delays could directly affect the scheduled start-up date.

- I. There were several open items to be resolved in the manufacturing area.
  - a. Fishers' concerns in the areas of magnetic particle acceptance criteria and hysteresis testing were answered in a wire from Gibbs & Hill prior to the 9/26 meeting.
  - b. Gibbs & Hill and TUSI approved Fisher's method of packaging valves 2" and smaller. NHS 164 was revised accordingly and signed off.
  - c. Fisher's concerns over the wording in the sequential marking requirements were clarified by TUSI. NHS 164 was revised accordingly and signed off.
  - d. Gibbs & Hill agreed to change the specification to eliminate PT of prod burns resulting from Magnetic Particle testing. NHS 164 was revised accordingly and signed off.
  - e. Fisher requested clarification of the witness and hold points required and also the notification time. TUSI agreed to investigate and inform Fisher.
- II. Dan Dombrosky expressed concern over the commercial aspects of the seismic testing program. Dan explained the new nuclear line of actuators and the fact that if time was not the most important variable, Fisher would probably elect to go to this new equipment to meet the specifications. The point was also mentioned that Fisher had stated in its original proposal that the equipment quoted was untested and any resulting equipment upgrading costs to meet the specification would be negotiated. TUSI was receptive to Fisher's comments and Dan stated that Fisher would arrive at a commercial proposal in the next several weeks and present it to TUSI and Gibbs & Hill.

#### Production

TUSI outlined the super-critical delivery items to Fisher, stating a drop-dead date of 12/31/78. Fisher gave the current status of these items and committed to do everything possible to make these dates.

TUSI got a commitment from Fisher management to do everything possible to make the dates required by TUSI.

Ron Schwarz promised to check the projected items to see if parts could be switched from less critical constructions. He stated that he would do this right away and let TUSI know any improvements.

*Scott McLagan*  
Scott McLagan

SM/cgd

# ITEM 2.

CYGNA	
JOB NO :	840112
DATE LOGGED :	6/7/84
LOG NO. :	1113
FILE :	11.1 Tech files
CROSS REF. FILE	11.1 Tech Files log
2.1.1 Inc. LR # 20	

RECEIVED

JUN 7 1984

CYGNA - SAN FRANCISCO

Incoming CPPA SMMarano/MS-20B, JIrons, KSchlask, MS-604,  
TEXAS UTILITIES SERVICES INC JCalamito, A. Adorning  
P. O. BOX 1002 - GLEN ROSE, TEXAS 76043 K.Bandyopadhyay

CPPA #19,525

Mr. R. E. Ballard  
Gibbs & Hill, Inc.  
393 Seventh Avenue  
New York, N. Y. 10001

RECEIVED

JUN 7 1982

GIBBS & HILL, INC.

May 25, 1982

Action: KSch, AA,  
KKB

KKB - Please supply  
necessary information

COMANCHE PEAK STEAM ELECTRIC STATION  
ITT-G RESONANT SEARCH TEST PROCEDURE  
NUMBER NSC/RS-001  
CP-020B and CP-604

to prepare DEC D's

024B/M1355

024B/I0334

Dear Mr. Ballard:

On May 10, 1982, Mr. Seb Marano and Mr. Kamal Bandyopadhyay of G & H and Mr. Harlan R. Deem of TUSI held a telephone conference to discuss the test results on the subject ITT-Grinnell valves. The resonant search test performed by ITT-G. failed for both the air operated and motor operated valves. The valves were to have been designed for 33hz. and the test indicated that the air operated valves could only reach 20 hz. and the motor operated valves 27 hz.

The following is a list of valves which ITT-Grinnell has yet to qualify:

1-HV-5157	Air Operated	20 hz.
1-HV-5158	Air Operated	20 hz.
2-HV-5157	Air Operated	20 hz.
2-HV-5158	Air Operated	20 hz.
1-CT-135	Motor Operated	27 hz.
1-CT-136	Motor Operated	27 hz.
2-CT-135	Motor Operated	27 hz.
2-CT-136	Motor Operated	27 hz.

Based on the resonant search test results, Kamel suggested that we look at three options. Option number 1 was to have ITT-Grinnell put gusset plates on the valves to increase the frequency to 33 hz. Option number 2 was for the site to add external bracing by means of valve supports and clamps. Option number 3 was for the stress analyst to review the valves with their given frequency and determine if the stress analysis would still be acceptable. It was mutually agreed upon that Option number 3 would be tried first.

TS/SSAG has reviewed the stress analysis reports for 1-HV-5157 and 5158 and have found them to be acceptable as is. The 1-CT-135 and 136 valves by comparison should be all right, however; we have not actually verified them at this time. The valves and piping are currently being rerouted and once the new routing is complete, SSAG will verify their acceptability.



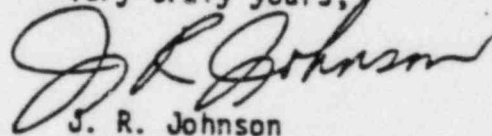
TUSI recommends that G & H proceed with obtaining necessary information from ITT-G in order to obtain final approval. TUSI will provide to G & H the loads which are applied to valves by stress analysis. The loads for 1-HV-5157 and 5158 are between 2G and 3G. We do not have the loads for 1-CT-135 and 136 valves at this time.

G & H will review the loads from SSAG for ITT-G valves and verify that the valve design parameters are still valid. G & H will then prepare a DECD to amend specifications MS-020B and MS-604.

TUSI will issue DCA to specification MS-020B and MS-604 when we have reviewed and accepted G & H's DECD.

It is imperative that the remaining work to qualify these valves be accomplished in a timely manner. The valves are waiting on shipment to the site and need the DCA to the specification before they can be released.

Very truly yours,



J. R. Johnson  
Project Mechanical Engineering

*not HCD*  
JRJ:HAH:HRD:ery

cc: ARMS  
M. R. McBay  
J. T. Merritt  
W. O. Hendley  
G. Krishnan  
D. Hicks

cc: E. Bond, A. Rutkowski, H.W. Mentel, K. Schlask, S. Marano  
FILE: ECM/AM

**Gibbs & Hill, Inc.**

Interoffice Memorandum

*- SPECIAL ANALYSIS G&H*  
TO: Kamal Bandyopadhyay      DATE: February 17, 1983  
*APPLIED MECHANICS G&H*  
FROM: S. Lim      JOB NO: 11-2323-030  
SUBJECT: "g" Loads on Flexible      REF. NO: AM-M-4379  
Valves

Please find attached the "g" loads for the following four valves identified by ITT Grinnell with first natural frequencies less than 33 hz:

- a. 1-HV-5157
- b. 1-HV-5158
- c. 1-CT-135
- d. 1-CT-136

The results indicate that the above mentioned valves are subjected to less than 3 "g" horizontally and less than 2 "g" vertically.



SL:ecm



**Gibbs & Hill, Inc.** Job No. 11-2323-030 Client TUSTI - CPSES

Subject FLEXIBLE VALVE "g" LOADS

Calculation Number

Sheet No.

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	MD	2/16/83								
Checker	MD	2/16/83								

FLEXIBLE VALVE "g" LOADS:

	1-HV-5157		1-HV-5158		1-CT-135		1-CT-136	
	1/2 SSE "g"	SSE "g"	1/2 SSE "g"	SSE "g"	1/2 SSE "g"	SSE "g"	1/2 SSE "g"	SSE "g"
X-dir	2	2.9	1	1.5	2.25	2.75	1.5	1.75
Y-dir	0.5	0.5	0.25	0.25	0.5	0.5	0.5	0.5
Z-dir	2.25	2.75	0.75	1.25	1.25	1.25	1.75	2.0

NOTE:

Coordinate System Used:



FLEXIBLE VALVE IDENTIFICATION:

G&H Valve Tag. No.	1-HV-5157	1-HV-5158	1-CT-135	1-CT-136
ITT Grinnell Valve Dwg. No.	SD-C-105925	SD-C-105925	SD-C-105690 Rev. A	SD-C-105690 Rev. A
Description	4" diaphragm valve	4" diaphragm valve	3" diaphragm valve	3" diaphragm valve
Test Report No.	3433/0	3433/0	3416/0	3415/0
G&H Stress Pb. No.	1-174	1-175	1-34A	1-34A
System	Cont. Spray	Cont. Spray	Vents & Drain	Vents & Drain

REBallard/MS-20B, OUTGOING, MSMiller, AKiwi/860.2716,  
XOMoore, KKBandyopadhyay, KSchlask, EJBond

A LITKO COMPANY

May 3, 1983

GTN- 65374

Texas Utilities Generating Company  
Post Office Box 1002  
Glen Rose, Texas 76043

Attention: Mr. J. B. George  
Vice President/Project Gen. Mgr.

Gentlemen:

TEXAS UTILITIES GENERATING COMPANY  
COMANCHE PEAK STEAM ELECTRIC STATION  
G&H PROJECT NO. 2323  
09410 DEVIATION REQUESTS  
DE/CD S-2716, Rev.1  
SPECIFICATION 2323-MS-20B

Enclosed for your review is a copy of Design Engineering  
Change Deviation Request number S-2716, R.1. Please  
inform us of your disposition of this request.

All recipients of this letter are advised that authorization  
from TUSI is required before proceeding with the action noted  
herein.

Very truly yours,

GIBBS & HILL, Inc.

REBa- *le* KKM:lc  
1 Letter + 1 Attachment  
CC: ARMS (B&R Site) OL + OA

*Robert E. Ballard, Jr.*  
Robert E. Ballard, Jr.  
Project Manager



DESIGN/ENGINEERING  
CHANGE/DEVIATION REQUEST

☒ NUCLEAR SAFETY-RELATED

☐ NON-NUCLEAR SAFETY RELATED -  
QA PROGRAM APPLICABLE

☐ NON-NUCLEAR SAFETY RELATED

G&H Job. No. 11-2323-056

DE/CD Request No. S-2716

Rev. 1

Requested By: G&H ☐ Client ☒ Field ☐ Vendor ☐ FROM

CPPA-19525 (JRJohnson)

Reference Document AM Memo AM M-4379 Rev. - Date 2/17/83

Documents Affected: G&H Specification 2323-MS-20B, Rev. 1 & Addendum 1

DESCRIPTION OF CHANGE/DEVIATION REQUESTED:

See attached

ENGINEERING JUSTIFICATION FOR ABOVE:

The motor-operated valves have a resonance frequency below 33 Hertz.

REQUEST PREPARED BY: K.K. Bandyopadhyay Title Sr. Eng'r Date 4/27/83

INTERDISCIPLINE REVIEWS

	Initials	Date
Structural		
Mechanical	KSch	4/27/83
Electrical	PRAC	4/28/83
QA		
AM	AMH	4-27-83
RWHS	Da	4-28-83

Design Reviewer/Engineer Completes This Section

1. Is this a significant deviation or error? YES ☐ NO ☐
2. Is this a recurring deviation or error? YES ☐ NO ☐

Design Reviewer Completes This Section

Design Verification: Approved ☒ Not Approved ☐

Design Review Eng. R. Mammala Date 4/27/83

Job Engineer Completes this Section

1. Is change potentially reportable under 10CFR21? YES ☐ NO ☒
2. Is change in compliance with BTP-ETSB 11-17 YES ☒ NO ☐ NA ☐
3. Applicable DCRP \_\_\_\_\_ Date \_\_\_\_\_

CHANGE/DEVIATION REQUEST:

Approved ☒ Not Approved ☐

Approved ☒ Not Approved ☐

J. E. [Signature] Date 4/27/83

Project Manager [Signature] Date \_\_\_\_\_

Description of Change/Deviation Requested

Revise G&H Specification 2323-MS-20B, Rev. 1 and Add. 1, as follows:

Revision 1 - Page 3-31, Paragraph 3.7.9.3.c (Addendum 1, page 5 of 7, Item 13, Renumbered Paragraph 3.7.9.4.b) - Rewrite the entire paragraph as follows:

If the valve assembly has a fundamental natural frequency of 33 Hertz or greater, the manual, motor-operated and self-actuated Saunders patent type steel valves shall be designed to withstand seismic forces resulting from accelerations of 3g in each of the two horizontal directions and 2g in the vertical direction caused by the Safe Shutdown Earthquake (SSE). The corresponding Operating Basis Earthquake (OBE) g-values shall be 2.25g and 1.5g. If the fundamental natural frequency of the valve assembly is less than 33 Hertz, the Seller shall provide all natural frequencies below 33 Hertz and applicable mass and stiffness data. This data will be incorporated in the supporting pipe system analysis, and the above mentioned g-values will be verified (by others). If the resulting acceleration levels exceed the g-values mentioned above, the Seller will be so notified, and the Seller shall qualify the equipment for the new g-values, otherwise, above listed g-values shall be used for qualification of the equipment. In all cases, the two (2) horizontal and vertical seismic accelerations shall be assumed to act simultaneously, with the resulting stresses, deflections, etc., obtained by the (SRSS) square root of the sum of the squares technique. The equipment function shall not be impaired by the SSE.

Revision 1 - Page 3-31, Paragraph 3.7.9.3.f (Addendum 1, page 6 of 7, Item 14, Renumbered Paragraph 3.7.9.4.e) -

Delete the entire paragraph.

- 2d. Documentation or a stress run for the 8-inch relief valve lifting only, does not exist. Upon reviewing the analysis, it shows that the thrust force of the relief valve is divided based on the stiffnesses of the support and of the pipe. The residual internal force in the pipe reacts at the penetration anchor in addition to the residual internal force from the safety load.

CYGNA	
B NO :	84042
TE LOGGED:	6/7/84
G NO.:	H114
LE:	11.1 Tech. Files
	11.1 Tech. Files 109
	2.1.1 Int. (11.1.10)

REVISED G & H RESPONSE  
RE ~~MSR~~ MSRV RESTRAINT  
LOAD.

JUN 7 1984

CYGNA - SAN FRANCISCO

ITEM 10



CYGNA

JOB NO :

DATE LOGGED:

LOG NO. :

DESIGN REVIEW FILE:

RECORD FORM CROSS REF. FILE

Texas Utilities Services, Inc. Comanche Peak S.E.S.  
CLIENT PROJECT

2222  
Gen Job No.

Title: Seismic Relative Displacement for Main Steam  
Lines

☐ Drawing

☒ Calculation

☐ Specification

DRB-1C, set 3  
DOCUMENT NO.

0  
REVISION NO.

2/11/83  
DATE

RS

COMMENTS ARE AS NOTED ON DOCUMENT SHEETS LISTED BELOW EXCEPT AS  
STATED HEREIN:

REQUIRED ACTION

NO ACTION REQUIRED

Frank Kodak  
DESIGN REVIEW ENGINEER

2-11-83  
REVIEW DATE

REQUIRED ACTION SATISFACTORILY COMPLETED

YES ☐ NO ☐

COMMENTS

RECEIVED

JUN 7 1984

DESIGN REVIEW ENGINEER

REVIEW DATE

CYGNA - SAN FRANCISCO

## DESIGN REVIEW PROCEDURE

## SPECIAL ANALYSIS CHECKLIST-CALCULATIONS

JOB NO. 2323

CALC. NO. DR8-1C, Set 3

REV. NO. 0

TITLE Seismic Relative Displacements for Main Steam Lines

ITEM	CONSIDERATION
1. USNRC "Current Events-Power Reactors" and "Operating Experience" records have been considered, where applicable (Ref. Job Engr.)	✓
2. Scope: covers all intended work, no interface gaps, no overlaps (Ref. Project Guide)	✓
3. Assumptions are listed, clearly defined and reasonable	✓
4. Items to be re-verified, later in design, identified	NA
5. References, including other calculations and sources, are listed	✓
6. A description of the appropriate methods of analysis and design is included (Ref. FSAR)	NA
7. Formulae and equations are applicable and defined FSAR SECT 3.7B.2.5	✓
8. Mathematical check indicates satisfactory solution	✓
9. Conforms to applicable specification	NA
10. Loads and load combinations are correct (Ref. FSAR) (including Environmental Considerations)	NA
11. Deflections and displacements are suitable and reasonable (Interface with other disciplines)	✓
12. Compatible with equipment information (Loads, Dimensions)	NA
13. Description of materials included (Ref. FSAR)	NA
14. Compatible with soil properties (Ref. FSAR and Soils Report) FSAR SECT 3.7B.1.1	✓
15. Compatible with related drawings	✓
16. Conforms to FSAR	✓
17. Specific references to codes and standards are included and conforms thereto (Ref. FSAR and Project Guide)	NA
18. Conforms to Structural Design Criteria	NA
19. Interface with other disciplines has been accomplished	✓
20. Properly indexed and filed	✓
21. Additional for Computerized Calculations:	
a. Proper Computer Program (Ref. FSAR) has been approved for use	NA
b. Data Input, Assumptions and Model are listed, defined and are satisfactory	NA
c. Interpretation of Output is included	NA
d. Check results for reasonableness; preferably verified by simplified parallel check (Ref. FSAR)	NA

NOTE: Design reviewer's signature confirms that design reviewer has considered each item on the checklist.

✓ Signifies design reviewer's completion of review

NA Not Applicable

Design Reviewer's Signature

Frank Kozah

Date

2/11/83

Design Reviewer's Name

FRANK

KOZAH

# Calculation Cover Sheet

G&amp;H Job No. 2323

Client TUSI

Calculation Number DB8-1C; set 3

Number of Sheets in Original Issue 9

Subject seismic relative Displacements for Main Steam Lines

- ☒ Nuclear Safety Related  
☐ Non-Nuclear Safety Related—QA Program Applicable  
☐ Non-Nuclear Safety Related

	Sheets Deleted	Sheets Added	Sheets Revised	Job Engineer	
				Signature	Date
Original				<i>[Signature]</i>	5/1/81
Revision					

**Gibbs & Hill, Inc.** Job No. 2323 Client TUCI  
 Subject Seismic Relative Displacements for Main Steam Lines  
 Calculation Number DRB-1C, Set 3 Sheet No. 1

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	WT	2/9/83								
Checker	RDP	2-11-83								

## Introduction

Seismic relative displacements for the main steam lines were requested by Applied Mechanics (see memo AM-M-4337 dated 2/8/83) for the piping analysis.

The main steam lines run between the Containment Bldg. and the R.B. Internal structure. To calculate less conservative relative displacements between these two structures, modal displacements obtained from the seismic analysis must be considered. The calculation is shown on the following pages.



**Gibbs & Hill, Inc.** Job No. 2323 Client TUSI  
 Subject Seismic Relative Displacements for Main Steam Lines  
 Calculation Number DRB-1C, Set 3 Sheet No. 2

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	WT	2/9/83								
Checker	EDP	2-10-83								

### References :

1. Computer output files DRB-12 P, Rev. 0 ( $\frac{k}{4}$ , Cracked Model)
2. " " DRB-13 P, Rev. 0 ( $\frac{k}{4}$ , Uncracked)
3. " " DRB-14 P, Rev. 0 ( $k$ , Cracked)
4. " " DRB-15 P, Rev. 0 ( $k$ , Uncracked)
5. " " DRB-16 P, Rev. 0 ( $2k$ , Cracked)
6. " " DRB-17 P, Rev. 0 ( $2k$ , Uncracked)
7. Reactor building Seismic Analysis, calculation Book no DRB-1C, Set 1, Rev. 0
8. Relative Displacements for TUSI Buildings, G+H report dated sept. 1975

From memo AM-M-4367 dated 2/8/83

Main steam line	Loop 1 & 4	EL. 877'-5"	Cent. Bldg.
		EL. 890'	Inter. str.
	Loop 2 & 3	EL. 877'-5"	Cent. Bldg.
		EL. 893'-9"	Inter. str.

Gibbs &amp; Hill, Inc.

Job No. 2323

Client TUSI

Subject Seismic Relative Displacements for Main Stem Lines

Calculation Number D2B-1C, set 3

Sheet No. 3

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	WT	2/10/83								
Checker	RDP	2-10-83								

Model	Earthquake Direction	Dominating Mode	Modal Displacements (feet)				Relative Displ. (feet)
			El. 893.25' Mass 4 (1)*	El. 834.75' Mass 5 (2)*	El. 877.42' Interpolated (3)*	El. 895.33' Mass 6 (4)*	
V/4 Cracked Model (Ref. 1)	X	2	0.03229	0.01182	0.02675	0.01327	0.01348
	Z	1	0.03235	0.01185	0.02680	0.01369	0.01311
	Y	5	0.00065	0.00049	0.00061	0.00082	+ 0.00021
		6	0.00749	0.00546	0.00694	0.00443	0.00251 <u><math>\Sigma = 0.00272</math></u>
V/4 Uncracked Model (Ref. 2)	X	2	0.02833	0.01189	0.02358	0.01836	0.00552
	Z	1	0.02845	0.01195	0.02399	0.01928	0.00471
	Y	4	0.00350	0.00300	0.00336	0.00370	+ 0.00034
		5	0.00320	0.00274	0.00308	0.00217	0.00091 <u><math>\Sigma = 0.00125</math></u>

\* (1), (2) and (4) are taken from the references  
 (3) is interpolated between (1) and (2)  
 (5)  $\equiv$  absolute value of (3) - (4)

Checking Method #

1 Line-by-line checking  
 2 Alternative Calculation Results compared  
 3 Identical Calculation Results compared  
 4 Compare inputs and results of computer with corresponding inputs and results of similar codes

F-166, 7-82

Gibbs &amp; Hill, Inc.

Job No. 2323

Client TUSI

Subject Seismic Relative Displacement for Main Stream Lines

Calculation Number DRG - 1C, set 3

Sheet No. 4

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	WT	2/10/83								
Checker	A-D P	2-10-83								

Model	Earthquake Direction	Dominating Mode	Modal Displacements (feet)				Relative Displ. (feet)
			El. 893.25' Mass 4 (1)	El. 834.75' Mass 5 (2)	El. 877.42' Interpolated (3)	El. 895.33' Mass 6 (4)	
10K Cracked Model (Ref. 3)	X	2	0.02206	0.00651	0.01785	0.00300	0.01485
	Z	1	0.02208	0.00652	0.01787	0.00312	0.01475
	Y	8	0.00373	0.00167	0.00317	0.00059	0.00258
		12	0.00017	0.00043	0.00024	0.00107	$\frac{+0.00083}{2=0.00341}$
20K Cracked Model (Ref. 5)	X	2	0.02024	0.00565	0.01644 <sup>29</sup>	0.00144	0.01497 <sup>25</sup>
	Z	1	0.02025	0.00566	0.01650	0.00150	0.01480
	Y	8	0.00291	0.00113	0.00243	0.00021	0.00222
		16	0.00008	0.00009	0.00009	0.00048	$\frac{+0.00039}{2=0.00261}$

Results for model K, Uncracked and 2K, Uncracked are not critical  
 Columns (1) to (5) are explained on page 3

Checking Method #

1. Line-by-line checking
2. Alternative Calculation Results compared
3. Identical Calculation Results compared
4. Compare inputs and results of computer with corresponding inputs and results of similar codes

F-166, 7-82

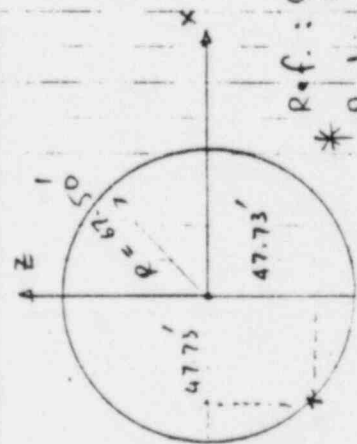
Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	WT	2-11-83								
Checker	ROP	2-11-83								

Calculation of vertical displacements due to rockings

Model	Earthquake Direction	Dismissing Mode	Modal Displacements (Rocking)				Relative Modal Displ (5)	Vertical Disp. (feet) (6)	
			(1)	(2)	(3)	(4)			
K/4 Cracked Model (Ref. 1)	X	2	El. 893.25' Mass 4	El. 834.75' Mass 5	El. 877.42' Interpolated	El. 893.33' Mass 6	0.000120	0.00573	
		5	-0.000248	-0.000157	-0.000223	-0.000103	0.000058	0.00277	
	Z	1	0.000249	0.000157	0.000224	0.000103	0.000121	0.00578	
		4	0	0	0	0.000060	0.000060	0.00286	
K/4 Overcracked Model (Ref. 2)	X	2	-0.000218	-0.000162	-0.000203	-0.000140	0.000063	0.00301	
		4	0	0	0	-0.000020	0.000020	-0.00045	
	Z	1	0.000219	0.000163	0.000204	0.000142	0.000062	0.00296	
		3	0	0	0	0.000040	0.000040	0.00191	
								20.00850	0.00396

Columns (1) to (5) are explained on page 3

Column (6) = Column (5) \* 47.73'



Ref.: Calculation book no. DRB-1C, Set 1  
 Rev. 0, page 1/13  
 \* Packing arm = 47.73'

Note: The other Modal Results are not significant



Subject seismic Relative Displacements for Main Steam Lines

Calculation Number DRB-1C, set 3

Sheet No. 6

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #										
Preparer	WT	2/19/83								
Checker	RD P	2-10-83								

Summary of the resultsMax. relative displacement due to x-EQK = 0.01485' (in x-direct<sup>n</sup>)

z-EQK = 0.01480 (in z- )

Assuming that the contribution due to other 2 earthquakes and their coupling effects is 80% (a very conservative number)

$$\text{Total rel. displ. in x-direction} = [0.01485^2 + (0.80 \times 0.01485)^2]^{1/2}$$

$$= 0.01902'$$

$$\text{z-direction} = [0.01480^2 + (0.80 \times 0.01480)^2]^{1/2}$$

$$= 0.01895'$$

$$\text{Max. relative displacement in y-direct}^n = [0.00341^2 + 0.00850^2 + 0.00864^2]^{1/2}$$

y-EQK
x-EQK
z-EQK

$$= 0.01260'$$

Assuming that the coupling effects due to the other earthquakes is 50% (very conservative).

$$\text{Total rel. displ. in y-direction} = [(0.01260)^2 + (0.50 \times 0.01260)^2]^{1/2}$$

$$= 0.01409'$$

Final relative displacements

$$\text{In both x and z-direction} = 0.01902'$$

$$= 0.23'' \quad \text{USE } \underline{\underline{0.26''}}$$

$$\text{In y-direction} = 0.01409'$$

$$= 0.1691'' \quad \text{USE } \underline{\underline{0.17''}}$$

Gibbs & Hill, Inc. Job No. 2323 Client TUSI  
 Subject seismic Relative Displacements for Main Steam Lines  
 Calculation Number DRB-1C, set 3 Sheet No. 7

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	WT	2/10/83								
Checker	RDP	2-10-83								

### Comparison of results

From the report on Relative Displacements of TUSI structures (Ref. 8), calculate relative displacements at elevation 877.42' for Containment bldg. and elev. 895.35' for R.B. Internal Str.

#### Reactor Building Internal Structure

From Ref. 8 pages 9, 10, 11 (elev. 895.35') (elev. 797.75')

Due to X-EOK; SSE  $x = 0.248' - 0.057" = 0.191$

$y = 0.123 - 0.096" = 0.027$

$z = 0.038 - 0.012" = 0.026$

Due to Y-EOK; SSE  $x = 0.015 - 0.002" = 0.013$

$y = 0.078 - 0.064" = 0.014$

$z = 0.027 - 0.004" = 0.023$

Due to Z-EOK; SSE  $x = 0.056 - 0.011" = 0.045$

$y = 0.118 - 0.099" = 0.019$

$z = 0.278 - 0.056" = 0.222$

SRSS's values

$$x = [0.191^2 + 0.013^2 + 0.045^2]^{1/2} = 0.1965"$$

$$y = [0.027^2 + 0.014^2 + 0.019^2]^{1/2} = 0.0359"$$

$$z = [0.026^2 + 0.023^2 + 0.222^2]^{1/2} = 0.2247"$$

**Gibbs & Hill, Inc.** Job No. 2323 Client TUCI  
 Subject Seismic Relative Displacements for Main Steam Line;  
 Calculation Number DRB-1C; Set 3 Sheet No. 8

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	WT	2/10/83								
Checker	ESP	2-10-83								

### Containment Reactor Building

From Ref 8; pages 6, 7, 8 (elev. 877.42') (elev. 797.75')

Due to x-EQX  $X = 0.340'' - 0.057'' = 0.283''$

$Y = 0.210'' - 0.096'' = 0.114''$

$Z = 0.050'' - 0.012'' = 0.038''$

Due to y-EQX  $X = 0.010'' - 0.002'' = 0.008''$

$Y = 0.090'' - 0.064'' = 0.026''$

$Z = 0.007'' - 0.004'' = 0.003''$

Due to z-EQX  $X = 0.060'' - 0.011'' = 0.049''$

$Y = 0.200'' - 0.099'' = 0.101''$

$Z = 0.340'' - 0.056'' = 0.284''$

### RSS's values

$X = [0.283^2 + 0.008^2 + 0.049^2]^{1/2} = 0.2873''$

$Y = [0.114^2 + 0.026^2 + 0.101^2]^{1/2} = 0.1545''$

$Z = [0.038^2 + 0.003^2 + 0.284^2]^{1/2} = 0.2865''$

For out-of-phase displacements between 2 structures

$X = 0.2873 + 0.1965 = 0.4838''$

$Y = 0.1545 + 0.0359 = 0.1904''$

$Z = 0.2865 + 0.2247 = 0.5112''$

} much higher than  
mode-by-mode displ.

Note that the displacements given in Ref. 8 are for individual structures only, phase relationship between buildings can not be determined. Therefore, only out-of-phase movements must be assumed. These results are always conservative as compared with the mode-by-mode displacements.

Checking Method #

1. Line-by-line checking
2. Alternative Calculation Results compared
3. Identical Calculation Results compared
4. Compare inputs and results of computer with corresponding inputs and results of similar codes

F-166, 7-82

**Gibbs & Hill, Inc.** Job No. 2323 Client TUSI  
 Subject Seismic Relative Displacements for Main Steam Lines  
 Calculation Number DMI-1C, Set 3 Sheet No. 9

Revision	Original Issue	Date	Rev.	Date	Rev.	Date	Rev.	Date	Rev.	Date
Checking Method #	1									
Preparer	WT	2/11/83								
Checker	RDP	2-11-83								

The seismic relative displacements were issued to Applied Mechanics via memo nr. SA-T-426 dated 2/11/83. The  $\frac{1}{2}$  SSE's values are taken as 0.60 of the SSE's values as per reference 8.



**ITEM 19**

Date: 6/15/79

JUN 7 1984

Time: 2:00 P.M.

CYGNA - SAN FRANCISCO

Call by: A. Rutkowski of Gibbs & Hill, Inc.  
(Name) (Company)Answer by: Doug Frazer of Westinghouse  
(Name) (Company)Contract No: 11-2323-001Subject discussed: Stress Analysis of the branch piping  
connected to RCL and subjected to the nozzle  
movements resulting from the LOCA event.

## SUMMARY OF DISCUSSION, DECISIONS AND COMMITMENTS.

D. Frazer stated that RCL movement due to the LOCA event is a result of dynamic response of the system and it will introduce the primary stress in the branch piping.

- a) For Class 1 and portions of Class 2 piping up to the penetration, W will use either time history or static equivalent displacements type of analysis. The allowable stress values for faulted operating conditions will be used.
- b) For Class 2 piping (Main Steam, Feed Water, Feed Water By-pass) the displacements in each of the six principal directions shall be analyzed separately. The resultant moments and forces have to be combined as a sum of the absolute values for each direction.

Then this resultant response have to be combined with SSE response by SRSS method. W feels that the allowable stress values for faulted conditions have to be used to verify the stress level in the piping.

ARu:ecm

CYGNA	
JOB NO :	<u>84060</u>
DATE LOGGED:	<u>6/17/84</u>
LOG NO. :	<u>#117</u>
FILE:	<u>11.1 Tech. files</u>
CROSS REF. FILE	<u>11.1 Tech. files log</u> <u>2-1-1 Tech. CR (#20)</u>

Telephone Conversation Record  
CIC, ANJB, JDL, DCMe, ECM/AM, 048, B, VORTCOING

Date: 3/20/79

118

Time: 3:00PM  
TC-1576

GTN- 36115

(4/24/79)

JUN 7 1984

Call by: A. RUTKOWSKI  
(Name)CYGNA - SAN FRANCISCO GIBBS & HILL, N.Y.  
(Company)Answer by: ROBERT KELLY  
(Name)of WESTINGHOUSE  
(Company)

Contract No: TEXAS UTILITIES GENERATING COMPANY G&amp;H 2323

Subject discussed: STEAM GENERATOR NOZZLE ALLOWABLE LOADS FOR  
STEAM HAMMER TRANSIENT LOADING DUE TO THE  
MS TURBINE TRIP-OUT (FAST CLOSURE OF THE  
STOP VALVE)

## SUMMARY OF DISCUSSION, DECISIONS AND COMMITMENTS.

Bob Kelly stated that the allowable nozzle loads can be obtained by adding allowables for Pressure, Thermal, Deadweight and 1/2 SSE. The resultant allowable values should be compared with the sum of actual loads due to Pressure, Thermal, Deadweight and Steam Hammer loadings.

ARu:ajv R S Ballard

cc: J. T. Merritt (TUSI Site)  
R. E. Holloway (G&H Dallas)  
A. T. Parker (WNES, Pitts.)  
R. Kelly (WNES, Pitts.)

CYGNA	
JOB NO :	84042
DATE LOGGED:	6/7/84
LOG NO: :	#118
FILE:	11.1 Tech. Files
CROSS REF. FILE	11.1 Tech. Files 2.1.1 G&H WES (H&H)

ATTACHMENT "A"

Revolving Code ~~2323-200~~ 1-4-2

Sheet No. 4 of 22

G & H Job No. 2323

*McGowan*

Telephone Conversation Record

Ref. Dwg./Spec. No. \_\_\_\_\_

Date: 11-2-79

REBa/MS46A, MS46A.1 PRR, EH, ARu/AJJB, ADL  
IS, GSi, B, 048 OUTGOING

Time: 10:30A.M.

GTN- 41464

Date: 11/8/79

Call by:

ISRAEL STEIN

(Name)

of

G&H, Inc.

(Company)

Answer by:

R. KELLY

(Name)

of

WNES

(Company)

Contract No: 11-2323-001

Subject discussed: Nozzle Loads on Main Steam Generator

SUMMARY OF DISCUSSION, DECISIONS AND COMMITMENTS.

Questions

1. Can we combine allowable thermal and deadweight for normal condition.
2. Thermal and deadweight and seismic (obe) for upset condition.
3. Thermal and deadweight and seismic (sse) for faulted condition.

Answer

G&H can combine loads as asked and also combine srss  
Fy & Fz as resultant shear force, and srss My &  
Mz as combined bending moment.

*ARU*  
ARU/IS:110  
HRR/IS:110

*Paul K. Kelly*



**ITEM 23**

Conservatism Built in the Welding Procedure

1. In The Equations of Acceptance of the Welding Attachment Procedure there are two set of terms. First set of terms represent the stress level obtained from the piping analysis computer output (ADLPIPE) for different load conditions. The second set of terms represent the local stress due to the attachment, from Cylnoz computer output, for the corresponding load conditions.

The Cylnoz program is based on Bijlaard analysis which applies to a simply supported cylindrical shell, and therefore a portion of the resulting stress and deformations is due to the beam-type action of the shell(Ref). Since the beam-type stress are already considered in the piping analysis (ADLPIPE), there is a significant degree of conservation.

2. The normal direct stress from piping analysis (ADLPIPE) is added colinearly to the maximum stress intensity out of the eight points analyzed in Cylnoz, regardless of direction.

Reference: W.G. Dodge - "Secondary Stress Indices for Integral Structural Attachments to Straight Pipe" - WRC Bulletin No. 198, Sept. 1974.

RECEIVED

JUN 7 1984

CYGNA - SAN FRANCISCO

CYGNA		102
JOB NO :	84042	
DATE LOGGED :	6/2/84	
LOG NO. :	H119	
FILE :	11.1 Tech. Files	
CROSS REF. FILE	11.1 Tech. Files LOG	

Loading Conditions	Equations of Acceptance	Stress Limits
Sustained Loads	(8') $S_{SL} + S'_{SL}$	$S_h$
Sustained and occasional loads (upset condition)	(9') $S_{OL} + S'_{OL}$ $S_{OL} + S'_{OL} + S''_{OL}$	$1.5 S_h$ $1.8 S_h$
Sustained and occasional loads (emergency condition)	(9'e) $S_{OLE} + S'_{OLE}$	$2.16 S_h$
Sustained loads, thermal expansion and anchor movements	(11') $S_{SL} + S_{TE} + S'_{SL} + S'_{TE}$	$S_A + S_h$

Where:

$S_{SL}$ ,  $S_{OL}$ ,  $S_{OLE}$  and  $S_{TE}$  is as defined previously on page 1 (ADDIT E)

$S'_{SL}$  = The primary localized membrane stress due to sustained loads.

$S'_{OL}$  = The primary localized membrane stress due to sustained and occasional loads such as earthquake (OBE).

$S'_{OLE}$  = The primary localized membrane stress due to sustained and occasional loads such as earthquake (SSE).

$S'_{OL}$  = The localized bending stress due to sustained and occasional loads such as earthquake (OBE).

$S'_{TE}$  = The localized secondary stresses from expansion loads and anchor movements.

# ITEM 29

G & H RESPONSE RE PENETRATION DESIGN LOAD



Regarding G&H response to CYGNA question 3a -  
(Telecopied questions dated March 21, 1984 - 8:30AM)

The G&H response states that "the penetrations were qualified to a maximum of 1200.8 kips." The subsequent CYGNA question is in regards to the source of this number (1200.8 kips) since the G&H specification no. 2323-MS-74 (for mechanical penetrations) states otherwise (in the order of 822 kips).

In response to CYGNA's subsequent question, the discrepancy observed is due to the fact that MS-74 has not been updated to reflect as-built loads. As part of the as-built program it was the responsibility of G&H to verify the penetration design for the as-built loading conditions. This was done by the preparation of design calculations. The calculations are completed, checked and design reviewed but as of the present time have not been issued to TUSI.

The following action items are pending:

- a) Issue of design calculations to TUSI.
- b) Issue a DCA on MS-74 appending the as-built load used in the calculation.

RECEIVED

JUN 7 1984

CYGNA - SAN FRANCISCO

CYGNA	
JOB NO :	84008
DATE LOGGED	6/7/84
LOG NO.	# 120
FILE:	11.1 Tech. Files
CROSS REF. FILE	11.1 Tech. Files Log

ITEM 33

G&H RESPONSE RE COMBINATION OF LOADS  
AT ANCHORS

For the anchor connecting stress problems 1-61A and 1-61B, support number CC-1-087-004-A33A, loads coming into the anchor from adjacent sides of the pipe are added algebraically to satisfy static equilibrium. For seismic the loads are conservatively added absolutely and for thermal, loads are ranged to meet the intent of equation 11. General membrane stress however is averaged from the two connecting problems. This is the approach taken in WCR-Bulleting 198. See paper "Secondary Stress Indices for Integral Structural Attachments to Straight Pipe" by W.G. Dodge.

RECEIVED

JUN 7 1984

CYGNA - SAN FRANCISCO

JOE NO.	
DATE	
LOG NO.	
FILE NO.	
CROSS REF. FILE	