Frederick W. Schneider
Vice President
Production

Public Service Electric and Gas Company 80 Park Place Newark, N.J. 07101 201/430-7373

June 14, 1979

Mr. Victor Stello, Jr., Director
U.S. Nuclear Regulatory Commission
Division of Operating Reactors
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Dear Mr. Stello:

NRR INFORMATION REQUEST DATED MAY 25, 1979
PWR FEEDWATER LINES
NO. 1 UNIT
SALEM GENERATING STATION

In response to your letter of May 25, 1979 transmitting the subject request which was received on May 29, 1979, we offer the following pursuant to items 1 and 2 with respect to design and fabrication history:

Design

1. Isometric drawings of each steam generator feedwater pipe line from the containment wall to the steam generator nozzles shows the design, dimensions, pipe schedules, support types, location and pipe restraints. There are no in-line valves in this section of the feedwater piping. The steam generator sparger is internal with no weld attachment to the steam generator nozzle. The sparger has J tubes attached to the sparger header for flow distribution.

2. A summary of thermal and seismic stress analysis results performed for this system indicates the stresses at the steam generator nozzle and the location of other stress points including the maximum.

A001
5 1/1

Fabrication History

1. The steam generator sparger material is carbon steel. The steam generator nozzle material is SA508 Grade 2 and the feedwater piping materials are shown in the tabulation attached to each isometric drawing. The O.D. of the attachment to the steam generator nozzle is 16½" to provide for the difference in the material match to the steam generator nozzles.

2. Welding details for nozzle to pipe and piping welds are shown in the attached tabulation entitled, Salem Nuclear Generating Station, Steam Generator Feed Pipe Field and Shop Weld Fabrication History." There is no weld attachment at the nozzle for the steam generator sparger which is an internal slip joint.

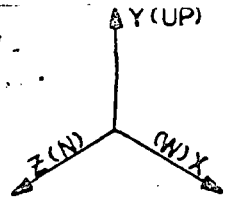
This is the information requested within 20 days. The additional information requested within 60 days is being accumulated and will be supplied subsequently.

Sincerely,

Attachment

CC Mr. B. H. Grier
NRC, King of Prussia, Pa.

Mr. L. J. Norrholm
NRC, Hancocks Bridge, N.J.



NOTE:

1. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
2. (B) = BRANCH CONN.
3. ALL RESTRAINTS - LIMIT STOPS SHOWN ONLY FOR THERMAL DEFLECTION

1/28/76	PIPDYN THERMAL
1/28/76	PIPDYN SEISMIC I

(7)

~~REQUIRED FOR~~	
NO. 1 UNIT OPER.	
COLD HYDRO.	
~~HOT FUNCT.~~	

REV. NO.	DATE	DESIGN DIVISION DESCRIPTION	COMMENTS	DWN	CHK	VER
AS BUILT	3/15/76			RPV	HEP	A.D.F.

TYPICAL NOMENCLATURE

- (7) = ELEMENT NO.
- (6) = STRESS NO. POINT
- (5) = STRESS NO. POINT. (MASTER)
- = SUPPORT OR RESTRAINT LOC. NO.
- = PIPE RUN TERMINATION POINT
- (A) = MATERIAL & SIZE DESIGNATION
- 1-SGF- = SPOOL PIECE MARK
- FW-SGF- = FIELDWELD MARK
- = SHOPWELD MARK

ENGINEERING STRESS ANAL. COMMENTS	CALC	VER	DATE

REFERENCE DRAWINGS

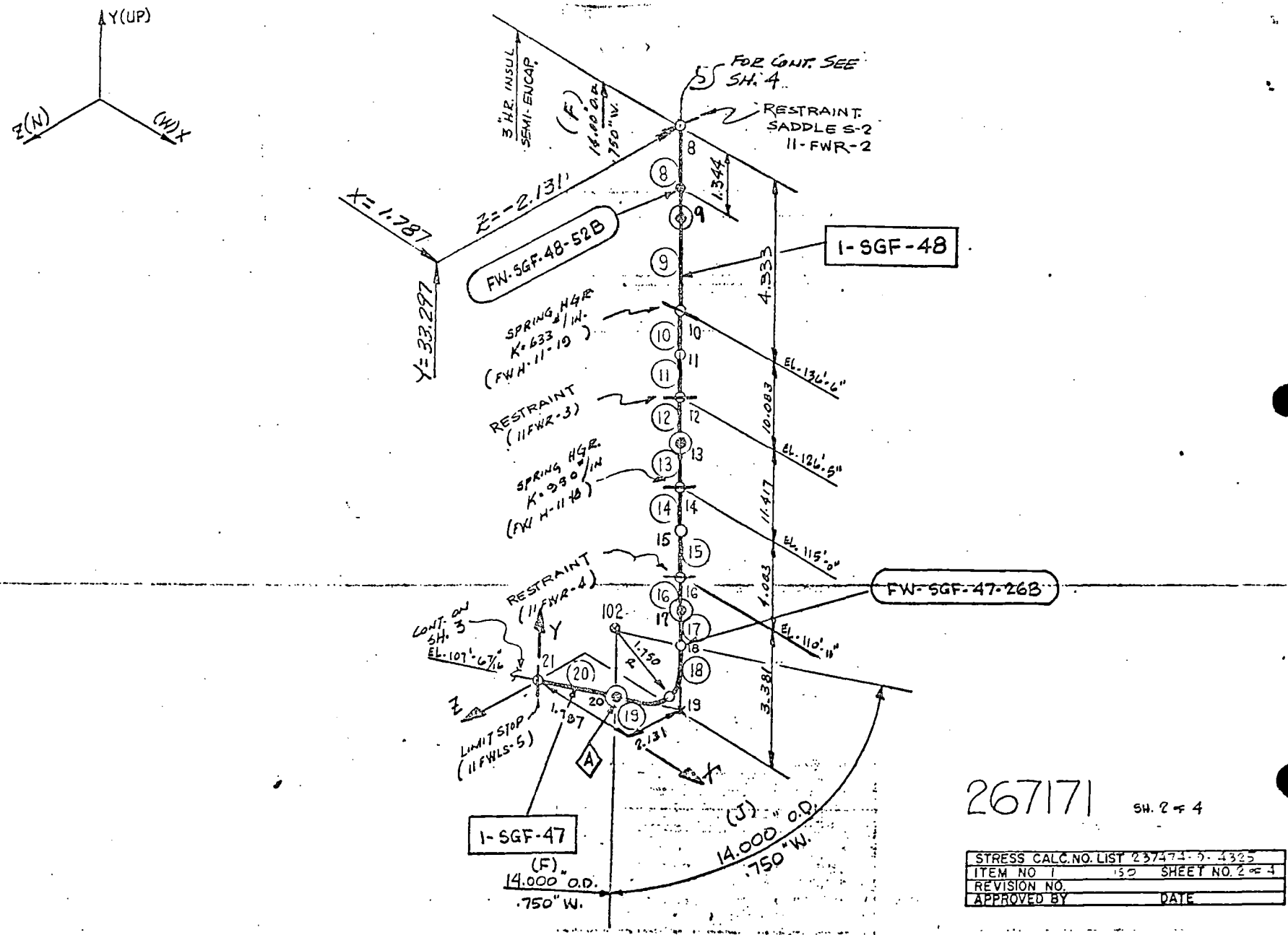
ARRGT. _____
DIAGRAM _____
HGR. LOC. _____
HGR. DET. _____
LG. SP. LOC. _____
LG. SP. DET. _____
SM. SP. LOC. _____
SM. SP. DET. _____
INSULATION _____
CONST. ISO. _____
E.C.N.'S _____
NO. 2 UNIT CALC. _____

SPEC: 15-164-SEISMIC-I-NUCLEAR II

SALEM NUCLEAR GEN. STA. NO. 1 UNIT
REACTOR CONTAINMENT BLDG.
STEAM GEN. FEEDWATER
FROM ANCHOR @ CONTAINMENT WALL ELV. #5
TO CONN. @ #11 STEAM GENERATOR

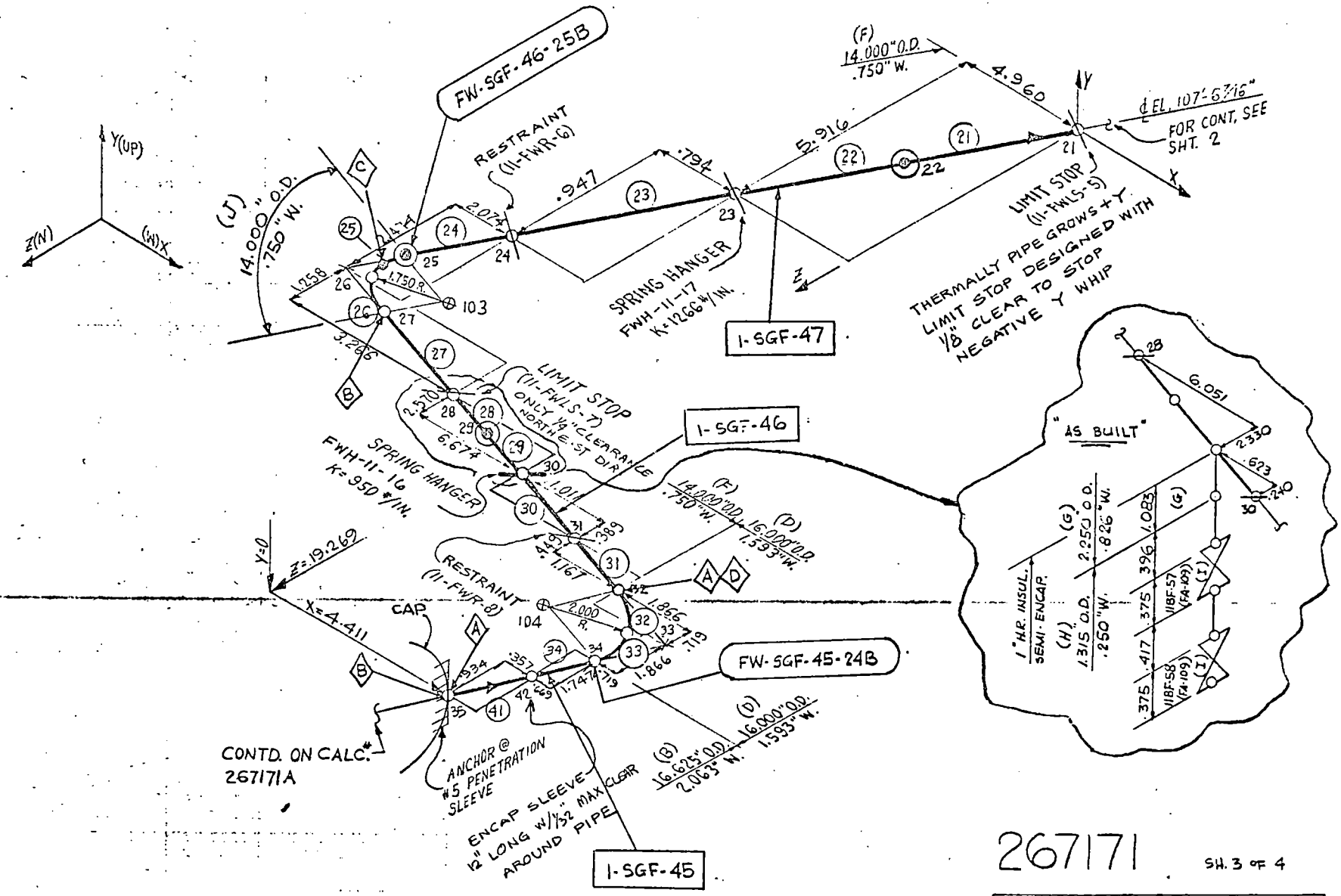
267171 SH. 1 OF 4

STRESS CALC. NO. LIST 237474-D-2325	
ITEM NO. 1	ISO SHEET NO. 1 OF 4
REVISION NO.	
APPROVED BY	DATE



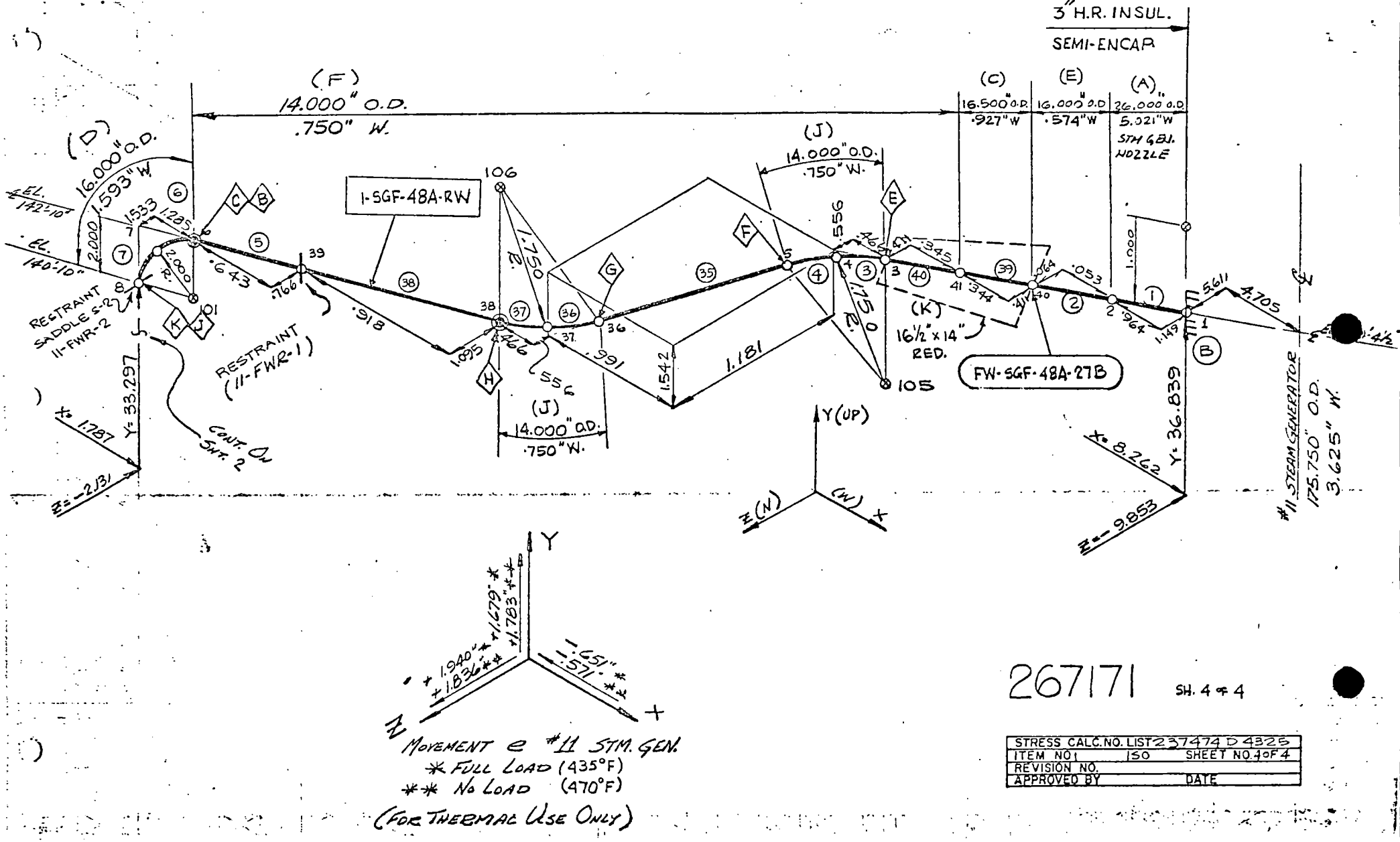
267171 SH. 2 OF 4

STRESS CALC. NO. LIST 237471-5-4325	
ITEM NO. 1	SHEET NO. 2 OF 4
REVISION NO.	
APPROVED BY	DATE



267171 SH. 3 OF 4

STRESS CALC. NO. LIST 237474-D-4325		
ITEM NO 1	150	SHEET NO. 3 OF 4
REVISION NO.		
APPROVED BY		DATE



MOVEMENT @ #11 STM. GEN.
* FULL LOAD (435°F)
** NO LOAD (470°F)
(FOR THERMAL USE ONLY)

267171 SH. 4 OF 4

STRESS CALC. NO. LIST 237474 D 4325		
ITEM NO. 1	ISO	SHEET NO. 4 OF 4
REVISION NO.		
APPROVED BY		DATE

	O.D.	W. THK.	SCHED.	EC	C TEMP	EH	H TEMP	PRESS. (P.S.I.)	MATERIAL	THERMAL EXP. COEFF.		SA (P.S.I.)
(A)	26.000"	5.021"	SPECIAL	29.9	70°	27.67	470°	1870	A508 CL. II FORGING	.03341 "/FT.	.00278 "/IN	30,000
B)	16.625"	2.063"	"	"	"	"	"	"	A-106 GR.C SEAM.	"	"	26,25
(C)	16.500"	.927"	"	"	"	"	"	"	"	"	"	"
(D)	16.000'	1.593	160	"	"	"	"	"	A-234 WP C	"	"	"
'F)	14.000"	.750"	80	"	"	"	"	"	A-106 GR. C SEAM.	"	"	"
(E)	16.000"	.574	SPECIAL	"	"	"	"	"	"	"	"	"
(G)	2.250"	.826"	FORGED BAR STOCK	"	"	"	"	"	A-105 GR. II	"	"	"
(H)	1.315"	.250"	160	"	"	"	"	"	A-106 GR.C	"	"	"
(J)	14.000"	.750"	80	"	"	"	"	"	A-234 WPC	"	"	"
(K)			16½ x 14 RED.	"	"	"	"	"	A-234 WPC	"	"	"

267171 SH. 3 OF 5

S_H = 17,500 PSI (PIPE) & (FITTING)

STRESS CALC. NO. LIST 237474-D-4325		
ITEM NO	TABLE	SHEET NO. 3 OF 5
REVISION NO.		
APPROVED BY		DATE

DWN.:
CHK.:

SALEM NUCLEAR GEN. STATION	
UNIT	1
SYSTEM	STEAM GEN. FEEDWATER PIPING
STRESS CALC #	267171

NOZZLE STRESSES AND LOCATION OF MAXIMUM STRESS (PSI.)

STRESS POINT #	PRESSURE	WEIGHT	THERMAL	OBE EARTHQUAKE X	Y	Z	$\sqrt{X^2+Y^2}$	$\sqrt{Y^2+Z^2}$	①	②	①/② RATIO
23	4697	363	2275	268	269	460	380	533	7868	42,188	.186
5	4697	253	3556	1107	877	1027	1412	1351	14918	42,188	.354
27	4697	198	2180	1278	688	833	1451	1080	8526	42,188	.202
3	4697	160	8149	997	1086	1150	1474	1582	14588	42,188	.346
* 40	7442	22	4659	487	455	460	666	647	12789	50,000	.256

① PRESSURE + DEADWEIGHT + THERMAL + LARGER OF $\sqrt{X^2+Y^2}$ OR $\sqrt{Y^2+Z^2}$

② $S_q + S_h$ AS ADDRESSED IN SALEM FSAR 14.5.3.1

* DENOTES NOZZLE STRESSES AND PRESSURE STRESS IS BASED ON 1195 PSI AND .574 WALL THICKNESS

PREPARED BY DB DATE 6.12.79

CHECKED BY MN DATE 6/13/79

VERIFIED BY RCK DATE 6/13/79

SALEM NUCLEAR GENERATING STATION
STEAM GENERATOR FEED PIPE FIELD AND SHOP WELD FABRICATION HISTORY (1)

STEAM GEN. NO.	SPOOL NO.	JOINT ID (WELD TYPE) (2)	WELD PROCESS(ES) (3) (4)	(°F) PREHEAT	(°F) POSTHEAT	FINISHED WELD J.T.	FINISHED WELD NDE
11	1-SGF-45	A (ATTACH)	SMAW	60	-	MT	
11	1-SGF-45	B (ATTACH)	SMAW	60	-	MT	
11	Field Weld	SGF-45-24B (BWI)	GTAW-Root; SMAW-Bal.	175 Root 400 Bal.	1150-1200	RT and MT	
11	1-SGF-46	A (BW)	GTAW-Root; SAW and SMAW Bal.	200	1100-1250	RT and MT	
11	1-SGF-46	B (BW)	Ditto	60	1100-1250	RT and MT	
11	1-SGF-46	C (BW)	Ditto	60	1100-1250	RT and MT	
11	1-SGF-46	D (WBU)	SMAW, SAW	175	1100-1250	RT and MT	
11	Field Weld	SGF-46-25B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT	
11	1-SGF-47	A (BW)	GTAW-Root; SAW and SMAW Bal.	60	1100-1250	RT and MT	
11	Field Weld	SGF-47-26B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT	
11	Field Weld	SGF-48A-52B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT	
11	1-SGF-48A RW	C (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT	
11	1-SGF-48A RW	B (WBU)	SAW	175	1100-1250	RT and MT	
11	1-SGF-48A RW	E (BWI)	GTAW-Root; SAW and SMAW Bal.	50	1100-1250	RT and MT	

NOTES: (1) Reference NRC request for info on PWR Feedwater Lines dated 5/25/79.

(2) (ATTACH) = Attachment Weld; (B.W.) = Circ. Single Butt Weld No Backing Ring; (B.W.I) = Circ. Single Butt Weld with Cons. Insert; (W.B.U.) = Weld Build-Up

(3) Shop Weld Filler Materials: GTAW-E70S-2; SMAW-E7018; SAW-F72-EM12K.

(4) Field Weld Filler Materials: GTAW-EB, Insert MS1; SMAW-E7018 (Except as noted).

STEAM GENERATOR FEED PIPE FIELD AND SHOP WELD FABRICATION HISTORY (1)

STEAM GEN. NO.	SPOOL NO.	JOINT ID (WELD TYPE) (2)	WELD PROCESS(ES) (3) (4)	(°F) PREHEAT	(°F) POSTHEAT	FINISHED WELD J.T. NDE
11	1-SGF-48A RW	F (BWI)	GTAW-Root; SAW and SMAW Bal.	50	1100-1250	RT and MT
11	1-SGF-48A RW	G (BWI)	GTAW Root; SMAW Bal.	50	1100-1250	RT and MT
11	1-SGF-48A RW	H (BWI)	GTAW Root; SMAW Bal.	50	1100-1250	RT and MT
11	1-SGF-48A RW	K (BWI)	GTAW Root; SMAW Bal.	200	1100-1250	RT and MT
11	1-SGF-48A RW	J (WBU)	SAW	175	1100-1250	RT and PT and MT
11	Field Weld	SGF-48A-27B (BWI)	GTAW Root; SMAW Bal. (E8018C3)	175 Root 250 Bal.	1100-1150	RT and MT
13	1-SGF-62	A (ATTACH)	SMAW	60	-	MT
13	1-SGF-62	B (ATTACH)	SMAW	60	-	MT
13	Field Weld	SGF-62-34B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT
13	1-SGF-63	A (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
13	1-SGF-63	B (WBU)	SMA, SAW	175	1100-1250	RT and MT
13	Field Weld	SGF-63-35B-A-1 (BWI)	GTAW-Root; SMAW-Bal.	175 Root 400 Bal.	1150-1200	RT and MT
13	1-SGF-64	A (BW)	GTAW-Root; SAW and SMAW-Bal.	60	1100-1250	RT and MT

NOTES: (1) Reference NRC request for info on PWR Feedwater Lines dated 5/25/79.

(2) (ATTACH) = Attachment Weld; (B.W.) = Circ. Single Butt Weld No Backing Ring; (B.W.I) = Circ. Single Butt Weld with Cons. Insert; (W.B.U.) = Weld Build-Up

(3) Shop Weld Filler Materials: GTAW-E70S-2; SMAW-E7018; SAW-F72-EM12K.

(4) Field Weld Filler Materials: GTAW-EB Insert MS1; SMAW-E7018 (Except as noted).

SALEM NUCLEAR GENERATING STATION

STEAM GENERATOR FEED PIPE FIELD AND SHOP WELD FABRICATION HISTORY (1)

STEAM GEN. NO.	SPOOL NO.	JOINT ID (WELD TYPE) (2)	WELD PROCESS(ES) (3) (4)	(°F) PREHEAT	(°F) POSTHEAT	FINISHED WELD J.T. NDE
13	1-SGF-64	B (BW)	GTAW-Root; SAW and SMAW-Bal.	60	1100-1250	RT and MT
13	1-SGF-64	C (WBU)	SAW	175	1100-1250	RT and MT
13	Field Weld	SGF-64-36B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT
13	1-SGF-66RW	A (WBU)	SAW	175	1100-1250	RT and MT
13	Field Weld	SGF-65-37B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT
13	1-SGF-66RW	A (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
13	1-SGF-66RW	G (WBU)	SAW	175	1100-1250	RT and MT
13	1-SGF-66RW	S (WBU)	SMAW, SAW	175	1100-1250	RT and MT
13	1-SGF-66RW	W (WBU)	SMAW, SAW	175	1100-1250	RT and MT
13	1-SGF-66RW	Q (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
13	1-SGF-66RW	K (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
13	1-SGF-66RW	T (BW)	GTAW-Root; SMAW-Bal.	200	1100-1250	RT and MT
13	1-SGF-66RW	R (BW)	GTAW-Root; SMAW-Bal.	200	1100-1250	RT and MT
13	1-SGF-66RW	P (BWI)	GTAW-Root; SMAW-Bal.	175	1100-1250	RT and MT

NOTES: (1) Reference NRC request for info on PWR Feedwater Lines dated 5/25/79.

(2) (ATTACH) = Attachment Weld; (B.W.) = Circ. Single Butt Weld No Backing Ring; (B.W.I) = Circ. Single Butt Weld with Cons. Insert; (W.B.U.) = Weld Build-Up

(3) Shop Weld Filler Materials: GTAW-E70S-2; SMAW-E7018; SAW-F72-EM12K.

(4) Field Weld Filler Materials: GTAW-EB Insert MS1; SMAW-E7018 (Except as noted).

STEAM GENERATOR FEED PIPE FIELD AND SHOP WELD FABRICATION HISTORY (1)

STEAM GEN. NO.	SPOOL NO.	JOINT ID (WELD TYPE) (2)	WELD PROCESS(ES) (3) (4)	(°F) PREHEAT	(°F) POSTHEAT	FINISHED WELD J.T. NDE
13	1-SGF-66RW	D (WBU)	SAW	175	1100-1250	RT and MT
13	Field Weld	SGF-66-38B (BWI)	GTAW-Root; SMAW-Bal. (E8018C3)	175 Root 250 Bal.	1100-1150	RT and MT
12	1-SGF-30	A (ATTACH)	SMAW	-	-	MT
12	1-SGF-30	B (ATTACH)	SMAW	-	-	MT
12	Field Weld	SGF-30-16B (BWI)	GTAW-Root; SMAW-Bal.	175 Root 400 Bal.	1150-1200	RT and MT
12	1-SGF-31	A (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
12	1-SGF-31	B (BW)	GTAW-Root; SAW and SMAW -Bal.	60	1100-1250	RT and MT
12	1-SGF-31	C (BW)	GTAW-Root; SAW and SMAW-Bal.	60	1100-1250	RT and MT
12	1-SGF-31	D (WBU)	SAW	175	1100-1250	RT and MT
12	Field Weld	SGF-31-17B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT
12	1-SGF-32	A (BW)	GTAW-Root; SAW and SMAW-Bal.	60	1100-1250	RT and MT
12	1-SGF-32	B (BW)	GTAW-Root; SAW and SMAW-Bal.	60	1100-1250	RT and MT
12	Field Weld	SGF-32-18B-A (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT

NOTES: (1) Reference NRC request for info on PWR Feedwater Lines dated 5/25/79.

(2) (ATTACH) = Attachment Weld; (B.W.) = Circ. Single Butt Weld No Backing Ring; (B.W.I) = Circ.. Single Butt Weld with Cons. Insert; (W.B.U.) = Weld Build-Up

(3) Shop Weld Filler Materials: GTAW-E70S-2; SMAW-E7018; SAW-F72-EM12K.

(4) Field Weld Filler Materials: GTAW-EB Insert MS1; SMAW-E7018 (Except as noted).

STEAM GENERATOR FIELD PIPE FIELD AND SHOP WELD FABRICATION HISTORY (1)

STEAM GEN. NO.	SPOOL NO.	JOINT ID (WELD TYPE) (2)	WELD PROCESS(ES) (3) (4)	(°F) PREHEAT	(°F) POSTHEAT	FINISHED WELD J.T. NDE
12	Field Weld	SGF-33A-51B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT
12	1-SGF-33A RW	C (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
12	1-SGF-33A RW	B (WBU)	SAW	175	1100-1250	RT and MT
12	1-SGF-33A RW	E (BW)	GTAW-Root; SAW and SMAW-Bal.	50	1100-1250	RT and PT
12	1-SGF-33A RW	F (BWI)	GTAW-Root; SAW and SMAW-Bal.	50	1100-1250	RT and PT
12	1-SGF-33A RW	G (BWI)	GTAW-Root; SMAW-Bal.	50	1100-1250	RT and PT
12	1-SGF-33A RW	H (BW)	GTAW-Root; SMAW-Bal.	50	1100-1250	RT and PT
12	1-SGF-33A RW	K (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and PT
12	1-SGF-33A RW	J (WBU)	SAW	175	1100-1250	RT and PT and MT
12	1-SGF-33A RW	AA (WBU)	SMAW	60	1100-1250	RT and MT
12	Field Weld	SGF-33A-19B(BWI)	GTAW-Root; SMAW-Bal. (E8018C3)	175 Root 250 Bal.	1100-1150	RT and MT
14	1-SGF-14	A (ATTACH)	SMAW	60	-	MT
14	1-SGF-14	B (ATTACH)	SMAW	60	-	MT

NOTES: (1) Reference NRC request for info on PWR Feedwater Lines dated 5/25/79.

(2) (ATTACH) = Attachment Weld; (B.W.) = Circ. Single Butt Weld No Backing Ring; (B.W.I) = Circ. Single Butt Weld with Cons. Insert; (W.B.U.) = Weld Build-Up

(3) Shop Weld Filler Materials: GTAW-E70S-2; SMAW-E7018; SAW-F72-EM12K.

(4) Field Weld Filler Materials: GTAW-EB Insert MS1; SMAW-E7018 (Except as noted).

SALEM NUCLEAR GENERATING STATION

STEAM GENERATOR FEED PIPE FIELD AND SHOP WELD FABRICATION HISTORY (1)

STEAM GEN. NO.	SPOOL NO.	JOINT ID (WELD TYPE) (2)	WELD PROCESS(ES) (3) (4)	(°F) PREHEAT	(°F) POSTHEAT	FINISHED WELD J.T. NDE
14	Field Weld	SGF-14-7B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT
14	1-SGF-15	A (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
14	1-SGF-15	B (WBU)	SAW	175	1100-1250	RT and MT
14	Field Weld	SGF-15-8B(BWI)	GTAW-Root; SMAW-Bal.	175 Root 250 Bal.	1150-1200	RT and MT
14	1-SGF-16	A (BW)	GTAW-Root; SAW and SMAW-Bal.	60	1100-1150	RT and MT
14	1-SGF-16	B (BW)	GTAW-Root; SAW and SMAW-Bal.	60	1100-1150	RT and MT
14	1-SGF-16	C (WBU)	SMA, SAW	175	1100-1250	RT and MT
14	Field Weld	SGF-16-9B (BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT
14	Field Weld	SGF-17-10B(BWI)	GTAW-Root; SMAW-Bal.	175	-	RT and MT
14	1-SGF-18RW	A (BW)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
14	1-SGF-18RW	C (WBU)	SAW	175	1100-1250	RT and MT
14	1-SGF-18RW	E (BWI)	GTAW-Root; SAW and SMAW-Bal.	50	1100-1250	RT and MT
14	1-SGF-18RW	F (BWI)	GTAW-Root; SAW and SMAW-Bal.	50	1100-1250	RT and MT

NOTES: (1) Reference NRC request for info on PWR Feedwater Lines dated 5/25/79.

(2) (ATTACH) = Attachment Weld; (B.W.) = Circ. Single Butt Weld No Backing Ring; (B.W.I) = Circ. Single Butt Weld with Cons. Insert; (W.B.U.) = Weld Build-Up

(3) Shop Weld Filler Materials: GTAW-E70S-2; SMAW-E7018; SAW-F72-EM12K.

(4) Field Weld Filler Materials: GTAW-EB Insert MS1; SMAW-E7018 (Except as noted).

STEAM GENERATOR FEED PIPE FIELD AND SHOP WELD FABRICATION HISTORY (1)

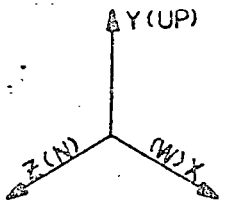
STEAM GEN. NO.	SPOOL NO.	JOINT ID (WELD TYPE) (2)	WELD PROCESS(ES) (3) (4)	(°F) PREHEAT	(°F) POSTHEAT	FINISHED WELD J.T. NDE
14	1-SGF-18RW	K (BWI)	GTAW-Root; SAW and SMAW-Bal.	200	1100-1250	RT and MT
14	1-SGF-18RW	J (WBU)	SAW	175	1100-1250	RT and PT and MT
14	1-SGF-18RW	H (BWI)	GTAW-Root; SAW and SMAW-Bal.	50	1100-1250	RT and MT
14	1-SGF-18RW	G (BWI)	GTAW-Root; SMAW-Bal.	50	1100-1250	RT and MT
14	1-SGF-18RW	AA (WBU)	SMAW	60	1100-1250	RT and MT
	Field Weld	SGF-18-11B(BWI)	GTAW-Root; SMAW-Bal. (E8018C3)	175 Root 250 Bal.	1100-1150	RT and MT

NOTES: (1) Reference NRC request for info on PWR Feedwater Lines dated 5/25/79.

(2) (ATTACH) = Attachment Weld; (B.W.) = Circ. Single Butt Weld No Backing Ring; (B.W.I) = Circ. Single Butt Weld with Cons. Insert; (W.B.U.) = Weld Build-Up

(3) Shop Weld Filler Materials: GTAW-E70S-2; SMAW-E7018; SAW-F72-EM12K.

(4) Field Weld Filler Materials: GTAW-EB Insert MS1; SMAW-E7018 (Except as noted).



NOTE:

1. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
2. (B) = BRANCH CONN.
3. ALL RESTRAINTS - LIMIT STOPS SHOWN ONLY FOR THERMAL DEFLECTIONS

1.26/75	PIPDYN THERMAL
1/26/75	PIPDYN SEISMIC I

(7)

REQUIRED FOR	
NO. 1 UNIT OPER.	
COLD HYDRO.	
HOT FUNCT.	

REV. NO.	DATE	DESIGN DIVISION DESCRIPTION	COMMENTS	DWN	CHK	VER	ENGINEERING STRESS ANAL. COMMENTS	CALC	VER	DATE
AS BUILT	3/15/76		PER ECN # 7236							

TYPICAL NOMENCLATURE

- (8) = ELEMENT NO.
- 7 = STRESS NO. POINT
- 6 = STRESS NO. POINT (MASTER)
- = SUPPORT OR RESTRAINT LOC. NO.
- = PIPE RUN TERMINATION POINT
- (A) = MATERIAL & SIZE DESIGNATION
- 1-SGF- = SPOOL PIECE MARK
- FW-SGF- = FIELDWELD MARK
- = SHOPWELD MARK

REFERENCE DRAWINGS

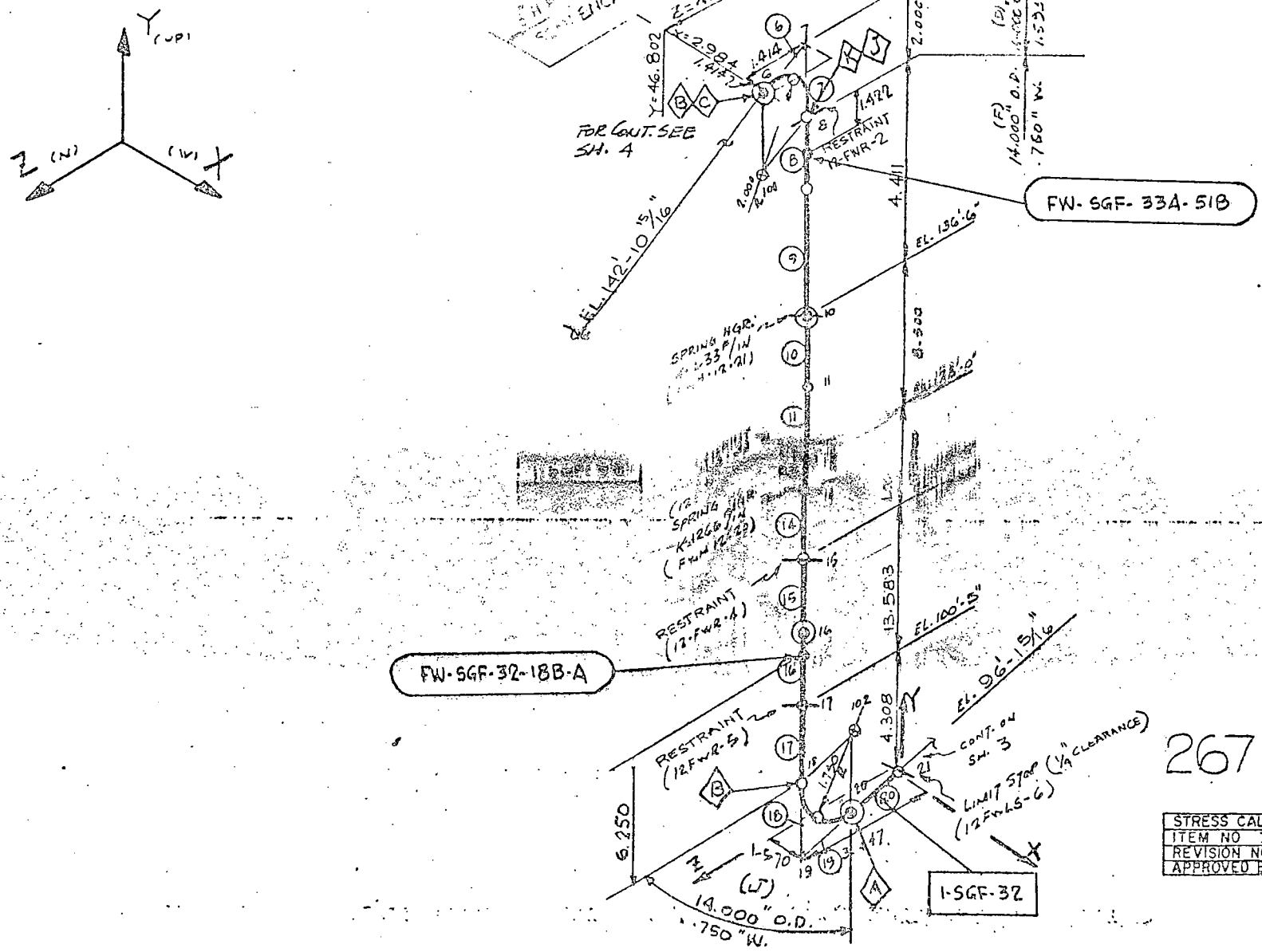
ARRGT. _____
DIAGRAM _____
HGR. LOC. _____
HGR. DET. _____
LG. SP. LOC. _____
LG. SP. DET. _____
SM. SP. LOC. _____
SM. SP. DET. _____
INSULATION _____
CONST. ISO. _____
E.C.N.'S _____
NO. 1 UNIT CALC. _____

SPEC. 15-16A SEISMIC I NUCLEAR II

SALEM NUCLEAR GEN. STA. NO. 1 UNIT
REACTOR CONTAINMENT BLDG.
STEAM GENERATOR FEEDWATER
FROM ANCHOR @ CONTAINMENT WALL SLV # 6
EL. 96-1 5/16" TO CONN. @ #12 STM GENERATOR

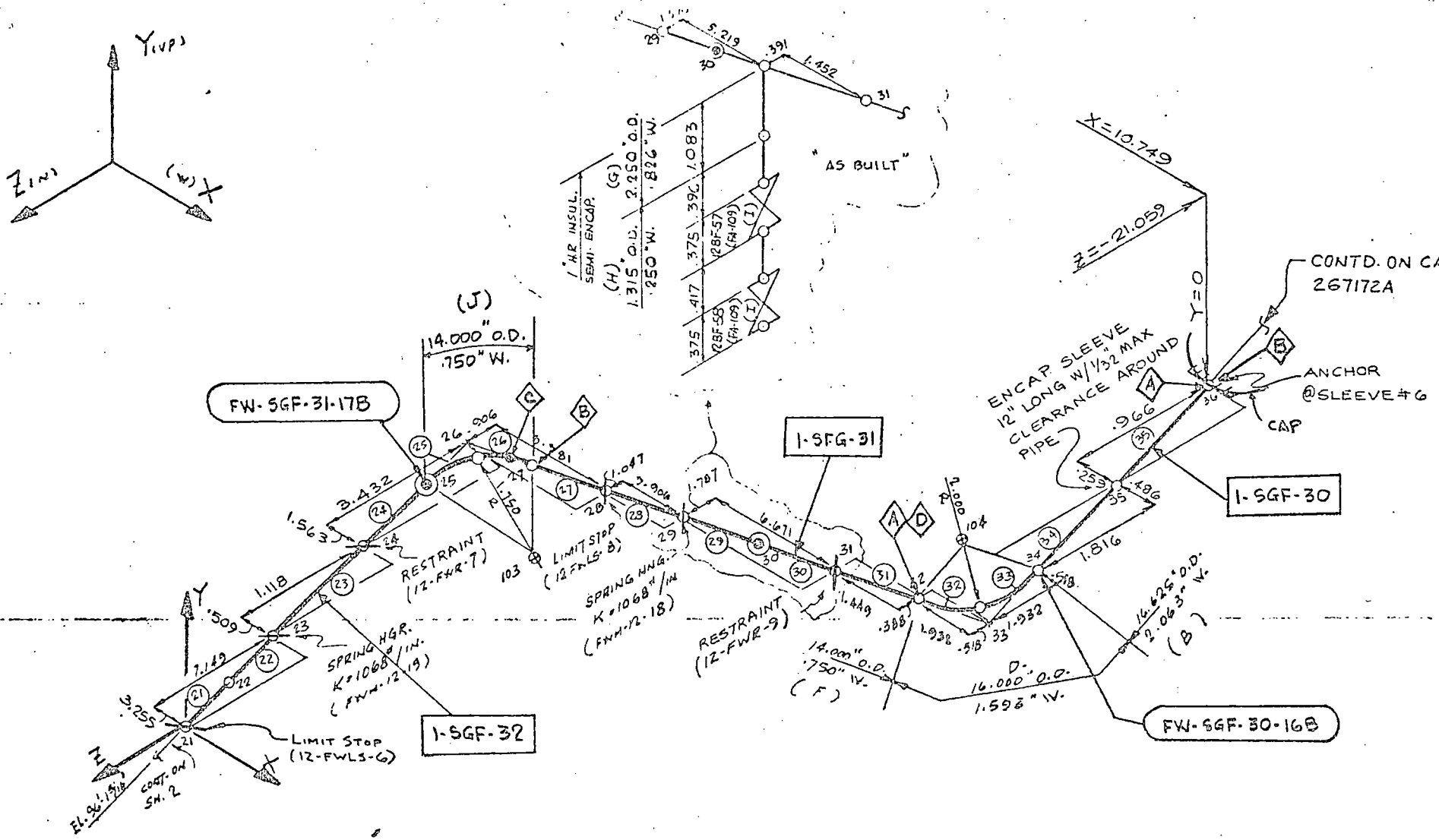
267172 SH. 1 of 4

STRESS CALC. NO. LIST 237474-3-4325	
ITEM NO 3 150	SHEET NO 1 OF 4
REVISION NO.	
APPROVED BY	DATE



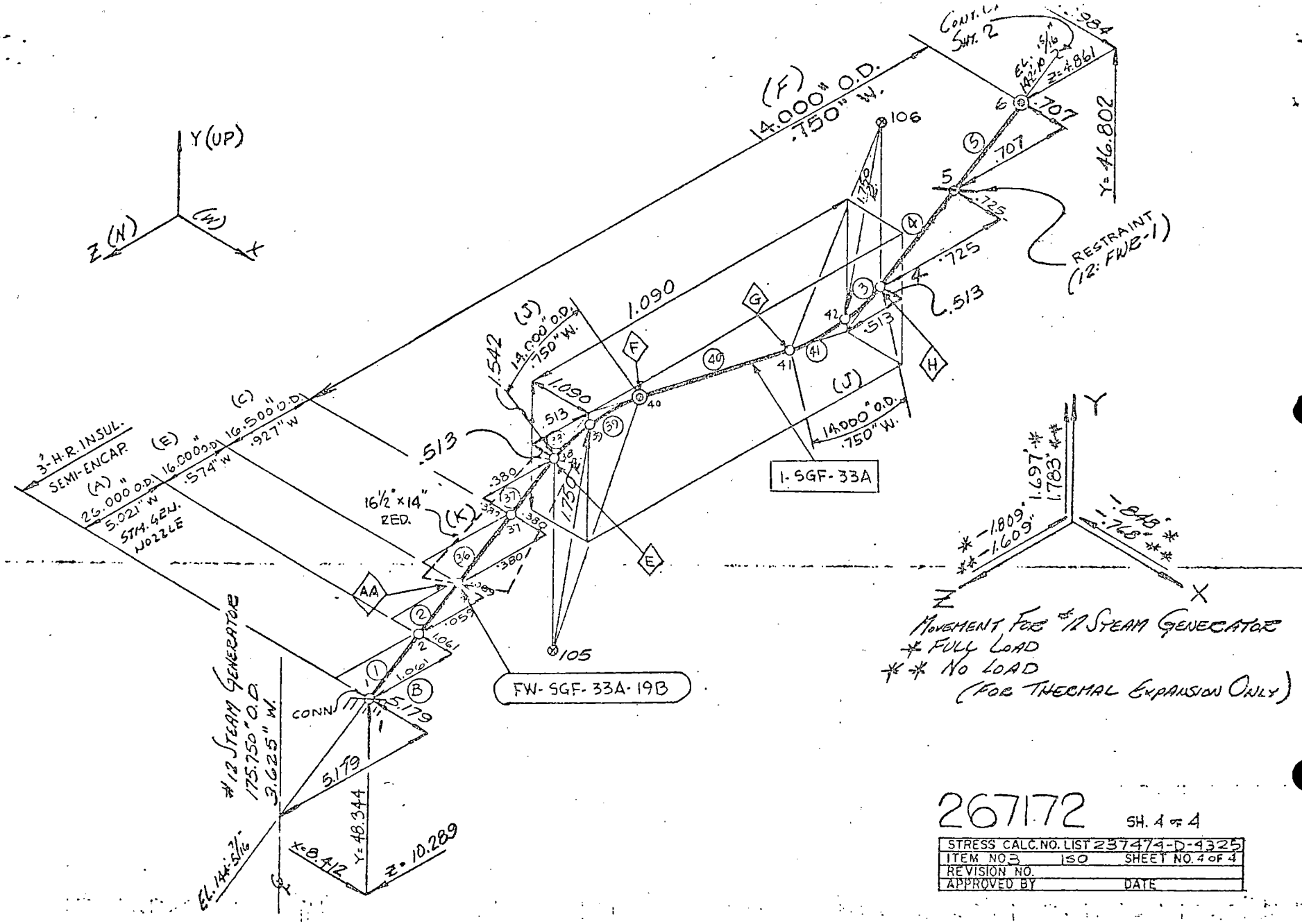
267172 SH. 2 OF 4

STRESS CALC. NO. LIST 7357474-D-4325		
ITEM NO 3	150	SHEET NO. 2 OF 4
REVISION NO.		
APPROVED BY		DATE



267172 SH. 3 OF 4

STRESS CALC. NO. LIST 237474-D-4325	
ITEM NO 3	ISO SHEET NO. 3 of 4
REVISION NO.	
APPROVED BY	DATE



267172 SH. 4 of 4

STRESS CALC. NO. LIST 237474-D-4325		
ITEM NO. 3	ISO	SHEET NO. 4 OF 4
REVISION NO.		
APPROVED BY		DATE

	O.D.	W. THK.	SCHED.	EC	C TEMP	EH	H TEMP	PRESS. (P.S.I.)	MATERIAL	THERMAL EXP. COEFF.		SA (P.S.I.)
(A)	26.000"	5.021"	SPECIAL	29.9	70°	27.67	470°	1950	A 508 CL. II FORGING	.03341"/FT	.00278"/IN.	30,000
B)	16.625"	2.063"	"	"	"	"	"	"	A-106 GR.C. SEAM.	"	"	26,250
(C)	16.500"	.927	"	"	"	"	"	"	"	"	"	"
D)	16.000"	1.593	160	"	"	"	"	"	A-234 WPC	"	"	"
F)	14.000"	.750	80	"	"	"	"	"	A-106 GR.C SEAM.	"	"	"
E)	16.000"	.574	Special	"	"	"	"	"	"	"	"	"
(G)	2.250"	.826"	FORGED BAR STOCK	"	"	"	"	"	A-105 GR. II	"	"	"
(H)	1.315"	.250"	160	"	"	"	"	"	A-106 GR.C	"	"	"
(J)	14.000"	.750"	80	"	"	"	"	"	A-234 WPC	"	"	"
(K)			16" x 14 RED.	"	"	"	"	"	A-234 WPC	"	"	"

S_H = 17,500 PSI (PIPE) & (FITTING)

267172 SH. 3 OF 5

STRESS CALC. NO. LIST 237474-D-4325	
ITEM NO 3 TABLE	SHEET NO. 3 OF 5
REVISION NO.	
APPROVED BY	DATE

DWN.:
CHK.:

SALEM NUCLEAR GEN. STATION

UNIT 1

SYSTEM STEAM GEN. FEEDWATER PIPING

STRESS CALC # 267172

NOZZLE STRESSES AND LOCATION OF MAXIMUM STRESS (PSI.)

STRESS POINT #	PRESSURE	WEIGHT	THERMAL	OBE EARTHQUAKE X	OBE EARTHQUAKE Y	OBE EARTHQUAKE Z	$\sqrt{X^2+Y^2}$	$\sqrt{Y^2+Z^2}$	①	②	①/② RATIO 1/2
36	1554	366	1044	2752	593	1053	2815	1208	5779	42,188	.137
40	4697	20	6343	4003	985	2059	4122	2282	15182	42,188	.360
32	4697	40	2436	4694	1318	2088	5136	2469	12309	42,188	.292
26	4697	58	1618	3455	903	2073	3571	2261	9944	42,188	.236
* 3	7442	207	3624	2626	823	1369	2752	1597	14025	50,000	.281

① PRESSURE + DEADWEIGHT + THERMAL + LARGER OF $\sqrt{X^2+Y^2}$ OR $\sqrt{Y^2+Z^2}$

② $S_q + S_b$ AS ADDRESSED IN SALEM FSAR 14.5.3.1

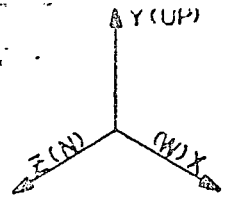
* DENOTES NOZZLE STRESSES AND

PRESSURE STRESS IS BASED ON 1195 PSI AND .574 WALL THICKNESS

PREPARED BY DB DATE 6-12-79

CHECKED BY MN DATE 6/13/79

VERIFIED BY RCK DATE 6/13/79



NOTE:

1. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
2. (B) = BRANCH CONN.
3. ALL RESTRAINTS - LIMIT STOPS SHOWN ONLY FOR THERMAL DEFLECTIONS

REV. NO.	DATE	DESIGN DIVISION DESCRIPTION	COMMENTS	DWN	CHK	VER	ENGINEERING STRESS ANAL. COMMENTS	CALC	VER	DATE
AS BUILT	3/18/76	TYPICAL NOMENCLATURE (7) = ELEMENT NO. 6 = STRESS NO. POINT 5 = STRESS NO. POINT (MASTER) = SUPPORT OR RESTRAINT LOC. NO. = PIPE RUN TERMINATION POINT (A) = MATERIAL & SIZE DESIGNATION 1-SGF- = SPOOL PIECE MARK FW-SGF- = FIELDWELD MARK ◇ = SHOPWELD MARK								

12/2/75	PIPDYN THERMAL
12/2/75	PIPDYN SEISMIC I

(7)

~~REQUIRED FOR~~
NO.1 UNIT OPER.
COLD HYDRO.
~~HOT FUNCT.~~

REFERENCE DRAWINGS

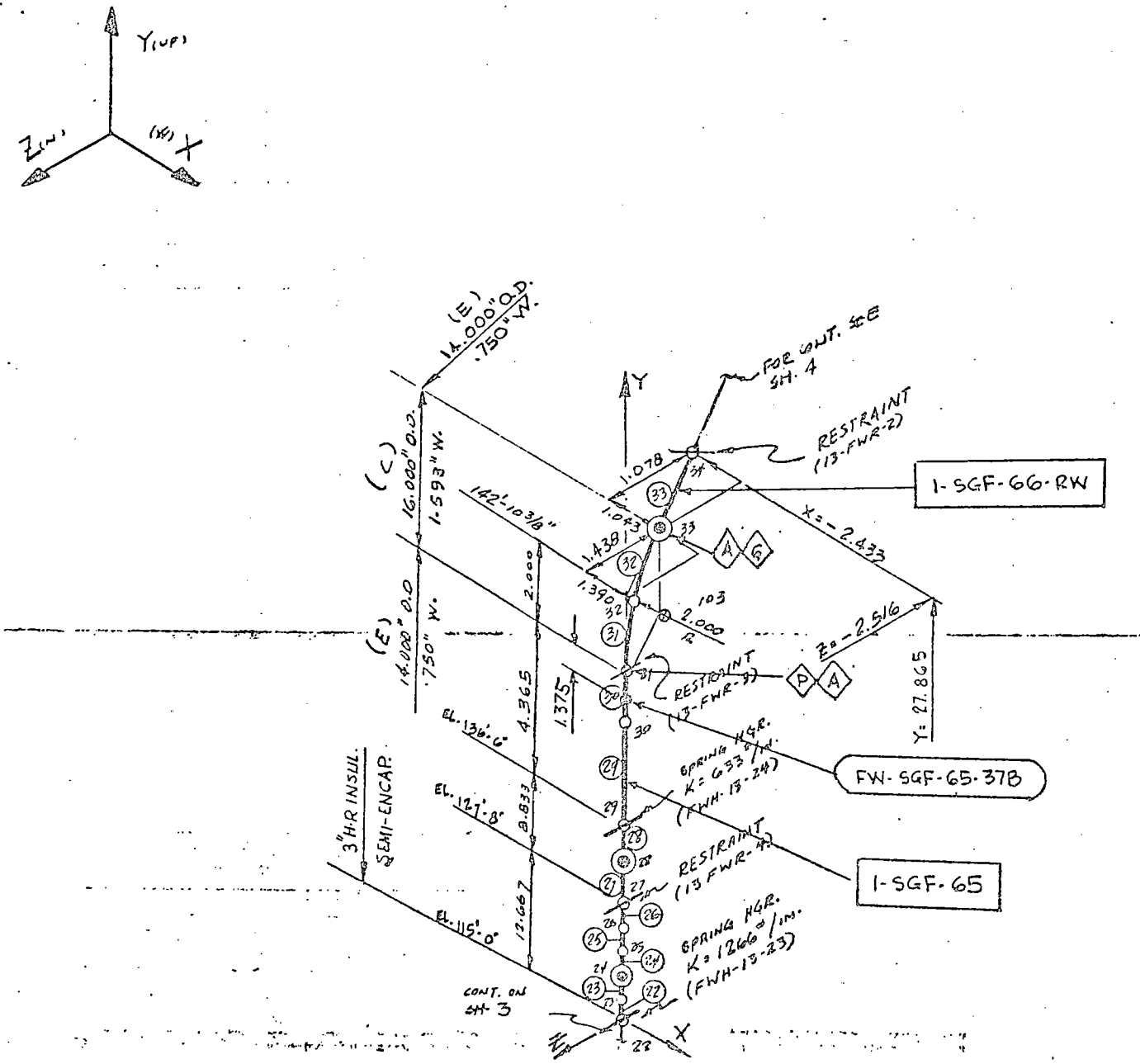
ARRGT. _____
DIAGRAM _____
HGR.LOC. _____
HGR.DET. _____
LG.SP.LOC. _____
LG.SP.DET. _____
SM.SP.LOC. _____
SM.SP.DET. _____
INSULATION _____
CONST.ISO. _____
E.C.N.'S _____
NO.1 UNIT CALC. _____

SPEC. 15-16A SEISMIC-I NUCLEAR II

SALEM NUCLEAR GEN.STA. NO. 1 UNIT
REACTOR CONTAINMENT BLDG.
STEAM GENERATOR FEEDWATER
FROM ANCHOR @ CONTAINMENT WALL SLV #7
@ EL. 96'-8¼" TO CONN @ #13 STM GENERATOR

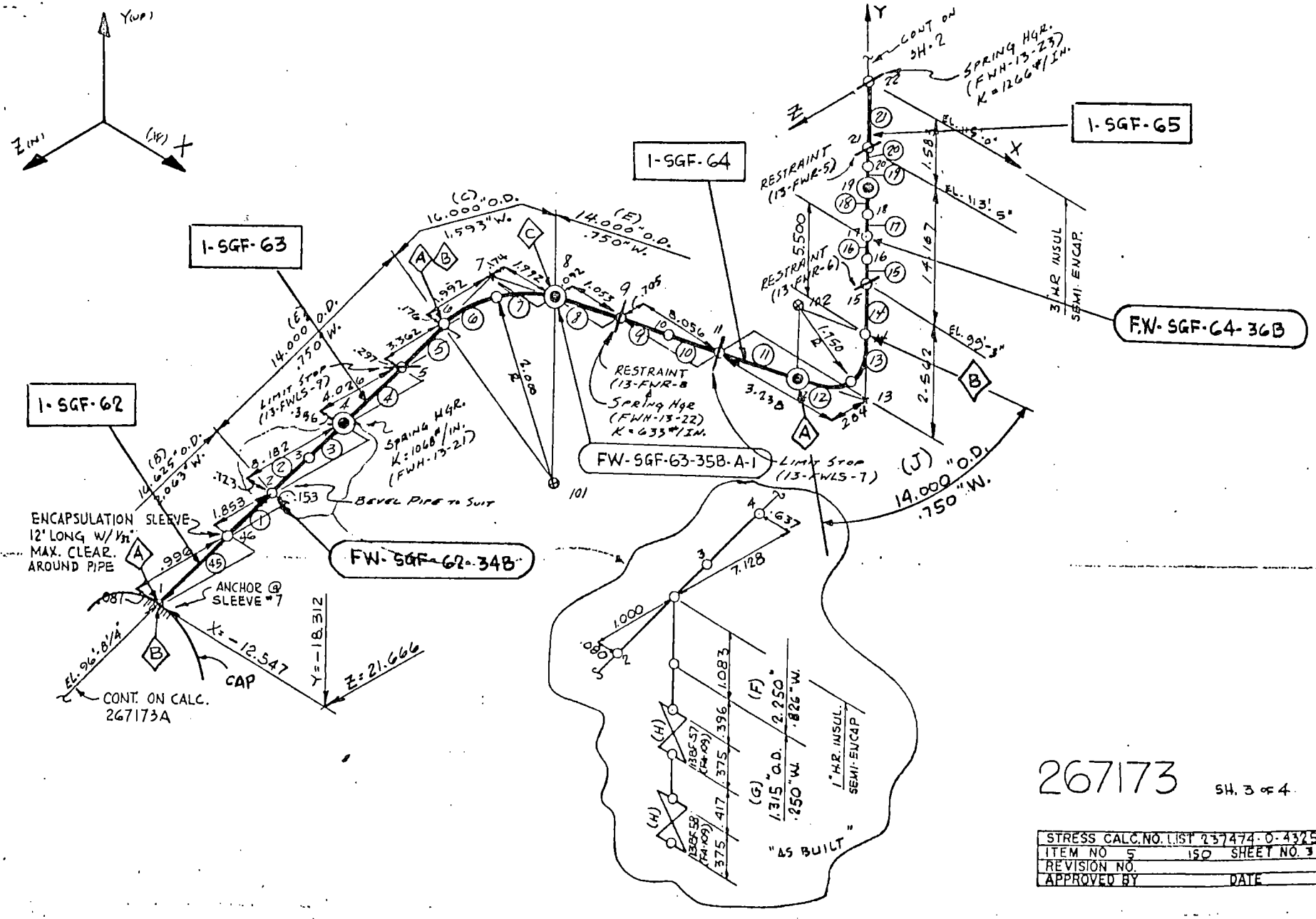
267173 SH. 1 OF 4

STRESS CALC. NO. LIST 237474-D-4325		
ITEM NO 5	ISO	SHEET NO. 1 OF 4
REVISION NO.		
APPROVED BY	DATE	



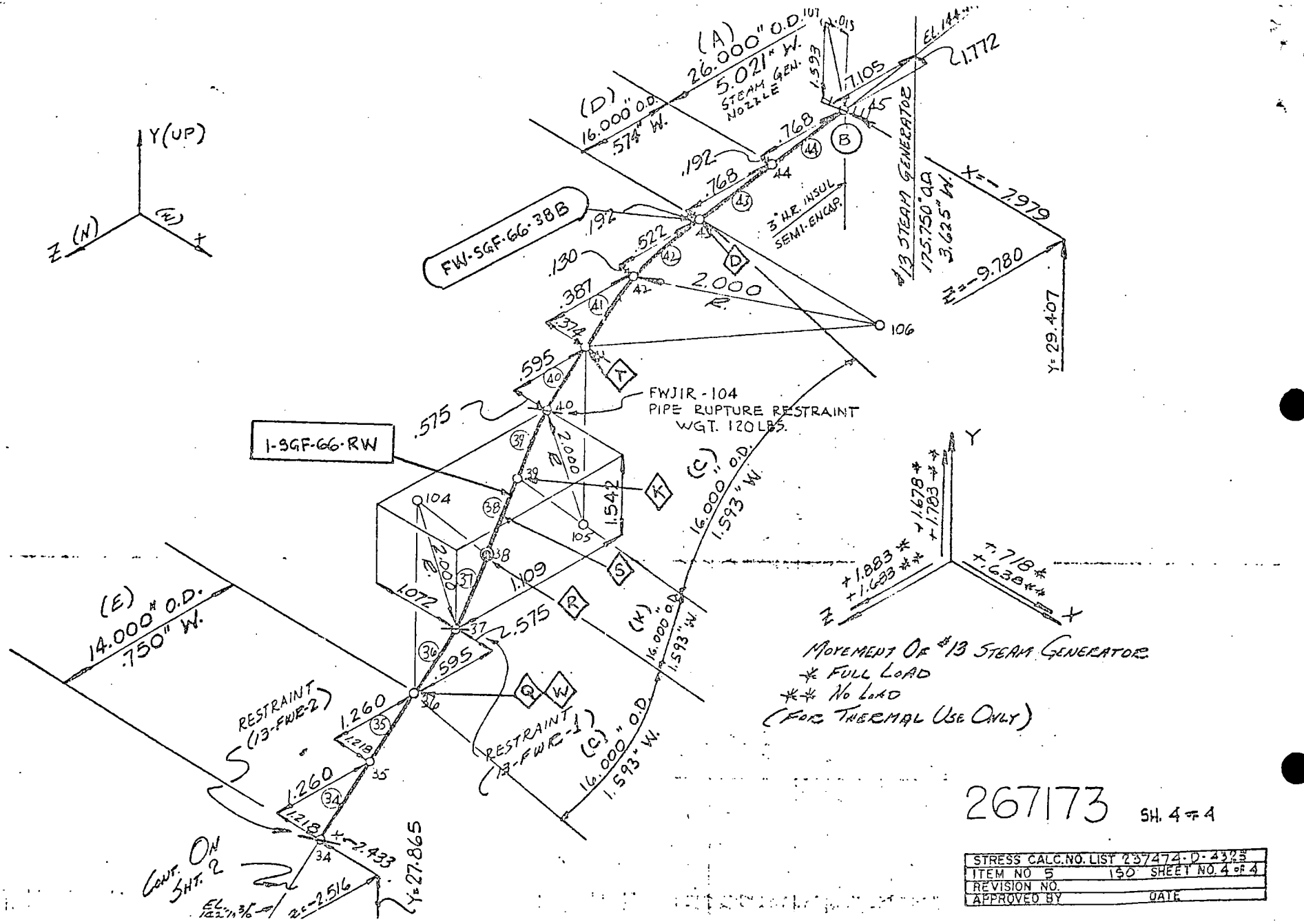
267173 SH. 2 OF 4

STRESS CALC. NO. LIST 237474-0-4325	
ITEM NO 5	ISO SHEET NO. 2 OF 4
REVISION NO.	
APPROVED BY	DATE



267173 SH. 3 OF 4

STRESS CALC. NO. LIST 237474-0-4325		
ITEM NO 5	ISO	SHEET NO. 3 OF 4
REVISION NO.		
APPROVED BY	DATE	



267173 SH. 4 of 4

STRESS CALC. NO.	LIST 237474-D-4328
ITEM NO	5 ISO SHEET NO. 4 of 4
REVISION NO.	
APPROVED BY	DATE

	O.D.	W. THK.	SCHED.	EC	C TEMP	EH	H TEMP	PRESS. (P.S.I.)	MATERIAL	THERMAL EXP. COEFF.		SA(P.S.I.)
A	26.000"	5.021"	SPEC.	29.9	70°	27.67	470°	1870	A508 CL. II FORGING	.03341"/FT.	.00278"/IN	30,000
B	16.625"	2.063"	"	"	"	"	"	"	A106 GR. C SEAM	"	"	26,250
C	16.000"	1.593"	160	"	"	"	"	"	A-234 WPC	"	"	"
D	16.000"	.574"	SPEC	"	"	"	"	"	A-106 GR. C SEAM	"	"	"
E	14.000"	.750"	80	"	"	"	"	"	"	"	"	"
F.	2.250"	.826"	FORGED BAR STOCK	"	"	"	"	"	A-105 GR. II	"	"	"
G.	1.315"	.250"	160	"	"	"	"	"	A-106 GR. C	"	"	"
(J)	14.000"	.750"	80	"	"	"	"	"	A-234 WPC	"	"	"
(K)	16.000"	1.593"	160	"	"	"	"	"	A106 GR C SEAM	"	"	"

267173 SH. 3 OF 5

S_H = 17,500 PSI (PIPE) & (FITTING)

STRESS CALC. NO. LIST 237474-D-4325	
ITEM NO 5	TABLE SHEET NO. 3 OF 5
REVISION NO.	
APPROVED BY	DATE

DWN.:

SALEM NUCLEAR GEN. STATION

UNIT 1

SYSTEM STEAM GEN. FEEDWATER PIPING

STRESS CALC # 26173

NOZZLE STRESSES AND LOCATION OF MAXIMUM STRESS (PSI.)

STRESS POINT #	PRESSURE	WEIGHT	THERMAL	OBE EARTHQUAKE X	OBE EARTHQUAKE Y	OBE EARTHQUAKE Z	$\sqrt{X^2+Y^2}$	$\sqrt{Y^2+Z^2}$	①	②	①/② RATIO 1/2
45	722	543	1744	1262	765	1097	1476	1337	4485	42,188	.106
44	7442	330	5025	2298	1348	1998	2664	2410	15461	42,188	.366
2	4697	79	1765	3690	1429	3261	3957	3560	10498	42,188	.249
43	7442	117	4856	2226	1223	1938	2540	2292	14955	50,000	.299

① PRESSURE + DEADWEIGHT + THERMAL + LARGER OF $\sqrt{X^2+Y^2}$ OR $\sqrt{Y^2+Z^2}$

② $S_A + S_L$ AS ADDRESSED IN SALEM FSAR 14.5.3.1

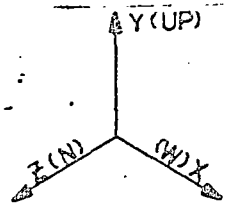
* DENOTES NOZZLE STRESSES AND

PRESSURE STRESS IS BASED ON 1195 PSI AND .574 WALL THICKNESS

PREPARED BY DB DATE 6.12.79

CHECKED BY MW. DATE 6-13-79.

VERIFIED BY RCK DATE 6-13-79



NOTE:

1. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
2. (B) = BRANCH CONN.
3. ALL RESTRAINTS · LIMIT STOPS SHOWN ONLY FOR THERMAL DEFLECTION

11/25/75	PIPDYN THERMAL
11/25/75	PIPDYN SEISMIC I

(7)

REQUIRED FOR
NO 1 UNIT OPER.
COLD HYDRO.
HOT FUNCT.

REV. NO.	DATE	DESIGN DIVISION DESCRIPTION	COMMENTS	DWN	CHK	VER
AS BUILT	3/25/76	TYPICAL NOMENCLATURE (7) = ELEMENT NO. 6 = STRESS NO. POINT 6 = STRESS NO. POINT (MASTER) = SUPPORT OR RESTRAINT LOC. NO. = PIPE RUN TERMINATION POINT (A) = MATERIAL & SIZE DESIGNATION 1-SGF- = SPOOL PIECE MARK FW-SGF- = FIELDWELD MARK ◇ = SHOPWELD MARK				

ENGINEERING STRESS ANAL. COMMENTS	CALC	VER	DATE
SPEC. 15-16A SEISMIC I NUCLEAR II			

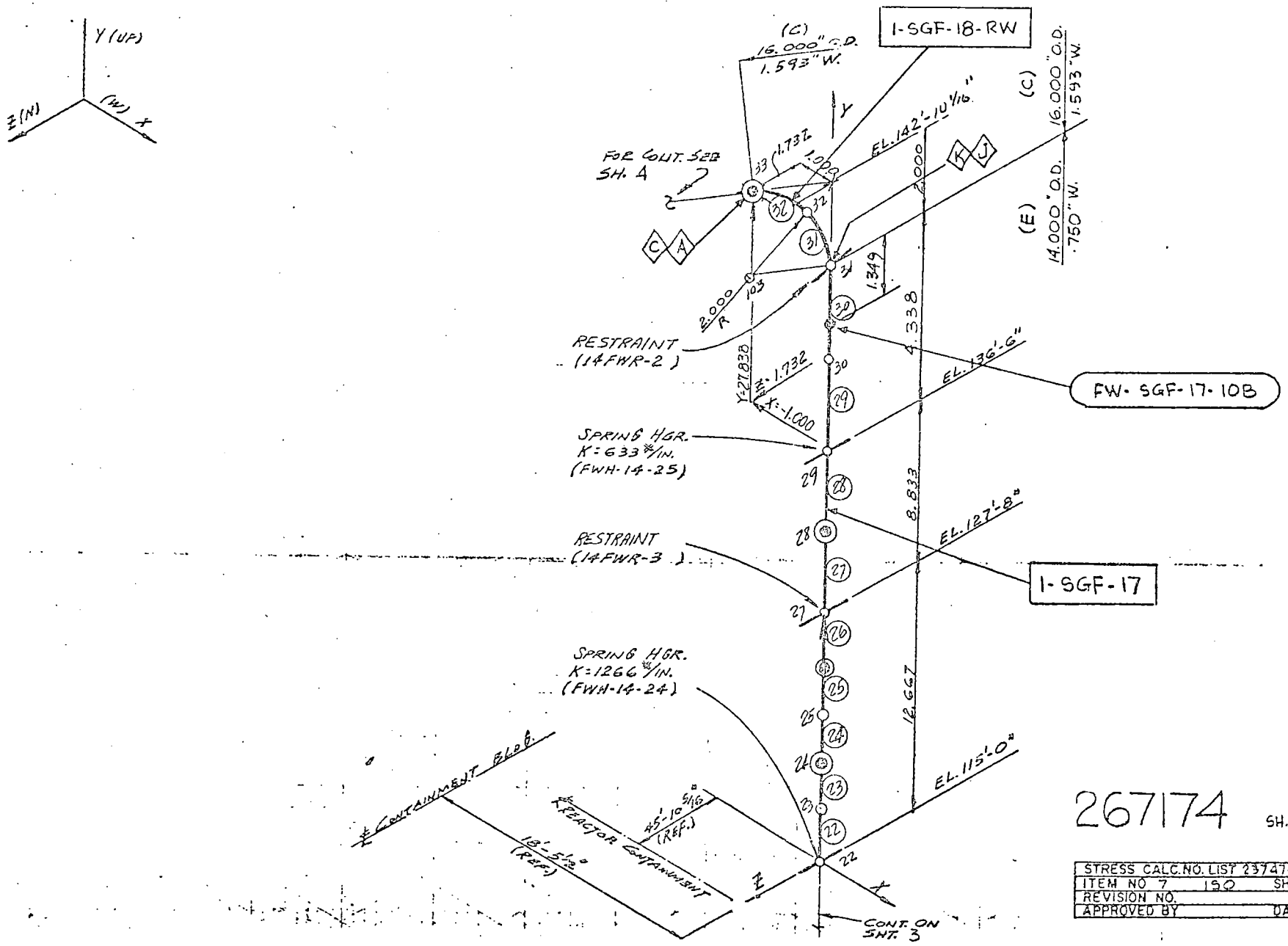
REFERENCE DRAWINGS

ARRGT. _____
DIAGRAM _____
HGR. LOC. _____
HGR. DET. _____
LG. SP. LOC. _____
LG. SP. DET. _____
SM. SP. LOC. _____
SM. SP. DET. _____
INSULATION _____
CONST. ISO. _____
E.C.N.'S _____
NO. 2 UNIT CALC. _____

SALEM NUCLEAR GEN. STA. NO. 1 UNIT
REACTOR CONTAINMENT BLDG.
STEAM GEN FEEDWATER
FROM ANCHOR @ CONTAINMENT WALL SLV # 8
@ EL 96'-8 5/8" TO CONN @ #14 STM GENERATOR

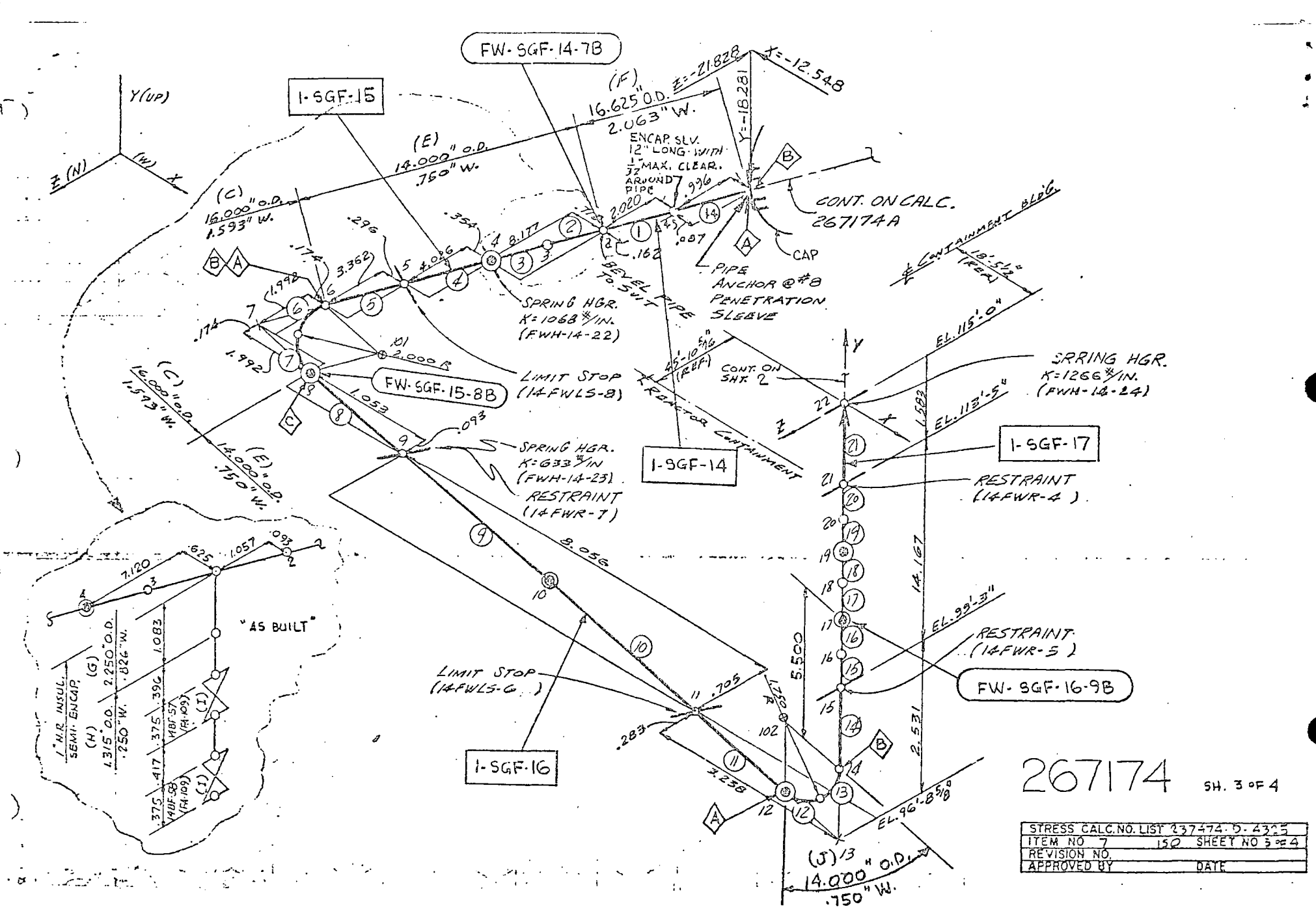
267174 SH. 1 OF 4

STRESS CALC. NO.	LIST 237474.3-4325
ITEM NO. 7	ISO SHEET NO. 1 OF 4
REVISION NO.	
APPROVED BY	DATE



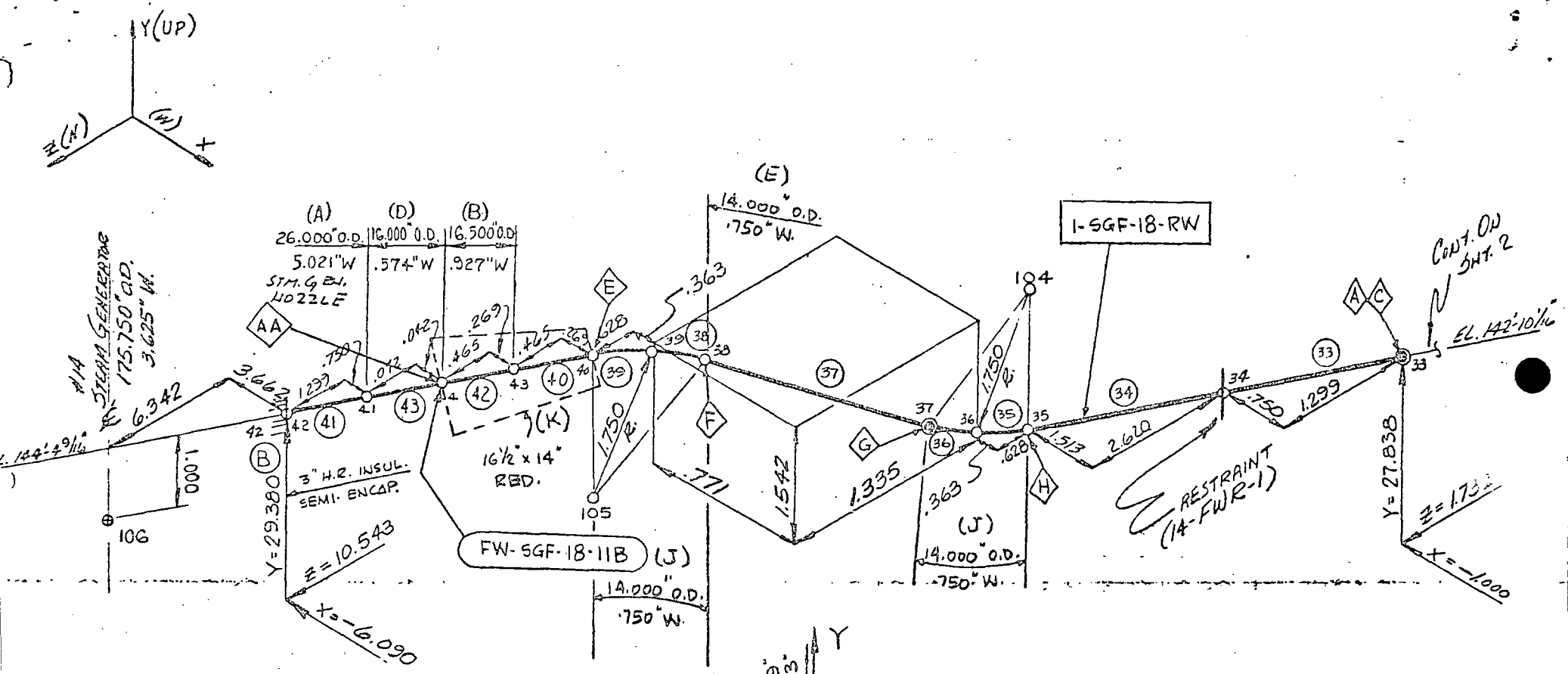
267174 SH. 2 OF 4

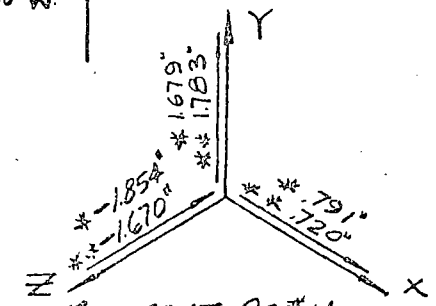
STRESS CALC. NO. LIST 237474-D-432		
ITEM NO 7	190	SHEET NO. 2 OF 4
REVISION NO.		
APPROVED BY		DATE



267174 SH. 3 OF 4

STRESS CALC. NO. LIST 237474-D-4325	
ITEM NO 7	150 SHEET NO 3 OF 4
REVISION NO.	
APPROVED BY	DATE





MOVEMENT OF #14 STEAM GENERATOR
* FULL LOAD
** NO LOAD
(FOR THERMAL CALC. ONLY)

267174 SH. 4 OF 4

STRESS CALC. NO. LIST 237474-0-4323	
ITEM NO 7	150 SHEET NO 4 of 4
REVISION NO.	
APPROVED BY	DATE

	O.D.	W. THK.	SCHED.	EC	C_{TEMP}	EH	H_{TEMP}	PRESS. (P.S.I.)	MATERIAL	THERMAL EXP. COEFF.		SA(P.S.I.)
(A)	26.000"	5.021"	SPEC.	29.9	70°	27.67	470°	1870	A508 CL. II FORGING	.03341"/FT.	.00278"/IN.	26,250
(B)	16.500"	.937"	"	"	"	"	"	"	A106 GR C SEAM.	"	"	26,25
(C)	16.000"	1.593"	160	"	"	"	"	"	A234 WPC	"	"	"
(D)	16.000"	.574"	SPEC.	"	"	"	"	"	A106 GR. C SEAM.	"	"	"
(E)	14.000"	.750"	80	"	"	"	"	"	"	"	"	"
(F)	16.625"	2.063"	SPEC.	"	"	"	"	"	"	"	"	"
(G)	2.250"	.826"	FORGED STOCK BAR	"	"	"	"	"	A-105 GR. II	"	"	"
(H)	1.315"	.250"	160	"	"	"	"	"	A-106 GR. C	"	"	"
(J)	14.000"	.750"	80	"	"	"	"	"	A234 WPC	"	"	"
(K)			16½ x 14 RED.	"	"	"	"	"	A234 WPC	"	"	"

S_H = 17,500 PSI (PIPE) & (FITTING)

DWN.:
CHK.:

267174 SH. 3 OF 5

STRESS CALC. NO. LIST 237474-D-4325		
ITEM NO 7	TABLE	SHEET NO. 3 OF 5
REVISION NO.		
APPROVED BY		DATE

SALEM NUCLEAR GEN. STATION

UNIT 1

SYSTEM STEAM GEN. FEEDWATER PIPING

STRESS CALC # 26719

NOZZLE STRESSES AND LOCATION OF MAXIMUM STRESS (PSI.)

STRESS POINT #	PRESSURE	WEIGHT	THERMAL	OBE EARTHQUAKE X	Y	Z	$\sqrt{X^2+Y^2}$	$\sqrt{Y^2+Z^2}$	①	②	①/② RATIO
9	4697	353	238	1107	632	949	1275	1140	6563	42,188	.156
40	4697	266	5789	3137	1894	2842	3664	3415	14416	42,188	.342
2	4697	37	1123	3945	1868	3858	4365	4286	10222	42,188	.242
44	7442	280	3374	1819	1155	1603	2155	1976	13251	50,000	.265

① PRESSURE + DEADWEIGHT + THERMAL + LARGER OF $\sqrt{X^2+Y^2}$ OR $\sqrt{Y^2+Z^2}$

② $S_q + S_h$ AS ADDRESSED IN SALEM FSAR 14.5.3.1

* DENOTES NOZZLE STRESSES AND

PRESSURE STRESS IS BASED ON 1195 PSI AND .574 WALL THICKNESS

PREPARED BY DB DATE 6-12-79

CHECKED BY MN DATE 6/13/79

VERIFIED BY RCK DATE 6/13/79