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TR-75-74

SEISMIC ANALYSIS OF A SHUTDOWN HEAT EXCHANGER, TYPE CEU FOR THE SOUTHERN CALIFORNIA EDISON COMPANY'S SAN ONOFRE UNITS NO. 2 AND NO. 3 PLANTS

Revision #1

Prepared For:

Engineers and Fabricators, Company
P.O. Box 7395
Houston, Texas 77008

NUS Technical Report No. 1514

10 February, 1976

Prepared By: J. W. Culley
R. A. Weiler, Jr.
P. T. Balamotis

Approved By: William W. McPherson
Manager
Eng. Mech. Dept.
Boston Office

Engineers and Fabricators, Company
Purchase Order No. 64087-D

NUS Corporation
400 Totten Pond Road
Waltham, Massachusetts
02154

RECORD OF REVISIONS

Revision No.	Date	Page	Description	Author
1	2/10/76	Title Page		J. Wawrzeniak
		Record of Revision Page		
		A-1 - A-3	Addition of Addendum #1 - Foundation Loads	

ADDENDUM #1

FOUNDATION LOADS

Rev. #1
2/10/76

SUMMARY OF SUPPORT AND SEISMIC LUG REACTIONS

THE FOLLOWING IS A SUMMARY OF THE FOUNDATION LOADS AT THE SEISMIC LUGS AND SUPPORTS AS EXTRACTED FROM COMBINE OUTPUT, APPENDIX B. THE LOADS HAVE BEEN CONVERTED INTO THE GLOBAL COORDINATE SYSTEM FIGURE 1 PAGE 6.1-2

LOADING - EQ1 + DW + NOZZLE LOADS

NODE	FX1	FX2	FX3	MX1	MX2	MX3
SUPPORTS						
13	1693	-7979	32224	-127330	-8552	4628
19	-959	7946	34587	204290	4826	9154
20	-7598	-1642	35268	-8283	203040	4882
25	7631	1010	31543	5095	-126080	8901
LUGS						
32	-15635	-1267	0	-244	-76	-8152
34	1283	-14891	0	158	-116	-9568
40	-38391	-3336	0	-360	-179	-25432
42	7213	-41878	0	234	-275	-17038

Rev 1

LOADING - EQ2 + DW + NOZZLE LOADS

NODE	FX1	FX2	FX3	MX1	MX2	MX3
SUPPORTS						
13	128	-7688	38144	-205640	-637	7597
19	-1430	7721	31459	164450	7190	747
20	-5120	-447	30099	-2192	150200	9503
25	5070	1816	36784	9119	-191390	1698
LUGS						
31	-12133	-1094	0	-197	-43	-6149
33	1332	-11412	0	128	-67	-8098
39	-33164	-3250	0	-362	-178	-23005
41	7030	-36847	0	235	-274	-13928

Rev #1

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400 Totten Pond Road
Waltham, Massachusetts
02154

Reviewed By: JRS 11-20-75
Approved By: DR 11-24-75

TABLE OF CONTENTS

Section 1.0

INTRODUCTION

The Engineering Mechanics Department of NUS Corporation received the Purchase Order No. 64087-D from Engineers and Fabricators, Co. to perform the seismic analysis of a Shutdown Heat Exchanger to be installed at the Southern California Edison Company's San Onofre Units No. 2 and No. 3 Plants. The above analysis is included herein and conforms to the requirements of the governing Combustion Engineering Specification, Reference 1.

Section 2.0

RESULTS AND CONCLUSIONS

This section presents a summary of the heat exchanger results as calculated in this report. The results include the effects of deadweight, seismic, nozzle and pressure loading on the supports and seismic lugs, support and seismic lug welds, support and seismic lug bolts, and local shell junctions. The analysis performed consisted of a worst case loading combination. When applicable, an upper bound for stress value was calculated.

The calculated natural frequency for the Shutdown Heat Exchanger was found to be:

48.5 Hz

The calculation of this natural frequency may be found in Section 8, beginning on Page 8.1-1. Flow induced vibrations are not a problem.

From a review of the summary of stress results, no failure areas were observed and, therefore, the heat exchanger meets the seismic and nozzle load requirements of the Combustion Engineering Specification, Reference 1.

Location	Type of Stress	Loading	Maximum Stress Value	Allowable Stress Value	
Nozzles N_1, N_2	Primary Local Membrane	Nozzle Loads			
Vessel			9136	28,000	(1)
Nozzle			7220	26,730	
Tubeside	Primary Membrane	Seismic + Deadweight + Nozzle Loads + Pressure			
Plenum			12156	19,250	(2)
Outlet			13043	19,250	
Inlet			13043	19,250	
Shellside	Primary Membrane				
Inlet Plenum			6756	19,250	
Inlet Nozzle			4651	16,500	(2)
Outlet Plenum			6729	19,250	
Outlet Nozzle			4987	16,500	
Shell	Primary Membrane		6832	19,250	(2)
Support/Vessel	Primary Local Membrane		5630	28,800	(1)
Seismic Lug/Vessel			5037	28,800	
Support/Vessel	Primary + Secondary		7856	52,500	(5)
Seismic Lug/Vessel			38078	52,500	
Support	General Membrane		1439	17,500	(3)
	General Membrane Plus Bending		4639	26,250	(4)
Support Weld	Shear In Fillet Weld		2142	21,000	(7)
Support Bolts	Tension In Bolt		15848	40,000	(6)

Location	Type of Stress	Loading	Maximum Stress Value	Allowable Stress Value
Seismic Lug	General Membrane General Membrane Plus Bending	Seismic + Deadweight + Nozzle Loads + Pressure	3363 12546	17,500 (3) 26,250 (4)
Seismic Lug Weld	Shear In Fillet Weld	↓	6784	21,000 (7)
Seismic Lug Bolts	Shear In Bolt	↓	13911	15,390 (6)

MAXIMUM STRESS VALUES

NOTES:

1) Primary Local Membrane Stresses are compared to 1.65 S, Reference 1.

2) Primary Membrane Stresses are compared to 1.1 S, Reference 1.

3) General Membrane Stress are compared to 1.0 S, Reference 9.

4) General Membrane plus Bending Stresses are compared to 1.5 S, Reference 9.

5) Primary Membrane plus Secondary Stresses are compared to 3 S_m, Reference 1.

6) Bolt Stresses are compared to Limits of Para. XVII-2460, Reference 9.

7) Weld Stresses are compared to 21000 psi shear, Reference 9, Table NF-3292.1-1.

Section 3.0

ANALYTICAL METHODS

A finite element model of the type CEU heat exchanger was developed using Control Data Corporation's STARDYNE computer code, Reference 10. This model included the major load paths, flexibility members, and mass of the unit.

The frequency analysis was performed using the Householder-QR option of program STARDYNE. For this analysis the units weight was distributed among nine (9) node points as described in Section 6.3.

The nozzle load analysis, deadweight analysis, and seismic analysis were performed using the STATIC option of program STARDYNE. The deadweight and seismic analysis consisted of inputing concentrated forces at the mass points equal to the mass times the respective "g" loadings. The nozzle loads were applied to be consistent with the seismic loading per Reference (1), Paragraph 4.1.3.

The final total stresses on each component were determined by absolutely summing the effects of nozzle, seismic and deadweight loads. NUS Corporation's computer codes PRECOM and COMBINE were used in the summing of the stresses.

A local shell analysis of the nozzle to shell junctions and support, seismic lug to shell junctions was performed using the

Welding Research Council Bulletin, Reference 4, as coded in the SANSAR computer code.

Program abstracts of the NUS Corporation programs PRECOM, COMBINE, and SANSAR are presented in their respective appendices.

Standard engineering mechanics of materials formulae will be used to calculate support and support lug stresses.

Section 4.0

REFERENCES

1. Combustion Engineering Specification No. 1370-PE-301, Rev. 03-1/27/75, Project Specification for a Heat Exchanger.

2. EFCO Drawing No. CD-16645, Rev. D

3. NUS Corporation Proposal No. 7507041 (P-421).

4. K. R. Wichman, A. G. Hopper and J. L. Mershon, "Local Stresses in Spherical and Cylindrical Shells due to External Loading," Welding Research Council Bulletin, August 1965 and Revised Printing, December, 1968.

5. Telecon with D. Ringo of EFCO on 9/17/75.

6. Chi-Teh, Wang, Applied Elasticity, Mc Graw Hill, New York, New York, 1953.

7. Gere and Weaver, Analysis of Framed Structures, Van Nostrand Reinhold Company, New York, New York, 1965.

8. ASME Boiler and Pressure Vessel Code, Section II, 1974, American Society of Mechanical Engineers, New York, New York.

9. ASME Boiler and Pressure Vessel Code, Section III, 1974, American Society of Mechanical Engineers, New York, New York.

10. MRI/STARDYNE Structural Analysis System, Mechanica Research, Inc., Los Angeles, California, 1970.

SECTION 5.0

MATERIAL PROPERTIES

THE MODULUS OF ELASTICITY, AND ALLOWABLE STRESS VALUES WERE OBTAINED FROM REF(9), TABLES 1-6.0 P 105 & 1-7.1 P 107 RESPECTIVELY FOR A-182-F304 TABLE 1-7.2 P115 FOR S.

COMPONENT	ASTM MATERIAL SPEC.*	DESIGN TEMP. (°F)	MODULUS OF ELASTICITY E, (PSI)	POISSON'S RATIO	ALLOWABLE STRESS S, (PSI)
ALL SHELLS, PLATES, AND SUPPORTS EXCEPT FLANGES	A-516-70 (CARBON CONTENT <.3%)	400	27.0×10^6	.3	17,500
		250	27.55×10^6	.3	17,500
NOZZLES N3 & N4	A-106 GRB (CARBON CONTENT≤.3)	250	27.55×10^6	.3	15,000
NOZZLES N1 & N2	A-182 F304	400	26.6×10^6	.3	16,200
FLANGES	A-105 (CARBON CONTENT ASSUME≤.3)	250	27.55×10^6	.3	17,500
		400	27.0×10^6	.3	17,500

* CARBON CONTENT FROM REF(8)

Section 6.0

MODEL

Presented herein are the model CALCOMP plots, nodal coordinates, element connectivity, element flexibilities, and nodal weights for the mathematical model used in this analysis.

This finite element model was developed with the use of the Control Data Corporation CDC-6600 STARDYNE computer code, Reference 10.

Section 6.1

Plots

Presented herein are CALCOMP plots of the model together with sketches illustrating the node and element numbering schemes. Also shown on the sketches are the dynamic "principal" mass nodes.

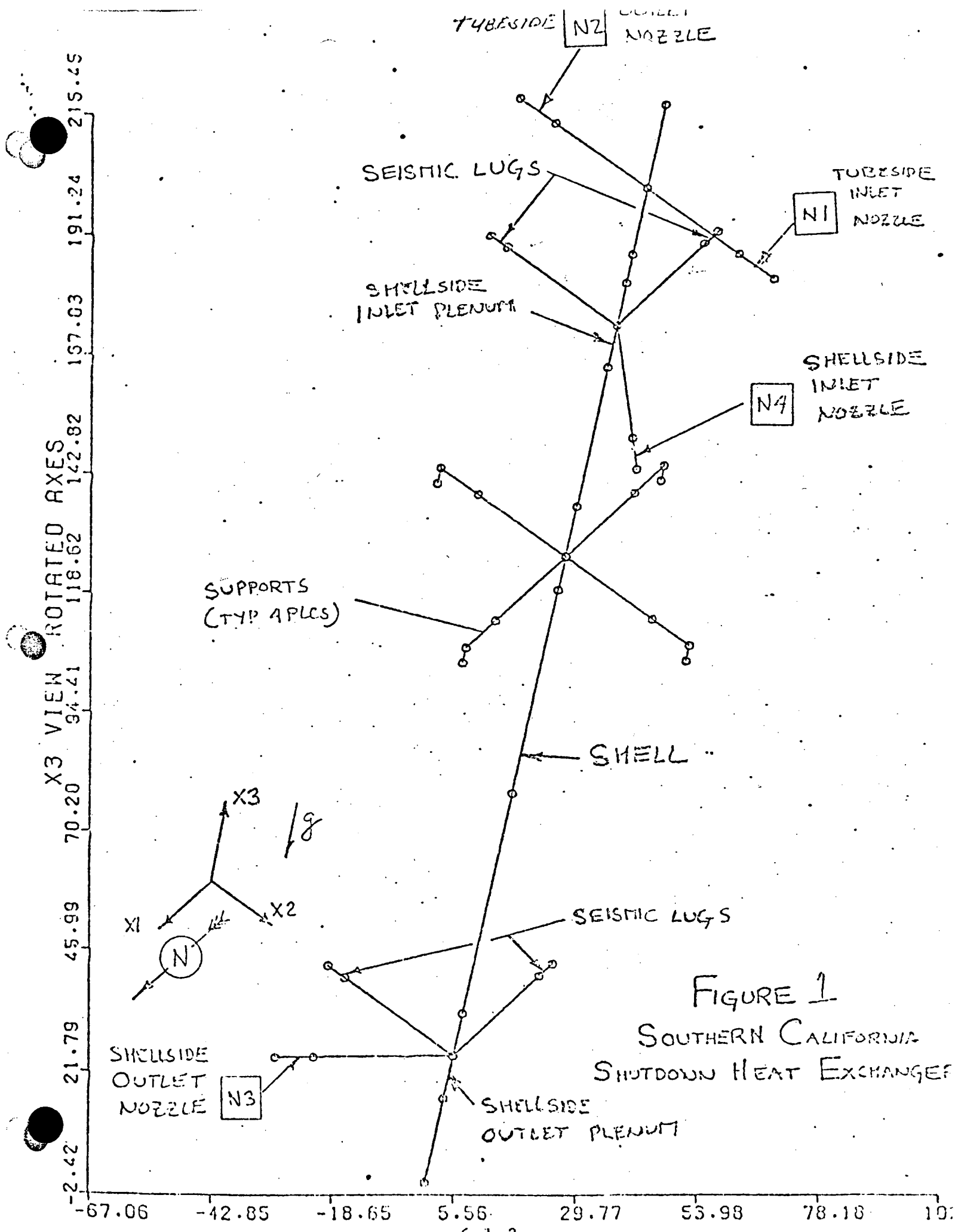


FIGURE 1
SOUTHERN CALIFORNIA
SHUTDOWN HEAT EXCHANGER

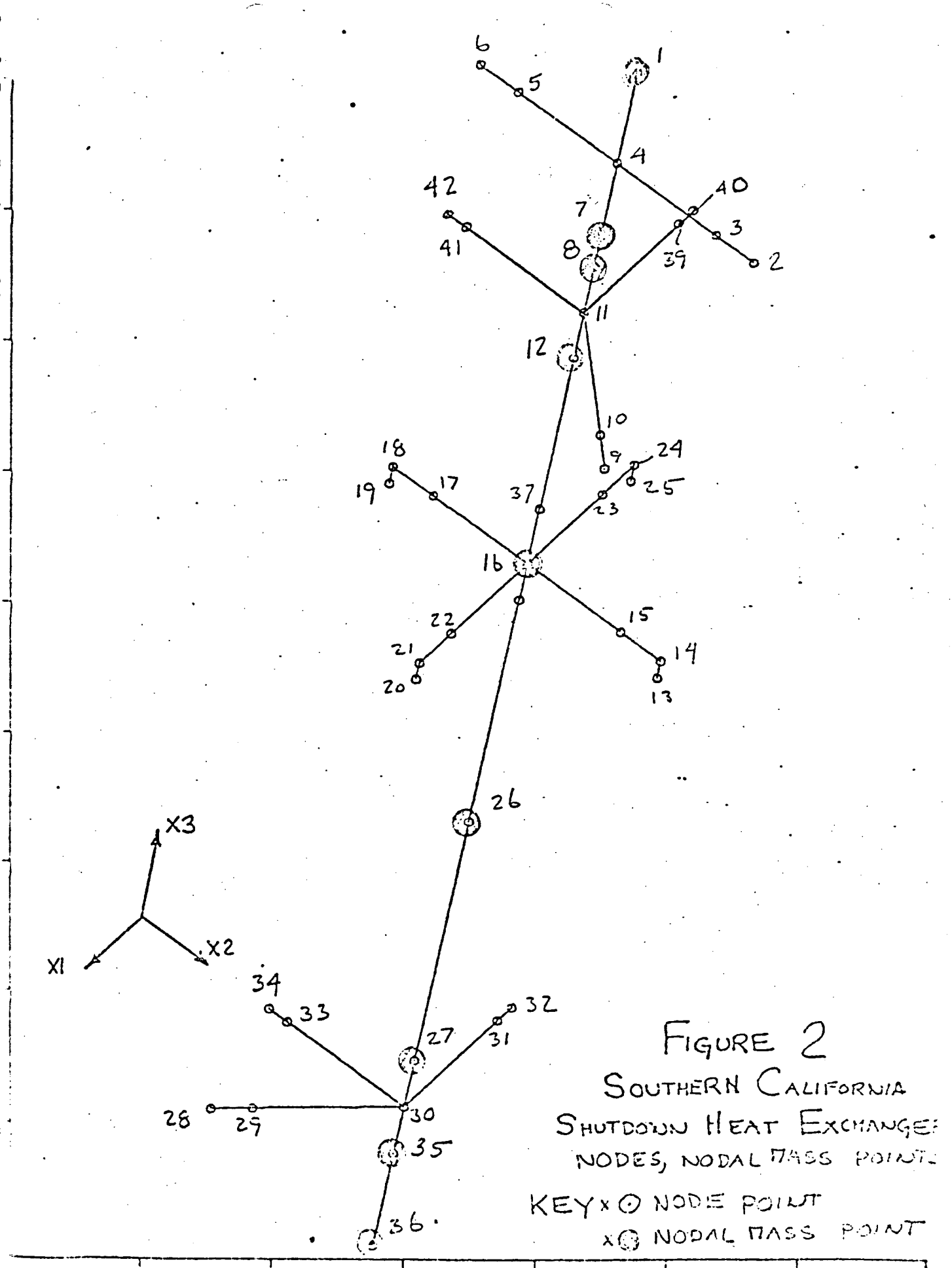


FIGURE 2

SOUTHERN CALIFORNIA SHUTDOWN HEAT EXCHANGER NODES, NODAL MASS POINTS

KEY ⊙ NODE POINT

⊙ NODAL MASS POINT

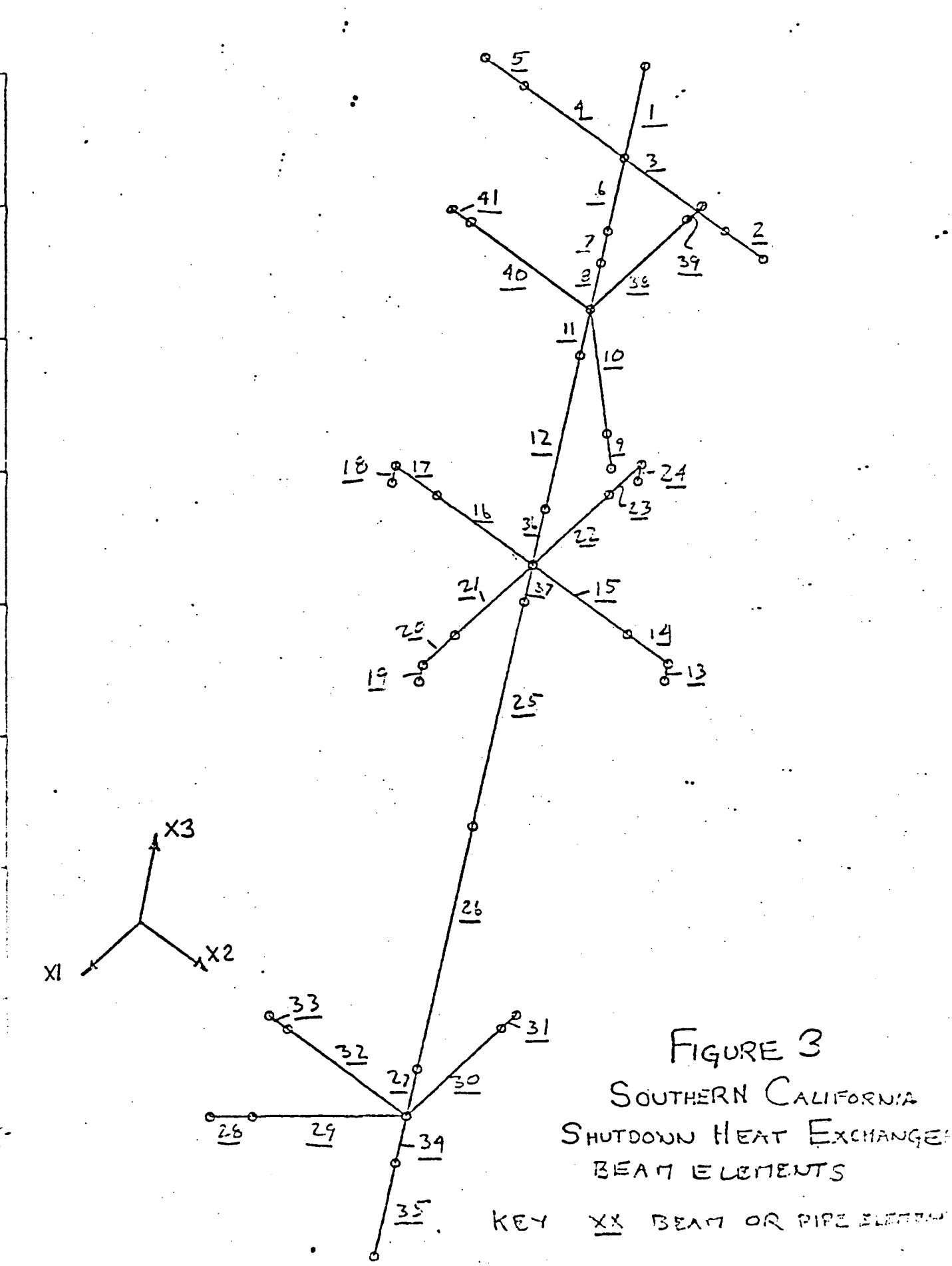


FIGURE 3
SOUTHERN CALIFORNIA
SHUTDOWN HEAT EXCHANGE
BEAM ELEMENTS

KEY XX BEAM OR PIPE ELEMENT

6.1 BEAM PROPERTIES

BPROP1 -1 RIGID BEAMS

ASSUME THAT THE RIGID BEAMS HAVE PROPERTIES 5 TIMES THE PROPERTIES OF THE 56" O.D. DISTRIBUTORS. THIS SHELL WAS CHOSEN BECAUSE IT HAS THE LARGEST INERTIA PROPERTIES.

DISTRIBUTOR SHELL

O.D. = 56 IN $\quad t = .625$ IN

AREA, A

$$A = 2\pi R_m t = 2\pi(27.69).625$$
$$= 108.7 \text{ IN}^2$$

POLAR MOMENT, J

$$J = 2\pi R_m^3 t = A R_m^2 = 108.7(27.69)^2$$
$$= 83374 \text{ IN}^4$$

MOMENT OF INERTIA, I_2, I_3

$$I_2 = I_3 = \frac{J}{2} = 41697 \text{ IN}^4$$

SUMMARY OF RESULTS ($\approx 6\times$ ABOVE PROPERTIES)

$$A = 500 \text{ IN}^2$$

$$J = 4 \times 10^5 \text{ IN}^4$$

$$I_2 = I_3 = 2 \times 10^5 \text{ IN}^4$$

ASSUME $\quad SF2 = SF3 = SSF2 = SSF3 = 1.0$

BY JWC DATE [illegible] SUBJECT BEAM PROPERTIES 2→6 & 9 SHEET NO. ... OF ...
CHKD. BY [illegible] DATE [illegible] JOB NO. [illegible]-2

BEAM PROPERTIES 2 → 6 & 9 ARE INPUT AS "PIPEG" BEAMS USING THE PROPERTIES LISTED AS FOLLOWS:

BPROP'S NO.	DESCRIPTION	O.D.	t
2	CHANNEL SHELL	41.75	1.25
3	NOZZLES N1, N2	12.75	.33
4	SHELLSIDE SHELL	45.	.50
5	DISTRIBUTORS	56.	.625
6	NOZZLES N3, N4	16.	.50
9	SHELLSIDE SHELL PLUS PAD	46.	1.00

AREA, A

$$A = 2A_1 + A_2$$

$$A = 2(.75)(14.11) + 15(.875)$$

$$A = 2(10.58) + 13.13$$

$$A = 34.29$$

CENTROID, $\bar{X}$

$$\bar{X} = (\sum A_i X_i)/A$$

$$\bar{X} = \left[2(10.58)7.93 + (13.13).438\right]/34.29$$

$$\bar{X} = 5.06$$

POLAR MOMENT OF INERTIA, J. REF (6) page 4.0.1

$$J = \sum \frac{1}{3} b_i t_i^3$$

$$J = 2\left(\frac{1}{3}(14.11)(.75)^3\right) + \frac{1}{3}(15)(.575)^3$$

$$J = 7.32 \text{ IN}^4$$

MOMENT OF INERTIA, I_2

$$I_2 = \sum \left(\frac{1}{12} b_i h_i^3 + A_i \bar{x}_{3i}^2\right)$$

$$I_2 = 2\left[\frac{1}{12}(14.11)(.75)^3 + 10.58(6.625)^2\right] + \frac{1}{12}(.875)(15)^3$$

$$I_2 = 1176 \text{ IN}^4$$

MOMENT OF INERTIA, I_3

$$I_3 = 2\left[\frac{1}{12}(14.11)^3(.75) + 10.55(2.37)^2\right] + \frac{1}{12}(.875)^3(15) + (13.13)(4.62)^2$$

$I_3 = 807 \text{ IN}^4$

SHEAR SHAPE FACTORS, SF2, SF3, REF 7 P459

$$SF2 \cong \frac{(15-.75)(.875)}{34.29} = .338$$

$SF3 = 1 - SF2 = .662$

TORSION STRESS FACTOR (CTORS) REF 6 P97

CTORS = GREATER THICKNESS

∴ CTORS = .875 IN

SHEAR STRESS FACTORS

FOR PRIMARY MEMBRANE SHEAR STRESSES

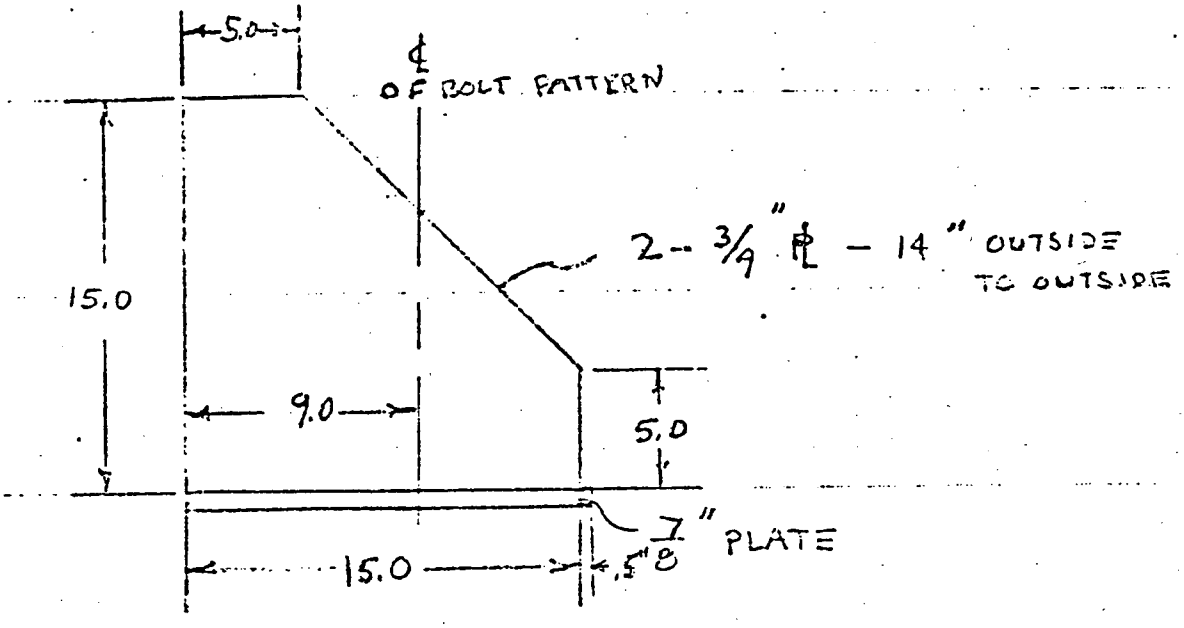
SSF2 = SSF3 = 1.0

SUMMARY OF RESULTS, BPROP 1, 7

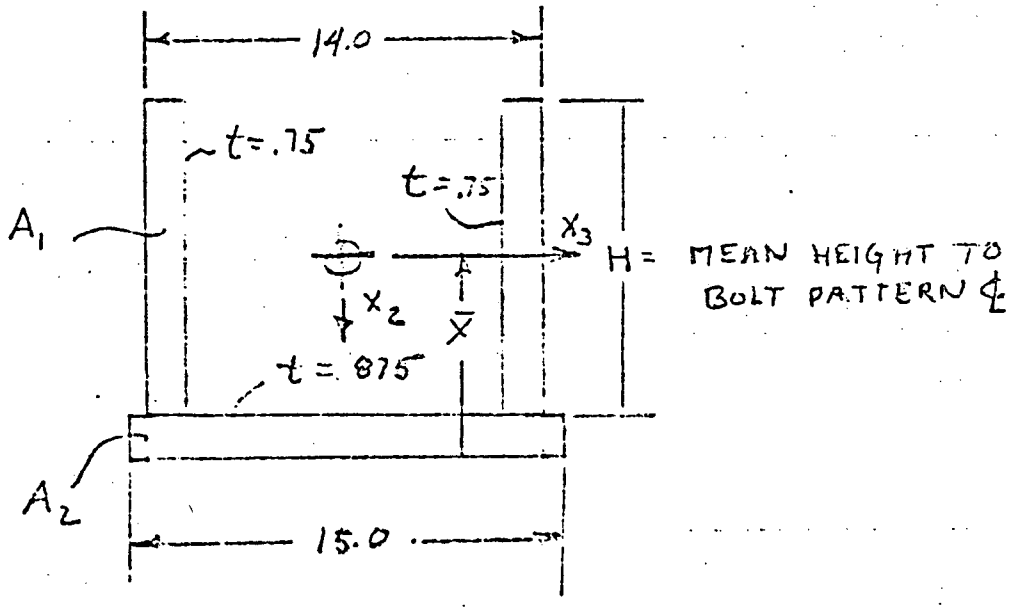
$A =$	34.29 IN^2	$SF2 =$	.338
$J =$	7.32 IN^4	$SF3 =$	.662
$I_2 =$	1176 IN^4	CTORS =	.875 IN
$I_3 =$	807 IN^4		

BPROP 1 – 7 SUPPORTS

ACTUAL GEOMETRY



ASSUMED GEOMETRY, AT VESSEL/SUPPORT JUNCTION



MEAN HEIGHT, H

$$H = \left[15(5) + \left(\frac{15+11}{2}\right)4\right] / 9 = 14.11"$$

EPROP 1-8 SEISMIC LUGS

GEOMETRY

3/4" PLATE x 12" LONG

AREA, A

$A = 3/4 \cdot 12 = 9\ IN^2$

POLAR MOMENT OF INERTIA, J

$J = \frac{1}{3}(12)(.75)^3 = 1.688\ IN^4$

MOMENT OF INERTIA, I_2

$I_2 = \frac{1}{12}(12)^3(.75) = 108\ IN^4$

MOMENT OF INERTIA, I_3

$I_3 = \frac{1}{12}(12)(.75)^3 = .422\ IN^4$

SHEAR SHAPE FACTORS, REF 7 P459

SF2 = 0 SF3 = .833

TORSION STRESS FACTOR, CTORS

CTORS = .75 IN

6.3 NODAL WEIGHT DISTRIBUTION

THE UNIT WEIGHT ABOVE & BELOW THE CG OF THE UNIT WILL BE EVENLY DISTRIBUTED ALONG THE LENGTH OF THE UNIT. THE WEIGHT ABOVE AND BELOW THE SUPPORTS WILL BE DETERMINED BY RATIOING THE CG DISTANCE ABOVE & BELOW THE SUPPORT AS SHOWN ON REF ( ).

$\therefore$ TOTAL WEIGHT = 61000 LBS

$$W_{BELOW} = \left(W_{TOTAL}(8')\right) / 8'-8'9''$$

$$W_{BELOW} = 61000\,(.478)$$

$$W_{BELOW} = 29200 \text{ LBS} = W_B$$

$$\therefore W_{ABOVE} = W_A = 61000 - 29200 = 31800 \text{ LBS.}$$

RATIOING BY LENGTH THE DISTRIBUTED MASS BECOMES:

$$W_1 = \frac{(361 - 310.5)(.5)}{361 - 204.5} W_A = .5 \frac{(50.5)}{(156.5)} 31{,}800$$

$$W_1 = 5131 \text{ LBS}$$

BY JJL DATE 7/6/15 SUBJECT NODAL WEIGHT DISTRIBUTION SHEET NO. OF
CHKD. BY DATE JOB NO. EIS0[illegible]

$$W_7 = W_1 + W_A(.5)\frac{(310.5-320.65)}{156.5} = 6108 \text{ LBS}$$

$$W_8 = (.5)W_A\frac{(310.5-272.99)}{156.5} = 3822 \text{ LBS}$$

$$W_{12} = (.5)W_A\frac{(300.88-204.5)}{156.5} = 9792 \text{ LBS}$$

$$W_{16} = (.5)W_A\frac{(272.88-204.5)}{156.5} + .5W_B\frac{(204.5-130.19)}{204.5} = 12252 \text{ LBS}$$

$$W_{26} = (.5)W_B\frac{(204.5-56.13)}{204.5} = 10593 \text{ LBS}$$

$$W_{27} = (.5)W_B\frac{(130.19-28.13)}{204.5} = 7286 \text{ LBS}$$

$$W_{35} = (.5)W_B\frac{(56.13-0)}{204.5} = 4007 \text{ LBS}$$

$$W_{36} = (.5)W_B\frac{(28.13)}{204.5} = 2008 \text{ LBS}$$

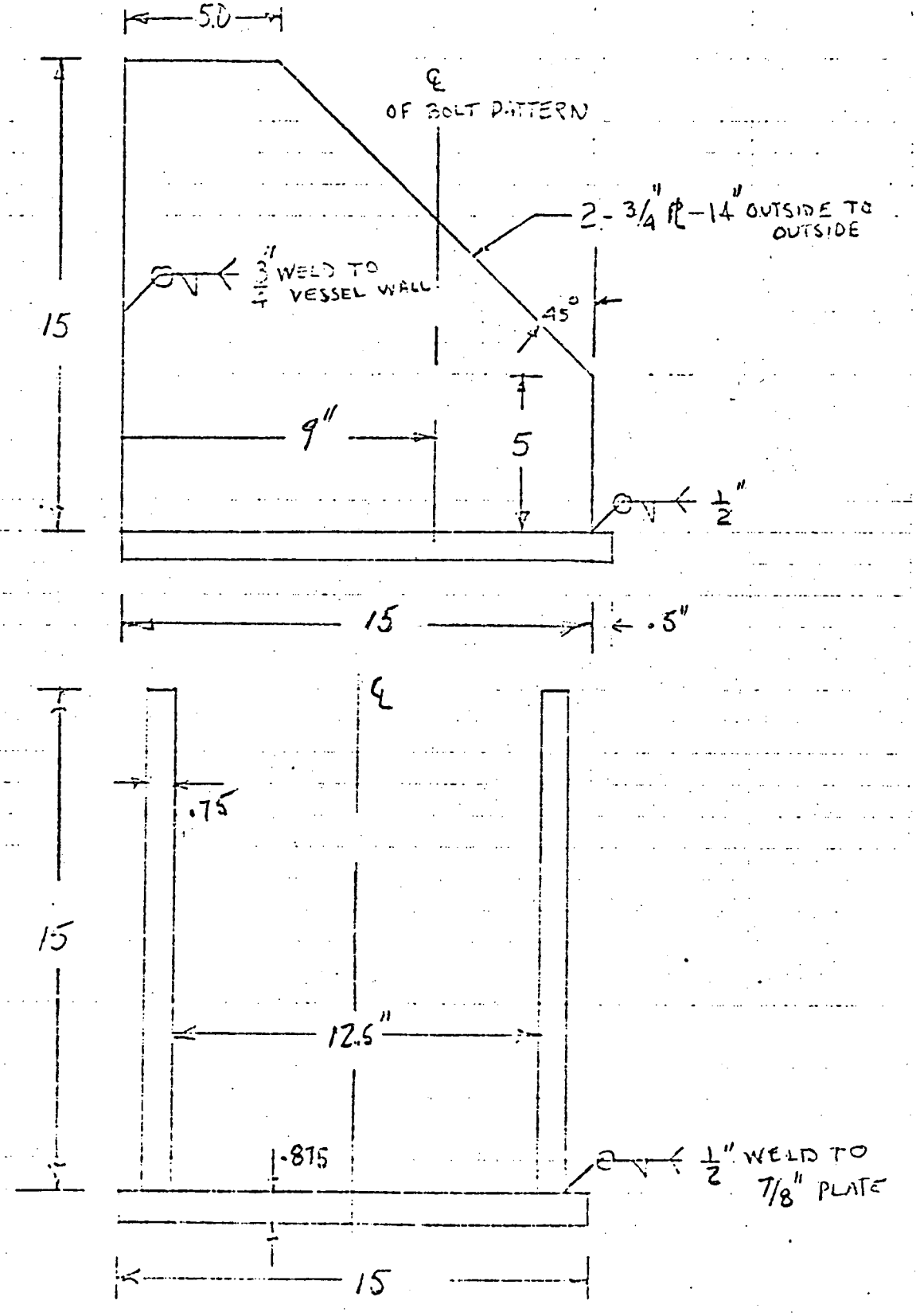
NODAL WEIGHT SUMMARY

NODE NO	NODAL WEIGHT (LBS)
1	5131
7	6108
8	3822
12	9792
16	12252
26	10593
27	7286
35	4007
36	2008
TOTAL	60999 LBS.

Section 6.4

Support and Seismic Lug Details

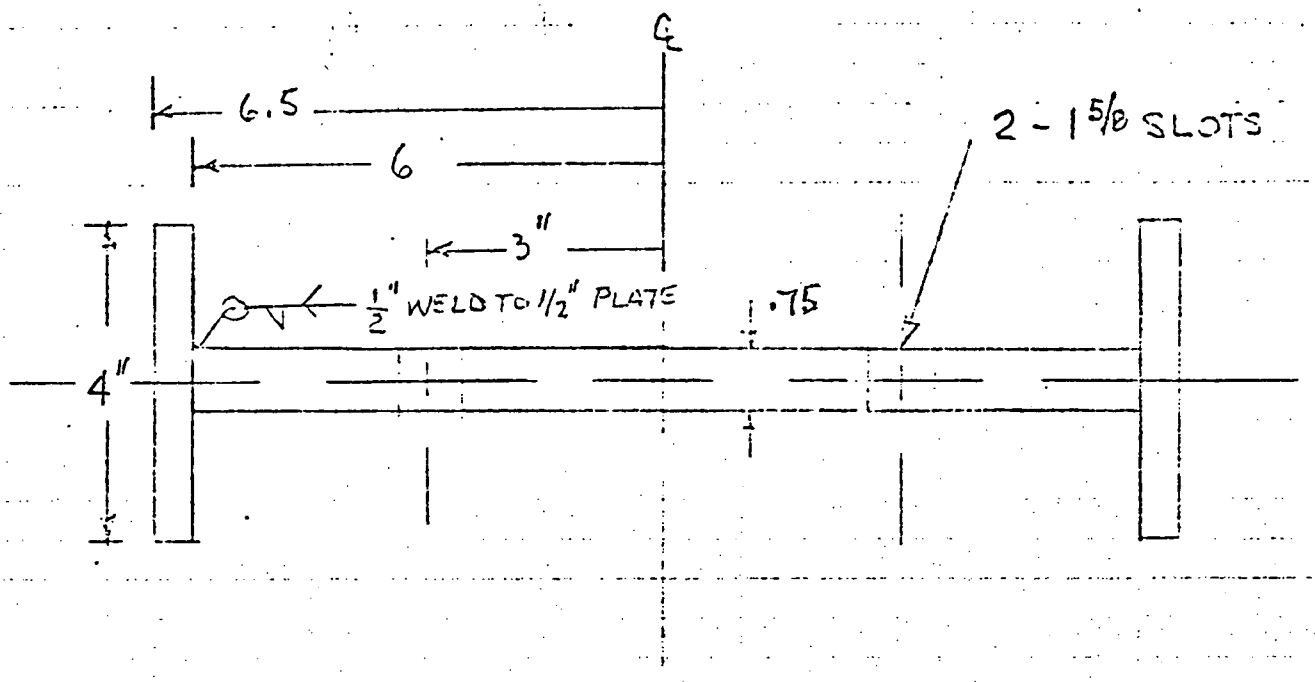
SUPPORT DETAIL

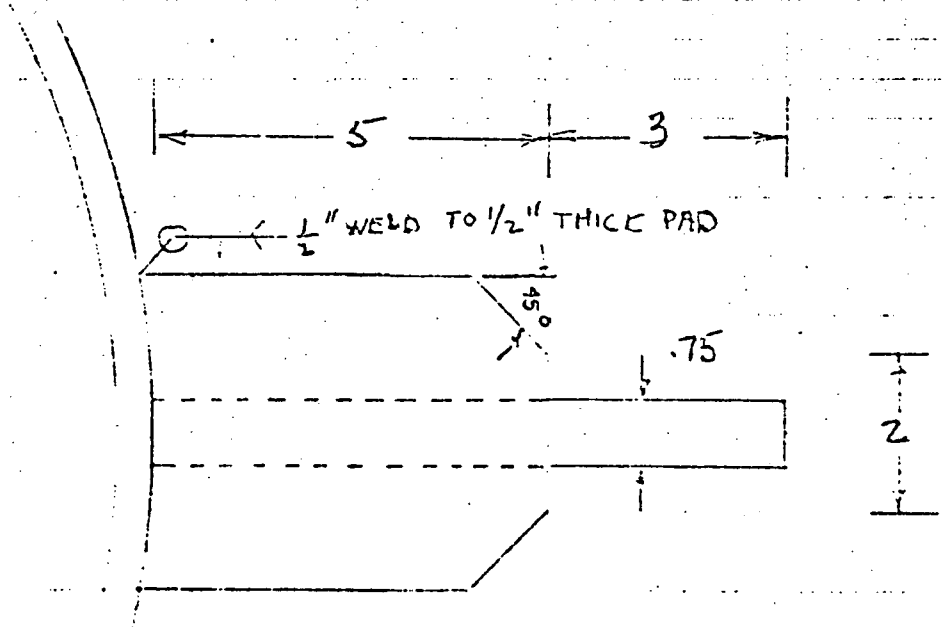


BY PB DATE 1/26/15 SUBJECT SHEET NO. OF

CHKD. BY DATE 1/27/15 JOB NO. EPCO-2

SEISMIC LUG DETAIL





← .5" THICK PAD, 10" x 18"

BY ... DATE ... SUBJECT ...

CHKD. BY ... DATE ...

JOB NO. ...

SUPPORT PAD LENGTH

LONG SHELL LENGTH FOR SUPPORT PAD, L

$R_m = 22.5''$ $\quad \nu = .3$

$t = 1.0''$ $\quad L = 3/\lambda$

$$\lambda = \left(\frac{3(1-\nu^2)}{R_m^2 t^2} \right)^{1/4}$$

$$\lambda = \left(\frac{3(.91)}{22.5^2 (1)^2} \right)^{1/4} = .271$$

$$L = 11.1''$$

∴ SUPPORT SHOULD BE 12" LONG, ON EACH SIDE OF SUPPORT CENTROID.

∴ USE 28" PAD $\frac{1}{2}$" THICK

WITH 6.125" BELOW $\frac{7}{8}$" ℓ

$\frac{1}{4}$ 6" ABOVE TOP OF SUPPORT

7.1 NOZZLE AND DEADWEIGHT LOAD ANALYSIS

DEADWEIGHT LOAD

THE DEAD WEIGHT ANALYSIS WILL BE PERFORMED BY INPUTING A -1g ACCELERATION FORCE ON THE NODAL MASSES OR:

NODE	DEADWEIGHT FORCE, FX3
1	-5131
7	-6108
9	-3622
12	-9792
16	-12252
26	-10593
27	-7296
35	-4007
36	-2008

NOZZLE LOADS

THE NOZZLE LOADS WILL BE APPLIED IN A DIRECTION THAT IS ADDITIVE TO THE SEISMIC LOAD DIRECTIONS OF SECTION 8.2 OF THIS REPORT (for

NOZZLE LOADS, (EARTHQUAKE 1)

NOZZLES N1 & N2, NODES 2 & 6

LOAD	(MAGNITUDE)	GLOBAL DIRECTION
F_A	2952	+ X2
F_S	2952	− X1
M_T	90300.	− X2
M_B	90300.	− X1

NOZZLE N3 NODE 28

FA	5523	−.707 X1	+.707 X2
FS	5523	+ X3	
MT	210300	−.707 X1	+.707 X2
MB	210300	−.707 X1	−.707 X2

NOZZLE N4 NODE 9

FA	5523	+.707 X1	−.707 X2
FS	5523	−.707 X1	+.707 X2
MT	210300	−.707 X1	−.707 X2
MB	210300	−.707 X1	+.707 X2

FOR LOAD CASE 2 (EARTHQUAKE 2), THE LOADS WILL BE THE SAME EXCEPT THAT THE NOZZLE N3, NODE 28 SIGNS WILL BE OPPOSITE THOSE OF LOAD CASE 1

NOZZLE LOAD SUMMARY

LOAD CASE	NODE	F_{x1}	F_{x2}	F_{x3}	M_{x1}	M_{x2}
EQ1	2	-2952	+2952	0	-90300	-90300
	6	-2952	+2952	0	-90300	-90300
	28	-3905	+3905	5523	-297400	0
	9	0	+7810	0	-297400	0
EQ2	2	-2952	+2952	0	-90300	-90300
	6	-2952	+2952	0	-90300	-90300
	28	+3905	-3905	-5523	+297400	0
	9	0	+7810	0	-297400	0

A THIRD NOZZLE LOAD CASE WILL BE RUN THAT WILL PRODUCE A MAXIMUM OVERTURNING MOMENT ABOUT THE SUPPORT PLANE

3	2	-2952	+2952	0	-90300	-90300
	6	-2952	+2952	0	-90300	-90300
	28	+3905	-3905	+5523	-297400	0
	9	0	+7810	0	-297400	0

7.2 LOCAL STRESS ANALYSIS OF NOZZLE/SHELL JUNCTIONS

PER REF(1) P2 THE FOLLOWING NOZZLE LOADS WILL BE USED IN THIS ANALYSIS.

	12" NOZZLES N1 & N2	16" NOZZLES N3 & N4
AXIAL FORCE (LBS)	2952	5523
TRANSVERSE (LBS)	2952	5523
TORSIONAL MOMENT (ft/LBS)	7525	17,525
BENDING MOMENT (ft/LBS)	7525	17,525

THE PRESSURE AND TEMPERATURE CONDITIONS TO BE USED ARE AS FOLLOWS (FROM REF (2)):

NOZZLES	PRESSURE P (PSI)	TEMP. T (°F)
N1 & N2	650	400°F
N3 & N4	150	250°F

NOZZLE/VESSEL JUNCTION PARAMETERS

NOZZLE	SV (KSI)	SN (KSI)	P (PSI)	RMV(1) (IN)	TV(1) (IN)	RON(1) (IN)	TN(1) (IN)
N1 + N2	17.5	16.2	650	23.69	3.125	7.188	1.143
N3 + N4	17.5	15.0	150	2825	1.5	9.0	.375

(1) NOTE: DIMENSIONS INCLUDE CORROSION ALLOWANCE WHERE APPLICABLE.

LOAD APPLICATION POINT

NOZZLE	X	Y	Z
N1 & N2	0	9.06	0
N3 & N4	0	7.75	0

SANSAR INPUT LOADS (IN SANSAR LOAD CONVENTION)

THESE LOADS ARE APPLIED TO MAXIMIZE STRESSES IN THE NOZZLE VESSEL JUNCTION

NOZZLE		F_X (LBS)	F_Y (LBS)	F_Z (LBS)	M_X (IN-LBS)	M_Y (IN-LBS)	M_Z (IN-LBS)
N1	CASE 1	- 2952	+ 2952	0	0	90300	+ 90300
	CASE 2	0	+ 2952	+ 2952	+ 90300	90300	0
N2	CASE 1	- 5523	+ 5523	0	0	210300	+ 210300
	CASE 2	0	+ 5523	+ 5523	+ 210300	210300	0

LOCAL NOZZLE STRESSES

THE FOLLOWING PRIMARY LOCAL MEMBRANE STRESSES ARE EXTRACTED FROM SANSAR OUTPUT, APPENDIX C.2

NOZZLE/ LOAD CASE	MAXIMUM PRINCIPLE STRESS (PSI)	MAXIMUM ALLOWABLE STRESS (1) (PSI)
NOZZLES N1 & N2		
LOAD CASE 1		
VESSEL	9136	28,800
NOZZLE	7220	26,730
LOAD CASE 2		
VESSEL	8908	28,800
NOZZLE	7220	26,730
NOZZLES N3 & N4		
LOAD CASE 1		
VESSEL	9168	28,800
NOZZLE	7378	24,750
LOAD CASE 2		
VESSEL	7429	28,800
NOZZLE	7378	24,750

(1) NOTE: THE MAXIMUM ALLOWABLE STRESSES ARE BASED ON NORMAL PLUS OBE LIMITS OF 1.65 S, REF(1) PARA 4.5.

SECTION 8.1

FREQUENCY ANALYSIS

THIS SECTION CONTAINS A SUMMARY OF THE SIGNIFICANT MODAL FREQUENCIES FROM THE FREQUENCY AND MODESHAPE ANALYSIS PRESENTED IN APPENDIX A.2.

THIS ANALYSIS REPRESENTS THE FREE VIBRATION RESULTS OF THE MATHEMATICAL MODEL PRESENTED IN SECTION 6.0.

THE FREQUENCIES AND MODESHAPES WERE EXTRACTED FROM $(K = \omega^2 m)\phi = 0$, BASED ON THE "CONDENSED INERTIA MATRIX, BY THE HOUSEHOLDER QR TRANSFORMATION TECHNIQUE, HQR OPTION OF "STARDYNE" REF 10.

MODE NO.	FREQUENCY (CPS)	NORMALIZED MODE (1)	DIRECTION (1)
1	48.5	1	$-X1$, $+X2$
2	50.5	1	$+X1$, $+X2$
3	62.2	26	$-X1$, $-X2$
4	62.3	26	$+X1$, $+X2$

(1) SEE MODEL PLOTS FOR NODE LOCATION AND GLOBAL COORDINATE DIRECTION.

8.2 SEISMIC LOADING

PER REF(1) PARA 4.13 THE FOLLOWING SEISMIC LOADS WILL BE USED IN THE ANALYSIS

CONDITION	ACCELERATION (G's) HORIZONTAL	VERTICAL
OBE	.55	±.6
DBE	1.2	±1.1

THE HORIZONTAL ACCELERATION WILL BE APPLIED TO THE UNIT COINCIDENT WITH THE DIRECTION OF THE MODESHAPE OF THE FIRST NATURAL FREQUENCY AS EXTRACTED FROM THE HQR OUTPUT. THIS DIRECTION IS THE MOST FLEXIBLE PLANE OF THE UNIT.

THE UNIT WILL BE ANALYZED USING DBE LOAD CONDITIONS AND STRESS COMPARISONS MADE TO OBE STRESS ALLOWABLES. FAILING THIS COMPARISON, OBE AND DBE LOADINGS WILL BE ANALYZED USING THEIR RESPECTIVE ALLOWABLES.

THE SEISMIC LOADING WILL BE INPUT AS NODAL FORCES ON THE NODAL WEIGHTS. PER REF(1) THE SEISMIC LOADS ARE TO BE APPLIED AS FOLLOWS:

1. HORIZONTAL ACCELERATIONS IN THE SAME DIRECTION ABOVE AND BELOW THE SUPPORT PLANE COMBINED WITH VERTICAL ACCELERATION.
2. HORIZONTAL ACCELERATIONS IN OPPOSITE DIRECTIONS ABOVE AND BELOW SUPPORT PLANE COMBINED WITH VERTICAL ACCELERATION.

FOR LOAD CASE 1, THE STATIC FORCE WILL BE APPLIED AS A CONSTANT FORCE ABOVE AND BELOW THE SUPPORT PLANE. FOR LOAD CASE 2, THE STATIC FORCE WILL BE APPLIED AS A LINEARLY VARYING FORCE PROPORTIONAL TO THE DISTANCE FROM THE SUPPORT PLANE TO THE NODAL MASS,

LOAD CASE 1, EARTHQUAKE 1

RESOLVED g ACCELERATION

(APPLIED IN DIRECTION OF FIRST FREQUENCY MODE SHAPE)

$g_{x1} = -\cos 45^\circ (1.2) = -.849\ g$

$g_{x2} = \sin 45^\circ (1.2) = +.849\ g$

$g_{x3} = -1.1\ g$

NODAL FORCE

NODE	WEIGHT	X1 FORCE (LBS)	X2 FORCE (LBS)	X3 FORCE (LBS) (1)
1	5131	-4354	4354	-5644
7	6108	-5183	5163	-6719
8	3822	-3243	3243	-4204
12	9792	-8309	8309	-10771
16	12252	-10396	10396	-13477
26	10593	-8988	8988	-11652
27	7286	-6182	6182	-8015
35	4007	-3400	3400	-4408
36	2008	-1704	1704	-2209

(1) APPLIED IN A DIRECTION TO SUM WITH THE DEADWEIGHT LOAD

LOAD CASE 2, EARTHQUAKE 2

NODES 1, 7, 8, 12, & 16 ARE ABOVE THE SUPPORT PLANE (X3 = 204.5") AND NODES 26, 27, 35 & 36 ARE BELOW THE SUPPORT PLANE.

NODE	FORCE MAGNITUDE BEFORE LINEARIZING	X3 LOCATION	DISTANCE FROM PLANE D	FORCE PROPORTION FACTOR (1) F	NODAL FORCE (2) X1 FORCE (LBS) (-X1)	X2 FORCE (LBS) (+X2)
1	4354	361	156.5	+1	-4354.	4354
7	5183	310.5	106.0	+.677	-3509.	3509.
8	3243	300.88	96.38	+.616	-1998.	1998.
12	8309	272.88	68.38	+.437	-3631	3631
16	10396	209.56	5.06	+.0323	-336	336
26	8988	130.19	-74.31	-.363	+3263	-3263
27	6182	56.13	-148.37	-.726	+4488	-4488
35	3400	28.13	-176.37	-.862	+2931	-2931
36	1704	0.0	-204.5	-1	+1704	-1704.

(1) $F = \frac{D}{156.5}$ ABOVE PLANE, $F = \frac{D}{209.5}$ BELOW PLANE

(2) THE X3 FORCES ARE THE SAME FOR LOAD CASE 2 AS FOR EARTHQUAKE 1.

SECTION 9.1

SUMMARY OF BEAM STRESSES
EXTRACTED FROM COMBINE OUTPUT APPENDIX B.2

BEAM NOS.	DESCRIPTION	EQ 1 MAXIMUM STRESS INTENSITY (PSI)	EQ 2 MAXIMUM STRESS INTENSITY (PSI)	ALLOWABLE STRESS (PSI) (1)
	TUBESIDE			
1, 6	PLENUM	12156	12156	19250
5	OUTLET	13043	13043	17820
2	INLET	13043	13043	17820
	SHELLSIDE			
8, 11	INLET PLENUM	6756	6747	19250
9	INLET NOZZLE	4651	4651	16500
27, 34	OUTLET PLENUM	6729	6725	19250
28	OUTLET NOZZLE	4987	4987	16500
7, 12, 25, 26 35, 36, 37	SHELL	6817	6832	19250
31, 33, 39, 41	SEISMIC LUG (2)			19250
14, 17, 20, 23	SUPPORT (2)			19250

(1) MEMBRANE STRESS LIMIT FOR NORMAL OPERATING OR UPSET, AND OBE 1.1 S

(2) REFINED SEISMIC LUG AND SUPPORT STRESS ANALYSIS IS PRESENTED IN SECTION 9.3

9.2 LOCAL STRESS ANALYSIS OF SUPPORT TO SHELL AND SEISMIC LUG TO SHELL JUNCTIONS

SUPPORT, LUG / VESSEL JUNCTION

PARAMETERS

JUNCTION	SMM (KSI)	P (PSI)	RM (1) (IN)	T (1) (IN)	TRANSVERSE LENGTH TWOC1 (IN)	AXIAL LENGTH TWOC2 (IN)
SUPPORT/ VESSEL	17.5	150	22.56	.875	15.0	15.875
LUG/ VESSEL	17.5	150	28.00 (2)	1.0 (2)	4.0 (2)	13.0 (2)

(1) NOTE: DIMENSIONS INCLUDE CORROSION ALLOWANCE WHERE APPLICABLE AND PAD THICKNESS WERE APPLICABLE.

(2) NOTE: SEE SECTION

LOAD APPLICATION POINT

	X	Y	Z
FOR BOTH JUNCTIONS	0	0	0

THE FOLLOWING LOADS ARE THE MAXIMUM LOADS EXTRACTED FROM COMBINE OUTPUT, APPENDIX B.2 FOR EACH OF THE TWO JUNCTION TYPES. THE MAXIMUM OF EACH INDIVIDUAL LOAD WILL BE USED TO PRODUCE A "WORST CASE" ANALYSIS.

CHKD. BY [illegible] DATE 1/[illegible]/[illegible] JOB NO. EIECO-2

JUNCTION	F_1 (P) (LBS)	F_2 (V2) (LBS)	F_3 (V3) (LBS)	M_T (IN-LBS)	M_2 (IN-LBS)	M_3 (IN-LBS)
SUPPORTS						
EQ1	7979	35268	1693	27	18653	170310
EQ2	7721	38144	1816	70	15554	195490
SEISMIC LUGS						
EQ1	41878	0	7213	360	26705	234
EQ2	36897	0	7030	362	25526	235

IN ORDER TO INPUT THESE LOADS INTO SANSAR THEY MUST BE CONVERTED TO SANSAR COORDINATES, THE CONVERSION IS.

FOR BEAMS 31, 33, 39, 41 (SEISMIC LUGS), 14, 17, 20, 23 (SUPPORTS), AT J_A END

SANSAR FORCE	STARDYNE FORCE
FX	F2
FY	F1
FZ	-F3
MX	M2
MY	MT
MZ	-M3

SUMMARY OF LOADS

	FX	FY	FZ	MX	MY	MZ
SEISMIC LUG	0	41878	-7213	26705	362	-235
SUPPORT	38144	7979	-1816	18653	70	-195490

LOCAL SUPPORT/LUG TO VESSEL STRESSES

THE FOLLOWING PRIMARY LOCAL MEMBRANE STRESSES ARE EXTRACTED FROM SANSAR OUTPUT, APPENDIX C.3.

JUNCTION	MAXIMUM PRINCIPLE STRESS (PSI)	MAXIMUM ALLOWABLE STRESS(1) (PSI)
SUPPORT/VESSEL	5630	28800
SEISMIC LUG/ VESSEL	-5037	28800

(1) NOTE: THE MAXIMUM ALLOWABLE STRESSES ARE BASED ON NORMAL PLUS OBE LIMITS OF 1.6 S PER REF(1) PARA 4.5.1.

THE FOLLOWING PRIMARY PLUS SECONDARY STRESSES ARE EXTRACTED FROM SANSAR OUTPUT, APPENDIX C.3.

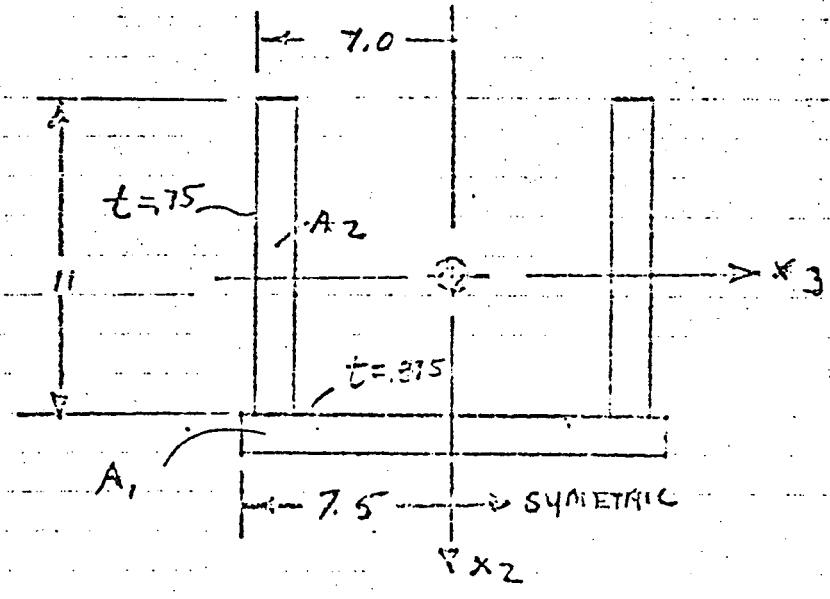
JUNCTION	MAXIMUM PRINCIPLE STRESS (PSI)	MAXIMUM ALLOWABLE STRESS(2) PSI
SUPPORT/VESSEL	-7586	52500
SEISMIC LUG/ VESSEL	-38078	52500

(2.) NOTE: ALLOWABLE STRESS = $3.0 S_m$ PER PARA 4.5.2 REF(1) ...

9.3 SUPPORT AND WELD STRESS EVALUATION

SUPPORT PROPERTIES

THE SUPPORTS ARE APPROXIMATED BY ASSUMING THE FOLLOWING MINIMUM CROSS SECTION (AT THE BOLT CIRCLE ℄). LOADS AT THE VESSEL/SUPPORT JUNCTION WILL BE APPLIED TO THIS MINIMUM CROSS SECTION TO PRODUCE CONSERVATIVE STRESSES.



$C_2 = 8.67$

$C_3 = 7.6$

AREA

$A = 2(A_1 + A_2)$

$A_1 = (.875)(7.5) = 6.56$ $\quad A_2 = (.75)(11) = 8.25$

$A = 29.62\ IN^2$

CENTROID, $\bar{x}_2$

$$\bar{x}_2 = \left(\sum A_i x_i\right)/A$$

$$\bar{x}_2 = (2)\left[6.56\left(\frac{.875}{2}\right) + 8.25\left(\frac{11}{2} + .875\right)\right] / 29.62$$

$$\bar{x}_2 = 3.75 \text{ "}$$

$$\therefore \quad \bar{x}_{21} = 3.313 \text{ "}$$

$$\bar{x}_{22} = 2.625$$

POLAR MOMENT OF INERTIA, J REF(6) PG 9

$$J = \sum \frac{1}{3} b_i t_i^3$$

$$J = 2\left(\frac{1}{3}(11)(.75)^3\right) + \frac{1}{3}(15)(.875)^3$$

$$J = 6.44 \text{ IN}^4$$

MOMENT OF INERTIA, I_2

$$I_2 = \frac{1}{12}(15)^3(.875) + 2\left[\frac{1}{12}(11)(.75)^3 + 8.25(6.625)^2\right]$$

$$I_2 = 971 \text{ IN}^4$$

MOMENT OF INERTIA, I_3

$$I_3 = 2\left[\frac{1}{12}(11)^3(.75) + 8.25(3.313)^2\right] + \frac{1}{12}(.875)^3(15) + (13.12)(2.625)^2$$

$$I_3 = 439 \text{ IN}^4$$

THE FOLLOWING SUPPORT LOADS WERE EXTRACTED FROM COMBINE.OUT PUT (SEE SECTION 9.2).

P (Lbs)	V_2 (Lbs)	V_3 (Lbs)	M_T (IN-LBS)	M_2 (INLBS)	M_3 (IN-LBS)
7979	38144	1816	70	18653	195490

GENERAL MEMBRANE STRESS

SHEAR STRESS

$$\tau = \frac{V}{A} + \frac{Tc}{J} \qquad V = (V_2^2 + V_3^2)^{1/2}$$

$$\tau = \frac{38187}{29.62} + \frac{70(.75)}{6.44} \qquad A = 29.62$$

$T = M_T = 70$

$c = .75 \quad J = 6.44$

$$\tau = 1297 \text{ psi}$$

NORMAL STRESS

$$\sigma_N = \frac{P}{A} \qquad P = 7979$$

$$\sigma_N = 7979/29.62$$

$$\sigma_N = 269 \text{ psi}$$

CALCULATING σ_1

$$\sigma_1 = +\frac{269}{2} + \left(\left(\frac{269}{2}\right)^2 + 1297^2\right)^{\frac{1}{2}}$$

$$\sigma_1 = 1439 \text{ psi} < 17500 \text{ KSI} = 1.0\,S^{(1)}$$

(1) ALLOWABLE STRESS PER PARA NF 3321.1

REF (9)

GENERAL MEMBRANE PLUS BENDING

NORMAL STRESS DUE TO M_2

$$\sigma_{M_2} = \pm \frac{M_2 C_3}{I_2}$$

$C_3 = 7.5$

$M_2 = 18653$

$I_2 = 971$

$$\sigma_{M_2} = \pm 144 \text{ psi}$$

NORMAL STRESS DUE TO M_3

$$\sigma_{M_3} = \pm \frac{M_3 C_2}{I_3}$$

$M_3 = 195490$

$C_2 = 8.67$

$I_3 = 439$

$$\sigma_{M_3} = \pm 3861 \text{ psi}$$

COMBINING BENDING STRESSES AS THEY WILL ADD

$$\sigma_M = \pm 144 \pm 3861 = \pm 4005$$

$$\sigma_1 = \sigma_M + \sigma_N$$

$$\sigma = 4005 + 269 = 4274 \text{ psi}$$

$$\tau = 1297 \text{ psi}$$

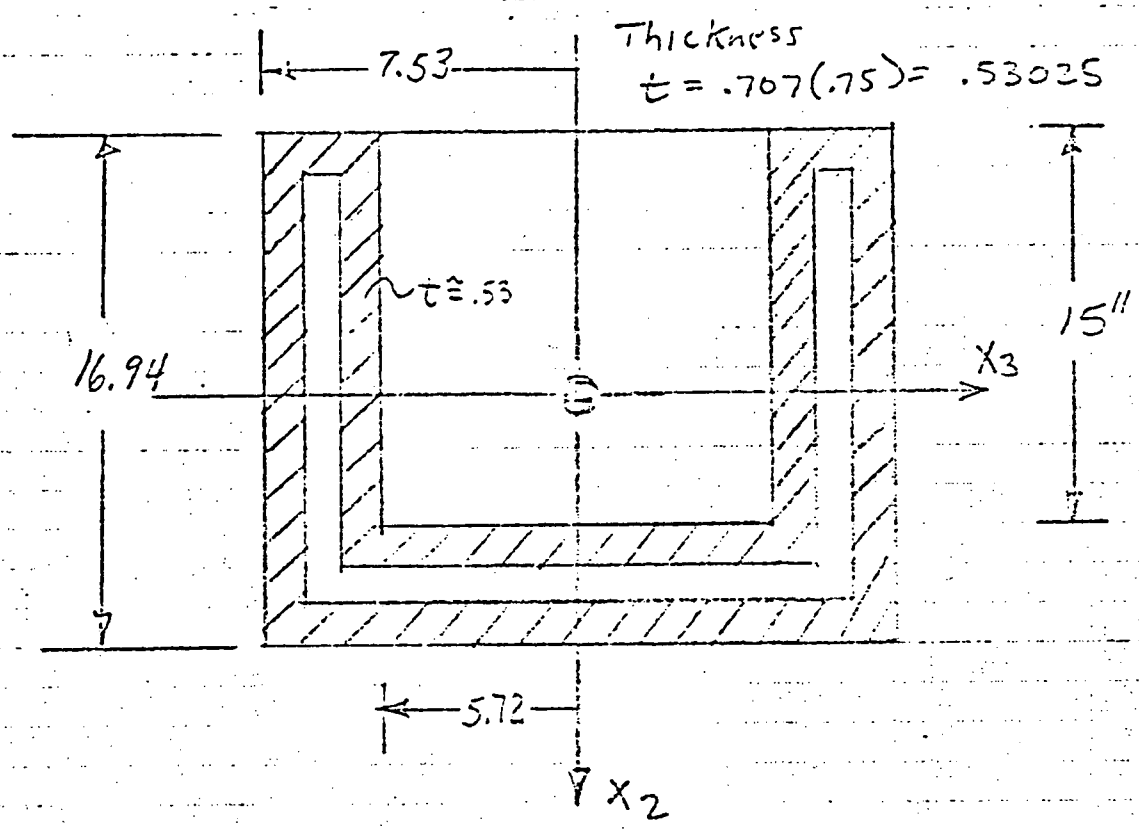
$$\therefore \sigma_1 = \frac{4274}{2} + \left(\left(\frac{4274}{2} \right)^2 + 1297^2 \right)^{\frac{1}{2}}$$

$$\sigma_1 = 4637 \text{ psi} < 26250 \text{ psi} = 1.5\,S^{(1)}$$

(1) ALLOWABLE STRESS PER PARA NF 3324.1 REF(9)

Support Weld Properties

The support weld configuration is approximated by the cross-hatched region shown below



Area

$$A_{WELD} = A_{TOTAL} - A_{SUPPORT} - 11.44(15)$$

$$= 16.94(15.06) - 2(15.815(.75) + 6.25(.875)) - 171.6$$

$$= 48.77 \text{ in}^2$$

Centroid, $\bar{x}_2$

$\bar{x}_2 = \Sigma A_i x_i / A$

$$\bar{x}_2 = \left(16.94(15.06)8.47 - 2(15.875)(.75)\left(\frac{15.875}{2}+.53025\right) - 12.5(.875)\left(\frac{.875}{2}+.53025\right) - 11.44(15)\left(\frac{15}{2}+2(.53025)+.875\right)\right) / A$$

$$\bar{x}_2 = \frac{255.12(8.47) - 23.81(8.47) - 10.94(.968) - 171.6(9.44)}{255.12 - 23.81 - 10.94 - 171.6}$$

$\bar{x}_2 = 6.74$

$$\bar{I}_3 = \frac{1}{12}15.06(16.94)^3 + 255.12(1.73)^2 - \left(\frac{2(.75)15.875^3}{12} + 23.81(1.73)^2\right) - \left(\frac{12.5(.875)^3}{12} + 6.125(5.772)^2\right) - \left(\frac{1}{12}11.44(15)^3 + 171.6(2.7)^2\right)$$

$\bar{I}_3 = 1620 \text{ in}^4$

$$\bar{I}_2 = \frac{1}{12}16.94(15.06)^3 - \left(\frac{2}{12}(15.875).75^3 + 23.81(6.625)^2\right) - \frac{1}{12}(.875)12.5^3 - \frac{1}{12}15(11.44)^3$$

$\bar{I}_2 = 1762 \text{ in}^4$

Area $= \frac{48.77}{.707} = 68.98$ $\quad P_{max} = 7979 \text{ lbs.}$

$\frac{P}{A} = \frac{7979}{68.98} = 116 \text{ psi} < 8750 \text{ psi} = .5S$

The stress on the effective throat of the fillet weld is required to meet the limits of Table NF-3292.1-1 of Ref. (9).

∴ For SA-515 Gr 70 $S_{OT} = 70$ ksi

$\tau_{WELD\ MAX} = 21$ ksi

Taking all stresses as shear

$$\tau_{MAX(1)} = \left[\left(\frac{V_2}{A}\right)^2 + \left(\frac{M_2 C_3}{I_2} + \frac{P}{A} + \frac{M_3 C_2}{I_3} + \frac{V_3}{A}\right)^2\right]^{1/2}$$

NOTE: M_T is negligible and neglected

$$\tau_{MAX(1)} = \left[\left(\frac{38144}{48.77}\right)^2 + \left(\frac{18653(7.53)}{1762} + \frac{7979}{48.77} + \frac{195490(9.26)}{1620} + \frac{1816}{48.77}\right)^2\right]^{1/2}$$

$$\tau_{MAX(1)} = \left(782^2 + \left(80 + 163 + 1117 + 37\right)^2\right)^{1/2}$$

$\tau_{MAX(1)} = 1601$ psi

$$\tau_{MAX(2)} = \left(\left(\frac{V_3}{A}\right)^2 + \left(\frac{M_2 C_3}{I_2} + \frac{P}{A} + \frac{M_3 C_2}{I_3} + \frac{V_2}{A}\right)^2\right)^{1/2}$$

$$\tau_{MAX(2)} = \left(37^2 + \left(80 + 163 + 1117 + 782\right)^2\right)^{1/2}$$

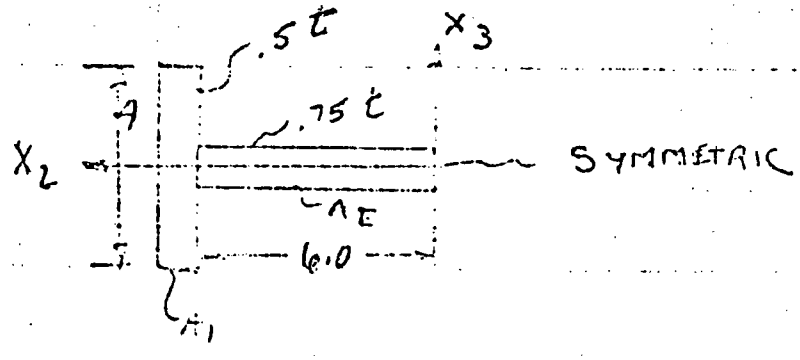
$\tau_{MAX(2)} = 2142$ psi $< 21{,}000$ psi

Therefore the support weld is OK

SEISMIC LUG STRESSES

THE SEISMIC LUG CONFIGURATION INPUT INTO "STARDYNE" WAS INCORRECTLY ORIENTED (X_2 AND X_3 DIRECTIONS WERE INVERTED). THE INVERTING OF AXES WILL HAVE LITTLE EFFECT ON THE REST OF THE STRUCTURE DUE TO THE REMOTENESS OF THE LUGS FROM THE SUPPORTS. THIS AXIS INVERSION WILL ALSO HAVE INSIGNIFICANT RESULTS ON THE FREQUENCY ANALYSIS. FOR PRIMARY LOCAL MEMBRANE PLUS BENDING CONSIDERATIONS, TWO END PLATES WERE ADDED TO THE SEISMIC LUGS, SEE SECTION (6.4). THIS NEW CROSS SECTION WILL BE ANALYZED FOR STRESSES USING THE LOADS FROM "COMBINE"

SECTION PROPERTIES



$C_3 = 2$ IN

$C_2 = 6.5$ IN

AREA

$$A = 2(A_1 + A_2)$$

$$A_1 = 4(.5) = 2$$

$$A_2 = .75(6) = 4.5$$

$$A = 13 \text{ IN}^2$$

POLAR MOMENT OF INERTIA, J

$$J = 2\left[\frac{1}{3}(.5)^3(4)\right] + \frac{1}{3}(.75)^3(12)$$

$$J = 2.021 \text{ IN}^4$$

MOMENT OF INERTIA, I_2

$$I_2 = 2\,\frac{1}{12}(4)^3(.5) + \frac{1}{12}(.75)^3(12)$$

$$I_2 = 5.755 \text{ IN}^4$$

MOMENT OF INERTIA, I_3

$$I_3 = 2\left(\frac{1}{12}(4)(.5)^3 + (6.25)^2(2)\right) + \frac{1}{12}(12)^3(.75)$$

$$I_3 = 264 \text{ IN}^4$$

THE MAXIMUM "COMBINE" LOADS ARE

P	V_2	V_3	M_T	M_2	M_3
41878	0	7213	362	26705	235

GENERAL MEMBRANE STRESS

SHEAR STRESS

$$\tau = \frac{V}{A} + \frac{Tc}{J}$$

$V = 7213$

$A = 13$

$T = 362$

$c = .75$

$J = 2.021$

$$\tau = \frac{7213}{13} + \frac{362(.75)}{2.021}$$

$$\tau = 689 \text{ psi}$$

NORMAL STRESS

$$\sigma_M = \frac{P}{A} = \frac{41878}{13}$$

$$\sigma_N = 3221 \text{ psi}$$

CALCULATING σ_{MAX}

$$\sigma_{MAX} = \frac{3221}{2} + \left(\left(\frac{3221}{2}\right)^2 - (689)^3\right)^{\frac{1}{2}}$$

$$\sigma_{MAX} = 3363 \text{ psi} < 17500 \text{ psi} = 1.05$$

GENERAL MEMBRANE PLUS BENDING

NORMAL STRESS DUE TO M_2

$$\sigma_{M2} = \frac{\pm 26705(2)}{5.755} = \pm 9281 \text{ psi}$$

NORMAL STRESS DUE TO M_3

$$\sigma_{M3} = \frac{\pm 235(6.5)}{264} = 6 \text{ psi}$$

COMBINE σ_{M1}, σ_{M2} & σ_{M3}

$$\sigma = 3221 + 9281 - 6 = 12508 \text{ psi}$$

$$\tau = 689 \text{ psi}$$

$$\sigma_{MAX} = \frac{12508}{2} + \left(\left(\frac{12508}{2}\right)^2 + 689^2\right)^{\frac{1}{2}}$$

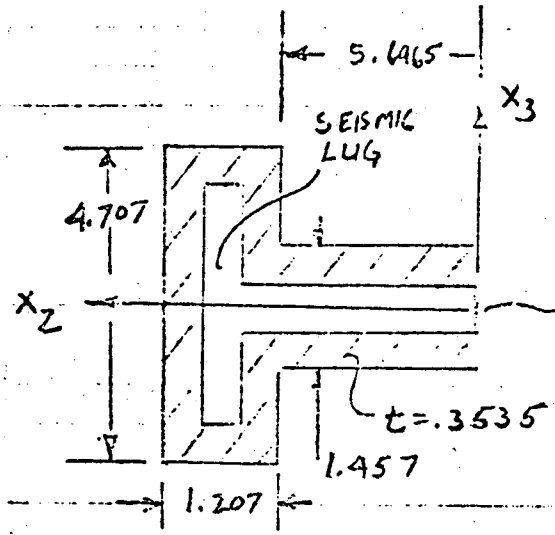
$$\sigma_{MAX} = 12546 \text{ psi} < 26250 \text{ psi} = 1.5S$$

SEISMIC LUG WELD STRESS

SECTION PROPERTIES

THICKNESS

$t = .707(.5) = .3535$



$C_2 = 6.8535$

$C_3 = 2.3535$

AREA

$A = A_{TOTAL} - A_{LUG}$

$A_{TOTAL} = 2(4 + 2(.3535))(.5 + 2(.3535)) + ((12 - 2(.3535))(.75 + 2(.3535))) = 27.82\ in^2$

$A = 27.82 - 13 = 14.82\ in^2$

MOMENT OF INERTIA, I_2

$I_2 = I_{2TOTAL} - I_{2LUG}$

$I_{2TOTAL} = 2\frac{1}{12}(9.707)^3(1.207) + \frac{1}{12}(1.457)^3(11.293)$

$I_{2TOTAL} = 23.89\ in^4$

$I_2 = 23.89 - 5.76 = 18.13\ in^4$

MOMENT OF INERTIA, I_3

$$I_3 = I_{3TOTAL} - I_{3LUG}$$

$$I_{3TOTAL} = 2\left(\frac{1}{12}(4.707)(1.207)^3 + (6.25)^2(5.69)\right) + \frac{1}{12}(11.293)^3(1.457)$$

$$I_{3TOTAL} \approx 620 \text{ IN}^4$$

$$I_3 = 620 - 264 = 356 \text{ IN}^4$$

THE STRESS ON THE THROUGH THICKNESS OF THE AREA UNDER THE WELD IS REQUIRED TO MEET .55 PER PARA. NF-3351.1 REF(9)

$$\therefore \text{AREA} = \frac{14.82}{.707} = 20.96 \text{ IN}^2$$

$$P_{MAX} = 41878 \text{ LBS}$$

$$P/A = \frac{41878}{20.96} = 1998 \text{ PSI} < 8750 = .55$$

THE STRESS ON THE EFFECTIVE THROAT OF FILLET WELD IS REQUIRED TO MEET THE LIMITS OF TABLE NF-3292.1-1 REF(9)

$\therefore$ FOR SA 515 GR 70 $S_{UT} = 70$KSI

$$\tau_{WELD\,MAX} \leq 21 \text{ KSI}$$

8	5234.	-1148.	-650.
9	3056.	-11173.	-650.
10	3056.	-12523.	-650.
11	16552.	11305.	.
12	14954.	11297.	.
13	3062.	-11853.	-650.
14	3053.	-11845.	-650.
15	15773.	11282.	.
16	15738.	11316.	.

THE RESULTING STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	8225.	1415.	-9639.
2	8221.	1417.	-9638.
3	3605.	2773.	-6379.
4	2838.	5059.	-7897.
5	10716.	-1889.	-8827.
6	10713.	-1888.	-8825.
7	5401.	1544.	-6945.
8	6382.	-498.	-5884.
9	14229.	-10523.	-3706.
10	15579.	-11873.	-3706.
11	5246.	11305.	-16552.
12	3656.	11297.	-14954.
13	14915.	-11203.	-3712.
14	14398.	-11195.	-3703.
15	4491.	11282.	-15773.
16	4422.	11316.	-15738.

NOZZLES N3 + N4 LOAD CASE 2

KOPT	KTYPE	KBETA	KDEF
3	1	0	0

KEY1	KEY2	KEY3	KEY4	KEY5
0	0	0	0	0

SM1	SM2	P	TN	TV	RN	RMV
17500.	15000.	150.	.3750	1.5000	8.0000	28.2500

GAMMA	BETA
18.83	.2478

X	Y	Z
.0000	7.7500	.0000

A1	A2	A3	A4	A5	A6
2.09495	.07266	.80504	.08500	2.05920	.03123

B1	B2	B3	B4	B5	B6
2.80574	.04293	1.39830	.04346	.77124	.05169

OPTION THREE OF PROGRAM NOZZLE

FOR THE FORCES(POUNDS) AND MOMENTS(POUND-INCHES)

FX	FY	FZ	MX	MY	MZ
.	5523.	5523.	210300.	210300.	.

THE PRIMARY STRESSES IN THE VESSEL AND NOZZLE ARE

LOCATION	SX	SO	SY	TOX
1	-125.	7396.	-75.	495.
2	-125.	7396.	-75.	202.
3	4884.	508.	-75.	349.
4	7270.	1881.	-75.	349.
5	-125.	7396.	-75.	495.
6	-125.	7396.	-75.	202.
7	4884.	508.	-75.	349.
8	7270.	1881.	-75.	349.
9	5380.	6309.	-75.	1461.
10	-1655.	6309.	-75.	1461.
11	5380.	6309.	-75.	1461.
12	-1655.	6309.	-75.	1461.
13	1863.	6309.	-75.	2062.
14	1863.	6309.	-75.	861.
15	1863.	6309.	-75.	2062.
16	1863.	6309.	-75.	861.

THE RESULTING PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	7429.	-158.	-75.
2	7402.	-131.	-75.
3	4911.	480.	-75.
4	7292.	1859.	-75.
5	7429.	-158.	-75.
6	7402.	-131.	-75.
7	4911.	480.	-75.
8	7292.	1859.	-75.
9	7373.	1311.	-75.

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4	7292.	1859.	-75.
5	7429.	-158.	-75.
6	7402.	-131.	-75.
7	4911.	480.	-75.
8	7292.	1859.	-75.
9	7378.	4311.	-75.
10	6569.	-1915.	-75.
11	7378.	4311.	-75.
12	6569.	-1915.	-75.
13	7118.	1054.	-75.
14	6470.	1701.	-75.
15	7118.	1054.	-75.
16	6470.	1701.	-75.

THE RESULTING STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	7586.	-83.	-7504.
2	7532.	-56.	-7477.
3	4431.	555.	-4986.
4	5433.	1934.	-7367.
5	7586.	-83.	-7504.
6	7532.	-56.	-7477.
7	4431.	555.	-4986.
8	5433.	1934.	-7367.
9	3067.	4386.	-7453.
10	8484.	-1840.	-6644.
11	3067.	4386.	-7453.
12	8484.	-1840.	-6644.
13	6064.	1129.	-7193.
14	4769.	1776.	-6545.
15	6064.	1129.	-7193.
16	4769.	1776.	-6545.

THE TOTAL STRESSES IN THE VESSEL AND NOZZLE ARE

LOCATION	SX	SO	SY	TOX
1	1382.	8729.	.	495.
2	1382.	8729.	.	202.
3	1588.	-5743.	.	349.
4	12355.	12023.	.	349.
5	-1633.	6064.	-150.	495.
6	-1633.	6064.	-150.	202.
7	8179.	6758.	-150.	349.
8	2184.	-8260.	-150.	349.
9	-8708.	2108.	-150.	1426.
10	-15575.	2109.	-150.	1426.
11	19469.	10510.	.	1497.
12	12264.	10510.	.	1497.
13	-12141.	2108.	-150.	2026.
14	-12141.	2108.	-150.	826.
15	15866.	10510.	.	2097.
16	15866.	10510.	.	896.

THE RESULTING PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	8762.	1349.	.
2	8735.	1377.	.
3	1604.	-5759.	.
4	12575.	11803.	.
5	6095.	-1664.	-150.
6	6069.	-1638.	-150.
7	8260.	6677.	-150.
8	2196.	-8271.	-150.
9	2293.	-8893.	-150.
10	2223.	-15689.	-150.
11	19712.	10267.	.

	[illegible]	[illegible]	-150.
10	[illegible]	[illegible]	-150.
11	19712.	10267.	.
12	13122.	9653.	.
13	2391.	-12424.	-150.
14	2156.	-12189.	-150.
15	16589.	9787.	.
16	16012.	10364.	.

THE RESULTING STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	7413.	1349.	-8762.
2	7358.	1377.	-8735.
3	7364.	-5759.	-1604.
4	773.	11803.	-12575.
5	7760.	-1514.	-6245.
6	7707.	-1488.	-6219.
7	1583.	6827.	-8410.
8	10467.	-8121.	-2346.
9	11186.	-8743.	-2443.
10	17912.	-15539.	-2373.
11	9445.	10267.	-19712.
12	3469.	9653.	-13122.
13	14815.	-12274.	-2541.
14	14345.	-12039.	-2306.
15	6802.	9787.	-16589.
16	5648.	10364.	-16012.

Appendix C.3

LOCAL SUPPORT STRESS OUTPUT

SUPPORT/VESSEL JUNCTION

KOPT	KTYPE	KBETA	KOEF
3	3	*	*

KEY1	KEY2	KEY3	KEY4	KEY5
*	*	*	*	*

SM	P	RM	T	TWOC1	TWOC2
17500.	150.	22.5600	.8750	15.0000	15.8750

GAMMA	BETA1	BETA2	BETA1/BETA2
25.78	.3324	.3518	.9449

X	Y	Z
-.0000	-.0000	-.0000

A1	A2	A3	A4	A5	A6
1.51182	.04062	1.06291	.06715	2.06837	.01814

B1	B2	B3	B4	B5	B6
2.94407	.01808	2.41481	.02949	1.02545	.03076

SHELL STRESSES DUE TO FORCES APPLIED TO A RECTANGULAR ATTACHMENT AND INTERNAL PRESSURE

THE TOTAL APPLIED LOADS ARE

FX	FY	FZ	MX	MY	MZ
38144.	7979.	-1816.	1d653.	70.	-195490.

VESSEL PRIMARY STRESSES

LOCATION	SX	SO	SY	TOX
1	2184.	5629.	-75.	-69.
2	2184.	5629.	-75.	-69.
3	-696.	884.	-75.	69.
4	-696.	884.	-75.	69.
5	1065.	3410.	-75.	-1373.
6	1065.	3410.	-75.	-1373.
7	423.	3103.	-75.	1373.
8	423.	3103.	-75.	1373.

THE RESULTING MEMBRANE PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	5630.	2182.	-75.
2	5630.	2182.	-75.
3	887.	-699.	-75.
4	887.	-699.	-75.
5	4043.	432.	-75.
6	4043.	432.	-75.
7	3682.	-156.	-75.
8	3682.	-156.	-75.

THE MEMBRANE STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	3448.	2257.	-5705.
2	3448.	2257.	-5705.

ATION	S12	S23	S31
1	3448.	2257.	-5705.
2	3448.	2257.	-5705.
3	1587.	-624.	-962.
4	1587.	-624.	-962.
5	3611.	507.	-4118.
6	3611.	507.	-4118.
7	3837.	-81.	-3757.
8	3837.	-81.	-3757.

SHELL STRESSES DUE TO FORCES APPLIED TO A RECTANGULAR ATTACHMENT AND INTERNAL PRESSURE

PRIMARY PLUS SECONDARY VESSEL STRESSES

LOCATION	SX	SO	SY	TOX
1	6809.	6824.	.	-69.
2	-2442.	4433.	-150.	-69.
3	-7583.	-5391.	.	69.
4	6191.	7159.	-150.	69.
5	419.	2099.	.	-1373.
6	1710.	4721.	-150.	-1373.
7	-1194.	-666.	.	1373.
8	2039.	6872.	-150.	1373.

THE RESULTING PRIMARY PLUS SECONDARY PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	6886.	6747.	.
2	4434.	-2442.	-150.
3	-5389.	-7586.	.
4	7164.	6186.	-150.
5	2868.	-350.	.
6	5253.	1178.	-150.
7	468.	-2328.	.
8	7235.	1676.	-150.

THE PRIMARY PLUS SECONDARY STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	139.	6747.	-6886.
2	6876.	-2292.	-4584.
3	2197.	-7586.	5389.
4	979.	6336.	-7314.
5	3219.	-350.	-2868.
6	4075.	1328.	-5403.

6	4073.	1334.	-5403.
7	2796.	-2328.	-468.
8	5558.	1826.	-7385.

1.5 SM = 26250. 3.0 SM = 52500.

SEISMIC LUG/ VESSEL JUNCTION

KOPT	KTYPE	KBETA	KOEF
3	3	*	*

KEY1	KEY2	KEY3	KEY4	KEY5
*	*	*	*	*

SM	P	RM	T	TWOC1	TWOC2
17500.	150.	28.0000	1.0000	4.0000	13.0000

GAMMA	BETA1	BETA2	BETA1/BETA2
28.00	.0714	.2321	.3077

X	Y	Z
-.0000	-.0000	-.0000

A1	A2	A3	A4	A5	A6
3.42188	.13118	.78337	.09439	3.11599	.04217

B1	B2	B3	B4	B5	B6
4.63331	.06432	1.10778	.04494	1.00449	.05379

SHELL STRESSES DUE TO FORCES APPLIED TO A RECTANGULAR ATTACHMENT AND INTERNAL PRESSURE

THE TOTAL APPLIED LOADS ARE

FX	FY	FZ	MX	MY	MZ
.	41878.	-7213.	26705.	362.	-235.

VESSEL PRIMARY STRESSES

LOCATION	SX	SO	SY	TOX
1	-4835.	-914.	-75.	-902.
2	-4835.	-914.	-75.	-902.
3	-4840.	-922.	-75.	902.
4	-4840.	-922.	-75.	902.
5	-4644.	-827.	-75.	-.
6	-4644.	-827.	-75.	-.
7	-5031.	-1009.	-75.	.
8	-5031.	-1009.	-75.	.

THE RESULTING MEMBRANE PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	-716.	-5032.	-75.
2	-716.	-5032.	-75.
3	-725.	-5037.	-75.
4	-725.	-5037.	-75.
5	-827.	-4644.	-75.
6	-827.	-4644.	-75.
7	-1009.	-5031.	-75.
8	-1009.	-5031.	-75.

THE MEMBRANE STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	4316.	-4957.	641.
2	4316.	-4957.	641.
3	4312.	-4962.	650.

1	4316.	-4957.	641.
2	4316.	-4957.	641.
3	4312.	-4962.	650.
4	4312.	-4962.	650.
5	3817.	-4569.	752.
6	3817.	-4569.	752.
7	4022.	-4956.	934.
8	4022.	-4956.	934.

SHELL STRESSES DUE TO FORCES APPLIED TO A RECTANGULAR ATTACHMENT AND INTERNAL PRESSURE

PRIMARY PLUS SECONDARY VESSEL STRESSES

LOCATION	SX	SO	SY	TOA
1	-20981.	-33859.	.	-902.
2	11312.	32032.	-150.	-902.
3	-21015.	-33898.	.	902.
4	11336.	32053.	-150.	902.
5	-19361.	-29679.	.	-.
6	10074.	28026.	-150.	-.
7	-22536.	-38078.	.	.
8	12574.	36060.	-150.	.

THE RESULTING PRIMARY PLUS SECONDARY PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	-20919.	-33922.	.
2	32071.	11272.	-150.
3	-20953.	-33961.	.
4	32092.	11297.	-150.
5	-19361.	-29679.	.
6	28026.	10074.	-150.
7	-22536.	-38078.	.
8	36060.	12574.	-150.

THE PRIMARY PLUS SECONDARY STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	13003.	-33922.	20919.
2	20799.	11422.	-32221.
3	13008.	-33961.	20953.
4	20795.	11447.	-32242.
5	10318.	-29679.	19361.
6	17952.	10224.	-28176.

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3	13008.	-33961.	20953.
4	20795.	11447.	-32242.
5	10318.	-29679.	19361.
6	17952.	10224.	-28176.
7	15442.	-38078.	22636.
8	23486.	12724.	-36210.

1.5 SM = 26250. 3.0 SM = 52500.

EARTHQUAKE 2 + NOZZLE LOADS + DEADWEIGHT EFCO-2

BEAM ELEMENT LOADS

NOZZLE LOADS + EARTHQUAKE NO. 1 + DEADWEIGHT

BEAM	NODE		AXIAL P	SHEAR V2	SHEAR V3	BENDING M2	BENDING M3	TORSION MT
1	1	JA	.10775E+05	.43540E+04	.43540E+04	.0	.0	.0
1	4	JB	-.10775E+05	.43540E+04	.43540E+04	.12300E+06	.12300E+06	.0
2	3	JA	.29520E+04	.0	.29520E+04	.26745E+05	.90300E+05	.90300E+05
2	2	JB	.29520E+04	.0	.29520E+04	.0	.90300E+05	.90300E+05
3	3	JA	.29520E+04	.0	.29520E+04	.26745E+05	.90300E+05	.90300E+05
3	4	JB	.29520E+04	.0	.29520E+04	.96678E+05	.90300E+05	.90300E+05
4	4	JA	.29520E+04	.0	.29520E+04	.96678E+05	.90300E+05	.90300E+05
4	5	JB	.29520E+04	.0	.29520E+04	.26745E+05	.90300E+05	.90300E+05
5	5	JA	.29520E+04	.0	.29520E+04	.26745E+05	.90300E+05	.90300E+05
5	6	JB	.29520E+04	.0	.29520E+04	.0	.90300E+05	.90300E+05
6	4	JA	.10775E+05	.10258E+05	.10258E+05	.30360E+05	.30360E+05	.0
6	7	JB	-.10775E+05	.10258E+05	.10258E+05	.53184E+06	.53184E+06	.0
7	7	JA	.23692E+05	.13767E+05	.13767E+05	.53184E+06	.53184E+06	.0
7	8	JB	-.23692E+05	.13767E+05	.13767E+05	.66428E+06	.66428E+06	.0
8	8	JA	.31628E+05	.15765E+05	.15765E+05	.66428E+06	.66428E+06	.0
8	11	JB	-.31628E+05	.15765E+05	.15765E+05	.88499E+06	.88499E+06	.0
9	10	JA	.55220E+04	.0	.55230E+04	.43189E+05	.21029E+06	.21029E+06
9	9	JB	.55220E+04	.0	.55230E+04	.0	.21029E+06	.21029E+06
10	10	JA	.55220E+04	.0	.55230E+04	.43189E+05	.21029E+06	.21029E+06
10	11	JB	.55220E+04	.0	.55230E+04	.19884E+06	.21029E+06	.21029E+06
11	11	JA	.31628E+05	.12777E+05	.16521E+05	.11670E+07	.87398E+06	.12633E+06
11	12	JB	-.31628E+05	.12777E+05	.16521E+05	.93565E+06	.69510E+06	.12633E+06
12	12	JA	.52191E+05	.91460E+04	.12890E+05	.93565E+06	.69510E+06	.12633E+06
12	37	JB	-.52191E+05	.91460E+04	.12890E+05	.33624E+06	.26980E+05	.12633E+06
13	13	JA	.38144E+05	.76880E+04	.12800E+03	.63700E+03	-.20564E+05	.75970E+04
13	14	JB	-.38144E+05	-.76880E+04	.12800E+03	.50000E+02	.16688E+06	.75970E+04
14	15	JA	.70880E+04	.38144E+05	.12800E+03	.70100E+04	.19549E+06	.50000E+02
14	14	JB	-.75880E+04	-.38144E+05	.12800E+03	.75970E+04	.16688E+06	.50000E+02
15	15	JA	.70880E+04	-.38144E+05	.12800E+03	.70100E+04	.19549E+06	.50000E+02
15	15	JB	-.70880E+04	.38144E+05	.12800E+03	.56200E+04	-.10537E+07	.50000E+02

EARTHQUAKEZ

BEAM ELEMENT LOADS

NOZZLE LOADS * EARTHQUAKE NO. 1 * DEADWEIGHT

BEAM NO	NODE		AXIAL F	SHEAR V2	SHEAR V3	BENDING M2	BENDING M3	TORSION MT
16	16	JA	.77210E+04	.31459E+05	.14300E+04	.45994E+05	.85620E+06	.50000E+02
16	17	JB	-.77210E+04	-.31459E+05	.14300E+04	.13801E+05	-.14836E+06	.50000E+02
17	17	JA	.77210E+04	.31459E+05	.14300E+04	.13801E+05	.14838E+06	.50000E+02
17	18	JB	-.77210E+04	-.31459E+05	.14300E+04	.74700E+03	.15989E+06	.50000E+02
18	19	JA	.31459E+05	.77210E+04	.14300E+04	.71900E+04	-.16445E+06	.74700E+03
18	18	JB	-.31459E+05	-.77210E+04	.14300E+04	.50000E+02	.15989E+06	.74700E+03
19	20	JA	.30099E+05	.51020E+04	.44700E+03	.21920E+04	-.15020E+06	.95030E+04
19	21	JB	-.30099E+05	-.51020E+04	.44700E+03	.70000E+02	.16089E+06	.95030E+04
20	22	JA	.51020E+04	.30099E+05	.44700E+03	.52570E+04	.13646E+06	.70000E+02
20	21	JB	-.51020E+04	-.30099E+05	.44700E+03	.95030E+04	.16089E+06	.70000E+02
21	22	JA	.51020E+04	-.30099E+05	.44700E+03	.52570E+04	.13646E+06	.70000E+02
21	16	JB	-.51020E+04	.30099E+05	.44700E+03	.53400E+04	-.81366E+06	.70000E+02
22	16	JA	.50700E+04	.36784E+05	.18160E+04	.56414E+05	.10112E+07	.70000E+02
22	23	JB	-.50700E+04	-.36784E+05	.18160E+04	.15554E+05	-.18356E+06	.70000E+02
23	23	JA	.50700E+04	.36784E+05	.18160E+04	.15554E+05	.18356E+06	.70000E+02
23	24	JB	-.50700E+04	-.36784E+05	.18160E+04	.16980E+04	.16588E+06	.70000E+02
24	25	JA	.36784E+05	.50700E+04	.18160E+04	.91190E+04	-.19139E+06	.16980E+04
24	24	JB	-.36784E+05	-.50700E+04	.18160E+04	.70000E+02	.16588E+06	.16980E+04
25	38	JA	-.55701E+05	.28270E+04	.50890E+04	.12011E+06	.63768E+05	.23106E+05
25	26	JB	.55701E+05	.28270E+04	.50890E+04	.22690E+06	.12896E+06	.23106E+05
26	26	JA	-.33456E+05	.24560E+04	.47180E+04	.22690E+06	.12896E+06	.23106E+05
26	27	JB	.33456E+05	.24560E+04	.47180E+04	.42164E+06	.15613E+06	.23106E+05
27	27	JA	-.18155E+05	.69440E+04	.92060E+04	.42164E+06	.15613E+06	.23106E+05
27	30	JB	.18155E+05	.69440E+04	.92060E+04	.55053E+06	.25334E+06	.23106E+05
28	29	JA	.55220E+04	.55230E+04	.0	.0	.25349E+06	.21029E+06
28	28	JB	.55220E+04	.55230E+04	.0	.0	.21029E+06	.21029E+06
29	29	JA	.55220E+04	.55230E+04	.0	.0	.25349E+06	.21029E+06
29	30	JB	.55220E+04	.55230E+04	.0	.0	.40915E+06	.21029E+06
30	30	JA	.12133E+05	.0	.10940E+04	.28859E+05	.43000E+02	.19700E+03
30	31	JB	.12133E+05	.0	.10940E+04	.55960E+04	.43000E+02	.19700E+03

BEAM ELEMENT LOADS

NOZZLE LOADS - EARTHQUAKE NO. 1 - DEADWEIGHT

BEAM NO	NODE		AXIAL F	SHEAR V2	SHEAR V3	BENDING M2	BENDING M3	TORSION MT
31	31	JA	.12133E+05	.0	.10940E+04	.55960E+04	.43000E+02	.19700E+03
	32	JB	.12133E+05	.0	.10940E+04	.61490E+04	.43000E+02	.19700E+03
32	30	JA	.11412E+05	.0	.13320E+04	.34513E+05	.12800E+03	.67000E+02
	33	JB	.11412E+05	.0	.13320E+04	.46710E+04	.12800E+03	.67000E+02
33	33	JA	.11412E+05	.0	.13320E+04	.46710E+04	.12800E+03	.67000E+02
	34	JB	.11412E+05	.0	.13320E+04	.80930E+04	.12800E+03	.67000E+02
34	30	JA	-.12832E+05	.46350E+04	.46350E+04	.11282E+06	.11282E+06	.0
	35	JB	.12832E+05	.46350E+04	.46350E+04	.47934E+05	.47934E+05	.0
35	35	JA	-.42170E+04	.17040E+04	.17040E+04	.47934E+05	.47934E+05	.0
	36	JB	.42170E+04	.17040E+04	.17040E+04	.0	.0	.0
36	37	JA	.52191E+05	.91460E+04	.12990E+05	.33624E+06	.26980E+06	.12633E+06
	16	JB	-.52191E+05	.91460E+04	.12990E+05	.11942E+06	.11596E+06	.12633E+06
37	16	JA	-.55701E+05	.28270E+04	.50890E+04	.17701E+06	.95367E+05	.23106E+05
	38	JB	.55701E+05	.28270E+04	.50890E+04	.12011E+06	.63768E+05	.23106E+05
38	11	JA	.33160E+05	.44300E+03	.32500E+04	.81009E+05	.12449E+05	.48200E+03
	39	JB	.33160E+05	.44300E+03	.32500E+04	.89920E+04	.17800E+03	.48200E+03
39	39	JA	.33164E+05	.0	.32500E+04	.89980E+04	.17800E+03	.36200E+03
	40	JB	.33164E+05	.0	.32500E+04	.23005E+05	.17800E+03	.36200E+03
40	11	JA	.36643E+05	.49200E+03	.70300E+04	.21106E+06	.13869E+05	.61500E+03
	41	JB	.36643E+05	.49200E+03	.70300E+04	.25520E+05	.23500E+03	.61500E+03
41	41	JA	.36647E+05	.0	.70300E+04	.25526E+05	.23500E+03	.27400E+03
	42	JB	.36647E+05	.0	.70300E+04	.13928E+05	.23500E+03	.27400E+03

EARTHQUAKE 2 + NOZZLE LOADS + DEADWEIGHT EFCU-2

BEAM ELEMENT STRESSES

NOZZLE LOADS + EARTHQUAKE NO. 1 + DEADWEIGHT

BEAM NO	NODE		AXIAL P/A	SHEAR V2/A	SHEAR V3/A	BENDING M2*C/I2	BENDING M3*C/I3	TORSION T*C/J
1	1	JA	.60297E+02	.24365E+02	.24365E+02	.0	.0	.0
1	4	JB	-.60297E+02	.24365E+02	.24365E+02	.62134E+02	.62134E+02	.0
2	3	JA	.22919E+03	.0	.22919E+03	.68625E+03	.23170E+04	.11585E+04
2	2	JB	.22919E+03	.0	.22919E+03	.0	.23170E+04	.11585E+04
3	3	JA	.59040E+01	.0	.59040E+01	.66862E-01	.22575E+00	.22575E+00
3	4	JB	.59040E+01	.0	.59040E+01	.24109E+00	.22575E+00	.22575E+00
4	4	JA	.59040E+01	.0	.59040E+01	.24109E+00	.22575E+00	.22575E+00
4	5	JB	.59040E+01	.0	.59040E+01	.66862E-01	.22575E+00	.22575E+00
5	5	JA	.22919E+03	.0	.22919E+03	.68625E+03	.23170E+04	.11585E+04
5	6	JB	.22919E+03	.0	.22919E+03	.0	.23170E+04	.11585E+04
6	4	JA	.60297E+02	.57403E+02	.57403E+02	.15336E+03	.15336E+03	.0
6	7	JB	-.60297E+02	.57403E+02	.57403E+02	.26866E+03	.26866E+03	.0
7	7	JA	.33765E+03	.19695E+03	.19695E+03	.69150E+03	.69150E+03	.0
7	8	JB	-.33765E+03	.19695E+03	.19695E+03	.86370E+03	.86370E+03	.0
8	8	JA	.29097E+03	.14503E+03	.14503E+03	.44624E+03	.44624E+03	.0
8	11	JB	-.29097E+03	.14503E+03	.14503E+03	.59451E+03	.59451E+03	.0
9	10	JA	.22674E+03	.0	.22682E+03	.47205E+03	.22985E+04	.11492E+04
9	9	JB	.22674E+03	.0	.22682E+03	.0	.22985E+04	.11492E+04
10	10	JA	.11044E+02	.0	.11046E+02	.10797E+00	.52573E+00	.52573E+00
10	11	JB	.11044E+02	.0	.11046E+02	.49711E+00	.52573E+00	.52573E+00
11	11	JA	.29097E+03	.11754E+03	.15199E+03	.78394E+03	.58711E+03	.42434E+02
11	12	JB	-.29097E+03	.11754E+03	.15199E+03	.62854E+03	.46694E+03	.42434E+02
12	12	JA	.74665E+03	.13084E+03	.18441E+03	.12165E+04	.90377E+03	.82132E+02
12	37	JB	-.74665E+03	.13084E+03	.18441E+03	.43718E+03	.35079E+03	.82132E+02
13	13	JA	.76288E+02	.15376E+02	.25600E+00	.15925E-02	-.51411E+00	.18992E-01
13	14	JB	-.76288E+02	-.15376E+02	.25600E+00	.12500E-03	.41720E+00	.18992E-01
14	15	JA	.22421E+03	.11124E+04	.37329E+01	.22353E+02	.12021E+04	.59768E+01
14	14	JB	-.22421E+03	-.11124E+04	.37329E+01	.24225E+02	.10262E+04	.59768E+01
15	15	JA	.15376E+02	-.76288E+02	.25600E+00	.17525E-01	.48871E+00	.12500E-03
15	15	JB	-.15376E+02	.76288E+02	.25600E+00	.14050E-01	-.26343E+01	.12500E-03

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15	16 JB	-.[illegible]	.[illegible]	.[illegible]	.[illegible]E-01	.[illegible]	-.20343E+01	.12500E-03

BEAM ELEMENT STRESSES

NOZZLE LOADS+EARTHQUAKE NO. 1+DEADWEIGHT

BEAM NO	NODE	AXIAL P/A	SHEAR V2/A	SHEAR V3/A	BENDING M2*C/I2	BENDING M3*C/I3	TORSION T*C/J
16	15 JA	.15442E+02	.62918E+02	.28600E+01	.11495E+00	.21405E+01	.12500E-03
16	17 JB	-.15442E+02	-.62918E+02	.28600E+01	.34502E-01	-.37095E+00	.12500E-03
17	17 JA	.22517E+03	.91744E+03	.41703E+02	.44008E+02	.91245E+03	.59768E+01
17	18 JB	-.22517E+03	-.91744E+03	.41703E+02	.23820E+01	.98322E+03	.59768E+01
18	19 JA	.62918E+02	.15442E+02	.28600E+01	.17975E-01	-.41113E+00	.18675E-02
18	18 JB	-.62918E+02	-.15442E+02	.28600E+01	.12500E-03	.39973E+00	.18675E-02
19	20 JA	.60198E+02	.10204E+02	.89400E+00	.54800E-02	-.37550E+00	.23757E-01
19	21 JB	-.60198E+02	-.10204E+02	.89400E+00	.17500E-03	.40223E+00	.23757E-01
20	22 JA	.14857E+03	.67778E+03	.13036E+02	.16763E+02	.83914E+03	.83675E+01
20	21 JB	-.14857E+03	-.67778E+03	.13036E+02	.30303E+02	.98934E+03	.83675E+01
21	22 JA	.10204E+02	-.60198E+02	.89400E+00	.13142E-01	.34115E+00	.17500E-03
21	16 JB	-.10204E+02	.60198E+02	.89400E+00	.13350E-01	-.20342E+01	.17500E-03
22	16 JA	.10140E+02	.73568E+02	.36320E+01	.14103E+00	.25280E+01	.17500E-03
22	23 JB	-.10140E+02	-.73568E+02	.36320E+01	.38885E-01	-.45491E+00	.17500E-03
23	23 JA	.14786E+03	.10727E+04	.52960E+02	.49598E+02	.11288E+04	.83675E+01
23	24 JB	-.14786E+03	-.10727E+04	.52960E+02	.54145E+01	.10291E+04	.83675E+01
24	25 JA	.73564E+02	.10145E+02	.36320E+01	.22797E-01	-.47848E+00	.42450E-02
24	24 JB	-.73564E+02	-.10140E+02	.36320E+01	.17500E-03	.41470E+00	.42450E-02
25	38 JA	-.79687E+03	.40443E+02	.72804E+02	.15617E+03	.82911E+02	.15022E+02
25	26 JB	.79687E+03	.40443E+02	.72804E+02	.29502E+03	.16768E+03	.15022E+02
26	26 JA	-.47863E+03	.35136E+02	.67496E+02	.29502E+03	.16768E+03	.15022E+02
26	27 JB	.47863E+03	.35136E+02	.67496E+02	.54821E+03	.20300E+03	.15022E+02
27	27 JA	-.16702E+03	.83892E+02	.84692E+02	.28324E+03	.10488E+03	.77609E+01
27	30 JB	.16702E+03	.83892E+02	.84692E+02	.36983E+03	.17019E+03	.77609E+01
28	29 JA	.22678E+03	.22582E+03	.0	.0	.27706E+04	.11492E+04
28	28 JB	.22678E+03	.22582E+03	.0	.0	.22985E+04	.11492E+04
29	29 JA	.11044E+02	.11046E+02	.0	.0	.63372E+00	.52573E+00
29	30 JB	.11044E+02	.11046E+02	.0	.0	.10229E+01	.52573E+00
30	30 JA	.24256E+02	.0	.21880E+01	.72147E-01	.10750E-03	.49250E-03
30	31 JB	.24256E+02	.0	.21880E+01	.13990E-01	.10750E-03	.49250E-03

BEAM ELEMENT STRESSES

NOZZLE LOADS + EARTHQUAKE NO. 1 + DEADWEIGHT

BEAM NO	NODE		AXIAL P/A	SHEAR V2/A	SHEAR V3/A	BENDING M2*C/I2	BENDING M3*C/I3	TORSION T*C/J
31	31	JA	.13481E+04	.0	.12156E+03	.97153E+01	.30569E+03	.87530E+02
31	32	JB	.13481E+04	.0	.12156E+03	.10675E+02	.30569E+03	.87530E+02
32	32	JA	.22824E+02	.0	.26640E+01	.86282E-01	.32000E-03	.16750E-03
32	33	JB	.22824E+02	.0	.26640E+01	.11677E-01	.32000E-03	.16750E-03
33	33	JA	.12680E+04	.0	.14800E+03	.81094E+01	.90995E+03	.29769E+02
33	34	JB	.12680E+04	.0	.14800E+03	.14059E+02	.90995E+03	.29769E+02
34	30	JA	-.11621E+03	.42640E+02	.42640E+02	.75791E+02	.75791E+02	.0
34	35	JB	.11621E+03	.42640E+02	.42640E+02	.32201E+02	.32201E+02	.0
35	35	JA	-.60324E+02	.24378E+02	.24378E+02	.62324E+02	.62324E+02	.0
35	36	JB	.60324E+02	.24378E+02	.24378E+02	.0	.0	.0
36	37	JA	.36910E+03	.64682E+02	.91160E+02	.21601E+03	.17332E+03	.40579E+02
36	16	JB	-.36910E+03	.64682E+02	.91160E+02	.76717E+02	.74495E+02	.40579E+02
37	16	JA	-.39393E+03	.19993E+02	.35990E+02	.11371E+03	.61266E+02	.74218E+01
37	38	JB	.39393E+03	.19993E+02	.35990E+02	.77164E+02	.40966E+02	.74218E+01
38	11	JA	.69320E+02	.68600E+00	.65000E+01	.20252E+00	.31122E-01	.12050E-02
38	39	JB	.69320E+02	.68600E+00	.65000E+01	.22480E-01	.44500E-03	.12050E-02
39	39	JA	.36649E+04	.0	.36111E+03	.15622E+02	.12654E+04	.16084E+03
39	40	JB	.36649E+04	.0	.36111E+03	.39939E+02	.12654E+04	.16084E+03
40	11	JA	.73696E+02	.98400E+00	.14060E+02	.52764E+00	.34672E-01	.15375E-02
40	41	JB	.73696E+02	.98400E+00	.14060E+02	.63800E-01	.58750E-03	.15375E-02
41	41	JA	.40941E+04	.0	.78111E+03	.44316E+02	.16706E+04	.12174E+03
41	42	JB	.40941E+04	.0	.78111E+03	.24161E+02	.16706E+04	.12174E+03

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EARTHQUAKE 2 + NOZZLE LOADS + DEADWEIGHT EFCU-2

ELEMENT TOTAL STRESSES AND MAXIMUM STRESS INTENSITY

NOZZLE LOADS + DEADWEIGHT + EARTHQUAKE NO 1

BEAM	NODE	PRESSURE AXIAL	PRESSURE HOOP	PRESSURE RADIAL	TOTAL AXIAL	TOTAL SHEAR	TOTAL AXIAL	MAXIMUM INTENSITY
1	1	.59150E+04	.11830E+05	-.32500E+03	.59753E+04	.34457E+02	.58547E+04	.12155E+05
1	4	.59150E+04	.11830E+05	-.32500E+03	.60623E+04	.34457E+02	.57677E+04	.12155E+05
2	3	.61159E+04	.12232E+05	-.32500E+03	.87611E+04	.13877E+04	.34707E+04	.13043E+05
2	2	.61159E+04	.12232E+05	-.32500E+03	.88621E+04	.13877E+04	.35697E+04	.13033E+05
3	3	.0	.0	.0	.59040E+01	.61297E+01	-.59040E+01	.13607E+02
3	4	.0	.0	.0	.59040E+01	.61297E+01	-.59040E+01	.13607E+02
4	4	.0	.0	.0	.59040E+01	.61297E+01	-.59040E+01	.13607E+02
4	5	.0	.0	.0	.59040E+01	.61297E+01	-.59040E+01	.13607E+02
5	5	.61159E+04	.12232E+05	-.32500E+03	.87611E+04	.13877E+04	.34707E+04	.13043E+05
5	6	.61159E+04	.12232E+05	-.32500E+03	.88621E+04	.13877E+04	.35697E+04	.13033E+05
6	4	.59150E+04	.11830E+05	-.32500E+03	.61913E+04	.81181E+02	.56387E+04	.12156E+05
6	7	.59150E+04	.11830E+05	-.32500E+03	.63543E+04	.81181E+02	.54757E+04	.12156E+05
7	7	.33375E+04	.66750E+04	-.75000E+02	.46522E+04	.27853E+03	.20228E+04	.67877E+04
7	8	.33375E+04	.66750E+04	-.75000E+02	.48962E+04	.27853E+03	.17788E+04	.67926E+04
8	8	.33225E+04	.66450E+04	-.75000E+02	.42445E+04	.20511E+03	.24005E+04	.67374E+04
8	11	.33225E+04	.66450E+04	-.75000E+02	.44535E+04	.20511E+03	.21915E+04	.67390E+04
9	10	.11625E+04	.23250E+04	-.75000E+02	.37353E+04	.13760E+04	-.14103E+04	.46513E+04
9	9	.11625E+04	.23250E+04	-.75000E+02	.36873E+04	.13760E+04	-.13623E+04	.46165E+04
10	10	.0	.0	.0	.11044E+02	.11572E+02	-.11044E+02	.25644E+02
10	11	.0	.0	.0	.12044E+02	.11572E+02	-.12044E+02	.26090E+02
11	11	.33225E+04	.66450E+04	-.75000E+02	.45925E+04	.23457E+03	.20525E+04	.67465E+04
11	12	.33225E+04	.66450E+04	-.75000E+02	.43965E+04	.23457E+03	.22485E+04	.67442E+04
12	12	.33375E+04	.66750E+04	-.75000E+02	.55992E+04	.30824E+03	.10754E+04	.68321E+04
12	37	.33375E+04	.66750E+04	-.75000E+02	.46442E+04	.30824E+03	.20308E+04	.67958E+04
13	13	.0	.0	.0	.76288E+02	.15397E+02	-.76288E+02	.82269E+02
13	14	.0	.0	.0	.76288E+02	.15397E+02	-.76288E+02	.82269E+02
14	15	.0	.0	.0	.14482E+04	.11184E+04	-.14482E+04	.26647E+04
14	14	.0	.0	.0	.12742E+04	.11184E+04	-.12742E+04	.25742E+04
15	15	.0	.0	.0	.15376E+02	.76289E+02	-.15376E+02	.15335E+03
15	16	.0	.0	.0	.17376E+02	.76289E+02	-.17376E+02	.15356E+03

EARTHQUAKE 2 + NOZZLE LOADS + DEADWEIGHT EFCU-2

ELEMENT TOTAL STRESSES AND MAXIMUM STRESS INTENSITY

NOZZLE LOADS + DEADWEIGHT + EARTHQUAKE NO 1

BEAM	NODE	PRESSURE AXIAL	PRESSURE HOOP	PRESSURE RADIAL	TOTAL AXIAL	TOTAL SHEAR	TOTAL AXIAL	MAXIMUM INTENSITY
15	16	.0	.0	.0	.17442E+02	.62983E+02	-.17442E+02	.12717E+03
16	17	.0	.0	.0	.15442E+02	.62983E+02	-.15442E+02	.12691E+03
17	17	.0	.0	.0	.11612E+04	.92436E+03	-.11612E+04	.21934E+04
17	18	.0	.0	.0	.12102E+04	.92436E+03	-.12102E+04	.22096E+04
18	19	.0	.0	.0	.62913E+02	.15700E+02	-.62913E+02	.70324E+02
18	18	.0	.0	.0	.62918E+02	.15706E+02	-.62918E+02	.70324E+02
19	20	.0	.0	.0	.60198E+02	.10267E+02	-.60198E+02	.63604E+02
19	21	.0	.0	.0	.60198E+02	.19267E+02	-.60198E+02	.63604E+02
20	22	.0	.0	.0	.10038E+04	.88624E+03	-.10038E+04	.20370E+04
20	21	.0	.0	.0	.11678E+04	.88624E+03	-.11678E+04	.21226E+04
21	22	.0	.0	.0	.10204E+02	.60205E+02	-.10204E+02	.12084E+03
21	16	.0	.0	.0	.12204E+02	.60205E+02	-.12204E+02	.12103E+03
22	16	.0	.0	.0	.12140E+02	.73658E+02	-.12140E+02	.14781E+03
22	23	.0	.0	.0	.10140E+02	.73658E+02	-.10140E+02	.14765E+03
23	23	.0	.0	.0	.13259E+04	.10824E+04	-.13259E+04	.25386E+04
23	24	.0	.0	.0	.11729E+04	.10824E+04	-.11729E+04	.24621E+04
24	25	.0	.0	.0	.73568E+02	.10775E+02	-.73568E+02	.76659E+02
24	24	.0	.0	.0	.73568E+02	.10775E+02	-.73568E+02	.76659E+02
25	26	.33375E+04	.66750E+04	-.75000E+02	.43104E+04	.98305E+02	.23946E+04	.67541E+04
25	25	.33375E+04	.66750E+04	-.75000E+02	.44734E+04	.98305E+02	.22016E+04	.67544E+04
26	25	.33375E+04	.66750E+04	-.75000E+02	.41551E+04	.91116E+02	.25199E+04	.67533E+04
26	27	.33375E+04	.66750E+04	-.75000E+02	.44001E+04	.91115E+02	.22749E+04	.67536E+04
27	27	.33225E+04	.66450E+04	-.75000E+02	.37415E+04	.11384E+03	.28535E+04	.67245E+04
27	30	.33225E+04	.66450E+04	-.75000E+02	.38965E+04	.11384E+03	.27485E+04	.67247E+04
28	29	.11625E+04	.23250E+04	-.75000E+02	.41593E+04	.13760E+04	-.18343E+04	.49473E+04
28	28	.11625E+04	.23250E+04	-.75000E+02	.36873E+04	.13760E+04	-.13623E+04	.46165E+04
29	29	.0	.0	.0	.11044E+02	.11572E+02	-.11044E+02	.25644E+02
29	30	.0	.0	.0	.12044E+02	.11572E+02	-.12044E+02	.26040E+02
30	30	.0	.0	.0	.24266E+02	.21885E+01	-.24266E+02	.24658E+02
30	31	.0	.0	.0	.24266E+02	.21885E+01	-.24266E+02	.24658E+02

EARTHQUAKE 2 + NOZZLE LOADS + DEADWEIGHT EFCU-2

ELEMENT TOTAL STRESSES AND MAXIMUM STRESS INTENSITY

NOZZLE LOADS + DEADWEIGHT + EARTHQUAKE NO 1

BEAM	NODE	PRESSURE AXIAL	PRESSURE HOOP	PRESSURE RADIAL	TOTAL AXIAL	TOTAL SHEAR	TOTAL AXIAL	MAXIMUM INTENSITY
31	31	.0	.0	.0	.16631E+04	.20909E+03	-.16631E+04	.17149E+04
31	32	.0	.0	.0	.16641E+04	.20909E+03	-.16641E+04	.17158E+04
32	32	.0	.0	.0	.22824E+02	.26642E+01	-.22824E+02	.23438E+02
32	33	.0	.0	.0	.22824E+02	.26642E+01	-.22824E+02	.23438E+02
33	33	.0	.0	.0	.21660E+04	.17777E+03	-.21660E+04	.22147E+04
33	34	.0	.0	.0	.21920E+04	.17777E+03	-.21920E+04	.22206E+04
34	34	.33225E+04	.66450E+04	-.75000E+02	.35457E+04	.60302E+02	.30993E+04	.67212E+04
34	35	.33225E+04	.66450E+04	-.75000E+02	.34837E+04	.60302E+02	.31613E+04	.67211E+04
35	35	.33375E+04	.66750E+04	-.75000E+02	.34858E+04	.34475E+02	.31892E+04	.67504E+04
35	36	.33375E+04	.66750E+04	-.75000E+02	.33976E+04	.34475E+02	.32772E+04	.67504E+04
36	37	.16875E+04	.33750E+04	-.75000E+02	.23326E+04	.15236E+03	.10424E+04	.34718E+04
36	16	.16875E+04	.33750E+04	-.75000E+02	.21626E+04	.15236E+03	.12124E+04	.34689E+04
37	16	.16875E+04	.33750E+04	-.75000E+02	.22104E+04	.48592E+02	.11646E+04	.34520E+04
37	38	.16875E+04	.33750E+04	-.75000E+02	.21684E+04	.48592E+02	.12066E+04	.34520E+04
39	11	.0	.0	.0	.66320E+02	.65613E+01	-.66320E+02	.67606E+02
39	39	.0	.0	.0	.66320E+02	.65613E+01	-.66320E+02	.67606E+02
39	39	.0	.0	.0	.49659E+04	.52195E+03	-.49659E+04	.50744E+04
39	40	.0	.0	.0	.49699E+04	.52195E+03	-.49699E+04	.50979E+04
40	11	.0	.0	.0	.73686E+02	.14096E+02	-.73686E+02	.78895E+02
40	41	.0	.0	.0	.73686E+02	.14096E+02	-.73686E+02	.78895E+02
41	41	.0	.0	.0	.58081E+04	.90285E+03	-.58081E+04	.60823E+04
41	42	.0	.0	.0	.57881E+04	.90285E+03	-.57881E+04	.60632E+04

Appendix C

SANSAR OUTPUT

This section contains the following:

Appendix C.1

SANSAR ABSTRACT

SANSAR ABSTRACT

SANSAR is a multi-purpose computer program, written in Fortran IV, and used in the evaluation of seismic and nozzle load stresses. The program has been developed for various horizontal and vertical heat exchanger designs but can be applied to tanks as well.

SANSAR is divided into two segments, NOZZLE and SIZMIK.

NOZZLE performs nozzle to shell stress analysis based upon the combined effects of external mechanical pipe loads, (beam stresses in the nozzle and Bijlaard stresses in the shell), Johns and Orange pressure discontinuities influence, and pressure membrane effects.

SIZMIK performs static equivalent seismic analysis of vessel supports using "rigid" vessel and flexible support models. SIZMIK accounts for both seismic and external mechanical pipe load effects on the supports as well as considering internal pressure influence. In determining vessel stresses in SIZMIK, the methods of Welding Research Council Bulletin #107 are used.

For both NOZZLE and SIZMIK both principal stresses and stress intensities are calculated, thus stress comparisons can be made for Class 1, 2, 3 or MC nuclear equipment.

Nozzle Options

This segment of "SANSAR" is so written as to allow for the calculation of allowable forces and moments as well as the evaluation of stresses due to specified loadings. Due to the infinite possible loading combinations, the allowable forces and moments are found on an individual nozzle basis without regard to support geometries. The possible options available to the user are:

Option #1

The calculation of maximum allowable nozzle forces and moments, applied individually. (Since nozzle reactions do not occur as individual loads in one direction but simultaneously with loads in all directions, the results of Option #1 should be used for information only.)

Option #2

The calculation of maximum resultant forces and moments, arbitrarily oriented and applied together. (These results are presented as resultant force over resultant moment ratios and are based on the worst possible force/moment orientation.) The results of Option #2 should be used for information only.

Option #3

The calculation of stress intensities for specific load cases. (These specified loads are saved and reacted to the support locations to be included in the seismic evaluation.)

The effects of pressure are taken into account in all three options. The effects of shear stress are taken into account in Options #1 and #3 but are neglected in Option #2.

For Options #1 and #2, the size of the allowable loads is based on stresses calculated at eight (8) locations in the vessel and eight (8) locations in the nozzle at the nozzle-to-vessel junction. The stress intensity limit is 1.5 S_m in all calculations.

SANSAR Stress Output is presented in two subgroups: "Primary Stresses" and "Total Stresses".

"Primary Stresses" are primary local stress results whereas "Total Stresses" are primary plus secondary stress results.

For NOZZLE only analysis, a total of sixteen (16) positions are reviewed for stress state; eight (8) in the vessel and eight (8) in the nozzle.

Positions 1 to 8 are located in the vessel and are identified using Welding Research Council Bulletin No. 107 nomenclature. Positions 1 to 8 are identified as A_{upper}, B_{upper}, C_{upper}, D_{upper}, A_{lower}, B_{lower}, C_{lower}, D_{lower} respectively.

Positions 9 to 16 are located in the nozzle and although not necessarily aligned to the four vessel positions A, B, C, D, the nozzle locations represent locations at the inside and outside of

the nozzle -- i.e., a plane passing through the nozzle centerline and cutting through the nozzle thickness would contain position 9 on the inside and position 11 on the outside. The remaining related positions are 10 and 12, 13 and 15, 14 and 16. Since the positions at which the resultant stresses due to shear and bending moments do not necessarily coincide, eight (8) positions around the nozzle (four (4) inside and four (4) outside) must be examined.

For both the shell and the nozzle, "Total Stresses" are calculated first and then to establish primary stresses, common plane stresses are averaged across the thickness; i.e.,

$$\frac{A_{upper} + A_{lower}}{2}$$

or $\frac{\text{"9"} + \text{"11"}}{2}$ where stresses are added on a component basis.

For SIZMIK, eight (8) stress positions are reported for each support and "load case"*. These eight (8) stress positions are identical in definition to the first eight stress positions for NOZZLE. "Primary" and "Total" stresses are similarly identified.

*The "load cases" considered in SIZMIK are"

1) Pressure loading
2) Nozzle loading
3) Deadweight loading (special case nozzle loading)
4) Static equivalent seismic "G" loads

SIZMIK has the capability of combining the above specified load cases as follows:

1) Absolute summation of load cases 1, 2, 3, 4

2) Absolute summation of load cases 1, 2, and 3 plus SRSS of load case 4

3) Algebraic summation of load cases 1, 2, 3, 4

4) Algebraic summation of load cases 1, 2, and 3 plus SRSS or absolute summation of load case 4

Pressure stress effects for rectangular or square support attachments are based on "thin shell" pressure membrane stress theory.

References

Technical Report R-103 titled "Theoretical Elastic Stress Distributions Arising From Discontinuities and Edge Loads In Several Shell-Type Structures", by Robert H. Johns and Thomas W. Orange, Lewis Research Center, Cleveland, Ohio.

Welding Research Council Bulletin No. 107 titled "Local Stresses In Spherical and Cylindrical Shells Due to External Loadings".

Appendix C.2

LOCAL NOZZLE STRESS OUTPUT

NOZZLES N1 • N2 LOAD CASE 1

KOPT	KTYPE	KBETA	KOEF
3	1	•	•

KEY1	KEY2	KEY3	KEY4	KEY5
•	•	•	•	•

SM1	SM2	P	TN	TV	RN	RMV
17500.	16200.	650.	1.1430	3.1250	7.1880	23.6900

GAMMA	BETA
7.58	.2655

X	Y	Z
.0000	9.0600	.0000

A1	A2	A3	A4	A5	A6
1.11050	.09807	.24391	.09464	.90938	.04378

B1	B2	B3	B4	B5	B6
1.28264	.07325	.45475	.05639	.24895	.05995

OPTION THREE OF PROGRAM NOZZLE

FOR THE FORCES(POUNDS) AND MOMENTS(POUND-INCHES)

FX	FY	FZ	MX	MY	MZ
-2952.	2952.	.	.	90300.	90300.

THE PRIMARY STRESSES IN THE VESSEL AND NOZZLE ARE

LOCATION	SX	SO	SY	TOX
1	-623.	8678.	-325.	89.
2	-498.	9135.	-325.	89.
3	6449.	1897.	-325.	47.
4	6449.	1897.	-325.	131.
5	-623.	8678.	-325.	89.
6	-498.	9135.	-325.	89.
7	6449.	1897.	-325.	47.
8	6449.	1897.	-325.	131.
9	2683.	7188.	-325.	285.
10	1204.	7188.	-325.	285.
11	2683.	7188.	-325.	285.
12	1204.	7188.	-325.	285.
13	1943.	7188.	-325.	161.
14	1943.	7188.	-325.	409.
15	1943.	7188.	-325.	161.
16	1943.	7188.	-325.	409.

THE RESULTING PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	8678.	-524.	-325.
2	9136.	-499.	-325.
3	6450.	1896.	-325.
4	6453.	1893.	-325.
5	8678.	-624.	-325.
6	9136.	-499.	-325.
7	6450.	1896.	-325.

C-2-2

			-325.
8	6453.	1893.	-325.
9	7206.	2665.	-325.
10	7201.	1191.	-325.
11	7206.	2665.	-325.
12	7201.	1191.	-325.
13	7193.	1939.	-325.
14	7220.	1912.	-325.
15	7193.	1939.	-325.
16	7220.	1912.	-325.

THE RESULTING STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	9302.	-299.	-9003.
2	9534.	-174.	-9461.
3	4554.	2221.	-6775.
4	4560.	2218.	-6778.
5	9302.	-299.	-9003.
6	9634.	-174.	-9461.
7	4554.	2221.	-6775.
8	4560.	2218.	-6778.
9	4541.	2990.	-7531.
10	6010.	1516.	-7526.
11	4541.	2990.	-7531.
12	6010.	1516.	-7526.
13	5254.	2264.	-7518.
14	5308.	2237.	-7545.
15	5254.	2264.	-7518.
16	5308.	2237.	-7545.

THE TOTAL STRESSES IN THE VESSEL AND NOZZLE ARE

LOCATION	SX	SO	SY	TOX
1	554.	8908.	.	89.
2	2279.	10366.	.	89.
3	7135.	3919.	.	47.
4	7135.	3919.	.	131.
5	-1800.	8447.	-650.	89.
6	-3275.	7903.	-650.	89.
7	5763.	-126.	-650.	47.
8	5763.	-126.	-650.	131.
9	-11168.	3052.	-650.	260.
10	-12519.	3052.	-650.	260.
11	16533.	11324.	.	310.
12	14927.	11324.	.	310.
13	-11843.	3052.	-650.	136.
14	-11843.	3052.	-650.	385.
15	15730.	11324.	.	185.
16	15730.	11324.	.	434.

THE RESULTING PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	8909.	554.	.
2	10367.	2278.	.
3	7136.	3918.	.
4	7141.	3913.	.
5	8448.	-1801.	-650.
6	7904.	-3276.	-650.
7	5764.	-126.	-650.
8	5766.	-129.	-650.
9	3056.	-11173.	-650.
10	3056.	-12523.	-650.
11	16552.	11305.	.

C 2-4

8	5766.	-129.	-650.
9	3056.	-11173.	-650.
10	3056.	-12523.	-650.
11	16552.	11305.	.
12	14954.	11297.	.
13	3053.	-11845.	-650.
14	3062.	-11853.	-650.
15	15738.	11316.	.
16	15773.	11282.	.

THE RESULTING STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	8356.	554.	-8909.
2	8089.	2278.	-10367.
3	3218.	3918.	-7136.
4	3227.	3913.	-7141.
5	10249.	-1151.	-9098.
6	11179.	-2626.	-8554.
7	5890.	524.	-6414.
8	5895.	521.	-6416.
9	14229.	-10523.	-3705.
10	15579.	-11873.	-3706.
11	5246.	11305.	-16552.
12	3656.	11297.	-14954.
13	14898.	-11195.	-3703.
14	14915.	-11203.	-3712.
15	4422.	11316.	-15738.
16	4491.	11282.	-15773.

NOZZLES N3 + N4 LOAD CASE 1

KOPT	KTYPE	KBETA	KOEF
3	1	*	*

KEY1	KEY2	KEY3	KEY4	KEY5
*	*	*	*	*

SM1	SM2	P	TN	TV	RN	RMV
17500.	15000.	150.	.3750	1.5000	8.0000	28.2500

GAMMA	BETA
18.83	.2478

X	Y	Z
.0000	7.7500	.0000

A1	A2	A3	A4	A5	A6
2.09495	.07266	.80504	.08500	2.05920	.03123

B1	B2	B3	B4	B5	B6
2.80674	.04293	1.39830	.04346	.77124	.05169

OPTION THREE OF PROGRAM NOZZLE

FOR THE FORCES(POUNDS) AND MOMENTS(POUND-INCHES)

FX	FY	FZ	MX	MY	MZ
-5523.	5523.	.	.	210300.	210300.

THE PRIMARY STRESSES IN THE VESSEL AND NOZZLE ARE

LOCATION	SX	SO	SY	TOX
1	-783.	5639.	-75.	349.
2	533.	9153.	-75.	349.
3	6077.	1195.	-75.	202.
4	6077.	1195.	-75.	495.
5	-783.	5639.	-75.	349.
6	533.	9153.	-75.	349.
7	6077.	1195.	-75.	202.
8	6077.	1195.	-75.	495.
9	5380.	6309.	-75.	1461.
10	-1655.	6309.	-75.	1461.
11	5380.	6309.	-75.	1461.
12	-1655.	6309.	-75.	1461.
13	1863.	6309.	-75.	861.
14	1863.	6309.	-75.	2062.
15	1863.	6309.	-75.	861.
16	1863.	6309.	-75.	2062.

THE RESULTING PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	5658.	-802.	-75.
2	9168.	519.	-75.
3	6085.	1186.	-75.
4	6126.	1145.	-75.
5	5658.	-802.	-75.
6	9168.	519.	-75.
7	6085.	1186.	-75.
8	6126.	1145.	-75.

		[illegible]	-75.
7	6085.	1186.	-75.
8	6126.	1145.	-75.
9	7378.	4311.	-75.
10	6569.	-1915.	-75.
11	7378.	4311.	-75.
12	6569.	-1915.	-75.
13	6470.	1701.	-75.
14	7118.	1054.	-75.
15	6470.	1701.	-75.
16	7118.	1054.	-75.

THE RESULTING STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	6460.	-727.	-5733.
2	8649.	594.	-9243.
3	4899.	1261.	-6160.
4	4981.	1220.	-6201.
5	6460.	-727.	-5733.
6	8649.	594.	-9243.
7	4899.	1261.	-6160.
8	4981.	1220.	-6201.
9	3067.	4386.	-7453.
10	8484.	-1840.	-6644.
11	3067.	4386.	-7453.
12	8484.	-1840.	-6644.
13	4769.	1776.	-6545.
14	6064.	1129.	-7193.
15	4769.	1776.	-6545.
16	6064.	1129.	-7193.

THE TOTAL STRESSES IN THE VESSEL AND NOZZLE ARE

LOCATION	SX	SO	SY	TOX
1	-4259.	3961.	.	349.
2	7024.	13497.	.	349.
3	6972.	3140.	.	202.
4	6972.	3140.	.	495.
5	2693.	7318.	-150.	349.
6	-5958.	4809.	-150.	349.
7	5182.	-751.	-150.	202.
8	5182.	-751.	-150.	495.
9	-8708.	2108.	-150.	1426.
10	-15575.	2108.	-150.	1426.
11	19469.	10510.	.	1497.
12	12264.	10510.	.	1497.
13	-12141.	2108.	-150.	826.
14	-12141.	2108.	-150.	2026.
15	15866.	10510.	.	896.
16	15866.	10510.	.	2097.

THE RESULTING PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	3976.	-4274.	.
2	13516.	7005.	.
3	6982.	3129.	.
4	7035.	3077.	.
5	7344.	2667.	-150.
6	4821.	-5969.	-150.
7	5189.	-758.	-150.
8	5223.	-792.	-150.
9	2293.	-8893.	-150.
10	2223.	-15689.	-150.
11	19712.	10267.	.

9	2293.	-14951.	-150.
10	2223.	-15689.	-150.
11	19712.	10267.	.
12	13122.	9653.	.
13	2156.	-12189.	-150.
14	2391.	-12424.	-150.
15	16012.	10364.	.
16	16589.	9787.	.

THE RESULTING STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	8250.	-4274.	-3976.
2	6511.	7005.	-13516.
3	3853.	3129.	-6982.
4	3957.	3077.	-7035.
5	4677.	2817.	-7494.
6	10790.	-5819.	-4971.
7	5946.	-608.	-5339.
8	6015.	-642.	-5373.
9	11186.	-8743.	-2443.
10	17912.	-15539.	-2373.
11	9445.	10267.	-19712.
12	3469.	9653.	-13122.
13	14345.	-12039.	-2306.
14	14915.	-12274.	-2541.
15	5648.	10364.	-16012.
16	6802.	9787.	-16589.

NOZZLES N1 • N2 LOAD CASE 2

KOPT	KTYPE	KBETA	KREF
3	1	•	•

KEY1	KEY2	KEY3	KEY4	KEY5
•	•	•	•	•

SM1	SM2	P	TN	TV	RN	RMV
17500.	16200.	650.	1.1430	3.1250	7.1880	23.6900

GAMMA •	BETA
7.58	.2655

X	Y	Z
.0000	9.0600	.0000

A1	A2	A3	A4	A5	A6
1.11050	.09807	.24391	.09464	.90938	.04378

B1	B2	B3	B4	B5	B6
1.28264	.07325	.45475	.05639	.24895	.06995

OPTION THREE OF PROGRAM NOZZLE

FOR THE FORCES(POUNDS) AND MOMENTS(POUND-INCHES)

FX	FY	FZ	MX	MY	MZ
.	2952.	2952.	90300.	90300.	.

THE PRIMARY STRESSES IN THE VESSEL AND NOZZLE ARE

LOCATION	SX	SO	SY	TOX
1	-560.	8906.	-325.	131.
2	-560.	8906.	-325.	47.
3	6335.	1835.	-325.	89.
4	6564.	1958.	-325.	89.
5	-560.	8906.	-325.	131.
6	-560.	8906.	-325.	47.
7	6335.	1835.	-325.	89.
8	6564.	1958.	-325.	89.
9	2683.	7188.	-325.	285.
10	1204.	7188.	-325.	285.
11	2683.	7188.	-325.	285.
12	1204.	7188.	-325.	285.
13	1943.	7188.	-325.	409.
14	1943.	7188.	-325.	161.
15	1943.	7188.	-325.	409.
16	1943.	7188.	-325.	161.

THE RESULTING PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	8908.	-562.	-325.
2	8906.	-561.	-325.
3	6337.	1833.	-325.
4	6565.	1956.	-325.
5	8908.	-562.	-325.
6	8906.	-561.	-325.
7	6337.	1833.	-325.

5	8908.	-562.	-325.
6	8908.	-561.	-325.
7	6337.	1833.	-325.
8	6565.	1956.	-325.
9	7206.	2665.	-325.
10	7201.	1191.	-325.
11	7206.	2665.	-325.
12	7201.	1191.	-325.
13	7220.	1912.	-325.
14	7193.	1939.	-325.
15	7220.	1912.	-325.
16	7193.	1939.	-325.

THE RESULTING STRESS INTENSITIES ARE

LOCATION	S12	S23	S31
1	9470.	-237.	-9233.
2	9467.	-236.	-9231.
3	4503.	2158.	-6662.
4	4609.	2281.	-6890.
5	9470.	-237.	-9233.
6	9467.	-236.	-9231.
7	4503.	2158.	-6662.
8	4609.	2281.	-6890.
9	4541.	2990.	-7531.
10	6010.	1516.	-7526.
11	4541.	2990.	-7531.
12	6010.	1516.	-7526.
13	5308.	2237.	-7545.
14	5254.	2264.	-7518.
15	5308.	2237.	-7545.
16	5254.	2264.	-7518.

THE TOTAL STRESSES IN THE VESSEL AND NOZZLE ARE

LOCATION	SX	SO	SY	TOX
1	1417.	9637.	.	131.
2	1417.	9637.	.	47.
3	6376.	2775.	.	89.
4	7895.	5062.	.	89.
5	-2538.	8175.	-650.	131.
6	-2538.	8175.	-650.	47.
7	6294.	895.	-650.	89.
8	5233.	-1146.	-650.	89.
9	-11168.	3052.	-650.	260.
10	-12519.	3052.	-650.	260.
11	16533.	11324.	.	310.
12	14927.	11324.	.	310.
13	-11843.	3052.	-650.	385.
14	-11843.	3052.	-650.	136.
15	15730.	11324.	.	434.
16	15730.	11324.	.	185.

THE RESULTING PRINCIPAL STRESSES ARE

LOCATION	S1	S2	S3
1	9639.	1415.	.
2	9638.	1417.	.
3	6379.	2773.	.
4	7897.	5059.	.
5	8177.	-2539.	-650.
6	8175.	-2538.	-650.
7	6295.	894.	-650.
8	5234.	-1148.	-650.
9	3056.	-11173.	-650.
10	3056.	-12523.	-650.
11	16552.	11305.	.

11	JA	11	-.[illegible]	.[illegible]	-.[illegible]E-10	-.[illegible]E+02	-.130E+03	.458E+04			
	JB	12	.[illegible]	-.[illegible]	.87[illegible]E-10	[illegible]E+02	.130E+03	-.977E+04			

EARTHQUAKE 2

B E A M S T R E S S E S FOR OUTPUT VECTOR 6

BEAM NO	BEAM LOAD-LOCATION NODE		PERCENT	--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	- STRESSES AT USER LOCATIONS - A	B	C	MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED SHEAR	
1	1	JA	0.0	-4.87E+01	-4.87E+01	0.	-3.159E+01	-3.159E+01	-3.159E+01	-3.1588E+01	-3.1588E+01	1.59E+01	PIPEG
1	4	JB	100.0	-4.87E+01	-4.87E+01	0.	-3.159E+01	3.055E+01	3.055E+01	5.6283E+01	-1.1946E+02	2.81E+01	
2	3	JA	0.0	-3.95E-11	-1.15E-10	-1.19E-11	1.447E-10	1.208E-10	6.177E-11	2.3093E-10	5.8342E-11	1.16E-10	PIPEG
2	2	JB	100.0	-3.95E-11	-1.15E-10	-1.19E-11	1.447E-10	1.984E-10	2.358E-10	2.5045E-10	3.8871E-11	1.26E-10	
3	3	JA	0.0	-6.52E-12	2.63E-11	0.	-2.980E-11	-2.965E-11	-2.984E-11	-2.9616E-11	-2.9989E-11	1.48E-11	BEAMG
3	4	JB	100.0	-6.52E-12	2.63E-11	0.	-2.980E-11	-2.965E-11	-3.055E-11	-2.8908E-11	-3.0696E-11	1.45E-11	
4	4	JA	0.0	-2.33E-11	1.68E-11	3.73E-13	-7.451E-11	-7.406E-11	-7.493E-11	-7.3630E-11	-7.5381E-11	3.68E-11	BEAMG
4	5	JB	100.0	-2.33E-11	1.68E-11	3.73E-13	-7.451E-11	-7.346E-11	-7.536E-11	-7.2606E-11	-7.6406E-11	3.63E-11	
5	5	JA	0.0	1.24E-11	4.69E-11	8.96E-12	-1.808E-10	-1.510E-10	-1.987E-10	-1.4599E-10	-2.1566E-10	7.35E-11	PIPEG
5	6	JB	100.0	1.24E-11	4.69E-11	8.96E-12	-1.808E-10	-1.808E-10	-2.301E-10	-1.3154E-10	-2.3011E-10	6.64E-11	
6	4	JA	0.0	-4.87E+01	-4.87E+01	4.70E-12	-3.159E+01	3.055E+01	3.055E+01	5.6283E+01	-1.1946E+02	2.81E+01	PIPEG
6	7	JB	100.0	-4.87E+01	-4.87E+01	4.70E-12	-3.159E+01	7.948E+01	7.948E+01	1.2549E+02	-1.8867E+02	6.27E+01	
7	7	JA	0.0	-2.25E+02	-2.25E+02	2.30E-11	-1.769E+02	1.090E+02	1.090E+02	2.2744E+02	-5.8117E+02	1.14E+02	PIPEG
7	8	JB	100.0	-2.25E+02	-2.25E+02	2.30E-11	-1.769E+02	2.074E+02	2.074E+02	3.6653E+02	-7.2026E+02	1.83E+02	
8	8	JA	0.0	-1.81E+02	-1.81E+02	7.51E-12	-1.524E+02	4.615E+01	4.615E+01	1.2838E+02	-4.3312E+02	6.42E+01	PIPEG
8	11	JB	100.0	-1.81E+02	-1.81E+02	7.51E-12	-1.524E+02	1.389E+02	1.389E+02	2.5954E+02	-5.6428E+02	1.30E+02	
9	10	JA	0.0	-5.28E-11	-6.96E-11	-5.34E-11	-3.055E-11	-3.708E-12	-7.509E-11	2.1445E-11	-8.2555E-11	5.45E-11	PIPEG
9	9	JB	100.0	-5.28E-11	-6.96E-11	-5.34E-11	-3.055E-11	4.146E-11	-2.562E-12	4.6713E-11	-1.0782E-10	5.83E-11	
10	10	JA	0.0	1.27E-11	4.19E-12	2.24E-13	5.935E-12	5.531E-12	5.972E-12	6.3752E-12	5.4942E-12	3.20E-12	BEAMG
10	11	JB	100.0	1.27E-11	4.19E-12	2.24E-13	5.935E-12	5.061E-12	5.860E-12	6.8825E-12	4.9868E-12	3.45E-12	
11	11	JA	0.0	1.43E+02	1.43E+02	1.93E+01	-1.524E+02	1.344E+02	1.344E+02	2.5314E+02	-5.5788E+02	1.28E+02	PIPEG
11	12	JB	100.0	1.43E+02	1.43E+02	1.93E+01	-1.524E+02	6.128E+01	6.128E+01	1.4977E+02	-4.5452E+02	7.73E+01	
12	12	JA	0.0	1.18E+02	1.18E+02	3.74E+01	-3.911E+02	2.242E+01	2.242E+01	1.9371E+02	-9.7591E+02	1.04E+02	PIPEG
12	37	JB	100.0	1.18E+02	1.18E+02	3.74E+01	-3.911E+02	-2.279E+02	-2.279E+02	-1.6030E+02	-6.2190E+02	8.44E+01	
13	13	JA	0.0	-4.87E+00	-1.89E-01	8.25E-03	-3.747E+01	-3.771E+01	-3.747E+01	-3.7233E+01	-3.7714E+01	1.86E+01	BEAMG
13	14	JB	100.0	-4.87E+00	-1.89E-01	8.25E-03	-3.747E+01	-3.768E+01	-3.747E+01	-3.7265E+01	-3.7682E+01	1.86E+01	
14	15	JA	0.0	5.46E+02	-2.70E+00	3.43E+00	7.101E+01	6.521E+02	7.867E+01	6.5979E+02	-5.1776E+02	3.30E+02	BEAMG
14	14	JB	100.0	5.46E+02	-2.70E+00	3.43E+00	7.101E+01	-4.424E+02	8.153E+01	5.9499E+02	-4.5297E+02	2.98E+02	
15	15	JA	0.0	-3.75E+01	-1.89E-01	7.18E-05	4.870E+00	5.106E+00	4.864E+00	5.1122E+00	4.6277E+00	2.56E+00	BEAMG
15	16	JB	100.0	-3.75E+01	-1.89E-01	7.18E-05	4.870E+00	6.160E+00	4.869E+00	6.1608E+00	3.5791E+00	3.08E+00	
16	16	JA	0.0	2.96E+01	1.25E+00	-7.18E-05	-4.930E+00	-3.947E+00	-4.881E+00	-3.8973E+00	-5.9632E+00	1.95E+00	BEAMG
16	17	JB	100.0	2.96E+01	1.25E+00	-7.18E-05	-4.930E+00	-4.740E+00	-4.916E+00	-4.7657E+00	-5.0947E+00	2.38E+00	
17	17	JA	0.0	4.32E+02	1.89E+01	-3.43E+00	-7.189E+01	2.976E+02	-5.377E+01	3.1596E+02	-4.5974E+02	1.58E+02	BEAMG
17	18	JB	100.0	4.32E+02	1.89E+01	-3.43E+00	-7.189E+01	-5.675E+02	-7.275E+01	4.2457E+02	-5.6835E+02	2.12E+02	
18	19	JA	0.0	4.93E+00	1.25E+00	-6.72E-04	-2.963E+01	-2.980E+01	-2.962E+01	-2.9447E+01	-2.9804E+01	1.47E+01	BEAMG
18	18	JB	100.0	4.93E+00	1.25E+00	-6.72E-04	-2.963E+01	-2.983E+01	-2.963E+01	-2.9424E+01	-2.9827E+01	1.47E+01	
19	20	JA	0.0	4.93E+00	-1.89E-01	8.25E-03	-2.963E+01	-2.980E+01	-2.963E+01	-2.9454E+01	-2.9797E+01	1.47E+01	BEAMG
19	21	JB	100.0	4.93E+00	-1.89E-01	8.25E-03	-2.963E+01	-2.983E+01	-2.963E+01	-2.9424E+01	-2.9827E+01	1.47E+01	

17	17 JA	0.0	4.32E+02	1.83E+01	-3.43E+00	-7.189E+01	2.978E+02	-5.377E+01	3.1596E+02	-4.5974E+02	1.58E+02	BEAMG	
17	18 JB	100.0	4.32E+02	1.83E+01	-3.43E+00	-7.189E+01	-5.675E+02	-7.275E+01	4.2457E+02	-5.6035E+02	2.12E+02		
18	19 JA	0.0	4.93E+00	1.25E+00	-6.72E-04	-2.963E+01	-2.980E+01	-2.962E+01	-2.9447E+01	-2.9804E+01	1.47E+01	BEAMG	
18	18 JB	100.0	4.93E+00	1.25E+00	-6.72E-04	-2.963E+01	-2.983E+01	-2.963E+01	-2.9424E+01	-2.9827E+01	1.47E+01		
19	20 JA	0.0	4.93E+00	-1.89E-01	8.25E-03	-2.963E+01	-2.980E+01	-2.963E+01	-2.9454E+01	-2.9797E+01	1.47E+01	BEAMG	
19	21 JB	100.0	4.93E+00	-1.89E-01	8.25E-03	-2.963E+01	-2.983E+01	-2.963E+01	-2.9424E+01	-2.9827E+01	1.47E+01		
20	22 JA	0.0	4.32E+02	-2.76E+00	3.43E+00	-7.189E+01	2.978E+02	-6.424E+01	3.0550E+02	-4.4928E+02	1.53E+02	BEAMG	
20	21 JB	100.0	4.32E+02	-2.76E+00	3.43E+00	-7.189E+01	-5.675E+02	-6.137E+01	4.3423E+02	-5.7801E+02	2.17E+02		
21	22 JA	0.0	-2.99E+01	-1.89E-01	7.18E-05	-4.930E+00	-4.780E+00	-4.936E+00	-4.7739E+00	-5.0865E+00	2.39E+00	BEAMG	
21	15 JB	100.0	-2.99E+01	-1.89E-01	7.18E-05	-4.930E+00	-3.947E+00	-4.931E+00	-3.9460E+00	-5.9144E+00	1.47E+00		
22	16 JA	0.0	3.79E+01	1.25E+00	-7.18E-05	4.870E+00	6.160E+00	4.919E+00	6.2096E+00	3.5303E+00	3.10E+00	BEAMG	
22	23 JB	100.0	3.79E+01	1.25E+00	-7.18E-05	4.870E+00	5.106E+00	4.884E+00	5.1204E+00	4.6195E+00	2.56E+00		
23	23 JA	0.0	5.46E+02	1.83E+01	-3.43E+00	7.101E+01	6.521E+02	8.913E+01	6.7025E+02	-5.2822E+02	3.35E+02	BEAMG	
23	24 JB	100.0	5.46E+02	1.83E+01	-3.43E+00	7.101E+01	-4.424E+02	7.015E+01	5.8533E+02	-4.4339E+02	2.93E+02		
24	25 JA	0.0	-4.87E+00	1.25E+00	-6.72E-04	-3.747E+01	-3.771E+01	-3.747E+01	-3.7226E+01	-3.7721E+01	1.86E+01	BEAMG	
24	24 JB	100.0	-4.87E+00	1.25E+00	-6.72E-04	-3.747E+01	-3.760E+01	-3.747E+01	-3.7265E+01	-3.7682E+01	1.86E+01		
25	38 JA	0.0	-5.20E+01	-5.20E+01	1.13E+01	3.760E+02	3.155E+02	3.155E+02	4.6159E+02	2.9045E+02	2.31E+02	PIPEG	
25	26 JB	100.0	-5.20E+01	-5.20E+01	1.13E+01	3.760E+02	4.766E+02	4.766E+02	5.1826E+02	2.3378E+02	2.59E+02		
26	26 JA	0.0	4.14E+01	4.14E+01	1.13E+01	2.093E+02	3.099E+02	3.099E+02	3.5156E+02	6.7090E+01	1.76E+02	PIPEG	
26	27 JB	100.0	4.14E+01	4.14E+01	1.13E+01	2.093E+02	1.706E+02	1.706E+02	2.6403E+02	1.5462E+02	1.33E+02		
27	27 JA	0.0	1.09E+02	1.09E+02	5.86E+00	6.086E+01	4.087E+01	4.087E+01	8.9122E+01	3.2594E+01	4.49E+01	PIPEG	
27	39 JB	100.0	1.09E+02	1.09E+02	5.86E+00	6.086E+01	-1.494E+01	-1.494E+01	1.6805E+02	-4.6333E+01	8.42E+01		
28	29 JA	0.0	-2.43E-10	4.97E-11	7.93E-12	4.303E-11	-2.122E-11	9.202E-11	1.2383E-10	-3.7767E-11	6.24E-11	PIPEG	
28	28 JB	100.0	-2.43E-10	4.97E-11	7.93E-12	4.303E-11	2.248E-10	4.049E-11	2.2484E-10	-1.3878E-10	1.13E-10		
29	29 JA	0.0	-2.25E-11	-5.12E-12	-2.92E-13	1.863E-12	1.518E-12	1.853E-12	2.2165E-12	1.5087E-12	1.15E-12	BEAMG	
29	30 JB	100.0	-2.25E-11	-5.12E-12	-2.92E-13	1.863E-12	2.333E-12	2.030E-12	2.5006E-12	1.2247E-12	1.28E-12		
30	30 JA	0.0	-2.35E-11	8.84E-01	9.07E-06	2.025E+01	2.025E+01	2.028E+01	2.0276E+01	2.0232E+01	1.01E+01	BEAMG	
30	31 JB	100.0	-2.35E-11	8.84E-01	9.07E-06	2.025E+01	2.025E+01	2.025E+01	2.0263E+01	2.0245E+01	1.01E+01		
31	31 JA	0.0	-1.76E-11	4.91E+01	1.81E+00	1.125E+03	1.108E+03	1.119E+03	1.1481E+03	1.1024E+03	5.74E+02	BEAMG	
31	32 JB	100.0	-1.76E-11	4.91E+01	1.81E+00	1.125E+03	1.109E+03	1.116E+03	1.1514E+03	1.0991E+03	5.76E+02		
32	30 JA	0.0	-4.65E-11	8.84E-01	9.07E-06	-2.025E+01	-2.025E+01	-2.023E+01	-2.0232E+01	-2.0276E+01	1.01E+01	BEAMG	
32	33 JB	100.0	-4.66E-11	8.84E-01	9.07E-06	-2.025E+01	-2.025E+01	-2.026E+01	-2.0245E+01	-2.0263E+01	1.01E+01		
33	33 JA	0.0	-8.08E-12	4.91E+01	1.81E+00	-1.125E+03	-1.108E+03	-1.131E+03	-1.1024E+03	-1.1481E+03	5.51E+02	BEAMG	
33	34 JB	100.0	-8.08E-12	4.91E+01	1.81E+00	-1.125E+03	-1.108E+03	-1.135E+03	-1.0991E+03	-1.1514E+03	5.50E+02		
34	30 JA	0.0	-8.52E+01	-8.52E+01	0.	6.086E+01	-1.493E+01	-1.493E+01	1.6804E+02	-4.6328E+01	8.40E+01	PIPEG	
34	35 JB	100.0	-8.52E+01	-8.52E+01	0.	6.086E+01	2.866E+01	2.866E+01	1.0640E+02	1.5320E+01	5.32E+01		
35	35 JA	0.0	-4.87E+01	-4.87E+01	-3.03E-13	3.160E+01	-3.072E+01	-3.072E+01	1.1974E+02	-5.6538E+01	5.99E+01	PIPEG	
35	36 JB	100.0	-4.87E+01	-4.87E+01	-3.03E-13	3.160E+01	3.160E+01	3.160E+01	3.1602E+01	3.1602E+01	1.58E+01		
36	37 JA	0.0	5.80E+01	5.80E+01	1.85E+01	-1.934E+02	-1.127E+02	-1.127E+02	-7.9343E+01	-3.0741E+02	4.38E+01	PIPEG	
36	16 JB	100.0	5.80E+01	5.80E+01	1.85E+01	-1.934E+02	-1.575E+02	-1.575E+02	-1.4261E+02	-2.4414E+02	7.37E+01		
37	16 JA	0.0	-2.57E+01	-2.57E+01	5.61E+00	1.859E+02	1.430E+02	1.430E+02	2.4665E+02	1.2519E+02	1.23E+02	PIPEG	
37	38 JB	100.0	-2.57E+01	-2.57E+01	5.61E+00	1.859E+02	1.560E+02	1.560E+02	2.2820E+02	1.4364E+02	1.14E+02		
38	11 JA	0.0	4.39E-01	-2.41E+00	-4.77E-04	-3.285E+01	-3.284E+01	-3.292E+01	-3.2766E+01	-3.2940E+01	1.64E+01	BEAMG	
38	39 JB	100.0	4.39E-01	-2.41E+00	-4.77E-04	-3.285E+01	-3.285E+01	-3.284E+01	-3.2841E+01	-3.2865E+01	1.64E+01		
39	39 JA	0.0	-1.29E-11	-1.34E+02	-5.76E+01	-1.825E+03	-1.227E+03	-1.817E+03	-1.2187E+03	-2.4319E+03	6.12E+02	BEAMG	
39	40 JB	100.0	-1.29E-11	-1.34E+02	-5.76E+01	-1.825E+03	-1.227E+03	-1.808E+03	-1.2097E+03	-2.4409E+03	6.08E+02		
40	11 JA	0.0	-4.39E-01	-2.41E+00	-4.77E-04	3.285E+01	3.284E+01	3.278E+01	3.2940E+01	3.2766E+01	1.65E+01	BEAMG	
40	41 JB	100.0	-4.39E-01	-2.41E+00	-4.77E-04	3.285E+01	3.285E+01	3.286E+01	3.2865E+01	3.2841E+01	1.64E+01		
41	41 JA	0.0	9.70E-12	-1.34E+02	-5.76E+01	1.825E+03	1.227E+03	1.833E+03	2.4319E+03	1.2187E+03	1.22E+03	BEAMG	
41	42 JB	100.0	9.70E-12	-1.34E+02	-5.76E+01	1.825E+03	1.227E+03	1.842E+03	2.4409E+03	1.2097E+03	1.22E+03		

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39	39 JA	0.0	-1.29E-11	-1.34E+02	-5.76E+01	-1.825E+03	-1.[illegible]E+03	-1.817E+03	-1.2187E+03	-2.4319E+03	6.12E+02	BEAMG	
[illegible]	40 JB	100.0	-1.29E-11	-1.34E+02	-5.76E+01	-1.825E+03	-1.[illegible]E+03	-1.808E+03	-1.2097E+03	-2.4409E+03	6.08E+02		
40	11 JA	0.0	-4.39E-01	-2.41E+00	-4.77E-04	3.285E+01	3.284E+01	3.278E+01	3.2940E+01	3.2766E+01	1.65E+01	BEAMG	
40	41 JB	100.0	-4.39E-01	-2.41E+00	-4.77E-04	3.285E+01	3.285E+01	3.286E+01	3.2965E+01	3.2841E+01	1.64E+01		
41	41 JA	0.0	9.70E-12	-1.34E+02	-5.76E+01	1.825E+03	1.227E+03	1.833E+03	2.4319E+03	1.2187E+03	1.22E+03	BEAMG	
41	42 JB	100.0	9.70E-12	-1.34E+02	-5.76E+01	1.825E+03	1.227E+03	1.842E+03	2.4409E+03	1.2097E+03	1.22E+03		

EARTHQUAKE 2

MAXIMUM STRESS SUMMARY FOR BEAM STRESSES FOR OUTPUT VECTOR 6

	--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	- STRESSES AT USER LOCATIONS - A	B	C	MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED STRESS
MAX. BEAM STRESSES=	5.46E+02	1.43E+02	3.74E+01	1.825E+03	1.227E+03	1.842E+03	2.4409E+03	1.2187E+03	1.22E+03
BEAM NOS. =	14.	11.	12.	41.	41.	41.	41.	41.	41.
MIN. BEAM STRESSES=	-2.25E+02	-2.25E+02	-5.76E+01	-1.825E+03	-1.227E+03	-1.817E+03	-1.2187E+03	-2.4409E+03	1.15E-12
BEAM NOS. =	7.	7.	39.	39.	39.	39.	39.	39.	29.

B E G I N INPUT LOAD CASE NO. 1 TITLE(NOZZLE LOAD CASE 1

NODAL POINT APPLIED FORCES FOR LOAD CASE NO. 1

NODE	X1	X2	X3	X4	X5	X6
2	-2.952000E+03	2.952000E+03	0.	-9.030000E+04	-9.030000E+04	-0.
6	-2.952000E+03	2.952000E+03	0.	-9.030000E+04	-9.030000E+04	-0.
28	-3.905000E+03	3.905000E+03	5.523000E+03	-2.974000E+05	0.	-0.
9	0.	7.810000E+03	0.	-2.974000E+05	0.	-0.

NODAL POINT APPLIED LOADS AND/OR DISPLACEMENTS FINAL SUMMARY FOR LOAD CASE NO. 1

NODE	X1	X2	X3	X4	X5	X6

NOTE IF A FINAL SUMMARY OF APPLIED NODAL LOADS AND GENERATED LOADS IS DESIRED AT THIS POINT,
CODE A 1 IN COLUMN 20 OF THE STATIC CARD.

FORCE AND MOMENT SUMMATION
ABOUT AXES PARALLEL TO SYSTEM AXES
WITH ORIGIN AT POINT (0,0,0)
SUMMATION INCLUDES LOADS APPLIED TO RESTRAINED DOF.

FX1 = -.9809000000E+04
FX2 = .1761000000E+05
FX3 = .5523000000E+04
MX1 = -.5235622030E+07
MX2 = -.2450280300E+07
MX3 = .1994+2600E+06

NOZZLE LOAD CASE 1

BEAM ELEMENT LOADS FOR OUTPUT VECTOR 1

BEAM NO	.LOAD-LOCATION. .NODE--PERCENT.			AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3	
1	1	JA	0.0	2.03727E-09	4.07454E-09	4.77303E-09	-3.72529E-09	5.96046E-08	7.45058E-09	PIPEG
1	4	JB	100.0	-2.03727E-09	-4.07454E-09	-4.77303E-09	3.72529E-09	-2.08616E-07	-8.94070E-08	
2	3	JA	0.0	-2.95200E+03	1.45519E-10	-2.95200E+03	9.03000E+04	2.67451E+04	-9.03000E+04	PIPEG
2	2	JB	100.0	2.95200E+03	-1.45519E-10	2.95200E+03	-9.03000E+04	2.44472E-09	9.03000E+04	
3	3	JA	0.0	-2.95200E+03	-4.65661E-09	-2.95200E+03	9.03000E+04	-2.67451E+04	-9.03000E+04	BEAMG
3	4	JB	100.0	2.95200E+03	4.65661E-09	2.95200E+03	-9.03000E+04	9.66780E+04	9.03000E+04	
4	4	JA	0.0	2.95200E+03	-5.58794E-09	2.95200E+03	-9.03000E+04	-9.66780E+04	9.03000E+04	BEAMG
4	5	JB	100.0	-2.95200E+03	5.58794E-09	-2.95200E+03	9.03000E+04	2.67451E+04	-9.03000E+04	
5	5	JA	0.0	2.95200E+03	1.16415E-10	2.95200E+03	-9.03000E+04	-2.67451E+04	9.03000E+04	PIPEG
5	6	JB	100.0	-2.95200E+03	-1.16415E-10	-2.95200E+03	9.03000E+04	-1.86265E-09	-9.03000E+04	
6	4	JA	0.0	-1.74623E-10	-5.90400E+03	-5.90400E+03	-3.35276E-08	-1.80600E+05	1.80600E+05	PIPEG
6	7	JB	100.0	1.74623E-10	5.90400E+03	5.90400E+03	3.35276E-08	3.11964E+05	-3.11964E+05	
7	7	JA	0.0	-9.31323E-10	-5.90400E+03	-5.90400E+03	-4.84298E-08	-3.11964E+05	3.11964E+05	PIPEG
7	8	JB	100.0	9.31323E-10	5.90400E+03	5.90400E+03	4.84298E-08	3.68760E+05	-3.68760E+05	
8	8	JA	0.0	-4.65661E-10	-5.90400E+03	-5.90400E+03	-4.09782E-08	-3.68760E+05	3.68760E+05	PIPEG
8	11	JB	100.0	4.65661E-10	5.90400E+03	5.90400E+03	4.09782E-08	4.51416E+05	-4.51416E+05	
9	10	JA	0.0	-5.52250E+03	-4.94765E-10	-5.52250E+03	2.10294E+05	4.31893E+04	-2.10294E+05	PIPEG
9	9	JB	100.0	5.52250E+03	4.94765E-10	5.52250E+03	-2.10294E+05	3.25963E-09	2.10294E+05	
10	10	JA	0.0	-5.52250E+03	1.39698E-09	-5.52250E+03	2.10294E+05	-4.31893E+04	-2.10294E+05	BEAMG
10	11	JB	100.0	5.52250E+03	-1.39698E-09	5.52250E+03	-2.10294E+05	1.98543E+05	2.10294E+05	
11	11	JA	0.0	3.02680E-09	4.71507E+03	7.84757E+03	-6.64135E+04	-7.40462E+05	4.47252E+05	PIPEG
11	12	JB	100.0	-3.02680E-09	-4.71507E+03	-7.84757E+03	6.64135E+04	6.30596E+05	-3.81241E+05	
12	12	JA	0.0	2.70666E-09	4.71507E+03	7.84757E+03	-6.64135E+04	-6.30596E+05	3.81241E+05	PIPEG
12	37	JB	100.0	-2.70666E-09	-4.71507E+03	-7.84757E+03	6.64135E+04	2.65684E+05	-1.61991E+05	
13	13	JA	0.0	-1.66562E+03	-1.88795E+03	2.08045E+02	-3.59717E+03	-1.05849E+03	-2.57467E+03	BEAMG
13	14	JB	100.0	1.66562E+03	1.88795E+03	-2.08045E+02	3.59717E+03	5.78821E+00	-6.97836E+03	
14	15	JA	0.0	-1.88795E+03	-1.66562E+03	2.08045E+02	-5.78821E+00	-5.57359E+03	-8.84503E+03	BEAMG
14	14	JB	100.0	1.88795E+03	1.66562E+03	-2.08045E+02	5.78821E+00	3.59717E+03	-6.97836E+03	
15	15	JA	0.0	-1.88795E+03	1.66562E+03	2.08045E+02	-5.78821E+00	5.57359E+03	-8.84503E+03	BEAMG
15	16	JB	100.0	1.88795E+03	-1.66562E+03	-2.08045E+02	5.78821E+00	-1.02546E+04	4.63215E+04	
16	16	JA	0.0	1.88547E+03	-1.09568E+03	6.60761E+02	5.80469E+00	-2.25006E+04	-2.85399E+04	BEAMG
16	17	JB	100.0	-1.88547E+03	1.09568E+03	-6.60761E+02	-5.80469E+00	7.63351E+03	3.88258E+03	
17	17	JA	0.0	1.88547E+03	-1.09568E+03	6.60761E+02	5.80469E+00	-7.63351E+03	-3.88258E+03	BEAMG
17	18	JB	100.0	-1.88547E+03	1.09568E+03	-6.60761E+02	-5.80469E+00	1.35628E+03	-6.52827E+03	
18	19	JA	0.0	-1.39588E+03	1.88547E+03	6.60761E+02	-1.35628E+03	-3.33765E+03	1.60688E+04	BEAMG
18	18	JB	100.0	1.39588E+03	-1.88547E+03	-6.60761E+02	1.35628E+03	-5.80469E+00	-6.52827E+03	
19	20	JA	0.0	-1.77651E+03	1.53734E+03	1.56842E+02	-3.85062E+03	-7.89400E+02	1.48185E+04	BEAMG
19	21	JB	100.0	1.77651E+03	-1.53734E+03	-1.56842E+02	3.85062E+03	-7.03257E+03		

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	BEAMG
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
18	19	JA	0.0	-1.39584E+03	1.88547E+03	5.60761E+02	-1.35528E+03	-3.33765E+03	1.60688E+04	BEAMG
18	18	JB	100.0	1.39584E+03	-1.88547E+03	-5.60761E+02	1.35528E+03	-5.80469E+00	-6.52427E+03	
19	20	JA	0.0	-1.77551E+03	1.53734E+03	1.56842E+02	-3.85062E+03	-7.89460E+02	1.48185E+04	BEAMG
19	21	JB	100.0	1.77551E+03	-1.53734E+03	-1.56842E+02	3.85062E+03	-4.16201E+00	-7.03957E+03	
20	22	JA	0.0	1.53734E+03	-1.77551E+03	1.56842E+02	4.16201E+00	-5.34062E+03	-9.83723E+03	BEAMG
20	21	JB	100.0	-1.53734E+03	1.77551E+03	-1.56842E+02	-4.16201E+00	3.85062E+03	-7.03957E+03	
21	22	JA	0.0	1.53734E+03	1.77551E+03	1.56842E+02	4.16201E+00	5.34062E+03	-9.83723E+03	BEAMG
21	15	JB	100.0	-1.53734E+03	-1.77551E+03	-1.56842E+02	-4.16201E+00	-8.86957E+03	4.98086E+04	
22	15	JA	0.0	-1.53982E+03	-9.84995E+02	7.11964E+02	-4.14553E+00	-2.38857E+04	-2.50528E+04	BEAMG
22	23	JB	100.0	1.53982E+03	9.84995E+02	-7.11964E+02	4.14553E+00	7.86648E+03	2.89039E+03	
23	23	JA	0.0	-1.53982E+03	-9.84995E+02	7.11964E+02	-4.14553E+00	-7.86648E+03	-2.89039E+03	BEAMG
23	24	JB	100.0	1.53982E+03	9.84995E+02	-7.11964E+02	4.14553E+00	1.10283E+03	-6.46707E+03	
24	25	JA	0.0	-9.84995E+02	-1.53982E+03	7.11964E+02	-1.10283E+03	-3.60668E+03	-1.32440E+03	BEAMG
24	24	JB	100.0	9.84995E+02	1.53982E+03	-7.11964E+02	1.10283E+03	4.14553E+00	-6.46707E+03	
25	38	JA	0.0	5.52300E+03	1.18520E+03	3.51903E+03	-9.03013E+02	-1.12136E+05	4.46651E+04	PIPEG
25	26	JB	100.0	-5.52300E+03	-1.18520E+03	-3.51903E+03	9.03013E+02	-1.27827E+05	3.61538E+04	
26	26	JA	0.0	5.52300E+03	1.18520E+03	3.51903E+03	-9.03013E+02	1.27827E+05	-3.61538E+04	PIPEG
26	27	JB	100.0	-5.52300E+03	-1.18520E+03	-3.51903E+03	9.03013E+02	-3.88446E+05	1.23930E+05	
27	27	JA	0.0	5.52300E+03	1.18520E+03	3.51903E+03	-9.03013E+02	3.88446E+05	-1.23930E+05	PIPEG
27	30	JB	100.0	-5.52300E+03	-1.18520E+03	-3.51903E+03	9.03013E+02	-4.37713E+05	1.40523E+05	
28	29	JA	0.0	5.52250E+03	5.52300E+03	-7.13953E-11	2.10294E+05	5.38421E-10	2.53487E+05	PIPEG
28	28	JB	100.0	-5.52250E+03	-5.52300E+03	7.13953E-11	-2.10294E+05	0.	-2.10294E+05	
29	29	JA	0.0	5.52250E+03	-5.52300E+03	7.27596E-11	2.10294E+05	9.31323E-10	2.53487E+05	BEAMG
29	30	JB	100.0	-5.52250E+03	5.52300E+03	-7.27596E-11	-2.10294E+05	-2.79397E-09	-4.09154E+05	
30	30	JA	0.0	1.91678E+03	-6.98492E-10	7.86995E+02	1.83652E+02	-2.41345E+04	3.65923E+01	BEAMG
30	31	JB	100.0	-1.91678E+03	6.98492E-10	-7.86995E+02	-1.83652E+02	2.34264E+03	-3.65923E+01	
31	31	JA	0.0	1.91678E+03	-1.81899E-11	7.86995E+02	1.83652E+02	-2.34264E+03	3.65923E+01	BEAMG
31	32	JB	100.0	-1.91678E+03	1.81899E-11	-7.86995E+02	-1.83652E+02	-1.04931E+03	-3.65923E+01	
32	30	JA	0.0	-1.17297E+03	4.19095E-09	-8.03020E+02	5.62951E+01	2.32315E+04	-1.19376E+02	BEAMG
32	33	JB	100.0	1.17297E+03	-4.19095E-09	8.03020E+02	-5.62951E+01	-9.95889E+02	1.19376E+02	
33	33	JA	0.0	-1.17297E+03	5.82077E-11	-8.03020E+02	5.62951E+01	9.95889E+02	-1.19376E+02	BEAMG
33	34	JB	100.0	1.17297E+03	-5.82077E-11	8.03020E+02	-5.62951E+01	2.46513E+03	1.19376E+02	
34	30	JA	0.0	-9.31323E-10	1.30967E-10	6.98492E-10	0.	-4.47035E-08	0.	PIPEG
34	35	JB	100.0	9.31323E-10	-1.30967E-10	-6.98492E-10	0.	2.98023E-08	7.45058E-09	
35	35	JA	0.0	-2.32831E-10	8.73115E-11	2.03727E-10	-1.16415E-10	-3.72529E-09	-2.79397E-09	PIPEG
35	36	JB	100.0	2.32831E-10	-8.73115E-11	-2.03727E-10	1.16415E-10	0.	1.86265E-09	
36	37	JA	0.0	1.39698E-09	4.71507E+03	7.84757E+03	-6.64135E+04	-2.65684E+05	1.61991E+05	PIPEG
36	16	JB	100.0	-1.39698E-09	-4.71507E+03	-7.84757E+03	6.64135E+04	1.33658E+05	-8.26831E+04	
37	16	JA	0.0	5.52300E+03	1.18520E+03	3.51903E+03	-9.03013E+02	-1.51478E+05	5.79157E+04	PIPEG
37	38	JB	100.0	-5.52300E+03	-1.18520E+03	-3.51903E+03	9.03013E+02	1.12136E+05	-4.46651E+04	
38	11	JA	0.0	1.62831E+04	2.17579E+02	-1.78941E+03	2.91172E+02	4.48332E+04	6.11788E+03	BEAMG
38	39	JB	100.0	-1.62831E+04	-2.17579E+02	1.78941E+03	-2.91172E+02	4.71990E+03	-9.25850E+01	
39	39	JA	0.0	1.62846E+04	-4.36557E-11	-1.78941E+03	2.24083E+02	-4.72337E+03	9.25850E+01	BEAMG
39	40	JB	100.0	-1.62846E+04	4.36557E-11	1.78941E+03	-2.24083E+02	1.24357E+04	-9.25850E+01	
40	11	JA	0.0	-1.97704E+04	-2.64176E+02	5.66552E+03	4.14755E+02	-1.77265E+05	-7.46391E+03	BEAMG
40	41	JB	100.0	1.97704E+04	2.64176E+02	-5.66552E+03	-4.14755E+02	2.03726E+04	1.48211E+02	
41	41	JA	0.0	-1.97722E+04	5.82077E-11	5.66552E+03	1.42520E+02	-2.03763E+04	-1.48211E+02	BEAMG

A.3.30

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	40	JB	100.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
+0	11	JA	0.0	-1.97704E+04	-2.64176E+02	5.66552E+03	4.14755E+02	-1.77265E+05	-7.46791E+03 BEAMG
+0	41	JB	100.0	1.97704E+04	2.64176E+02	-5.66552E+03	-4.14755E+02	2.03726E+04	1.48211E+02
+1	41	JA	0.0	-1.97722E+04	5.82077E-11	5.66552E+03	1.42520E+02	-2.03763E+04	-1.48211E+02 BEAMG
+1	42	JB	100.0	1.97722E+04	-5.82077E-11	-5.66552E+03	-1.42520E+02	-4.04205E+03	1.48211E+02

NOZZLE LOAD CASE 1

MAXIMUM LOAD SUMMARY FOR B E A M E L E M E N T L O A D S FOR OUTPUT VECTOR 1

	AXIAL F	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3
MAXIMUM BEAM LOADS =	1.97722E+04	5.90400E+03	7.84757E+03	2.10294E+05	6.30596E+05	4.47252E+05
BEAM NOS. =	41.	7.	36.	28.	11.	11.
MINIMUM BEAM LOADS =	-1.62846E+04	-5.90400E+03	-7.84757E+03	-2.10294E+05	-7.40462E+05	-4.51416E+05
BEAM NOS. =	39.	7.	36.	28.	11.	8.

NOZZLE LOAD CASE 1

BEAM	--NODES--		BEAM END LOADS IN GLOBAL SYSTEM FOR OUTPUT VECTOR 1 FX1	FX2	FX3	MX1	MX2	MX3
1	JA	1	.407E-08	-.477E-08	-.204E-08	.596E-07	-.745E-08	.373E-08
	JB	4	-.407E-08	.477E-08	.204E-08	-.209E-06	-.994E-07	-.373E-08
2	JA	3	.295E+04	-.295E+04	-.146E-09	.903E+05	.903E+05	-.267E+05
	JB	2	-.295E+04	.295E+04	.146E-09	-.903E+05	-.903E+05	-.244E-08
3	JA	3	-.295E+04	.295E+04	.466E-08	-.903E+05	-.903E+05	.267E+05
	JB	4	.295E+04	-.295E+04	-.466E-08	.903E+05	.903E+05	-.967E+05
4	JA	4	.295E+04	-.295E+04	.559E-08	.903E+05	.903E+05	.967E+05
	JB	5	-.295E+04	.295E+04	-.559E-08	-.903E+05	-.903E+05	-.267E+05
5	JA	5	.295E+04	-.295E+04	-.116E-09	.903E+05	.903E+05	.267E+05
	JB	6	-.295E+04	.295E+04	.116E-09	-.903E+05	-.903E+05	.186E-08
6	JA	4	-.590E+04	.590E+04	.175E-09	-.181E+06	-.181E+06	.335E-07
	JB	7	.590E+04	-.590E+04	-.175E-09	.312E+06	.312E+06	-.335E-07
7	JA	7	-.590E+04	.590E+04	.931E-09	-.312E+06	-.312E+06	.484E-07
	JB	8	.590E+04	-.590E+04	-.931E-09	.369E+06	.369E+06	-.484E-07
8	JA	8	-.590E+04	.590E+04	.466E-09	-.369E+06	-.369E+06	.410E-07
	JB	11	.590E+04	-.590E+04	-.466E-09	.451E+06	.451E+06	-.410E-07
9	JA	10	.611E-09	-.781E+04	.495E-09	.297E+05	.279E-08	-.432E+05
	JB	9	-.611E-09	.781E+04	-.495E-09	-.297E+06	-.745E-08	-.326E-08
10	JA	10	.736E-08	.781E+04	-.140E-08	-.297E+06	.615E-07	.432E+05
	JB	11	-.736E-08	-.781E+04	.140E-08	.297E+06	-.829E-07	-.199E+06
11	JA	11	.472E+04	-.785E+04	-.303E-08	-.740E+06	-.447E+06	.664E+05
	JB	12	-.472E+04	.785E+04	.303E-08	.631E+06	.381E+06	-.664E+05
12	JA	12	.472E+04	-.785E+04	-.271E-08	-.631E+06	-.381E+06	.664E+05
	JB	37	-.472E+04	.785E+04	.271E-08	.266E+06	.162E+06	-.664E+05
13	JA	13	.206E+03	.189E+04	-.167E+04	-.257E+04	.106E+04	-.360E+04
	JB	14	-.206E+03	-.189E+04	.167E+04	-.698E+04	-.579E+01	.360E+04
14	JA	15	-.206E+03	-.189E+04	.167E+04	.885E+04	-.579E+01	.557E+04
	JB	14	.206E+03	.189E+04	-.167E+04	.698E+04	.579E+01	-.360E+04
15	JA	15	.203E+03	.189E+04	-.167E+04	-.885E+04	.579E+01	-.557E+04
	JB	16	-.203E+03	-.189E+04	.167E+04	.463E+05	-.579E+01	.103E+05
16	JA	16	.661E+03	-.189E+04	.110E+04	-.285E+05	-.580E+01	.225E+05
	JB	17	-.661E+03	.189E+04	-.110E+04	.388E+04	.580E+01	-.763E+04
17	JA	17	.661E+03	-.189E+04	.110E+04	-.388E+04	-.580E+01	.763E+04
	JB	18	-.661E+03	.189E+04	-.110E+04	-.653E+04	.580E+01	-.136E+04
18	JA	19	-.661E+03	.189E+04	-.110E+04	-.161E+05	-.334E+04	-.136E+04
	JB	18	.661E+03	-.189E+04	.110E+04	.653E+04	-.580E+01	.136E+04
19	JA	20	-.154E+04	-.157E+03	-.178E+04	.789E+03	-.148E+05	-.385E+04
	JB	21	.154E+04	.157E+03	.178E+04	.416E+01	.704E+04	.385E+04
20	JA	22	.154E+04	.157E+03	.178E+04	.416E+01	-.984E+04	.534E+04
	JB	21	-.154E+04	-.157E+03	-.178E+04	-.416E+01	-.704E+04	

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18	JA	18	-.661E+03	.189E+04	-.110E+04	-.161E+05	-.334E+04	-.136E+04
	JB	18	.661E+03	-.189E+04	.110E+04	.653E+04	-.580E+01	.136E+04
19	JA	20	-.154E+04	-.157E+03	-.178E+04	.789E+03	-.148E+05	-.385E+04
	JB	21	.154E+04	.157E+03	.178E+04	.416E+01	.704E+04	.385E+04
20	JA	22	.154E+04	.157E+03	.178E+04	.416E+01	-.984E+04	.534E+04
	JB	21	-.154E+04	-.157E+03	-.178E+04	-.416E+01	-.704E+04	-.385E+04
21	JA	22	-.154E+04	-.157E+03	-.178E+04	-.416E+01	.984E+04	-.534E+04
	JB	16	.154E+04	.157E+03	.178E+04	.416E+01	-.498E+05	.887E+04
22	JA	16	.154E+04	-.712E+03	.985E+03	.415E+01	.251E+05	.239E+05
	JB	23	-.154E+04	.712E+03	-.985E+03	-.415E+01	-.289E+04	-.787E+04
23	JA	23	.154E+04	-.712E+03	.985E+03	.415E+01	.289E+04	.787E+04
	JB	24	-.154E+04	.712E+03	-.985E+03	-.415E+01	.647E+04	-.110E+04
24	JA	25	-.154E+04	.712E+03	-.985E+03	-.301E+04	-.132E+04	-.110E+04
	JB	24	.154E+04	-.712E+03	.985E+03	.415E+01	-.647E+04	.110E+04
25	JA	34	.119E+04	-.352E+04	-.552E+04	-.112E+06	-.447E+05	.903E+03
	JB	26	-.119E+04	.352E+04	.552E+04	-.128E+06	-.362E+05	-.903E+03
26	JA	26	.119E+04	-.352E+04	-.552E+04	.128E+06	.362E+05	.903E+03
	JB	27	-.119E+04	.352E+04	.552E+04	-.388E+06	-.124E+06	-.903E+03
27	JA	27	.119E+04	-.352E+04	-.552E+04	.388E+06	.124E+06	.903E+03
	JB	30	-.119E+04	.352E+04	.552E+04	-.438E+06	-.141E+06	-.903E+03
28	JA	29	-.391E+04	.391E+04	-.552E+04	.328E+06	.305E+05	-.538E-09
	JB	28	.391E+04	-.391E+04	.552E+04	-.297E+06	.466E-08	0.
29	JA	29	-.391E+04	.391E+04	.552E+04	-.328E+06	-.305E+05	-.931E-09
	JB	33	.391E+04	-.391E+04	-.552E+04	.438E+06	.141E+06	.279E-08
30	JA	30	-.192E+04	-.787E+03	.698E-09	-.184E+03	-.366E+02	.241E+05
	JB	31	.192E+04	.787E+03	-.698E-09	.184E+03	.366E+02	-.234E+04
31	JA	31	-.192E+04	-.787E+03	.182E-10	-.184E+03	-.366E+02	.234E+04
	JB	32	.192E+04	.787E+03	-.182E-10	.184E+03	.366E+02	.105E+04
32	JA	33	-.803E+03	.117E+04	-.419E-08	-.119E+03	-.563E+02	-.232E+05
	JB	33	.803E+03	-.117E+04	.419E-08	.119E+03	.563E+02	.996E+03
33	JA	33	-.803E+03	.117E+04	-.582E-10	-.119E+03	-.563E+02	-.996E+03
	JB	34	.803E+03	-.117E+04	.582E-10	.119E+03	.563E+02	-.247E+04
34	JA	30	.131E-09	-.698E-09	.931E-09	-.447E-07	0.	0.
	JB	35	-.131E-09	.698E-09	-.931E-09	.298E-07	-.745E-08	0.
35	JA	35	.873E-10	-.204E-09	.233E-09	-.373E-08	.279E-08	.116E-09
	JB	36	-.873E-10	.204E-09	-.233E-09	0.	-.186E-08	-.116E-09
36	JA	37	.472E+04	-.785E+04	-.140E-08	-.266E+06	-.162E+06	.664E+05
	JB	16	-.472E+04	.785E+04	.140E-08	.134E+06	.827E+05	-.664E+05
37	JA	16	.119E+04	-.352E+04	-.552E+04	-.151E+06	-.579E+05	.903E+03
	JB	38	-.119E+04	.352E+04	.552E+04	.112E+06	.447E+05	-.903E+03
38	JA	11	-.163E+05	.179E+04	-.147E-08	-.890E+03	-.612E+04	-.448E+05
	JB	39	.163E+05	-.179E+04	.147E-08	.228E+03	.926E+02	-.472E+04
39	JA	39	-.163E+05	.179E+04	.437E-10	-.228E+03	-.926E+02	.472E+04
	JB	40	.163E+05	-.179E+04	-.437E-10	.228E+03	.926E+02	-.124E+05
40	JA	11	.567E+04	.198E+05	.375E-08	-.746E+04	.195E+04	.177E+06
	JB	41	-.567E+04	-.198E+05	-.375E-08	.148E+03	.143E+03	-.204E+05
41	JA	41	.567E+04	.198E+05	-.582E-10	-.148E+03	-.143E+03	.204E+05
	JB	42	-.567E+04	-.198E+05	.582E-10	.148E+03	.143E+03	.404E+04

	JB	40	.193E+03	-.179E+04	-.437E-10	.220E+03	.925E+02	-.124E+05	
40	JA	41	.567E+04	.179E+05	-.437E-08	-.748E+04	.195E+04	.177E+06	
	JB	41	-.567E+04	-.179E+05	-.437E-08	.148E+03	.143E+03	-.204E+05	
41	JA	41	.567E+04	.179E+05	-.582E-10	-.148E+03	-.143E+03	.204E+05	
	JB	42	-.567E+04	-.179E+05	.582E-10	.148E+03	.143E+03	.494E+04	

NOZZLE LOAD CASE 1

BEAM NO	BEAM .LOAD-LOCATION. .NODE--PERCENT.		--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	BEAM STRESSES - STRESSES AT USER LOCATIONS - A	B	C	FOR OUTPUT MAXIMUM (P/A+MC/I)	VECTOR 1 MINIMUM (P/A-MC/I)	COMBINED SHEAR	
1	1 JA	0.0	4.56E-11	5.34E-11	9.41E-13	-1.140E-11	-7.638E-12	-4.151E-11	1.8942E-11	-4.1745E-11	9.52E-12	PIPEG
1	4 JB	100.0	4.56E-11	5.34E-11	9.41E-13	-1.140E-11	-5.657E-11	-1.168E-10	1.0325E-10	-1.2605E-10	5.16E-11	
2	3 JA	0.0	2.28E-11	-4.58E+02	-1.16E+03	2.293E+02	-2.088E+03	-4.570E+02	2.6457E+03	-2.1872E+03	1.76E+03	PIPEG
2	2 JB	100.0	2.28E-11	-4.58E+02	-1.16E+03	2.293E+02	-2.088E+03	2.293E+02	2.5462E+03	-2.0877E+03	1.72E+03	
3	3 JA	0.0	-9.31E-12	-5.90E+00	-2.26E-01	5.904E+00	5.678E+00	5.971E+00	6.1966E+00	5.6114E+00	3.11E+00	BEAMG
3	4 JB	100.0	-9.31E-12	-5.90E+00	-2.26E-01	5.904E+00	5.678E+00	6.146E+00	6.3714E+00	5.4366E+00	3.19E+00	
4	4 JA	0.0	-1.12E-11	5.90E+00	2.26E-01	-5.904E+00	-5.678E+00	-5.662E+00	-5.4366E+00	-6.3714E+00	2.73E+00	BEAMG
4	5 JB	100.0	-1.12E-11	5.90E+00	2.26E-01	-5.904E+00	-5.678E+00	-5.837E+00	-5.6114E+00	-6.1966E+00	2.81E+00	
5	5 JA	0.0	1.81E-11	4.58E+02	1.16E+03	-2.293E+02	2.088E+03	4.570E+02	2.1872E+03	-2.6457E+03	1.59E+03	PIPEG
5	6 JB	100.0	1.81E-11	4.58E+02	1.16E+03	-2.293E+02	2.088E+03	-2.293E+02	2.0877E+03	-2.5462E+03	1.56E+03	
6	4 JA	0.0	-6.81E+01	-6.61E+01	8.47E-12	9.773E-13	9.123E+01	9.123E+01	1.2902E+02	-1.2902E+02	6.45E+01	PIPEG
6	7 JB	100.0	-6.81E+01	-6.61E+01	8.47E-12	9.773E-13	1.576E+02	1.576E+02	2.2286E+02	-2.2286E+02	1.11E+02	
7	7 JA	0.0	-1.69E+02	-1.69E+02	3.15E-11	1.332E-11	4.056E+02	4.056E+02	5.7364E+02	-5.7364E+02	2.87E+02	PIPEG
7	8 JB	100.0	-1.69E+02	-1.69E+02	3.15E-11	1.332E-11	4.795E+02	4.795E+02	6.7807E+02	-6.7807E+02	3.39E+02	
8	8 JA	0.0	-1.09E+02	-1.09E+02	1.38E-11	4.283E-12	2.477E+02	2.477E+02	3.5033E+02	-3.5033E+02	1.75E+02	PIPEG
8	11 JB	100.0	-1.09E+02	-1.09E+02	1.38E-11	4.283E-12	3.032E+02	3.032E+02	4.2886E+02	-4.2886E+02	2.14E+02	
9	10 JA	0.0	-4.06E-11	-4.53E+02	-1.15E+03	2.268E+02	-2.072E+03	-2.452E+02	2.5733E+03	-2.1196E+03	1.73E+03	PIPEG
9	9 JB	100.0	-4.06E-11	-4.53E+02	-1.15E+03	2.268E+02	-2.072E+03	2.268E+02	2.5253E+03	-2.0717E+03	1.71E+03	
10	10 JA	0.0	2.79E-12	-1.10E+01	-5.26E-01	1.105E+01	1.052E+01	1.115E+01	1.1679E+01	1.0411E+01	5.86E+00	BEAMG
10	11 JB	100.0	2.79E-12	-1.10E+01	-5.26E-01	1.105E+01	1.052E+01	1.154E+01	1.2068E+01	1.0022E+01	6.06E+00	
11	11 JA	0.0	8.67E+01	1.44E+02	2.23E+01	-2.784E-11	3.005E+02	4.974E+02	5.8112E+02	-5.8112E+02	2.91E+02	PIPEG
11	12 JB	100.0	8.67E+01	1.44E+02	2.23E+01	-2.784E-11	2.561E+02	4.236E+02	4.9502E+02	-4.9502E+02	2.49E+02	
12	12 JA	0.0	1.35E+02	2.25E+02	4.32E+01	-3.872E-11	4.957E+02	8.199E+02	9.5811E+02	-9.5811E+02	4.81E+02	PIPEG
12	37 JB	100.0	1.35E+02	2.25E+02	4.32E+01	-3.872E-11	2.106E+02	3.454E+02	4.0460E+02	-4.0460E+02	2.07E+02	
13	13 JA	0.0	-3.76E+00	4.10E-01	8.99E-03	3.331E+00	3.325E+00	3.334E+00	3.3403E+00	3.3222E+00	1.67E+00	BEAMG
13	14 JB	100.0	-3.78E+00	4.10E-01	8.99E-03	3.331E+00	3.349E+00	3.331E+00	3.3487E+00	3.3138E+00	1.67E+00	
14	15 JA	0.0	-4.86E+01	6.07E+00	6.92E-01	5.506E+01	6.674E-01	7.283E+01	1.2722E+02	-1.7106E+01	6.36E+01	BEAMG
14	14 JB	100.0	-4.86E+01	6.07E+00	6.92E-01	5.506E+01	9.797E+01	6.653E+01	1.0944E+02	6.7559E-01	5.47E+01	
15	15 JA	0.0	-3.33E+00	4.10E-01	1.45E-05	3.776E+00	3.754E+00	3.762E+00	3.8119E+00	3.7399E+00	1.91E+00	BEAMG
15	16 JB	100.0	-3.33E+00	4.10E-01	1.45E-05	3.776E+00	3.660E+00	3.750E+00	3.9173E+00	3.6345E+00	1.96E+00	
16	16 JA	0.0	-2.19E+00	1.32E+00	-1.45E-05	-3.771E+00	-3.842E+00	-3.715E+00	-3.6433E+00	-3.8985E+00	1.82E+00	BEAMG
16	17 JB	100.0	-2.19E+00	1.32E+00	-1.45E-05	-3.771E+00	-3.781E+00	-3.752E+00	-3.7421E+00	-3.7997E+00	1.87E+00	
17	17 JA	0.0	-3.20E+01	1.93E+01	-6.94E-01	-5.499E+01	-7.886E+01	-3.064E+01	-6.7692E+00	-1.0320E+02	3.46E+00	BEAMG
17	18 JB	100.0	-3.20E+01	1.93E+01	-6.94E-01	-5.499E+01	-1.484E+01	-5.066E+01	-1.0517E+01	-9.9455E+01	5.30E+00	
18	19 JA	0.0	3.77E+00	1.32E+00	3.39E-03	2.192E+00	2.232E+00	2.200E+00	2.2403E+00	2.1432E+00	1.12E+00	BEAMG
18	18 JB	100.0	3.77E+00	1.32E+00	3.39E-03	2.192E+00	2.204E+00	2.192E+00	2.2081E+00	2.1754E+00	1.10E+00	
19	20 JA	0.0	3.07E+00	3.14E-01	9.63E-03	3.553E+00	3.590E+00	3.555E+00	3.5920E+00	3.5140E+00	1.90E+00	BEAMG
19	21 JB	100.0	3.07E+00	3.14E-01	9.63E-03	3.553E+00	3.571E+00	3.553E+00	3.5706E+00	3.5354E+00	1.79E+00	

													BEAMG
													BEAMG
21	22	JA	0.0	3.55E+00	3.14E-01	-1.04E-05	-3.075E+00	-3.099E+00	-3.084E+00	-3.0367E+00	-3.1125E+00	1.52E+00	BEAMG
21	16	JB	100.0	3.55E+00	3.14E-01	-1.04E-05	-3.075E+00	-3.199E+00	-3.097E+00	-2.9230E+00	-3.2214E+00	1.46E+00	
22	16	JA	0.0	-1.97E+00	1.42E+00	1.04E-05	3.080E+00	3.017E+00	3.139E+00	3.2020E+00	2.9573E+00	1.60E+00	BEAMG
22	23	JB	100.0	-1.97E+00	1.42E+00	1.04E-05	3.080E+00	3.072E+00	3.099E+00	3.1065E+00	3.0527E+00	1.55E+00	
23	23	JA	0.0	-2.87E+01	2.08E+01	4.96E-01	4.491E+01	2.713E+01	6.999E+01	6.7764E+01	2.0473E+00	4.39E+01	BEAMG
23	24	JB	100.0	-2.87E+01	2.08E+01	4.96E-01	4.491E+01	8.467E+01	4.842E+01	8.8190E+01	1.6210E+00	4.41E+01	
24	25	JA	0.0	-3.08E+00	1.42E+00	2.76E-03	1.970E+00	1.967E+00	1.979E+00	1.9823E+00	1.9577E+00	9.91E-01	BEAMG
24	24	JB	100.0	-3.08E+00	1.42E+00	2.76E-03	1.970E+00	1.986E+00	1.970E+00	1.9862E+00	1.9539E+00	9.93E-01	
25	38	JA	0.0	3.39E+01	1.01E+02	5.87E-01	-7.901E+01	-2.094E+01	6.579E+01	7.7929E+01	-2.3595E+02	3.90E+01	PIPEG
25	26	JB	100.0	3.39E+01	1.01E+02	5.87E-01	-7.901E+01	-1.260E+02	-2.452E+02	9.3711E+01	-2.5174E+02	4.69E+01	
26	26	JA	0.0	3.39E+01	1.01E+02	5.87E-01	-7.901E+01	-1.260E+02	-2.452E+02	9.3711E+01	-2.5174E+02	4.69E+01	PIPEG
26	27	JB	100.0	3.39E+01	1.01E+02	5.87E-01	-7.901E+01	-2.401E+02	-5.341E+02	4.5114E+02	-6.0916E+02	2.26E+02	
27	27	JA	0.0	2.18E+01	6.47E+01	3.03E-01	-5.080E+01	-1.340E+02	-3.117E+02	2.2311E+02	-3.2470E+02	1.12E+02	PIPEG
27	30	JB	100.0	2.18E+01	6.47E+01	3.03E-01	-5.080E+01	-1.452E+02	-3.448E+02	2.5403E+02	-3.5962E+02	1.29E+02	
28	29	JA	0.0	4.53E+02	-5.85E-12	-1.15E+03	-2.268E+02	2.544E+03	-2.268E+02	2.5437E+03	-2.9974E+03	1.71E+03	PIPEG
28	28	JB	100.0	4.53E+02	-5.85E-12	-1.15E+03	-2.268E+02	2.072E+03	-2.268E+02	2.0717E+03	-2.5253E+03	1.55E+03	
29	29	JA	0.0	-1.10E+01	1.40E-13	-5.26E-01	-1.105E+01	-1.041E+01	-1.105E+01	-1.0411E+01	-1.1679E+01	5.23E+00	BEAMG
29	30	JB	100.0	-1.10E+01	1.40E-13	-5.26E-01	-1.105E+01	-1.002E+01	-1.105E+01	-1.0022E+01	-1.2068E+01	5.04E+00	
30	30	JA	0.0	-1.40E-12	1.57E+00	-4.59E-04	-3.834E+00	-3.833E+00	-3.773E+00	-3.7731E+00	-3.8940E+00	1.89E+00	BEAMG
30	31	JB	100.0	-1.40E-12	1.57E+00	-4.59E-04	-3.834E+00	-3.833E+00	-3.828E+00	-3.8276E+00	-3.8395E+00	1.91E+00	
31	31	JA	0.0	-2.02E-12	8.74E+01	-8.16E+01	-2.130E+02	4.716E+01	-2.089E+02	5.1226E+01	-4.7718E+02	8.55E+01	BEAMG
31	32	JB	100.0	-2.02E-12	8.74E+01	-8.16E+01	-2.130E+02	4.719E+01	-2.148E+02	4.8981E+01	-4.7493E+02	8.52E+01	
32	30	JA	0.0	8.38E-12	-1.61E+00	-1.41E-04	2.346E+00	2.346E+00	2.288E+00	2.4043E+00	2.2875E+00	1.20E+00	BEAMG
32	33	JB	100.0	8.38E-12	-1.61E+00	-1.41E-04	2.346E+00	2.346E+00	2.343E+00	2.3487E+00	2.3431E+00	1.17E+00	
33	33	JA	0.0	6.47E-12	-8.92E+01	-2.50E+01	1.303E+02	-7.183E+02	1.286E+02	9.8070E+02	-7.2004E+02	4.91E+02	BEAMG
33	34	JB	100.0	6.47E-12	-8.92E+01	-2.50E+01	1.303E+02	-7.183E+02	1.346E+02	9.8325E+02	-7.2259E+02	4.92E+02	
34	30	JA	0.0	2.41E-12	1.28E-11	0.		8.566E-12	8.566E-12	3.860E-11	3.8596E-11	-2.1465E-11	1.93E-11	PIPEG
34	35	JB	100.0	2.41E-12	1.28E-11	0.		8.566E-12	3.560E-12	2.859E-11	2.9202E-11	-1.2071E-11	1.46E-11	
35	35	JA	0.0	2.50E-12	5.83E-12	7.57E-14	3.331E-12	-3.019E-13	8.175E-12	9.3855E-12	-2.7237E-12	4.69E-12	PIPEG
35	36	JB	100.0	2.50E-12	5.83E-12	7.57E-14	3.331E-12	9.090E-13	3.331E-12	5.7527E-12	9.0904E-13	2.88E-12	
36	37	JA	0.0	6.67E+01	1.11E+02	2.13E+01	-9.862E-12	1.041E+02	1.707E+02	1.9990E+02	-1.9990E+02	1.02E+02	PIPEG
36	16	JB	100.0	6.67E+01	1.11E+02	2.13E+01	-9.862E-12	5.312E+01	8.588E+01	1.0098E+02	-1.0098E+02	5.48E+01	
37	16	JA	0.0	1.68E+01	4.98E+01	2.90E-01	-3.907E+01	-1.861E+00	5.824E+01	6.5115E+01	-1.4325E+02	3.26E+01	PIPEG
37	38	JB	100.0	1.68E+01	4.98E+01	2.90E-01	-3.907E+01	-1.037E+01	3.297E+01	3.8475E+01	-1.1661E+02	1.92E+01	
38	11	JA	0.0	4.35E-01	-3.58E+00	-7.48E-04	-3.257E+01	-3.255E+01	-3.268E+01	-3.2439E+01	-3.2694E+01	1.62E+01	BEAMG
38	39	JB	100.0	4.35E-01	-3.58E+00	-7.48E-04	-3.257E+01	-3.257E+01	-3.255E+01	-3.2554E+01	-3.2578E+01	1.63E+01	
39	39	JA	0.0	-4.65E-12	-1.99E+02	-1.01E+02	-1.809E+03	-1.151E+03	-1.801E+03	-1.1430E+03	-2.4754E+03	5.80E+02	BEAMG
39	40	JB	100.0	-4.65E-12	-1.99E+02	-1.01E+02	-1.809E+03	-1.151E+03	-1.788E+03	-1.1296E+03	-2.4892E+03	5.74E+02	
40	11	JA	0.0	-5.26E-01	1.13E+01	-1.04E-03	3.954E+01	3.952E+01	3.998E+01	4.0003E+01	3.9079E+01	2.00E+01	BEAMG
40	41	JB	100.0	-5.26E-01	1.13E+01	-1.04E-03	3.954E+01	3.954E+01	3.959E+01	3.9592E+01	3.9489E+01	1.98E+01	
41	41	JA	0.0	6.47E-12	6.36E+02	-6.33E+01	2.197E+03	1.143E+03	2.232E+03	3.2859E+03	1.1079E+03	1.64E+03	BEAMG
41	42	JB	100.0	6.47E-12	6.36E+02	-6.33E+01	2.197E+03	1.143E+03	2.190E+03	3.2570E+03	1.1383E+03	1.63E+03	

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	40	JB	100.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	BEAM6
40	41	JA	0.0	-5.28E-01	1.13E+01	-1.04E-03	3.954E+01	3.952E+01	3.998E+01	4.0003E+01	3.9679E+01	2.00E+01	BEAM6
	41	JB	100.0	-5.28E-01	1.13E+01	-1.04E-03	3.954E+01	3.954E+01	3.959E+01	3.9592E+01	3.9489E+01	1.98E+01	
41	41	JA	0.0	6.47E-12	6.30E+02	-6.33E+01	2.197E+03	1.143E+03	2.232E+03	3.2859E+03	1.1079E+03	1.64E+03	BEAM6
	42	JB	100.0	6.47E-12	6.30E+02	-6.33E+01	2.197E+03	1.143E+03	2.190E+03	3.2576E+03	1.1363E+03	1.63E+03	

NOZZLE LOAD CASE 1

MAXIMUM STRESS SUMMARY FOR BEAM STRESSES FOR OUTPUT VECTOR 1

	--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	- STRESSES AT USER LOCATIONS - A	B	C	MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED STRESS
MAX. BEAM STRESSES=	4.53E+02	6.30E+02	1.16E+03	2.197E+03	2.544E+03	2.232E+03	3.2859E+03	1.1363E+03	1.76E+03
BEAM NOS. =	25.	41.	5.	41.	28.	41.	41.	41.	2.
MIN. BEAM STRESSES=	-1.69E+02	-4.58E+02	-1.16E+03	-1.809E+03	-2.088E+03	-1.801E+03	-1.1430E+03	-2.9974E+03	2.88E-12
BEAM NOS. =	7.	2.	2.	39.	2.	39.	39.	28.	35.

B E G I N INPUT LOAD CASE NO. 2 TITLE(NOZZLE LOAD CASE 2

NODAL POINT APPLIED FORCES FOR LOAD CASE NO. 2

NODE	X1	X2	X3	X4	X5	X6
2	-2.952000E+03	2.952000E+03	0.	-9.030000E+04	-9.030000E+04	-0.
6	-2.952000E+03	2.952000E+03	0.	-9.030000E+04	-9.030000E+04	-0.
28	3.905000E+03	-3.905000E+03	-5.523000E+03	2.974000E+05	0.	-0.
9	0.	7.810000E+03	0.	-2.974000E+05	0.	-0.

NODAL POINT APPLIED LOADS AND/OR DISPLACEMENTS FINAL SUMMARY FOR LOAD CASE NO. 2

NODE	X1	X2	X3	X4	X5	X6

NOTE IF A FINAL SUMMARY OF APPLIED NODAL LOADS AND GENERATED LOADS IS DESIRED AT THIS POINT,
CODE A 1 IN COLUMN 20 OF THE STATIC CARD.

FORCE AND MOMENT SUMMATION
ABOUT AXES PARALLEL TO SYSTEM AXES
WITH ORIGIN AT POINT (0,0,0)
SUMMATION INCLUDES LOADS APPLIED TO RESTRAINED DOF.

FX1	=	-.19990000000E+04
FX2	=	.99090000000E+04
FX3	=	-.55230000000E+04
MX1	=	-.40805550700E+07
MX2	=	-.13402277000E+07
MX3	=	.19834260000E+06

NOZZLE LOAD CASE 2

BEAM NO	LOAD-LOCATION. NODE		PERCENT.	AXIAL F	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3	
				BEAM ELEMENT LOADS				FOR OUTPUT VECTOR 2		
1	1	JA	0.0	1.45519E-09	3.14321E-09	4.77303E-09	0.	4.47035E-08	7.45058E-09	PIPEG
1	4	JB	100.0	-1.45519E-09	-3.14321E-09	-4.77303E-09	0.	-1.93715E-07	5.96046E-08	
2	3	JA	0.0	-2.95200E+03	1.45519E-10	-2.95200E+03	9.03000E+04	2.67451E+04	-9.03000E+04	PIPEG
2	2	JB	100.0	2.95200E+03	-1.45519E-10	2.95200E+03	-9.03000E+04	2.79397E-09	9.03000E+04	
3	3	JA	0.0	-2.95200E+03	-3.72529E-09	-2.95200E+03	9.03000E+04	-2.67451E+04	-9.03000E+04	BEAMG
3	4	JB	100.0	2.95200E+03	3.72529E-09	2.95200E+03	-9.03000E+04	9.66780E+04	9.03000E+04	
4	4	JA	0.0	2.95200E+03	-2.79397E-09	2.95200E+03	-9.03000E+04	-9.66780E+04	9.03000E+04	BEAMG
4	5	JA	100.0	-2.95200E+03	2.79397E-09	-2.95200E+03	9.03000E+04	2.67451E+04	-9.03000E+04	
5	5	JA	0.0	2.95200E+03	1.16415E-10	2.95200E+03	-9.03000E+04	-2.67451E+04	9.03000E+04	PIPEG
5	6	JB	100.0	-2.95200E+03	-1.16415E-10	-2.95200E+03	9.03000E+04	-2.29920E-09	-9.03000E+04	
6	4	JA	0.0	2.27010E-09	-5.90400E+03	-5.90400E+03	-3.72529E-08	-1.80600E+05	1.80600E+05	PIPEG
6	7	JB	100.0	-2.27010E-09	5.90400E+03	5.90400E+03	3.72529E-08	3.11964E+05	-3.11964E+05	
7	7	JA	0.0	2.38651E-09	-5.90400E+03	-5.90400E+03	-6.51926E-08	-3.11964E+05	3.11964E+05	PIPEG
7	8	JB	100.0	-2.38651E-09	5.90400E+03	5.90400E+03	6.51926E-08	3.68760E+05	-3.68760E+05	
8	2	JA	0.0	3.08501E-09	-5.90400E+03	-5.90400E+03	-2.98023E-08	-3.68760E+05	3.68760E+05	PIPEG
8	11	JB	100.0	-3.08501E-09	5.90400E+03	5.90400E+03	2.98023E-08	4.51416E+05	-4.51416E+05	
9	10	JA	0.0	-5.52250E+03	-2.91038E-11	-5.52250E+03	2.10294E+05	4.31893E+04	-2.10294E+05	PIPEG
9	9	JB	100.0	5.52250E+03	2.91038E-11	5.52250E+03	-2.10294E+05	3.25963E-09	2.10294E+05	
10	10	JA	0.0	-5.52250E+03	6.98492E-10	-5.52250E+03	2.10294E+05	-4.31893E+04	-2.10294E+05	BEAMG
10	11	JB	100.0	5.52250E+03	-6.98492E-10	5.52250E+03	-2.10294E+05	1.98843E+05	2.10294E+05	
11	11	JA	0.0	5.93718E-09	5.00595E+03	8.75039E+03	-6.87962E+04	-7.40121E+05	4.47142E+05	PIPEG
11	12	JB	100.0	-5.93718E-09	-5.00595E+03	-8.75039E+03	6.87962E+04	6.17616E+05	-3.77059E+05	
12	12	JA	0.0	6.37374E-09	5.00595E+03	8.75039E+03	-6.87962E+04	-6.17616E+05	3.77059E+05	PIPEG
12	37	JB	100.0	-6.37374E-09	-5.00595E+03	-8.75039E+03	6.87962E+04	2.10723E+05	-1.44282E+05	
13	13	JA	0.0	4.15744E+03	-5.23904E+03	3.29303E+01	-4.29669E+03	-1.87346E+02	-3.53065E+04	BEAMG
13	14	JB	100.0	-4.15744E+03	5.23904E+03	-3.29303E+01	4.29669E+03	2.07186E+01	8.79695E+03	
14	15	JA	0.0	-5.23904E+03	4.15744E+03	3.29303E+01	-2.07186E+01	-4.60953E+03	3.06987E+04	BEAMG
14	14	JB	100.0	5.23904E+03	-4.15744E+03	-3.29303E+01	2.07186E+01	4.29669E+03	8.79695E+03	
15	15	JA	0.0	-5.23904E+03	-4.15744E+03	3.29303E+01	-2.07186E+01	4.60953E+03	3.06987E+04	BEAMG
15	16	JB	100.0	5.23904E+03	4.15744E+03	-3.29303E+01	2.07186E+01	-5.35046E+03	-1.24241E+05	
16	16	JA	0.0	5.24152E+03	-1.39594E+03	8.04466E+02	2.07344E+01	-2.62206E+04	-4.93797E+04	BEAMG
16	17	JB	100.0	-5.24152E+03	1.39594E+03	-8.04466E+02	-2.07344E+01	8.12010E+03	1.79711E+04	
17	17	JA	0.0	5.24152E+03	-1.39594E+03	8.04466E+02	2.07344E+01	-8.12010E+03	-1.79711E+04	BEAMG
17	18	JB	100.0	-5.24152E+03	1.39594E+03	-8.04466E+02	-2.07344E+01	4.77677E+02	4.70968E+03	
18	19	JA	0.0	-1.39594E+03	5.24152E+03	8.04466E+02	-4.77677E+02	-4.04986E+03	2.18124E+04	BEAMG
18	18	JB	100.0	1.39594E+03	-5.24152E+03	-8.04466E+02	4.77677E+02	-2.07344E+01	4.70968E+03	
19	20	JA	0.0	-3.55834E+01	2.62323E+03	-3.52292E+02	-5.20349E+03	1.74197E+03	7.56297E+03	BEAMG
19	21	JB	100.0	3.55834E+01	-2.62323E+03	3.52292E+02	6.20349E+03	4.06265E+01	5.71058E+03	

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17	17	JA	0.0	5.24152E+03	-1.39594E+03	8.04466E+02	2.07344E+01	-8.12010E+03	-1.79711E+04	BEAMG		
17	18	JB	100.0	-5.24152E+03	1.39594E+03	-8.04466E+02	-2.07344E+01	4.77677E+02	4.70968E+03			
18	19	JA	0.0	-1.39594E+03	5.24152E+03	8.04466E+02	-4.77677E+02	-4.04986E+03	2.18124E+04	BEAMG		
18	18	JB	100.0	1.39594E+03	-5.24152E+03	-8.04466E+02	4.77677E+02	-2.07344E+01	4.70968E+03			
19	20	JA	0.0	-3.55834E+01	2.62323E+03	-3.52292E+02	-6.20349E+03	1.74197E+03	7.56297E+03	BEAMG		
19	21	JB	100.0	3.55834E+01	-2.62323E+03	3.52292E+02	6.20349E+03	4.06265E+01	5.71058E+03			
20	22	JA	0.0	2.62323E+03	-3.55834E+01	-3.52292E+02	-4.06265E+01	-2.85672E+03	-6.04862E+03	BEAMG		
20	21	JB	100.0	-2.62323E+03	3.55834E+01	3.52292E+02	4.06265E+01	6.20349E+03	5.71058E+03			
21	22	JA	0.0	2.62323E+03	3.55834E+01	-3.52292E+02	-4.06265E+01	2.85672E+03	-6.04862E+03	BEAMG		
21	16	JB	100.0	-2.62323E+03	-3.55834E+01	3.52292E+02	4.06265E+01	5.06985E+03	6.84925E+03			
22	16	JA	0.0	-2.62075E+03	2.79708E+03	1.18969E+03	4.06424E+01	-3.66409E+04	8.17106E+04	BEAMG		
22	23	JB	100.0	2.62075E+03	-2.79708E+03	-1.18969E+03	-4.06424E+01	9.87291E+03	-1.87762E+04			
23	23	JA	0.0	-2.62075E+03	2.79708E+03	1.18969E+03	4.06424E+01	-9.87291E+03	1.87762E+04	BEAMG		
23	24	JB	100.0	2.62075E+03	-2.79708E+03	-1.18969E+03	-4.06424E+01	-1.42913E+03	7.79606E+03			
24	25	JA	0.0	2.79708E+03	-2.62075E+03	1.18969E+03	1.42913E+03	-5.97918E+03	-2.10571E+04	BEAMG		
24	24	JB	100.0	-2.79708E+03	2.62075E+03	-1.18969E+03	-1.42913E+03	-4.06424E+01	7.79606E+03			
25	39	JA	0.0	-5.52300E+03	-1.00957E+03	-3.27216E+03	-5.65415E+03	7.35778E+04	-1.72325E+04	PIPEG		
25	26	JB	100.0	5.52300E+03	1.00957E+03	3.27216E+03	5.65415E+03	-1.49551E+05	-5.16098E+04			
26	26	JA	0.0	-5.52300E+03	-1.00957E+03	-3.27216E+03	-5.65415E+03	-1.49551E+05	5.16098E+04	PIPEG		
26	27	JB	100.0	5.52300E+03	1.00957E+03	3.27216E+03	5.65415E+03	3.91887E+05	-1.26378E+05			
27	27	JA	0.0	-5.52300E+03	-1.00957E+03	-3.27216E+03	-5.65415E+03	-3.91887E+05	1.26378E+05	PIPEG		
27	30	JB	100.0	5.52300E+03	1.00957E+03	3.27216E+03	5.65415E+03	4.37697E+05	-1.40512E+05			
28	29	JA	0.0	-5.52250E+03	-5.52300E+03	8.23093E-11	-2.10294E+05	-6.11180E-10	-2.53487E+05	PIPEG		
28	28	JB	100.0	5.52250E+03	5.52300E+03	-8.23093E-11	2.10294E+05	-1.45519E-11	2.10294E+05			
29	29	JA	0.0	-5.52250E+03	5.52300E+03	-1.45519E-10	-2.10294E+05	-1.86265E-09	-2.53487E+05	BEAMG		
29	30	JB	100.0	5.52250E+03	-5.52300E+03	1.45519E-10	2.10294E+05	5.58794E-09	4.09154E+05			
30	30	JA	0.0	-2.00589E+03	-1.16415E-09	-6.51941E+02	-1.93086E+02	2.01331E+04	-4.07667E+01	BEAMG		
30	31	JB	100.0	2.00589E+03	1.16415E-09	6.51941E+02	1.93086E+02	-2.08085E+03	4.07667E+01			
31	31	JA	0.0	-2.00589E+03	3.27418E-11	-6.51941E+02	-1.93086E+02	2.08085E+03	-4.07667E+01	BEAMG		
31	32	JB	100.0	2.00589E+03	-3.27418E-11	6.51941E+02	1.93086E+02	7.29015E+02	-4.07667E+01			
32	30	JA	0.0	1.28478E+03	-2.79397E-09	8.89544E+02	-6.27172E+01	-2.57872E+04	1.25508E+02	BEAMG		
32	33	JB	100.0	-1.28478E+03	2.79397E-09	-8.89544E+02	6.27172E+01	1.15578E+03	-1.25508E+02			
33	33	JA	0.0	1.28478E+03	-2.91038E-11	8.89544E+02	-6.27172E+01	-1.15578E+03	1.25508E+02	BEAMG		
33	34	JB	100.0	-1.28478E+03	2.91038E-11	-8.89544E+02	6.27172E+01	-2.67815E+03	-1.25508E+02			
34	30	JA	0.0	9.31323E-10	-1.16415E-10	-5.82077E-10	0.	2.98023E-08	7.45058E-09	PIPEG		
34	35	JB	100.0	-9.31323E-10	1.16415E-10	5.82077E-10	0.	-4.47035E-08	0.			
35	35	JA	0.0	4.65661E-10	-7.27596E-11	-3.49246E-10	1.16415E-10	3.72529E-09	1.86265E-09	PIPEG		
35	36	JB	100.0	-4.65661E-10	7.27596E-11	3.49246E-10	-1.16415E-10	0.	-1.86265E-09			
36	37	JA	0.0	7.45058E-09	5.00595E+03	8.75039E+03	-6.87962E+04	-2.10723E+05	1.44282E+05	PIPEG		
36	16	JB	100.0	-7.45058E-09	-5.00595E+03	-8.75039E+03	6.87962E+04	6.35415E+04	-6.00819E+04			
37	16	JA	0.0	-5.52300E+03	-1.00957E+03	-3.27216E+03	-5.65415E+03	1.10161E+05	-2.85194E+04	PIPEG		
37	38	JB	100.0	5.52300E+03	1.00957E+03	3.27216E+03	5.65415E+03	-7.35778E+04	1.72325E+04			
38	11	JA	0.0	1.67345E+04	2.23610E+02	-2.04577E+03	2.91377E+02	5.22350E+04	6.28596E+03	BEAMG		
38	39	JB	100.0	-1.67345E+04	-2.23610E+02	2.04577E+03	-2.91377E+02	4.41742E+03	-9.36383E+01			
39	39	JA	0.0	1.67360E+04	-2.91038E-11	-2.04577E+03	2.32329E+02	-4.42092E+03	9.36383E+01	BEAMG		
39	40	JB	100.0	-1.67360E+04	2.91038E-11	2.04577E+03	-2.32329E+02	1.32382E+04	-9.36383E+01			
40	11	JA	0.0	-2.04186E+04	-2.72814E+02	5.82606E+03	4.24033E+02	-1.82283E+05	-7.70586E+03	BEAMG		
40	41	JB	100.0	2.04186E+04	2.72814E+02	-5.82606E+03	-4.24033E+02	2.09454E+04	1.50970E+02			
41	41	JA	0.0	-2.04186E+04	8.73115E-11	5.82606E+03	1.44142E+02	-2.09492E+04	-1.50970E+02	BEAMG		
41	42	JB	100.0	2.04186E+04	-8.73115E-11	-5.82606E+03	-1.44142E+02	-4.16100E+03	1.50970E+02			

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
=0	11 JA	0.0	-2.04186E+04	-2.72814E+02	5.82606E+03	4.24033E+02	-1.82283E+05	-7.70586E+03	BEAMG
=0	41 JB	100.0	2.04186E+04	2.72814E+02	-5.82606E+03	-4.24033E+02	2.09454E+04	1.50970E+02	
=1	41 JA	0.0	-2.04186E+04	8.73115E-11	5.82606E+03	1.44142E+02	-2.09492E+04	-1.50970E+02	BEAMG
=1	42 JB	100.0	2.04186E+04	-8.73115E-11	-5.82606E+03	-1.44142E+02	-4.16109E+03	1.50970E+02	

NOZZLE LOAD CASE 2

MAXIMUM LOAD SUMMARY FOR BEAM ELEMENT LOADS FOR OUTPUT VECTOR 2

	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3
MAXIMUM BEAM LOADS =	2.04186E+04	5.90400E+03	8.75039E+03	2.10294E+05	6.17616E+05	4.47142E+05
BEAM NOS. =	41.	8.	36.	28.	11.	11.
MINIMUM BEAM LOADS =	-1.67350E+04	-5.90400E+03	-8.75039E+03	-2.10294E+05	-7.40121E+05	-4.51416E+05
BEAM NOS. =	39.	8.	36.	28.	11.	8.

NOZZLE LOAD CASE 2

BEAM FORCES IN GLOBAL SYSTEM FOR OUTPUT VECTOR 2

BEAM	--NODES--		FX1	FX2	FX3	MX1	MX2	MX3
1	JA	1	.314E-08	-.477E-08	-.146E-08	.447E-07	-.745E-08	0.
	JB	4	-.314E-08	.477E-08	.146E-08	-.194E-06	-.596E-07	0.
2	JA	3	.295E+04	-.295E+04	-.145E-09	.903E+05	.903E+05	-.267E+05
	JB	2	-.295E+04	.295E+04	.146E-09	-.903E+05	-.903E+05	-.279E-08
3	JA	3	-.295E+04	.295E+04	.373E-08	-.903E+05	-.903E+05	.267E+05
	JB	4	.295E+04	-.295E+04	-.373E-08	.903E+05	.903E+05	-.967E+05
4	JA	4	.295E+04	-.295E+04	.279E-08	-.903E+05	.903E+05	.967E+05
	JB	5	-.295E+04	.295E+04	-.279E-08	.903E+05	-.903E+05	-.267E+05
5	JA	5	.295E+04	-.295E+04	-.116E-09	.903E+05	.903E+05	.267E+05
	JB	6	-.295E+04	.295E+04	.116E-09	-.903E+05	-.903E+05	.230E-08
6	JA	4	-.590E+04	.590E+04	-.227E-08	-.181E+06	-.181E+06	.373E-07
	JB	7	.590E+04	-.590E+04	.227E-08	.312E+06	.312E+06	-.373E-07
7	JA	7	-.590E+04	.590E+04	-.239E-08	-.312E+06	-.312E+06	.652E-07
	JB	8	.590E+04	-.590E+04	.239E-08	.369E+06	.369E+06	-.652E-07
8	JA	8	-.590E+04	.590E+04	-.309E-08	-.369E+06	-.369E+06	.298E-07
	JB	11	.590E+04	-.590E+04	.309E-08	.451E+06	.451E+06	-.298E-07
9	JA	10	.132E-08	-.781E+04	.291E-10	.297E+06	.466E-08	-.432E+05
	JB	9	-.132E-08	.781E+04	-.291E-10	-.297E+06	-.652E-08	-.326E-08
10	JA	10	.803E-08	-.781E+04	-.698E-09	-.297E+06	.230E-06	.432E+05
	JB	11	-.803E-08	-.781E+04	.698E-09	.297E+06	-.230E-06	-.199E+06
11	JA	11	.501E+04	-.875E+04	-.594E-08	-.740E+06	-.447E+06	.688E+05
	JB	12	-.501E+04	.875E+04	.594E-08	.618E+06	.377E+06	-.688E+05
12	JA	12	.501E+04	-.875E+04	-.637E-08	-.618E+06	-.377E+06	.688E+05
	JB	37	-.501E+04	.875E+04	.637E-08	.211E+06	.144E+06	-.688E+05
13	JA	13	.329E+02	.524E+04	.416E+04	-.353E+05	.187E+03	-.430E+04
	JB	14	-.329E+02	-.524E+04	-.416E+04	.880E+04	-.207E+02	.430E+04
14	JA	15	-.329E+02	-.524E+04	-.416E+04	-.307E+05	-.207E+02	.461E+04
	JB	14	.329E+02	.524E+04	.416E+04	-.880E+04	.207E+02	-.430E+04
15	JA	15	.329E+02	.524E+04	.416E+04	.307E+05	.207E+02	-.461E+04
	JB	16	-.329E+02	-.524E+04	-.416E+04	-.124E+06	-.207E+02	.535E+04
16	JA	16	.804E+03	-.524E+04	.140E+04	-.494E+05	-.207E+02	.262E+05
	JB	17	-.804E+03	.524E+04	-.140E+04	.180E+05	.207E+02	-.812E+04
17	JA	17	.804E+03	-.524E+04	.140E+04	-.180E+05	-.207E+02	.812E+04
	JB	18	-.804E+03	.524E+04	-.140E+04	.471E+04	.207E+02	-.478E+03
18	JA	19	-.804E+03	.524E+04	-.140E+04	-.218E+05	-.405E+04	-.478E+03
	JB	15	.804E+03	-.524E+04	.140E+04	-.471E+04	-.207E+02	.478E+03
19	JA	20	-.262E+04	.352E+03	-.356E+02	-.174E+04	-.756E+04	-.620E+04
	JB	21	.262E+04	-.352E+03	.356E+02	-.406E+02	-.571E+04	.620E+04
20	JA	22	.262E+04	-.352E+03	.356E+02	-.406E+02	-.605E+04	.286E+04
	JB	21	-.262E+04	.352E+03	-.356E+02	.406E+02	.571E+04	-.620E+04

	JB	18	-.804E+03	.524E+04	-.140E+04	.471E+04	.207E+02	-.478E+03	
	JA	19	-.804E+03	.524E+04	-.140E+04	-.218E+05	-.405E+04	-.478E+03	
	JB	18	.804E+03	-.524E+04	.140E+04	-.471E+04	-.207E+02	.478E+03	
19	JA	20	-.262E+04	.352E+03	-.356E+02	-.174E+04	-.756E+04	-.620E+04	
	JB	21	.262E+04	-.352E+03	.356E+02	-.406E+02	-.571E+04	.620E+04	
20	JA	22	-.262E+04	-.352E+03	.356E+02	-.406E+02	-.605E+04	.286E+04	
	JB	21	-.262E+04	.352E+03	-.356E+02	.406E+02	.571E+04	-.620E+04	
21	JA	22	-.262E+04	.352E+03	-.356E+02	.406E+02	.605E+04	-.286E+04	
	JB	16	.262E+04	-.352E+03	.356E+02	-.406E+02	-.685E+04	-.507E+04	
22	JA	16	.262E+04	-.119E+04	-.280E+04	-.406E+02	-.817E+05	.366E+05	
	JB	23	-.262E+04	.119E+04	.280E+04	.406E+02	.188E+05	-.987E+04	
23	JA	23	.262E+04	-.119E+04	-.280E+04	-.406E+02	-.188E+05	.987E+04	
	JB	24	-.262E+04	.119E+04	.280E+04	.406E+02	-.780E+04	.143E+04	
24	JA	25	-.262E+04	.119E+04	.280E+04	-.598E+04	-.211E+05	.143E+04	
	JB	24	.262E+04	-.119E+04	-.280E+04	-.406E+02	.780E+04	-.143E+04	
25	JA	38	-.101E+04	.327E+04	.552E+04	.736E+05	.172E+05	.565E+04	
	JB	26	.101E+04	-.327E+04	-.552E+04	.150E+06	.516E+05	-.565E+04	
26	JA	26	-.101E+04	.327E+04	.552E+04	-.150E+06	-.516E+05	.565E+04	
	JB	27	.101E+04	-.327E+04	-.552E+04	.392E+06	.126E+06	-.565E+04	
27	JA	27	-.101E+04	.327E+04	.552E+04	-.392E+06	-.126E+06	.565E+04	
	JB	30	.101E+04	-.327E+04	-.552E+04	.438E+06	.141E+06	-.565E+04	
28	JA	29	-.391E+04	.391E+04	.552E+04	-.328E+06	-.305E+05	.611E-09	
	JB	28	.391E+04	-.391E+04	-.552E+04	.297E+06	-.559E-08	.146E-10	
29	JA	29	.391E+04	-.391E+04	-.552E+04	.328E+06	.305E+05	.186E-08	
	JB	30	-.391E+04	.391E+04	.552E+04	-.438E+06	-.141E+06	-.559E-08	
30	JA	30	.201E+04	.652E+03	.116E-08	.193E+03	.408E+02	-.201E+05	
	JB	31	-.201E+04	-.652E+03	-.116E-08	-.193E+03	-.408E+02	.208E+04	
31	JA	31	.201E+04	.652E+03	-.327E-10	.193E+03	.408E+02	-.208E+04	
	JB	32	-.201E+04	-.652E+03	.327E-10	-.193E+03	-.408E+02	-.729E+03	
32	JA	30	.890E+03	-.128E+04	.279E-08	.126E+03	.627E+02	.258E+05	
	JB	33	-.890E+03	.128E+04	-.279E-08	-.126E+03	-.627E+02	-.116E+04	
33	JA	33	.890E+03	-.128E+04	.291E-10	.126E+03	.627E+02	.116E+04	
	JB	34	-.890E+03	.128E+04	-.291E-10	-.126E+03	-.627E+02	.268E+04	
34	JA	30	-.116E-09	.582E-09	-.931E-09	.298E-07	-.745E-08	0.	
	JB	35	.116E-09	-.582E-09	.931E-09	-.447E-07	0.	0.	
35	JA	35	-.728E-10	.349E-09	-.466E-09	.373E-08	-.186E-08	-.116E-09	
	JB	36	.728E-10	-.349E-09	.466E-09	0.	.186E-08	.116E-09	
36	JA	37	.501E+04	-.875E+04	-.745E-08	-.211E+06	-.144E+06	.688E+05	
	JB	16	-.501E+04	.875E+04	.745E-08	.635E+05	.601E+05	-.688E+05	
37	JA	16	-.101E+04	.327E+04	.552E+04	.110E+06	.295E+05	.565E+04	
	JB	38	.101E+04	-.327E+04	-.552E+04	-.736E+05	-.172E+05	-.565E+04	
38	JA	11	-.167E+05	.205E+04	-.160E-08	-.989E+03	-.629E+04	-.522E+05	
	JB	39	.167E+05	-.205E+04	.160E-08	.232E+03	.936E+02	-.442E+04	
39	JA	39	-.167E+05	.205E+04	.291E-10	-.232E+03	-.936E+02	.442E+04	
	JB	40	.167E+05	-.205E+04	-.291E-10	.232E+03	.936E+02	-.132E+05	
40	JA	11	.583E+04	.204E+05	.803E-08	-.771E+04	.201E+04	.182E+06	
	JB	41	-.583E+04	-.204E+05	-.803E-08	.151E+03	.144E+03	-.209E+05	
41	JA	41	.583E+04	.204E+05	-.873E-10	-.151E+03	-.144E+03	.209E+05	
	JB	42	-.583E+04	-.204E+05	.873E-10	.151E+03	.144E+03	.416E+04	

	JB 40	.167E+05	-.205E+04	-.241E-10	.232E+03	.936E+02	-.132E+05	
	JA 11	.593E+04	.204E+05	.803E-08	-.771E+04	.201E+04	.142E+06	
	JB 41	-.583E+04	-.204E+05	-.803E-08	.151E+03	.144E+03	-.209E+05	
41	JA 41	.583E+04	.204E+05	-.873E-10	-.151E+03	-.144E+03	.209E+05	
	JB 42	-.583E+04	-.204E+05	.873E-10	.151E+03	.144E+03	.416E+04	

NOZZLE LOAD CASE 2

BEAM NO	BEAM LOAD-LOCATION, NODE--PERCENT.	--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	BEAM STRESSES - STRESSES AT USER LOCATIONS - A	B	C	FOR OUTPUT VECTOR 2 MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED SHEAR	
1	1 JA 0.0	3.52E-11	5.34E-11	0.	-8.144E-12	-4.381E-12	-3.073E-11	1.4749E-11	-3.1038E-11	7.37E-12	PIPEG
1	4 JB 100.0	3.52E-11	5.34E-11	0.	-8.144E-12	-3.825E-11	-1.060E-10	9.4238E-11	-1.1053E-10	4.71E-11	
2	3 JA 0.0	2.26E-11	-4.58E+02	-1.16E+03	2.293E+02	-2.088E+03	-4.570E+02	2.6457E+03	-2.1872E+03	1.76E+03	PIPEG
2	2 JB 100.0	2.26E-11	-4.58E+02	-1.16E+03	2.293E+02	-2.088E+03	2.293E+02	2.5462E+03	-2.0877E+03	1.72E+03	
3	3 JA 0.0	-7.45E-12	-5.90E+00	-2.26E-01	5.904E+00	5.678E+00	5.971E+00	6.1966E+00	5.6114E+00	3.11E+00	BEAMG
3	4 JB 100.0	-7.45E-12	-5.90E+00	-2.26E-01	5.904E+00	5.678E+00	6.146E+00	6.3714E+00	5.4366E+00	3.19E+00	
4	4 JA 0.0	-5.59E-12	5.90E+00	2.26E-01	-5.904E+00	-5.678E+00	-5.662E+00	-5.4366E+00	-6.3714E+00	2.73E+00	BEAMG
4	5 JB 100.0	-5.59E-12	5.90E+00	2.26E-01	-5.904E+00	-5.678E+00	-5.837E+00	-5.6114E+00	-6.1966E+00	2.81E+00	
5	5 JA 0.0	1.81E-11	4.58E+02	1.16E+03	-2.293E+02	2.088E+03	4.570E+02	2.1872E+03	-2.6457E+03	1.59E+03	PIPEG
5	6 JB 100.0	1.81E-11	4.58E+02	1.16E+03	-2.293E+02	2.088E+03	-2.293E+02	2.0877E+03	-2.5462E+03	1.56E+03	
6	4 JA 0.0	-6.61E+01	-6.61E+01	9.41E-12	-1.270E-11	9.123E+01	9.123E+01	1.2902E+02	-1.2902E+02	6.45E+01	PIPEG
6	7 JB 100.0	-6.61E+01	-6.61E+01	9.41E-12	-1.270E-11	1.576E+02	1.576E+02	2.2286E+02	-2.2286E+02	1.11E+02	
7	7 JA 0.0	-1.69E+02	-1.69E+02	4.24E-11	-3.414E-11	4.056E+02	4.056E+02	5.7364E+02	-5.7364E+02	2.87E+02	PIPEG
7	8 JB 100.0	-1.69E+02	-1.69E+02	4.24E-11	-3.414E-11	4.795E+02	4.795E+02	6.7807E+02	-6.7807E+02	3.39E+02	
8	8 JA 0.0	-1.09E+02	-1.09E+02	1.00E-11	-2.837E-11	2.477E+02	2.477E+02	3.5033E+02	-3.5033E+02	1.75E+02	PIPEG
8	11 JB 100.0	-1.09E+02	-1.09E+02	1.00E-11	-2.837E-11	3.032E+02	3.032E+02	4.2886E+02	-4.2886E+02	2.14E+02	
9	10 JA 0.0	-2.39E-12	-4.53E+02	-1.15E+03	2.268E+02	-2.072E+03	-2.452E+02	2.5733E+03	-2.1196E+03	1.73E+03	PIPEG
9	9 JB 100.0	-2.39E-12	-4.53E+02	-1.15E+03	2.268E+02	-2.072E+03	2.268E+02	2.5253E+03	-2.0717E+03	1.71E+03	
10	10 JA 0.0	1.40E-12	-1.10E+01	-5.26E-01	1.105E+01	1.052E+01	1.115E+01	1.1679E+01	1.0411E+01	5.46E+00	BEAMG
10	11 JB 100.0	1.40E-12	-1.10E+01	-5.26E-01	1.105E+01	1.052E+01	1.154E+01	1.2068E+01	1.0022E+01	6.06E+00	
11	11 JA 0.0	9.21E+01	1.61E+02	2.31E+01	-5.461E-11	3.004E+02	4.972E+02	5.8088E+02	-5.8088E+02	2.91E+02	PIPEG
11	12 JB 100.0	9.21E+01	1.61E+02	2.31E+01	-5.461E-11	2.533E+02	4.149E+02	4.8611E+02	-4.8611E+02	2.44E+02	
12	12 JA 0.0	1.43E+02	2.50E+02	4.47E+01	-9.118E-11	4.903E+02	8.030E+02	9.4086E+02	-9.4086E+02	4.73E+02	PIPEG
12	37 JB 100.0	1.43E+02	2.50E+02	4.47E+01	-9.118E-11	1.876E+02	2.740E+02	3.3206E+02	-3.3206E+02	1.72E+02	
13	13 JA 0.0	-1.05E+01	6.57E-02	1.07E-02	-8.315E+00	-8.403E+00	-8.314E+00	-8.2261E+00	-8.4036E+00	4.11E+00	BEAMG
13	14 JB 100.0	-1.05E+01	6.57E-02	1.07E-02	-8.315E+00	-8.337E+00	-8.315E+00	-8.2928E+00	-8.3369E+00	4.15E+00	
14	15 JA 0.0	1.21E+02	9.60E-01	2.48E+00	1.528E+02	3.416E+02	1.675E+02	3.5626E+02	-5.0689E+01	1.78E+02	BEAMG
14	14 JB 100.0	1.21E+02	9.60E-01	2.48E+00	1.528E+02	9.869E+01	1.665E+02	2.2058E+02	8.4990E+01	1.10E+02	
15	15 JA 0.0	-8.31E+00	6.59E-02	5.14E-05	1.048E+01	1.055E+01	1.047E+01	1.0566E+01	1.0390E+01	5.28E+00	BEAMG
15	16 JB 100.0	-8.31E+00	6.59E-02	5.18E-05	1.048E+01	1.079E+01	1.046E+01	1.0802E+01	1.0154E+01	5.40E+00	
16	16 JA 0.0	-2.79E+00	1.61E+00	-5.18E-05	-1.048E+01	-1.061E+01	-1.042E+01	-1.0294E+01	-1.0672E+01	5.15E+00	BEAMG
16	17 JB 100.0	-2.79E+00	1.61E+00	-5.18E-05	-1.048E+01	-1.053E+01	-1.046E+01	-1.0418E+01	-1.0548E+01	5.21E+00	
17	17 JA 0.0	-4.07E+01	2.35E+01	-2.48E+00	-1.529E+02	-2.634E+02	-1.270E+02	-1.6455E+01	-2.8926E+02	8.59E+00	BEAMG
17	18 JB 100.0	-4.07E+01	2.35E+01	-2.48E+00	-1.529E+02	-1.818E+02	-1.513E+02	-1.2237E+02	-1.8334E+02	6.12E+01	
18	19 JA 0.0	1.95E+01	1.61E+00	1.19E-03	2.792E+00	2.846E+00	2.802E+00	2.8565E+00	2.7272E+00	1.43E+00	BEAMG
18	18 JB 100.0	1.95E+01	1.61E+00	1.19E-03	2.792E+00	2.780E+00	2.792E+00	2.8037E+00	2.7800E+00	1.40E+00	
19	20 JA 0.0	5.25E+00	-7.05E-01	1.35E-02	7.117E-02	9.007E-02	6.681E-02	9.4429E-02	4.7904E-02	4.97E-02	BEAMG
19	21 JB 100.0	5.25E+00	-7.05E-01	1.35E-02	7.117E-02	5.490E-02	7.192E-02	8.5585E-02	5.6290E-02		

17	17 JA	0.0	-4.07E+01	2.35E+01	-2.48E+00	-1.529E+02	-2.[illegible]E+02	-1.270E+02	-1.6455E+01	-2.8926E+02	8.59E+00	BEAMG		
	18 JB	100.0	-4.07E+01	2.35E+01	-2.48E+00	-1.529E+02	-1.[illegible]E+02	-1.513E+02	-1.2237E+02	-1.8334E+02	6.12E+01			
18	19 JA	0.0	1.05E+01	1.61E+00	1.19E-03	2.792E+00	2.846E+00	2.802E+00	2.8565E+00	2.7272E+00	1.43E+00	BEAMG		
	13 JB	100.0	1.05E+01	1.61E+00	1.19E-03	2.792E+00	2.780E+00	2.792E+00	2.8037E+00	2.7800E+00	1.40E+00			
19	20 JA	0.0	5.25E+00	-7.05E-01	1.55E-02	7.117E-02	9.007E-02	8.581E-02	9.4429E-02	4.7904E-02	4.97E-02	BEAMG		
	21 JB	100.0	5.25E+00	-7.05E-01	1.55E-02	7.117E-02	5.689E-02	7.127E-02	8.5545E-02	5.6789E-02	4.55E-02			
20	22 JA	0.0	-1.04E+00	-1.03E+01	4.86E+00	-7.650E+01	-1.137E+02	-6.739E+01	-3.0197E+01	-1.2281E+02	1.59E+01	BEAMG		
	21 JB	100.0	-1.04E+00	-1.03E+01	4.86E+00	-7.650E+01	-1.119E+02	-5.672E+01	-2.1604E+01	-1.3140E+02	1.18E+01			
21	22 JA	0.0	7.12E-02	-7.05E-01	1.02E-04	-5.246E+00	-5.268E+00	-5.254E+00	-5.2242E+00	-5.2687E+00	2.61E+00	BEAMG		
	16 JB	100.0	7.12E-02	-7.05E-01	1.02E-04	-5.246E+00	-5.264E+00	-5.234E+00	-5.2167E+00	-5.2763E+00	2.61E+00			
22	16 JA	0.0	5.59E+00	2.36E+00	-1.02E-04	5.242E+00	5.446E+00	5.333E+00	5.5374E+00	4.9456E+00	2.77E+00	BEAMG		
	23 JB	100.0	5.59E+00	2.36E+00	-1.02E-04	5.242E+00	5.248E+00	5.266E+00	5.3131E+00	5.1699E+00	2.46E+00			
23	23 JA	0.0	8.16E+01	3.47E+01	-4.86E+00	7.643E+01	1.919E+02	1.079E+02	2.2337E+02	-7.0515E+01	1.12E+02	BEAMG		
	24 JB	100.0	8.16E+01	3.47E+01	-4.86E+00	7.643E+01	2.849E+01	7.187E+01	1.2893E+02	2.3931E+01	6.46E+01			
24	25 JA	0.0	-5.24E+00	2.36E+00	-3.57E-03	-5.594E+00	-5.647E+00	-5.579E+00	-5.5266E+00	-5.6613E+00	2.76E+00	BEAMG		
	24 JB	100.0	-5.24E+00	2.36E+00	-3.57E-03	-5.594E+00	-5.614E+00	-5.594E+00	-5.5746E+00	-5.6138E+00	2.79E+00			
25	38 JA	0.0	-2.69E+01	-9.36E+01	3.68E+00	7.901E+01	5.661E+01	-1.666E+01	1.7727E+02	-1.9244E+01	8.87E+01	PIPEG		
	26 JB	100.0	-2.69E+01	-9.36E+01	3.68E+00	7.901E+01	1.461E+02	2.735E+02	2.8471E+02	-1.2669E+02	1.42E+02			
26	26 JA	0.0	-2.69E+01	-9.36E+01	3.68E+00	7.901E+01	1.461E+02	2.735E+02	2.8471E+02	-1.2669E+02	1.42E+02	PIPEG		
	27 JB	100.0	-2.69E+01	-9.36E+01	3.68E+00	7.901E+01	2.433E+02	5.886E+02	6.1439E+02	-4.5637E+02	3.07E+02			
27	27 JA	0.0	-1.86E+01	-6.04E+01	1.90E+00	5.080E+01	1.357E+02	3.141E+02	3.2741E+02	-2.2581E+02	1.64E+02	PIPEG		
	30 JB	100.0	-1.86E+01	-6.04E+01	1.90E+00	5.080E+01	1.452E+02	3.448E+02	3.5961E+02	-2.5802E+02	1.80E+02			
28	29 JA	0.0	-4.53E+02	6.70E-12	1.15E+03	2.268E+02	-2.544E+03	2.268E+02	2.9974E+03	-2.5437E+03	1.89E+03	PIPEG		
	28 JB	100.0	-4.53E+02	6.70E-12	1.15E+03	2.268E+02	-2.072E+03	2.268E+02	2.5253E+03	-2.0717E+03	1.71E+03			
29	29 JA	0.0	1.10E+01	-2.91E-13	5.26E-01	1.105E+01	1.041E+01	1.105E+01	1.1679E+01	1.0411E+01	5.86E+00	BEAMG		
	30 JB	100.0	1.10E+01	-2.91E-13	5.26E-01	1.105E+01	1.002E+01	1.105E+01	1.2068E+01	1.0022E+01	6.06E+00			
30	30 JA	0.0	-2.33E-12	-1.30E+00	4.83E-04	4.012E+00	4.012E+00	3.961E+00	4.0622E+00	3.9613E+00	2.03E+00	BEAMG		
	31 JB	100.0	-2.33E-12	-1.30E+00	4.83E-04	4.012E+00	4.012E+00	4.007E+00	4.0171E+00	4.0065E+00	2.01E+00			
31	31 JA	0.0	3.64E-12	-7.24E+01	8.58E+01	2.229E+02	-6.693E+01	2.193E+02	5.1630E+02	-7.0547E+01	2.72E+02	BEAMG		
	32 JB	100.0	3.64E-12	-7.24E+01	8.58E+01	2.229E+02	-6.693E+01	2.241E+02	5.1395E+02	-6.8200E+01	2.71E+02			
32	30 JA	0.0	-5.59E-12	1.78E+00	1.57E-04	-2.570E+00	-2.569E+00	-2.505E+00	-2.5048E+00	-2.6343E+00	1.25E+00	BEAMG		
	33 JB	100.0	-5.59E-12	1.78E+00	1.57E-04	-2.570E+00	-2.569E+00	-2.567E+00	-2.5664E+00	-2.5729E+00	1.28E+00			
33	33 JA	0.0	-3.23E-12	9.88E+01	2.79E+01	-1.428E+02	7.495E+02	-1.407E+02	7.5149E+02	-1.0370E+03	3.77E+02	BEAMG		
	34 JB	100.0	-3.23E-12	9.88E+01	2.79E+01	-1.428E+02	7.495E+02	-1.474E+02	7.5413E+02	-1.0396E+03	3.78E+02			
34	30 JA	0.0	-2.14E-12	-1.07E-11	0.		-8.566E-12	-3.560E-12	-2.859E-11	1.2071E-11	-2.9202E-11	6.04E-12	PIPEG	
	35 JB	100.0	-2.14E-12	-1.07E-11	0.		-8.566E-12	-8.566E-12	-3.860E-11	2.1465E-11	-3.8596E-11	1.07E-11		
35	35 JA	0.0	-2.08E-12	-9.99E-12	-7.57E-14	-6.662E-12	-4.240E-12	-1.151E-11	-1.2463E-12	-1.2077E-11	6.28E-13	PIPEG		
	36 JB	100.0	-2.08E-12	-9.99E-12	-7.57E-14	-6.662E-12	-4.240E-12	-6.662E-12	-4.2399E-12	-9.0836E-12	2.12E-12			
36	37 JA	0.0	7.08E+01	1.24E+02	2.21E+01	-5.270E-11	9.269E+01	1.354E+02	1.6406E+02	-1.6406E+02	8.50E+01	PIPEG		
	16 JB	100.0	7.08E+01	1.24E+02	2.21E+01	-5.270E-11	3.860E+01	4.082E+01	5.6179E+01	-5.6179E+01	3.57E+01			
37	16 JA	0.0	-1.43E+01	-4.63E+01	1.82E+00	3.907E+01	2.075E+01	-3.170E+01	1.1217E+02	-3.4035E+01	5.61E+01	PIPEG		
	38 JB	100.0	-1.43E+01	-4.63E+01	1.82E+00	3.907E+01	2.800E+01	-8.200E+00	8.7614E+01	-9.4794E+00	4.38E+01			
38	11 JA	0.0	4.47E-01	-4.09E+00	-7.28E-04	-3.347E+01	-3.345E+01	-3.360E+01	-3.3323E+01	-3.3615E+01	1.67E+01	BEAMG		
	39 JB	100.0	4.47E-01	-4.09E+00	-7.28E-04	-3.347E+01	-3.347E+01	-3.346E+01	-3.3458E+01	-3.3480E+01	1.67E+01			
39	39 JA	0.0	-3.23E-12	-2.27E+02	-1.03E+02	-1.860E+03	-1.194E+03	-1.852E+03	-1.1962E+03	-2.5329E+03	6.02E+02	BEAMG		
	40 JB	100.0	-3.23E-12	-2.27E+02	-1.03E+02	-1.860E+03	-1.194E+03	-1.837E+03	-1.1709E+03	-2.5482E+03	5.94E+02			
40	11 JA	0.0	-5.46E-01	1.17E+01	-1.06E-03	4.083E+01	4.091E+01	4.129E+01	4.1309E+01	4.0359E+01	2.07E+01	BEAMG		
	41 JB	100.0	-5.46E-01	1.17E+01	-1.06E-03	4.083E+01	4.083E+01	4.089E+01	4.0886E+01	4.0781E+01	2.04E+01			
41	41 JA	0.0	9.70E-12	6.47E+02	-6.40E+01	2.269E+03	1.195E+03	2.305E+03	3.3784E+03	1.1591E+03	1.69E+03	BEAMG		
	42 JB	100.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			

41	41	0A	0.0	[illegible]	1.17E+01	-1.96E-03	4.08E+01	4.08E+01	4.12E+01	4.13E+01	4.03E+01	2.07E+01	BEAM6
	41		100.0	[illegible]	1.17E+01	-1.97E-03	4.08E+01	4.08E+01	4.08E+01	4.08E+01	4.07E+01	2.04E+01	
41	41	0A	0.0	9.70E-12	6.47E+02	-6.46E+01	2.26E+03	1.19E+03	2.30E+03	3.37E+03	1.15E+03	1.69E+03	BEAM6
	42	0B	100.0	9.70E-12	6.47E+02	-6.40E+01	2.26E+03	1.19E+03	2.25E+03	3.34E+03	1.18E+03	1.68E+03	

NOZZLE LOAD CASE 2

MAXIMUM STRESS SUMMARY FOR

BEAM STRESSES FOR OUTPUT VECTOR 2

		--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	- STRESSES AT USER LOCATIONS - A	B	C	MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED STRESS
MAX.	BEAM STRESSES=	1.43E+02	6.47E+02	1.16E+03	2.26E+03	2.08E+03	2.30E+03	3.37E+03	1.18E+03	1.69E+03
	BEAM NOS. =	12.	41.	5.	41.	5.	41.	41.	41.	28.
MIN.	BEAM STRESSES=	-4.53E+02	-4.56E+02	-1.16E+03	-1.86E+03	-2.54E+03	-1.85E+03	-1.18E+03	-2.64E+03	6.28E-13
	BEAM NOS. =	28.	2.	2.	39.	28.	39.	39.	5.	35.

B E G I N INPUT LOAD CASE NO. 3 TITLE(NUZZLE LOAD CASE 3- MAXIMUM OVERTURNING MOMENT

NODAL POINT APPLIED FORCES FOR LOAD CASE NO. 3

NODE	X1	X2	X3	X4	X5	X6
2	-2.952000E+03	2.952000E+03	0.	-9.030000E+04	-9.030000E+04	-0.
6	-2.952000E+03	2.952000E+03	0.	-9.030000E+04	-9.030000E+04	-0.
28	3.905000E+03	-3.905000E+03	5.523000E+03	-2.974000E+05	0.	-0.
9	0.	7.810000E+03	0.	-2.974000E+05	0.	-0.

NODAL POINT APPLIED LOADS AND/OR DISPLACEMENTS FINAL SUMMARY FOR LOAD CASE NO. 3

NODE	X1	X2	X3	X4	X5	X6

NOTE IF A FINAL SUMMARY OF APPLIED NODAL LOADS AND GENERATED LOADS IS DESIRED AT THIS POINT,
CODE A 1 IN COLUMN 20 OF THE STATIC CARD.

FORCE AND MOMENT SUMMATION
ABOUT AXES PARALLEL TO SYSTEM AXES
WITH ORIGIN AT POINT (0,0,0)
SUMMATION INCLUDES LOADS APPLIED TO RESTRAINED DOF.

FX1 = -.199900000000E+04
FX2 = .998000000000E+04
FX3 = .552300000000E+04
MX1 = -.499955573000E+07
MX2 = -.212126330000E+07
MX3 = .199842600000E+06

NOZZLE LOAD CASE 3- MAXIMUM OVERTURNING MOMENT

BEAM ELEMENT LOADS FOR OUTPUT VECTOR 3

BEAM NO	LOAD-LOCATION NODE--PERCENT	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3	
1	1 JA 0.0	1.16415E-09	3.37604E-09	5.58794E-09	-1.86265E-09	4.47035E-08	2.98023E-08	PIPEG
1	4 JB 100.0	-1.16415E-09	-3.37604E-09	-5.58794E-09	1.86265E-09	-2.08616E-07	7.45058E-08	
2	3 JA 0.0	-2.95200E+03	3.49246E-10	-2.95200E+03	9.03000E+04	2.67451E+04	-9.03000E+04	PIPEG
2	2 JB 100.0	2.95200E+03	-3.49246E-10	2.95200E+03	-9.03000E+04	1.86265E-09	9.03000E+04	
3	3 JA 0.0	-2.95200E+03	-2.79397E-09	-2.95200E+03	9.03000E+04	-2.67451E+04	-9.03000E+04	BEAMG
3	4 JB 100.0	2.95200E+03	2.79397E-09	2.95200E+03	-9.03000E+04	9.66780E+04	9.03000E+04	
4	4 JA 0.0	2.95200E+03	-1.86265E-09	2.95200E+03	-9.03000E+04	-9.66780E+04	9.03000E+04	BEAMG
4	5 JB 100.0	-2.95200E+03	1.86265E-09	-2.95200E+03	9.03000E+04	2.67451E+04	-9.03000E+04	
5	5 JA 0.0	2.95200E+03	5.82077E-11	2.95200E+03	-9.03000E+04	-2.67451E+04	9.03000E+04	PIPEG
5	6 JB 100.0	-2.95200E+03	-5.82077E-11	-2.95200E+03	9.03000E+04	-2.24099E-09	-9.03000E+04	
6	4 JA 0.0	-1.16415E-10	-5.90400E+03	-5.90400E+03	-3.35270E-08	-1.80600E+05	1.80600E+05	PIPEG
6	7 JB 100.0	1.16415E-10	5.90400E+03	5.90400E+03	3.35270E-08	3.11964E+05	-3.11964E+05	
7	7 JA 0.0	-1.57161E-09	-5.90400E+03	-5.90400E+03	-5.58794E-08	-3.11964E+05	3.11964E+05	PIPEG
7	8 JB 100.0	1.57161E-09	5.90400E+03	5.90400E+03	5.58794E-08	3.68760E+05	-3.68760E+05	
8	8 JA 0.0	-1.22236E-09	-5.90400E+03	-5.90400E+03	-3.35270E-08	-3.68760E+05	3.68760E+05	PIPEG
8	11 JB 100.0	1.22236E-09	5.90400E+03	5.90400E+03	3.35270E-08	4.51416E+05	-4.51416E+05	
9	10 JA 0.0	-5.52250E+03	2.91038E-11	-5.52250E+03	2.10294E+05	4.31893E+04	-2.10294E+05	PIPEG
9	9 JB 100.0	5.52250E+03	-2.91038E-11	5.52250E+03	-2.10294E+05	4.88944E-09	2.10294E+05	
10	10 JA 0.0	-5.52250E+03	2.09548E-09	-5.52250E+03	2.10294E+05	-4.31893E+04	-2.10294E+05	BEAMG
10	11 JB 100.0	5.52250E+03	-2.09548E-09	5.52250E+03	-2.10294E+05	1.98843E+05	2.10294E+05	
11	11 JA 0.0	3.31784E-09	4.73776E+03	7.87026E+03	-6.76285E+04	-7.40454E+05	4.47244E+05	PIPEG
11	12 JB 100.0	-3.31784E-09	-4.73776E+03	-7.87026E+03	6.76285E+04	6.30270E+05	-3.80915E+05	
12	12 JA 0.0	2.92493E-09	4.73776E+03	7.87026E+03	-6.76285E+04	-6.30270E+05	3.80915E+05	PIPEG
12	37 JB 100.0	-2.92493E-09	-4.73776E+03	-7.87026E+03	6.76285E+04	2.64303E+05	-1.60609E+05	
13	13 JA 0.0	-1.59590E+03	-1.91380E+03	1.39807E+02	-3.24864E+03	-7.14233E+02	-2.75745E+03	BEAMG
13	14 JB 100.0	1.59590E+03	1.91380E+03	-1.39807E+02	3.24864E+03	6.80903E+00	6.92638E+03	
14	15 JA 0.0	-1.91380E+03	-1.59590E+03	1.39807E+02	-6.80903E+00	-4.57681E+03	-8.23470E+03	BEAMG
14	14 JB 100.0	1.91380E+03	1.59590E+03	-1.39807E+02	6.80903E+00	3.24864E+03	-6.92638E+03	
15	15 JA 0.0	-1.91380E+03	1.59590E+03	1.39807E+02	-6.80903E+00	4.57681E+03	-8.23470E+03	BEAMG
15	16 JB 100.0	1.91380E+03	-1.59590E+03	-1.39807E+02	6.80903E+00	-7.72246E+03	4.41425E+04	
16	16 JA 0.0	1.91132E+03	-1.16560E+03	6.00132E+02	6.82307E+00	-2.01743E+04	-3.07188E+04	BEAMG
16	17 JB 100.0	-1.91132E+03	1.16560E+03	-6.00132E+02	-6.82307E+00	6.67134E+03	4.49292E+03	
17	17 JA 0.0	1.91132E+03	-1.16560E+03	6.00132E+02	6.82307E+00	-6.67134E+03	-4.49292E+03	BEAMG
17	18 JB 100.0	-1.91132E+03	1.16560E+03	-6.00132E+02	-6.82307E+00	9.70082E+02	-6.58026E+03	
18	19 JA 0.0	-1.16560E+03	1.91132E+03	6.00132E+02	-9.70082E+02	-3.02985E+03	1.62515E+04	BEAMG
18	18 JB 100.0	1.16560E+03	-1.91132E+03	-6.00132E+02	9.70082E+02	-6.82307E+00	-6.58026E+03	
19	20 JA 0.0	-1.16560E+03	1.91132E+03	6.00132E+02	-9.70082E+02	-3.02985E+03	1.62515E+04	BEAMG

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19	19 JA	0.0	-1.16560E+03	1.91132E+03	6.00132E+02	-9.70082E+02	-3.02985E+03	1.62515E+04	BEAMG
18	18 JB	100.0	1.16560E+03	-1.91132E+03	-6.00132E+02	9.70082E+02	-6.82307E+00	-6.58026E+03	
20	20 JA	0.0	-1.84622E+03	1.56319E+03	8.86047E+01	-3.50208E+03	-4.45199E+02	1.50013E+04	BEAMG
19	21 JB	100.0	1.84622E+03	-1.56319E+03	-8.86047E+01	3.50208E+03	-3.14119E+00	-7.09155E+03	
20	22 JA	0.0	1.56319E+03	-1.84622E+03	8.86047E+01	3.14119E+00	-4.34383E+03	-1.04476E+04	BEAMG
20	21 JB	100.0	-1.56319E+03	1.84622E+03	-8.86047E+01	-3.14119E+00	3.50208E+03	-7.09155E+03	
21	22 JA	0.0	1.56319E+03	1.84622E+03	8.86047E+01	3.14119E+00	4.34383E+03	-1.04476E+04	BEAMG
21	16 JB	100.0	-1.56319E+03	-1.84622E+03	-8.86047E+01	-3.14119E+00	-6.33743E+03	5.19876E+04	
22	16 JA	0.0	-1.56557E+03	-9.15278E+02	6.51335E+02	-3.12716E+00	-2.15593E+04	-2.28739E+04	BEAMG
22	23 JB	100.0	1.56557E+03	9.15278E+02	-6.51335E+02	3.12716E+00	6.90432E+03	2.28005E+03	
23	23 JA	0.0	-1.56557E+03	-9.15278E+02	6.51335E+02	-3.12716E+00	-6.90432E+03	-2.28005E+03	BEAMG
23	24 JB	100.0	1.56557E+03	9.15278E+02	-6.51335E+02	3.12716E+00	7.16636E+02	-6.41508E+03	
24	25 JA	0.0	-9.15278E+02	-1.56507E+03	6.51335E+02	-7.16636E+02	-3.29888E+03	-1.50719E+03	BEAMG
24	24 JB	100.0	9.15278E+02	1.56507E+03	-6.51335E+02	7.16636E+02	3.12716E+00	-6.41508E+03	
25	39 JA	0.0	5.52300E+03	1.14659E+03	3.48241E+03	-1.18349E+04	-1.06422E+05	3.89515E+04	PIPEG
25	26 JB	100.0	-5.52300E+03	-1.14659E+03	-3.48241E+03	1.18349E+04	-1.31044E+05	3.93706E+04	
26	26 JA	0.0	5.52300E+03	1.14659E+03	3.48241E+03	-1.18349E+04	1.31044E+05	-3.93706E+04	PIPEG
26	27 JB	100.0	-5.52300E+03	-1.14659E+03	-3.48241E+03	1.18349E+04	-3.88951E+05	1.24435E+05	
27	27 JA	0.0	5.52300E+03	1.14659E+03	3.48241E+03	-1.18349E+04	3.88951E+05	-1.24435E+05	PIPEG
27	30 JB	100.0	-5.52300E+03	-1.14659E+03	-3.48241E+03	1.18349E+04	-4.37705E+05	1.40515E+05	
28	29 JA	0.0	-5.52250E+03	5.52300E+03	3.06500E-10	2.10294E+05	-2.21189E-09	2.53487E+05	PIPEG
28	28 JB	100.0	5.52250E+03	-5.52300E+03	-3.06500E-10	-2.10294E+05	-1.16415E-10	-2.10294E+05	
29	29 JA	0.0	-5.52250E+03	-5.52300E+03	-1.16415E-09	2.10294E+05	1.11759E-08	2.53487E+05	BEAMG
29	30 JB	100.0	5.52250E+03	5.52300E+03	1.16415E-09	-2.10294E+05	2.23517E-08	-4.09154E+05	
30	30 JA	0.0	-5.56274E+03	9.31323E-10	1.08086E+03	1.88311E+02	-2.96005E+04	3.96208E+01	BEAMG
30	31 JB	100.0	5.56274E+03	-9.31323E-10	-1.08086E+03	-1.88311E+02	-3.28507E+02	-3.96208E+01	
31	31 JA	0.0	-5.56274E+03	-1.22782E-11	1.08086E+03	1.88311E+02	3.28507E+02	3.96208E+01	BEAMG
31	32 JB	100.0	5.56274E+03	1.22782E-11	-1.08086E+03	-1.88311E+02	-4.98701E+03	-3.96208E+01	
32	30 JA	0.0	6.30655E+03	6.51926E-09	-5.09156E+02	6.09542E+01	1.77656E+04	-1.22404E+02	BEAMG
32	33 JB	100.0	-6.30655E+03	-6.51926E-09	5.09156E+02	-6.09542E+01	-3.66703E+03	1.22404E+02	
33	33 JA	0.0	6.30655E+03	2.91038E-11	-5.09156E+02	6.09542E+01	3.66703E+03	-1.22404E+02	BEAMG
33	34 JB	100.0	-6.30655E+03	-2.91038E-11	5.09156E+02	-6.09542E+01	-1.47257E+03	1.22404E+02	
34	30 JA	0.0	-4.65661E-10	1.45519E-10	5.82077E-10	0.	-5.96046E-08	0.	PIPEG
34	35 JB	100.0	4.65661E-10	-1.45519E-10	-5.82077E-10	0.	4.47035E-08	0.	
35	35 JA	0.0	-2.32831E-10	5.82077E-11	3.49246E-10	0.	-3.72529E-09	-2.79397E-09	PIPEG
35	36 JB	100.0	2.32831E-10	-5.82077E-11	-3.49246E-10	0.	0.	0.	
36	37 JA	0.0	1.92085E-09	4.73776E+03	7.87026E+03	-6.76285E+04	-2.64303E+05	1.60609E+05	PIPEG
36	16 JB	100.0	-1.92085E-09	-4.73776E+03	-7.87026E+03	6.76285E+04	1.31925E+05	-3.09201E+04	
37	16 JA	0.0	5.52300E+03	1.14659E+03	3.48241E+03	-1.18349E+04	-1.45355E+05	5.17927E+04	PIPEG
37	38 JB	100.0	-5.52300E+03	-1.14659E+03	-3.48241E+03	1.18349E+04	1.06422E+05	-3.89515E+04	
38	11 JA	0.0	1.62855E+04	2.17611E+02	-1.80969E+03	2.90613E+02	4.54408E+04	6.11881E+03	BEAMG
38	39 JB	100.0	-1.62855E+04	-2.17611E+02	1.80969E+03	-2.90613E+02	4.67414E+03	-9.26194E+01	
39	39 JA	0.0	1.62870E+04	-1.45519E-11	-1.80969E+03	2.28136E+02	-4.67750E+03	9.26194E+01	BEAMG
39	40 JB	100.0	-1.62870E+04	1.45519E-11	1.80969E+03	-2.28136E+02	1.24774E+04	-9.26194E+01	
40	11 JA	0.0	-1.97724E+04	-2.64209E+02	5.64523E+03	4.14197E+02	-1.76657E+05	-7.46484E+03	BEAMG
40	41 JB	100.0	1.97724E+04	2.64209E+02	-5.64523E+03	-4.14197E+02	2.03268E+04	1.48246E+02	
41	41 JA	0.0	-1.97746E+04	5.82077E-11	5.64523E+03	1.42572E+02	-2.03305E+04	-1.48246E+02	BEAMG
41	42 JB	100.0	1.97746E+04	-5.82077E-11	-5.64523E+03	-1.42572E+02	4.00038E+03	1.48246E+02	

[illegible]	[illegible] JA	0.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	BEAMG
	40 J8	100.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	11 JA	0.0	-1.97724E+04	-2.64209E+02	5.64523E+03	4.14197E+02	-1.76657E+05	-7.46484E+03	BEAMG
	41 J8	100.0	1.97724E+04	2.64209E+02	-5.64523E+03	-4.14197E+02	2.03268E+04	1.48246E+02	
-1	41 JA	0.0	-1.97746E+04	5.82077E-11	5.64523E+03	1.42572E+02	-2.03305E+04	-1.48246E+02	BEAMG
-1	42 J9	100.0	1.97746E+04	-5.82077E-11	-5.64523E+03	-1.42572E+02	-4.00039E+03	1.48246E+02	

NOZZLE LOAD CASE 3- MAXIMUM OVERTURNING MOMENT

MAXIMUM LOAD SUMMARY FOR BEAM ELEMENT LOADS FOR OUTPUT VECTOR 3

	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3
MAXIMUM BEAM LOADS =	1.97746E+04	5.90400E+03	7.87026E+03	2.10294E+05	6.30270E+05	4.47244E+05
BEAM NOS. =	41.	8.	36.	28.	11.	11.
MINIMUM BEAM LOADS =	-1.62870E+04	-5.90400E+03	-7.87026E+03	-2.10294E+05	-7.40454E+05	-4.51416E+05
BEAM NOS. =	39.	8.	36.	28.	11.	8.

NOZZLE LOAD CASE 3- MAXIMUM OVERTURNING MOMENT

BEAM END LOADS IN GLOBAL SYSTEM FOR OUTPUT VECTOR 3

BEAM	--NODES--		FX1	FX2	FX3	MX1	MX2	MX3
1	JA	1	.338E-08	-.559E-08	-.116E-08	.447E-07	-.298E-07	.186E-08
	JB	4	-.338E-08	.559E-08	.116E-08	-.209E-06	-.745E-07	-.186E-08
2	JA	3	.295E+04	-.295E+04	-.349E-09	.903E+05	.903E+05	-.267E+05
	JB	2	-.295E+04	.295E+04	.349E-09	-.903E+05	-.903E+05	-.186E-08
3	JA	3	-.295E+04	.295E+04	.279E-08	-.903E+05	-.903E+05	.267E+05
	JB	4	.295E+04	-.295E+04	-.279E-08	.903E+05	.903E+05	-.967E+05
4	JA	4	.295E+04	-.295E+04	.186E-08	.903E+05	.903E+05	.967E+05
	JB	5	-.295E+04	.295E+04	-.186E-08	-.903E+05	-.903E+05	-.267E+05
5	JA	5	.295E+04	-.295E+04	-.582E-10	.903E+05	.903E+05	.267E+05
	JB	6	-.295E+04	.295E+04	.582E-10	-.903E+05	-.903E+05	.224E-08
6	JA	4	-.590E+04	.590E+04	.116E-09	-.181E+06	-.181E+06	.335E-07
	JB	7	.590E+04	-.590E+04	-.116E-09	.312E+06	.312E+06	-.335E-07
7	JA	7	-.590E+04	.590E+04	.157E-08	-.312E+06	-.312E+06	.559E-07
	JB	8	.590E+04	-.590E+04	-.157E-08	.369E+06	.369E+06	-.559E-07
8	JA	8	-.590E+04	.590E+04	.122E-08	-.369E+06	-.369E+06	.335E-07
	JB	11	.590E+04	-.590E+04	-.122E-08	.451E+06	.451E+06	-.335E-07
9	JA	10	.176E-08	-.781E+04	-.291E-10	.297E+06	.652E-08	-.432E+05
	JB	9	-.176E-08	.781E+04	.291E-10	-.297E+06	-.652E-08	-.489E-08
10	JA	10	.754E-08	.781E+04	-.210E-08	-.297E+06	.240E-06	.432E+05
	JB	11	-.754E-08	-.781E+04	.210E-08	.297E+06	-.262E-06	-.199E+06
11	JA	11	.474E+04	-.787E+04	-.332E-08	-.740E+06	-.447E+06	.676E+05
	JB	12	-.474E+04	.787E+04	.332E-08	.630E+06	.381E+06	-.676E+05
12	JA	12	.474E+04	-.787E+04	-.292E-08	-.630E+06	-.381E+06	.676E+05
	JB	37	-.474E+04	.787E+04	.292E-08	.264E+06	.161E+06	-.676E+05
13	JA	13	.140E+03	.191E+04	-.160E+04	-.276E+04	.714E+03	-.325E+04
	JB	14	-.140E+03	-.191E+04	.160E+04	-.693E+04	-.681E+01	.325E+04
14	JA	15	-.140E+03	-.191E+04	.160E+04	.823E+04	-.681E+01	.458E+04
	JB	14	.140E+03	.191E+04	-.160E+04	.693E+04	.681E+01	-.325E+04
15	JA	15	.140E+03	.191E+04	-.160E+04	-.823E+04	.681E+01	-.458E+04
	JB	16	-.140E+03	-.191E+04	.160E+04	.441E+05	-.681E+01	.772E+04
16	JA	16	.600E+03	-.191E+04	.117E+04	-.307E+05	-.682E+01	.202E+05
	JB	17	-.600E+03	.191E+04	-.117E+04	.449E+04	.682E+01	-.667E+04
17	JA	17	.600E+03	-.191E+04	.117E+04	-.449E+04	-.682E+01	.667E+04
	JB	18	-.600E+03	.191E+04	-.117E+04	-.658E+04	.682E+01	-.970E+03
18	JA	19	-.600E+03	.191E+04	-.117E+04	-.163E+05	-.303E+04	-.970E+03
	JB	18	.600E+03	-.191E+04	.117E+04	.658E+04	-.682E+01	.970E+03
19	JA	20	-.156E+04	-.886E+02	-.185E+04	.445E+03	-.150E+05	-.350E+04
	JB	21	.156E+04	.886E+02	.185E+04	.314E+01	.709E+04	.350E+04
20	JA	22	.156E+04	.886E+02	.185E+04	.314E+01	-.104E+05	.434E+04

19	JA	20	-.156E+04	-.000E+02	-.185E+04	.444E+01	-.150E+05	-.350E+04
	JB	21	.156E+04	.000E+02	.185E+04	.314E+01	.709E+04	.350E+04
20	JA	22	.156E+04	.886E+02	.185E+04	.314E+01	-.104E+05	.434E+04
	JB	21	-.156E+04	-.886E+02	-.185E+04	-.314E+01	-.709E+04	-.350E+04
21	JA	22	-.156E+04	-.886E+02	-.185E+04	-.314E+01	.104E+05	-.434E+04
	JB	16	.156E+04	.886E+02	.185E+04	.314E+01	-.520E+05	.634E+04
22	JA	16	.157E+04	-.651E+03	.915E+03	.313E+01	.229E+05	.216E+05
	JB	23	-.157E+04	.651E+03	-.915E+03	-.313E+01	-.228E+04	-.690E+04
23	JA	23	.157E+04	-.651E+03	.915E+03	.313E+01	.228E+04	.690E+04
	JB	24	-.157E+04	.651E+03	-.915E+03	-.313E+01	.642E+04	-.717E+03
24	JA	25	-.157E+04	.651E+03	-.915E+03	-.330E+04	-.151E+04	-.717E+03
	JB	24	.157E+04	-.651E+03	.915E+03	.313E+01	-.642E+04	.717E+03
25	JA	38	.115E+04	-.348E+04	-.552E+04	-.106E+06	-.390E+05	.118E+05
	JB	26	-.115E+04	.348E+04	.552E+04	-.131E+06	-.394E+05	-.118E+05
26	JA	26	.115E+04	-.348E+04	-.552E+04	.131E+06	.394E+05	.118E+05
	JB	27	-.115E+04	.348E+04	.552E+04	-.389E+06	-.124E+06	-.118E+05
27	JA	27	.115E+04	-.349E+04	-.552E+04	.389E+06	.124E+06	.118E+05
	JB	30	-.115E+04	.348E+04	.552E+04	-.438E+06	-.141E+06	-.118E+05
28	JA	29	-.391E+04	.391E+04	-.552E+04	.329E+06	.305E+05	.221E-08
	JB	28	.391E+04	-.391E+04	.552E+04	-.297E+06	.559E-04	.116E-09
29	JA	29	.391E+04	-.390E+04	.552E+04	-.328E+06	-.305E+05	-.112E-07
	JB	30	-.391E+04	.390E+04	-.552E+04	.438E+06	.141E+06	-.224E-07
30	JA	30	.556E+04	-.108E+04	-.931E-09	-.189E+03	-.396E+02	.296E+05
	JB	31	-.556E+04	.108E+04	.931E-09	.188E+03	.396E+02	.329E+03
31	JA	31	.556E+04	-.108E+04	.123E-10	-.188E+03	-.396E+02	-.329E+03
	JB	32	-.556E+04	.108E+04	-.123E-10	.188E+03	.396E+02	.499E+04
32	JA	30	-.509E+03	-.631E+04	-.652E-08	-.122E+03	-.610E+02	-.178E+05
	JB	33	.509E+03	.631E+04	.652E-08	.122E+03	.610E+02	.367E+04
33	JA	33	-.509E+03	-.631E+04	-.291E-10	-.122E+03	-.610E+02	-.367E+04
	JB	34	.509E+03	.631E+04	.291E-10	.122E+03	.610E+02	.147E+04
34	JA	33	.146E-09	-.502E-09	.466E-09	-.596E-07	0.	0.
	JB	35	-.146E-09	.502E-09	-.466E-09	.447E-07	0.	0.
35	JA	35	.582E-10	-.349E-09	.233E-09	-.373E-08	.279E-08	0.
	JB	36	-.582E-10	.349E-09	-.233E-09	0.	0.	0.
36	JA	37	.474E+04	-.787E+04	-.192E-08	-.264E+06	-.161E+06	.676E+05
	JB	16	-.474E+04	.787E+04	.192E-08	.132E+06	.809E+05	-.676E+05
37	JA	16	.115E+04	-.348E+04	-.552E+04	-.145E+06	-.518E+05	.118E+05
	JB	38	-.115E+04	.349E+04	.552E+04	.106E+06	.390E+05	-.118E+05
38	JA	11	-.163E+05	.181E+04	-.146E-08	-.898E+03	-.612E+04	-.454E+05
	JB	39	.163E+05	-.181E+04	.146E-08	.228E+03	.926E+02	-.468E+04
39	JA	39	-.163E+05	.181E+04	.146E-10	-.228E+03	-.926E+02	.468E+04
	JB	40	.163E+05	-.181E+04	-.146E-10	.228E+03	.926E+02	-.125E+05
40	JA	11	.565E+04	.194E+05	.698E-08	-.746E+04	.195E+04	.177E+06
	JB	41	-.565E+04	-.194E+05	-.698E-08	.148E+03	.143E+03	-.203E+05
41	JA	41	.565E+04	.194E+05	-.582E-10	-.148E+03	-.143E+03	.203E+05
	JB	42	-.565E+04	-.194E+05	.582E-10	.148E+03	.143E+03	.400E+04

21	JA	21				-.5842E-10	-.144BE+03	-.143E+03	.203E+05	
	JB	42	-.5555E-04	-.1998E+05	.584E-10	.144L+03	.143E+03	.400E+04		

NOZZLE LOAD CASE 3- MAXIMUM OVERTURNING MOMENT

BEAM NO	BEAM LOAD-LOCATION NODE	--PERCENT.	--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	B E A M S T R E S S E S - STRESSES AT USER LOCATIONS - A	B	C	FOR OUTPUT VECTOR 3 MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED SHEAR	
1	1 JA	0.0	3.78E-11	6.25E-11	4.70E-13	-6.515E-12	8.539E-12	-2.910E-11	2.0625E-11	-3.3655E-11	1.03E-11	PIPEG
1	4 JB	100.0	3.78E-11	6.25E-11	4.70E-13	-6.515E-12	-4.415E-11	-1.119E-10	1.0539E-10	-1.1842E-10	5.27E-11	
2	3 JA	0.0	5.42E-11	-4.56E+02	-1.16E+03	2.293E+02	-2.088E+03	-4.570E+02	2.6457E+03	-2.1872E+03	1.76E+03	PIPEG
2	2 JB	100.0	5.42E-11	-4.56E+02	-1.16E+03	2.293E+02	-2.088E+03	2.293E+02	2.5462E+03	-2.0877E+03	1.72E+03	
3	3 JA	0.0	-5.59E-12	-5.90E+00	-2.26E-01	5.904E+00	5.678E+00	5.971E+00	6.1966E+00	5.6114E+00	3.11E+00	BEAMG
3	4 JB	100.0	-5.59E-12	-5.90E+00	-2.26E-01	5.904E+00	5.678E+00	6.146E+00	6.3714E+00	5.4366E+00	3.19E+00	
4	4 JA	0.0	-3.73E-12	5.90E+00	2.26E-01	-5.904E+00	-5.678E+00	-5.662E+00	-5.4366E+00	-6.3714E+00	2.73E+00	BEAMG
4	5 JB	100.0	-3.73E-12	5.90E+00	2.26E-01	-5.904E+00	-5.678E+00	-5.837E+00	-5.6114E+00	-6.1966E+00	2.81E+00	
5	5 JA	0.0	9.04E-12	4.56E+02	1.16E+03	-2.293E+02	2.088E+03	4.570E+02	2.1872E+03	-2.6457E+03	1.59E+03	PIPEG
5	6 JB	100.0	9.04E-12	4.56E+02	1.16E+03	-2.293E+02	2.088E+03	-2.293E+02	2.0877E+03	-2.5462E+03	1.56E+03	
6	4 JA	0.0	-6.61E+01	-5.61E+01	8.47E-12	6.515E-13	9.123E+01	9.123E+01	1.2902E+02	-1.2902E+02	6.45E+01	PIPEG
6	7 JB	100.0	-6.61E+01	-5.61E+01	8.47E-12	6.515E-13	1.576E+02	1.576E+02	2.2286E+02	-2.2286E+02	1.11E+02	
7	7 JA	0.0	-1.69E+02	-1.69E+02	3.63E-11	2.248E-11	4.056E+02	4.056E+02	5.7364E+02	-5.7364E+02	2.87E+02	PIPEG
7	8 JB	100.0	-1.69E+02	-1.69E+02	3.63E-11	2.248E-11	4.795E+02	4.795E+02	6.7807E+02	-6.7807E+02	3.39E+02	
8	8 JA	0.0	-1.09E+02	-1.09E+02	1.13E-11	1.124E-11	2.477E+02	2.477E+02	3.5033E+02	-3.5033E+02	1.75E+02	PIPEG
8	11 JB	100.0	-1.09E+02	-1.09E+02	1.13E-11	1.124E-11	3.032E+02	3.032E+02	4.2886E+02	-4.2886E+02	2.14E+02	
9	10 JA	0.0	2.39E-12	-4.53E+02	-1.15E+03	2.268E+02	-2.072E+03	-2.452E+02	2.5733E+03	-2.1196E+03	1.73E+03	PIPEG
9	9 JB	100.0	2.39E-12	-4.53E+02	-1.15E+03	2.268E+02	-2.072E+03	2.268E+02	2.5253E+03	-2.0717E+03	1.71E+03	
10	10 JA	0.0	4.19E-12	-1.10E+01	-5.26E-01	1.105E+01	1.052E+01	1.115E+01	1.1679E+01	1.0411E+01	5.86E+00	BEAMG
10	11 JB	100.0	4.19E-12	-1.10E+01	-5.26E-01	1.105E+01	1.052E+01	1.154E+01	1.2068E+01	1.0022E+01	6.06E+00	
11	11 JA	0.0	8.71E+01	1.45E+02	2.27E+01	-3.051E-11	3.004E+02	4.974E+02	5.8111E+02	-5.8111E+02	2.91E+02	PIPEG
11	12 JB	100.0	8.71E+01	1.45E+02	2.27E+01	-3.051E-11	2.554E+02	4.234E+02	4.9472E+02	-4.9472E+02	2.48E+02	
12	12 JA	0.0	1.36E+02	2.25E+02	4.40E+01	-4.184E-11	4.953E+02	8.195E+02	9.5753E+02	-9.5753E+02	4.81E+02	PIPEG
12	37 JB	100.0	1.36E+02	2.25E+02	4.40E+01	-4.184E-11	2.086E+02	3.437E+02	4.0213E+02	-4.0213E+02	2.06E+02	
13	13 JA	0.0	-3.83E+00	2.80E-01	8.12E-03	3.192E+00	3.185E+00	3.194E+00	3.2005E+00	3.1831E+00	1.60E+00	BEAMG
13	14 JB	100.0	-3.83E+00	2.80E-01	8.12E-03	3.192E+00	3.209E+00	3.192E+00	3.2091E+00	3.1745E+00	1.60E+00	
14	15 JA	0.0	-4.65E+01	4.05E+00	8.14E-01	5.581E+01	5.174E+00	7.041E+01	1.2104E+02	-9.4200E+00	6.05E+01	BEAMG
14	14 JB	100.0	-4.65E+01	4.05E+00	8.14E-01	5.581E+01	9.840E+01	6.617E+01	1.0876E+02	2.8605E+00	5.44E+01	
15	15 JA	0.0	3.19E+00	2.80E-01	1.70E-05	3.828E+00	3.807E+00	3.816E+00	3.8596E+00	3.7956E+00	1.93E+00	BEAMG
15	16 JB	100.0	3.19E+00	2.80E-01	1.70E-05	3.828E+00	3.717E+00	3.808E+00	3.9573E+00	3.6979E+00	1.98E+00	
16	16 JA	0.0	-2.33E+00	1.20E+00	-1.71E-05	-3.823E+00	-3.899E+00	-3.772E+00	-3.6954E+00	-3.9499E+00	1.85E+00	BEAMG
16	17 JB	100.0	-2.33E+00	1.20E+00	-1.71E-05	-3.823E+00	-3.834E+00	-3.806E+00	-3.7947E+00	-3.8505E+00	1.90E+00	
17	17 JA	0.0	-3.40E+01	1.75E+01	-8.16E-01	-5.574E+01	-8.337E+01	-3.447E+01	-6.8381E+00	-1.0464E+02	3.51E+00	BEAMG
17	18 JB	100.0	-3.40E+01	1.75E+01	-8.16E-01	-5.574E+01	-1.528E+01	-5.265E+01	-1.2182E+01	-9.9297E+01	6.15E+00	
18	19 JA	0.0	3.82E+00	1.20E+00	2.43E-03	2.331E+00	2.372E+00	2.339E+00	2.3794E+00	2.2930E+00	1.19E+00	BEAMG
18	18 JB	100.0	3.82E+00	1.20E+00	2.43E-03	2.331E+00	2.348E+00	2.331E+00	2.3477E+00	2.3147E+00	1.17E+00	
19	20 JA	0.0	3.13E+00	1.77E-01	8.76E-03	3.692E+00	3.730E+00	3.694E+00	3.7311E+00	3.6538E+00	1.87E+00	BEAMG
19	21 JB	100.0	3.13E+00	1.77E-01	8.76E-03	3.692E+00	3.710E+00	3.692E+00	3.7102E+00	3.6747E+00	1.86E+00	

[illegible]	17	JA	0.0	-3.49E+01	1.79E+01	-4.16E-01	-5.574E+01	-8[illegible]+01	-3.447E+01	-6.8341E+00	-1.0464E+02	3.51E+00	BEAMG	
[illegible]	19	JA	100.0	-3.49E+01	1.79E+01	-4.16E-01	-5.574E+01	-1[illegible]+01	-5.265E+01	-1.2142E+01	-9.9297E+01	6.15E+00		
[illegible]	19	JA	0.0	3.62E+00	1.20E+00	2.49E-03	2.331E+00	2.374E+00	2.339E+00	2.3794E+00	2.2630E+00	1.19E+00	BEAMG	
[illegible]	19	JB	100.0	3.62E+00	1.20E+00	2.49E-03	2.331E+00	2.346E+00	2.331E+00	2.3477E+00	2.3147E+00	1.17E+00		
19	20	JA	0.0	3.13E+00	1.77E-01	8.79E-03	3.692E+00	3.730E+00	3.694E+00	3.7311E+00	3.6538E+00	1.87E+00	BEAMG	
19	21	JB	100.0	3.13E+00	1.77E-01	8.79E-03	3.692E+00	3.710E+00	3.692E+00	3.7102E+00	3.6747E+00	1.86E+00		
20	22	JA	0.0	-5.38E+01	2.58E+00	-3.75E-01	-4.559E+01	-1.098E+02	-3.174E+01	3.2510E+01	-1.2368E+02	1.63E+01	BEAMG	
20	21	JB	100.0	-5.38E+01	2.58E+00	-3.75E-01	-4.559E+01	-1.979E+00	-3.442E+01	9.1884E+00	-1.0036E+02	4.61E+00		
21	22	JA	0.0	3.49E+00	1.77E-01	-7.85E-06	-3.126E+00	-3.152E+00	-3.137E+00	-3.0894E+00	-3.1633E+00	1.54E+00	BEAMG	
21	16	JB	100.0	3.49E+00	1.77E-01	-7.85E-06	-3.126E+00	-3.256E+00	-3.142E+00	-2.9806E+00	-3.2722E+00	1.49E+00		
22	16	JA	0.0	-1.83E+00	1.30E+00	7.82E-06	3.131E+00	3.074E+00	3.185E+00	3.2424E+00	3.0202E+00	1.62E+00	BEAMG	
22	23	JB	100.0	-1.83E+00	1.30E+00	7.82E-06	3.131E+00	3.126E+00	3.149E+00	3.1543E+00	3.1084E+00	1.58E+00		
23	23	JA	0.0	-2.07E+01	1.90E+01	3.74E-01	4.566E+01	3.164E+01	8.768E+01	8.1697E+01	9.6225E+00	4.09E+01	BEAMG	
23	24	JB	100.0	-2.07E+01	1.90E+01	3.74E-01	4.566E+01	8.511E+01	4.794E+01	8.7393E+01	3.9260E+00	4.37E+01		
24	25	JA	0.0	-3.13E+00	1.30E+00	1.79E-03	1.831E+00	1.827E+00	1.839E+00	1.8426E+00	1.8185E+00	9.21E-01	BEAMG	
24	24	JB	100.0	-3.13E+00	1.30E+00	1.79E-03	1.831E+00	1.847E+00	1.831E+00	1.8466E+00	1.8145E+00	9.23E-01		
25	38	JA	0.0	3.29E+01	9.90E+01	7.69E+00	-7.901E+01	-2.837E+01	5.936E+01	6.8337E+01	-2.2636E+02	3.50E+01	PIPEG	
25	26	JB	100.0	3.29E+01	9.90E+01	7.69E+00	-7.901E+01	-1.302E+02	-2.494E+02	9.8897E+01	-2.5692E+02	5.00E+01		
26	26	JA	0.0	3.29E+01	9.90E+01	7.69E+00	-7.901E+01	-1.302E+02	-2.494E+02	9.8897E+01	-2.5692E+02	5.00E+01	PIPEG	
26	27	JB	100.0	3.29E+01	9.90E+01	7.69E+00	-7.901E+01	-2.408E+02	-5.847E+02	4.5196E+02	-6.0999E+02	2.26E+02		
27	27	JA	0.0	2.11E+01	6.40E+01	3.98E+00	-5.080E+01	-1.344E+02	-3.121E+02	2.2354E+02	-3.2513E+02	1.12E+02	PIPEG	
27	30	JB	100.0	2.11E+01	6.40E+01	3.98E+00	-5.080E+01	-1.452E+02	-3.448E+02	2.5802E+02	-3.5961E+02	1.29E+02		
28	29	JA	0.0	4.53E+02	2.52E-11	-1.15E+03	2.268E+02	2.997E+03	2.268E+02	2.9974E+03	-2.5437E+03	1.89E+03	PIPEG	
28	28	JB	100.0	4.53E+02	2.52E-11	-1.15E+03	2.268E+02	2.525E+03	2.268E+02	2.5253E+03	-2.0717E+03	1.71E+03		
29	29	JA	0.0	-1.19E+01	-2.33E-12	-5.26E-01	1.105E+01	1.168E+01	1.105E+01	1.1679E+01	1.0411E+01	5.86E+00	BEAMG	
29	30	JB	100.0	-1.19E+01	-2.33E-12	-5.26E-01	1.105E+01	1.207E+01	1.105E+01	1.2068E+01	1.0922E+01	6.06E+00		
30	30	JA	0.0	1.85E-12	2.19E+00	-4.71E-04	1.113E+01	1.113E+01	1.120E+01	1.1200E+01	1.1051E+01	5.60E+00	BEAMG	
30	31	JB	100.0	1.85E-12	2.19E+00	-4.71E-04	1.113E+01	1.113E+01	1.112E+01	1.1126E+01	1.1125E+01	5.56E+00		
31	31	JA	0.0	-1.36E-12	1.20E+02	-8.37E+01	6.181E+02	8.997E+02	6.175E+02	9.0032E+02	3.3585E+02	4.58E+02	BEAMG	
31	32	JB	100.0	-1.36E-12	1.20E+02	-8.37E+01	6.181E+02	8.997E+02	6.094E+02	9.0840E+02	3.2775E+02	4.62E+02		
32	30	JA	0.0	1.30E-11	-1.02E+00	-1.52E-04	-1.261E+01	-1.261E+01	-1.266E+01	-1.2558E+01	-1.2659E+01	6.28E+00	BEAMG	
32	33	JB	100.0	1.30E-11	-1.02E+00	-1.52E-04	-1.261E+01	-1.261E+01	-1.262E+01	-1.2604E+01	-1.2623E+01	6.30E+00		
33	33	JA	0.0	3.23E-12	-5.60E+01	-2.71E+01	-7.007E+02	-1.571E+03	-7.071E+02	1.7581E+02	-1.5773E+03	9.20E+01	BEAMG	
33	34	JB	100.0	3.23E-12	-5.60E+01	-2.71E+01	-7.007E+02	-1.571E+03	-7.033E+02	1.7200E+02	-1.5735E+03	9.02E+01		
34	30	JA	0.0	2.68E-12	1.07E-11	0.	4.283E-12	4.283E-12	4.432E-11	4.4323E-11	-3.5758E-11	2.22E-11	PIPEG	
34	35	JB	100.0	2.68E-12	1.07E-11	0.	4.283E-12	4.283E-12	3.431E-11	3.4313E-11	-2.5749E-11	1.72E-11		
35	35	JA	0.0	1.07E-12	9.99E-12	0.	3.331E-12	-3.019E-13	8.175E-12	9.3855E-12	-2.7237E-12	4.69E-12	PIPEG	
35	36	JB	100.0	1.07E-12	9.99E-12	0.	3.331E-12	3.331E-12	3.331E-12	3.3309E-12	3.3309E-12	1.67E-12		
36	37	JA	0.0	6.70E+01	1.11E+02	2.17E+01	-1.359E-11	1.032E+02	1.698E+02	1.9868E+02	-1.9868E+02	1.02E+02	PIPEG	
36	16	JB	100.0	6.70E+01	1.11E+02	2.17E+01	-1.359E-11	5.196E+01	8.475E+01	9.9424E+01	-9.9424E+01	5.43E+01		
37	16	JA	0.0	1.62E+01	4.92E+01	3.80E+00	-3.907E+01	-5.795E+03	5.431E+01	6.0062E+01	-1.3820E+02	3.03E+01	PIPEG	
37	38	JB	100.0	1.62E+01	4.92E+01	3.80E+00	-3.907E+01	-1.404E+01	2.930E+01	3.3735E+01	-1.1187E+02	1.73E+01		
38	11	JA	0.0	4.35E-01	-3.62E+00	-7.27E-04	-3.257E+01	-3.256E+01	-3.268E+01	-3.2442E+01	-3.2700E+01	1.62E+01	BEAMG	
38	39	JB	100.0	4.35E-01	-3.62E+00	-7.27E-04	-3.257E+01	-3.257E+01	-3.256E+01	-3.2559E+01	-3.2583E+01	1.63E+01		
39	39	JA	0.0	-1.52E-12	-2.01E+02	-1.01E+02	-1.810E+03	-1.151E+03	-1.902E+03	-1.1431E+03	-2.4762E+03	5.80E+02	BEAMG	
39	40	JB	100.0	-1.52E-12	-2.01E+02	-1.01E+02	-1.810E+03	-1.151E+03	-1.788E+03	-1.1296E+03	-2.4898E+03	5.74E+02		
40	11	JA	0.0	-5.28E-01	1.13E+01	-1.04E-03	3.955E+01	3.953E+01	3.999E+01	4.0005E+01	3.9085E+01	2.00E+01	BEAMG	
40	41	JB	100.0	-5.28E-01	1.13E+01	-1.04E-03	3.955E+01	3.955E+01	3.960E+01	3.9597E+01	3.9494E+01	1.98E+01		
41	41	JA	0.0	9.97E-12	6.27E+02	-6.33E+01	2.197E+03	1.143E+03	2.232E+03	3.2863E+03	1.1080E+03	1.64E+03	BEAMG	
41	42	JB	100.0	9.97E-12	6.27E+02	-6.33E+01	2.197E+03	1.143E+03	2.190E+03	3.2580E+03	1.1364E+03	1.63E+03		

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NOZZLE LOAD CASE 3- MAXIMUM OVERTURNING MOMENT

MAXIMUM STRESS SUMMARY FOR

	--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	B E A M S T R E S S E S - STRESSES AT USER LOCATIONS - A	B	C	FOR OUTPUT VECTOR 3 MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED STRESS
MAX. BEAM STRESSES=	4.53E+02	6.27E+02	1.16E+03	2.197E+03	2.997E+03	2.232E+03	3.2863E+03	1.1364E+03	1.89E+03
BEAM NOS. =	25.	41.	5.	41.	28.	41.	41.	41.	28.
MIN. BEAM STRESSES=	-1.69E+02	-4.53E+02	-1.16E+03	-1.810E+03	-2.088E+03	-1.802E+03	-1.1431E+03	-2.6457E+03	1.67E-12
BEAM NOS. =	7.	2.	2.	39.	2.	39.	39.	5.	35.

Appendix B

COMBINE OUTPUT

This section contains the following:

Appendix B.1

COMBINE ABSTRACT

PROGRAM COMBINE

ABSTRACT

"COMBINE" is designed to take beam element loads from a STARDYNE model and combine these loads in the following manner:

1) Beam loads due to nozzle or external load cases are combined in a square root of the sum of the squares or absolute sum manner.

2) Beam loads due to earthquake and deadweight are used directly from tape.

3) The program calculates stresses due to the above loads separately and adds and subtracts the beam stresses from cylinder membrane stresses (if the beam is a pipe or elbow), calculates the maximum stress intensity for both cases and prints out the absolute maximum.

4) The program also adds the absolute sum or SRSS of the external loads from 1) with each earthquake and deadweight and then adds in pressure stresses as in 3).

The primary use for the program is in making Section III comparisons for faulted and upset conditions. A key in the program allows the external and earthquake cases to be multiplied by factors, thus allowing, for example, upset conditions to be calculated from faulted conditions. The program also has a key which allows the input of beam properties different from those used in the STARDYNE analysis. COMBINE is written in FORTRAN 4 for use on the CDC 6600 computer. Verification prepared by John C. Minichiello.

THEORY

The load and stress calculations for "COMBINE" are performed in the following manner.

1) Assume for beam N in a STARDYNE model we have external load cases which produce an axial force at node JB of:

Case 1, P = M

Case 2, P = L

Case 3, P = Q

then, in the external load analysis, the axial force used at JB of beam N is

$$P_{SRSS} = \sqrt{M^2 + L^2 + Q^2}$$

IF the beam has a cross-section of A, then the axial stress due to P_{SRSS} is

$$\sigma_{SRSS} = P_{SRSS}/A$$

Similar treatment is given to the shear loads V_2 and V_3, the bending loads M_2 and M_3 and the torsional load T with the following results:

$$\sigma(SRSS) = P(SRSS)/A$$

$$\tau_2(SRSS) = V_2(SRSS)/A$$

$$\tau_3(SRSS) = V_3(SRSS)/A$$

$$B_2(SRSS) = M_2(SRSS)\ C_3/I_2$$

$$B_3(SRSS) = M_3(SRSS)\ C_2/I_2$$

$$\tau_o(SRSS) = T(SRSS)\ CTORS/J$$

where:

A = Cross-section area

C_3 = Half beam width in "3" direction

C_2 = Half beam width in "2" direction

I_2 = Moment of inertia about "2" axis

I_3 = Moment of inertia about "3" axis

CTORS = Torsional multiplier

J = Torsional constant

If beam N is a pipe or elbow, the pressure stresses are:

$$\sigma(\text{AXIAL})_p = pR/2t$$

$$\sigma(\text{HOOP})_p = pR/t$$

$$\sigma(\text{RADIAL})_p = -p/2$$

where:

p = pressure

R = mean radius

t = wall thickness

If beam N is a general or rectangular beam, pressure stresses are zero.

The SRSS stresses are combined with pressure thusly:

a) If the beam is a pipe or elbow

$$\sigma(\text{AXIAL})_{\text{TOTAL}} = \frac{pR}{2t} \pm \left(\sigma(\text{SRSS}) + \sqrt{B_2(\text{SRSS})^2 + B_3(\text{SRSS})^2}\right)$$

b) If the beam i rectangular or general

$$\sigma(AXIAL)_{TOTAL} = \sigma(SRSS) + B_2(SRSS) + B_3(SRSS)$$

The shear stress on the axial plane in the hoop direction is found by

$$\tau(AX\text{-}HOOP)_{TOTAL} = \tau_0(SRSS) + \sqrt{\tau_2(SRSS)^2 + \tau_3(SRSS)^2}$$

and the hoop and radial stress are as shown previously.

The maximum stress intensity for each total (pressure ± SRSS) is now calculated

$$\sigma_1 = (\sigma(AXIAL)_{TOTAL} + \sigma(HOOP)_p/2 + \sqrt{\frac{(\sigma(AXIAL)_{TOTAL} - \sigma(HOOP)_p)^2}{4} + \tau^2_{TOTAL}}$$

$$\sigma_2 = (\sigma(AXIAL)_{TOTAL} + \sigma(HOOP)_p)/2 - \sqrt{\qquad\qquad}$$

$$\sigma_3 = \sigma(RADIAL)_p$$

Max stress intensity = absolute maximum of

$$((\sigma_1-\sigma_2,\ \sigma_2-\sigma_3,\ \sigma_3-\sigma_1)_p + SRSS,\ (\sigma_1-\sigma_2,\ \sigma_2-\sigma_3,\ \sigma_3-\sigma_1)_{p-SRSS})$$

Similar calculations are done if an absolute sum of the external load effects is desired. Referring to the previous discussion of beam N

$$P_{ABS} = |M| + |L| + |-Q|$$

The treatment for all remaining calculations is identical with ABS replacing SRSS as a subscript.

2) For loads due to a static or dynamic (DYNRE4) earthquake analysis, "COMBINE" reads the earthquake loads directly from each of the earthquake files. If earthquakes (for example, vertical plus north-south) are to be combined in an SRSS or absolute sum procedure, this must be done before input to "COMBINE". This is done internally in a DYNRE4 analysis. For static seismic earthquakes, program "PRECOM" does the required manipulations. The method used in "PRECOM" is identical to that used by "COMBINE" for external loads. The file output from "PRECOM" can then be used as input to "COMBINE".

Stresses due to the earthquake loads of <u>each</u> earthquake file input to "COMBINE" are now combined with pressure as in 1) and the maximum stress intensity calculated.

3) For beam loads due to deadweight and other external loads the sign and direction of which are known, "COMBINE" reads directly from the STARDYNE output file which contains the loads. The stresses due to these loads are then calculated and combined with pressure as in 1) and the maximum stress intensity calculated.

4) "COMBINE" now finds the sum of the beam loads due to the SRSS (or absolute sum) of the external loads (1) + earthquake (2) + deadweight and signed external loads (3) for each earthquake file. Since the SRSS (or absolute sum) loads and earthquake loads can be either positive or negative, the sum is made such that the sign of the deadweight run load is used, i.e., if for beam N at node JA we have

$$P(SRSS)_{AXIAL} = +10$$

$$P(EARTHQUAKE\ 1)_{AXIAL} = +20$$

$$P(DEADWEIGHT)_{AXIAL} = -30$$

then

$$P(TOTAL)_{AXIAL} = -60$$

Beam load stresses are now calculated for the total as in 1). These stresses are combined with pressure as in 1) with the following exceptions. If the axial and bending stresses due to total beam loads are negative because of deadweight and signed loads, the absolute value of the sum is added to and subtracted from the axial pressure stress to obtain the two possible load cases. If the torsional stress is negative for the same reason, it is made positive before addition to the transverse shear stress. The maximum intensity is now calculated as before.

Appendix B.2

COMBINE OUTPUT

EARTHQUAKE 1 + NOZZLE LOADS + DEADWEIGHT

BEAM ELEMENT LOADS

NOZZLE LOADS + EARTHQUAKE NO. 1 + DEADWEIGHT

BEAM NO.	NODE		AXIAL F	SHEAR V2	SHEAR V3	BENDING M2	BENDING M3	TORSION MT
1	1	JA	.10775E+05	.43540E+04	.43540E+04	.0	.0	.0
1	4	JB	-.10775E+05	.43540E+04	.43540E+04	.12300E+06	.12300E+06	.0
2	3	JA	.29520E+04	.0	.29520E+04	.26745E+05	.90300E+05	.90300E+05
2	2	JB	.29520E+04	.0	.29520E+04	.0	.90300E+05	.90300E+05
3	3	JA	.29520E+04	.0	.29520E+04	.26745E+05	.90300E+05	.90300E+05
3	4	JB	.29520E+04	.0	.29520E+04	.96678E+05	.90300E+05	.90300E+05
4	4	JA	.29520E+04	.0	.29520E+04	.96678E+05	.90300E+05	.90300E+05
4	5	JB	.29520E+04	.0	.29520E+04	.26745E+05	.90300E+05	.90300E+05
5	5	JA	.29520E+04	.0	.29520E+04	.26745E+05	.90300E+05	.90300E+05
5	6	JB	.29520E+04	.0	.29520E+04	.0	.90300E+05	.90300E+05
6	4	JA	.10775E+05	.10258E+05	.10258E+05	.30360E+06	.30360E+06	.0
6	7	JB	-.10775E+05	.10258E+05	.10258E+05	.53184E+06	.53184E+06	.0
7	7	JA	.23602E+05	.15441E+05	.15441E+05	.53184E+06	.53184E+06	.0
7	8	JB	-.23602E+05	.15441E+05	.15441E+05	.68038E+06	.68038E+06	.0
8	8	JA	.31628E+05	.18684E+05	.18684E+05	.68038E+06	.68038E+06	.0
8	11	JB	-.31628E+05	.18684E+05	.18684E+05	.94196E+06	.94196E+06	.0
9	10	JA	.55220E+04	.0	.55230E+04	.43189E+05	.21029E+06	.21029E+06
9	9	JB	.55220E+04	.0	.55230E+04	.0	.21029E+06	.21029E+06
10	10	JA	.55220E+04	.0	.55230E+04	.43189E+05	.21029E+06	.21029E+06
10	11	JB	.55220E+04	.0	.55230E+04	.19884E+06	.21029E+06	.21029E+06
11	11	JA	.31628E+05	.15588E+05	.18721E+05	.12220E+07	.92882E+06	.13943E+06
11	12	JB	-.31628E+05	.15588E+05	.18721E+05	.95994E+06	.71059E+06	.13943E+06
12	12	JA	.52191E+05	.72790E+04	.10412E+05	.95994E+06	.71059E+06	.13943E+06
12	37	JB	-.52191E+05	.72790E+04	.10412E+05	.47578E+06	.37209E+06	.13943E+06
13	13	JA	.32224E+05	.79790E+04	.16930E+04	.85520E+04	-.12733E+06	.46280E+04
13	14	JB	-.32224E+05	-.79790E+04	.16930E+04	.27000E+02	.16255E+06	.46280E+04
14	15	JA	.79790E+04	.32224E+05	.16930E+04	.18653E+05	.14357E+06	.27000E+02
14	14	JB	-.79790E+04	-.32224E+05	.16930E+04	.46280E+04	.16255E+06	.27000E+02
15	15	JA	.79790E+04	-.32224E+05	.16930E+04	.18653E+05	.14357E+06	.27000E+02
15	16	JB	-.79790E+04	.32224E+05	.16930E+04	.56753E+05	-.86860E+06	.27000E+02

B

BEAM ELEMENT LOADS

NOZZLE LOADS*EARTHQUAKE NO. 1*DEADWEIGHT

BEAM NO	NODE		AXIAL P	SHEAR V2	SHEAR V3	BENDING M2	BENDING M3	TORSION MT
16	16	JA	.79460E+04	.34587E+05	.95900E+03	.24251E+05	.94256E+06	.27000E+02
16	17	JB	-.79460E+04	-.34587E+05	.95900E+03	.12597E+05	-.16436E+06	.27000E+02
17	17	JA	.79460E+04	.34587E+05	.95900E+03	.12597E+05	.16436E+06	.27000E+02
17	18	JB	-.79460E+04	-.34587E+05	.95900E+03	.91540E+04	.16422E+06	.27000E+02
18	19	JA	.34587E+05	.79460E+04	.95900E+03	.48260E+04	-.20429E+06	.91540E+04
18	16	JB	-.34587E+05	-.79460E+04	.95900E+03	.27000E+02	.16422E+06	.91540E+04
19	20	JA	.35268E+05	.75980E+04	.16420E+04	.82830E+04	-.20304E+06	.49820E+04
19	21	JB	-.35268E+05	-.75980E+04	.16420E+04	.25000E+02	.16473E+06	.49820E+04
20	22	JA	.75980E+04	.35268E+05	.16420E+04	.18420E+05	.17031E+06	.25000E+02
20	21	JB	-.75980E+04	-.35268E+05	.16420E+04	.48820E+04	.16473E+06	.25000E+02
21	22	JA	.75980E+04	-.35268E+05	.16420E+04	.18420E+05	.17031E+06	.25000E+02
21	16	JB	-.75980E+04	.35268E+05	.16420E+04	.55368E+05	-.96383E+06	.25000E+02
22	15	JA	.76310E+04	.31543E+05	.10100E+04	.25636E+05	.84733E+06	.25000E+02
22	23	JB	-.76310E+04	-.31543E+05	.10100E+04	.12829E+05	-.13761E+06	.25000E+02
23	23	JA	.76310E+04	.31543E+05	.10100E+04	.12829E+05	.13761E+06	.25000E+02
23	24	JB	-.76310E+04	-.31543E+05	.10100E+04	.89010E+04	.16204E+06	.25000E+02
24	25	JA	.31543E+05	.76310E+04	.10100E+04	.50950E+04	-.12608E+06	.89010E+04
24	24	JB	-.31543E+05	-.76310E+04	.10100E+04	.25000E+02	.16204E+06	.89010E+04
25	35	JA	-.55701E+05	.72610E+04	.95950E+04	.30296E+06	.23549E+06	.17386E+05
25	26	JB	.55701E+05	.72610E+04	.95950E+04	.35132E+06	.25965E+06	.17386E+05
26	26	JA	-.33456E+05	.40970E+04	.64310E+04	.35132E+06	.25965E+06	.17386E+05
26	27	JB	.33456E+05	.40970E+04	.64310E+04	.39627E+06	.13176E+06	.17386E+05
27	27	JA	-.18155E+05	.10279E+05	.12613E+05	.39627E+06	.13176E+06	.17386E+05
27	30	JB	.18155E+05	.10279E+05	.12613E+05	.55720E+06	.26001E+06	.17386E+05
28	29	JA	.55220E+04	.55230E+04	.0	.0	.25349E+06	.21029E+06
28	28	JB	.55220E+04	.55230E+04	.0	.0	.21029E+06	.21029E+06
29	29	JA	.55220E+04	.55230E+04	.0	.0	.25349E+06	.21029E+06
29	30	JB	.55220E+04	.55230E+04	.0	.0	.40915E+06	.21029E+06
30	30	JA	.15635E+05	.0	.12670E+04	.32377E+05	.76000E+02	.24400E+03
30	31	JB	.15635E+05	.0	.12670E+04	.73800E+04	.76000E+02	.24400E+03

R.D.2

BEAM ELEMENT LOADS

NOZZLE LOADS + EARTHQUAKE NO. 1 + DEADWEIGHT

BEAM NO	NODE		AXIAL P	SHEAR V2	SHEAR V3	BENDING M2	BENDING M3	TORSION MT
31	31	JA	.15635E+05	.0	.12670E+04	.73800E+04	.76000E+02	.24400E+03
31	32	JB	.15635E+05	.0	.12670E+04	.81520E+04	.76000E+02	.24400E+03
32	32	JA	.14691E+05	.0	.12830E+04	.31474E+05	.15800E+03	.11600E+03
32	33	JB	.14691E+05	.0	.12830E+04	.60330E+04	.15800E+03	.11600E+03
33	33	JA	.14691E+05	.0	.12830E+04	.60330E+04	.15800E+03	.11600E+03
33	34	JB	.14691E+05	.0	.12830E+04	.95600E+04	.15800E+03	.11600E+03
34	34	JA	-.12632E+05	.51040E+04	.51040E+04	.11939E+06	.11939E+06	.0
34	35	JB	.12632E+05	.51040E+04	.51040E+04	.47934E+05	.47934E+05	.0
35	35	JA	-.42170E+04	.17040E+04	.17040E+04	.47934E+05	.47934E+05	.0
35	36	JB	.42170E+04	.17040E+04	.17040E+04	.0	.0	.0
36	37	JA	.52191E+05	.72790E+04	.10412E+05	.47578E+06	.37209E+06	.13943E+06
36	16	JB	-.52191E+05	.72790E+04	.10412E+05	.30069E+06	.24954E+05	.13943E+06
37	16	JA	-.55701E+05	.72610E+04	.95950E+04	.41023E+06	.31566E+06	.17386E+05
37	38	JB	.55701E+05	.72610E+04	.95950E+04	.30296E+06	.23549E+06	.17386E+05
38	11	JA	.38387E+05	.51300E+03	.33360E+04	.81345E+05	.14383E+05	.50800E+03
38	39	JB	.38387E+05	.51300E+03	.33360E+04	.11045E+06	.17900E+03	.50800E+03
39	39	JA	.38391E+05	.0	.33360E+04	.11052E+06	.17900E+03	.36000E+03
39	40	JB	.38391E+05	.0	.33360E+04	.25432E+05	.17900E+03	.36000E+03
40	11	JA	.41874E+05	.55900E+03	.72130E+04	.21376E+06	.15729E+05	.63200E+03
40	41	JB	.41874E+05	.55900E+03	.72130E+04	.26699E+05	.23400E+03	.63200E+03
41	41	JA	.41876E+05	.0	.72130E+04	.26705E+05	.23400E+03	.27500E+03
41	42	JB	.41874E+05	.0	.72130E+04	.17036E+05	.23400E+03	.27500E+03

EARTHQUAKE 1 + NOZZLE LOADS + DEADWEIGHT

BEAM ELEMENT STRESSES

NOZZLE LOADS + EARTHQUAKE NO. 1 + DEADWEIGHT

BEAM NO	NODE	AXIAL P/A	SHEAR V2/A	SHEAR V3/A	BENDING M2*C/I2	BENDING M3*C/I3	TORSION T*C/J
1	1 JA	.60297E+02	.24365E+02	.24365E+02	.0	.0	.0
1	4 JB	-.60297E+02	.24365E+02	.24365E+02	.62134E+02	.62134E+02	.0
2	3 JA	.22919E+03	.0	.22919E+03	.69625E+03	.23170E+04	.11585E+04
2	2 JB	.22919E+03	.0	.22919E+03	.0	.23170E+04	.11585E+04
3	3 JA	.59040E+01	.0	.59040E+01	.66862E-01	.22575E+00	.22575E+00
3	4 JB	.59040E+01	.0	.59040E+01	.24169E+00	.22575E+00	.22575E+00
4	4 JA	.59040E+01	.0	.59040E+01	.24169E+00	.22575E+00	.22575E+00
4	5 JB	.59040E+01	.0	.59040E+01	.66862E-01	.22575E+00	.22575E+00
5	5 JA	.22919E+03	.0	.22919E+03	.69625E+03	.23170E+04	.11585E+04
5	6 JB	.22919E+03	.0	.22919E+03	.0	.23170E+04	.11585E+04
6	4 JA	.60297E+02	.57403E+02	.57403E+02	.15336E+03	.15336E+03	.0
6	7 JB	-.60297E+02	.57403E+02	.57403E+02	.26866E+03	.26866E+03	.0
7	7 JA	.33765E+03	.22090E+03	.22090E+03	.69150E+03	.69150E+03	.0
7	8 JB	-.33765E+03	.22090E+03	.22090E+03	.88464E+03	.88464E+03	.0
8	8 JA	.29097E+03	.17189E+03	.17189E+03	.45706E+03	.45706E+03	.0
8	11 JB	-.29097E+03	.17189E+03	.17189E+03	.63278E+03	.63278E+03	.0
9	10 JA	.22678E+03	.0	.22682E+03	.47205E+03	.22985E+04	.11492E+04
9	9 JB	.22678E+03	.0	.22682E+03	.0	.22985E+04	.11492E+04
10	10 JA	.11044E+02	.0	.11046E+02	.10797E+00	.52573E+00	.52573E+00
10	11 JB	.11044E+02	.0	.11046E+02	.49711E+00	.52573E+00	.52573E+00
11	11 JA	.29097E+03	.14340E+03	.17223E+03	.82093E+03	.62396E+03	.46831E+02
11	12 JB	-.29097E+03	.14340E+03	.17223E+03	.64486E+03	.47735E+03	.46831E+02
12	12 JA	.74665E+03	.10413E+03	.14496E+03	.12491E+04	.92391E+03	.90644E+02
12	37 JB	-.74665E+03	.10413E+03	.14496E+03	.61861E+03	.48379E+03	.90644E+02
13	13 JA	.64444E+02	.15958E+02	.33460E+01	.21380E-01	-.31833E+00	.11570E-01
13	14 JB	-.64444E+02	-.15958E+02	.33460E+01	.67500E-04	.40630E+00	.11570E-01
14	15 JA	.23269E+03	.93975E+03	.49373E+02	.59480E+02	.88286E+03	.32275E+01
14	14 JB	-.23269E+03	-.93975E+03	.49373E+02	.14756E+02	.99959E+03	.32275E+01
15	15 JA	.15958E+02	-.64448E+02	.33460E+01	.46632E-01	.35892E+00	.67500E-04
15	16 JB	-.15958E+02	.64448E+02	.33460E+01	.14188E+00	-.21715E+01	.67500E-04

BEAM ELEMENT STRESSES

BEAM NO.	NODE	AXIAL P/A	SHEAR V2/A	SHEAR V3/A	BENDING M2*C/I2	BENDING M3*C/I3	TORSION T*C/J
16	16 JA	.15892E+02	.69174E+02	.19180E+01	.60527E-01	.23564E+01	.67500E-04
16	17 JB	-.15892E+02	-.69174E+02	.19180E+01	.31492E-01	-.41089E+00	.67500E-04
17	17 JA	.23173E+03	.10087E+04	.27967E+02	.40169E+02	.10107E+04	.32275E+01
17	18 JB	-.23173E+03	-.10087E+04	.27967E+02	.29190E+02	.10098E+04	.32275E+01
18	19 JA	.69174E+02	.15892E+02	.19180E+01	.12065E-01	-.51072E+00	.22885E-01
18	18 JB	-.69174E+02	-.15892E+02	.19180E+01	.67500E-04	.41055E+00	.22885E-01
19	20 JA	.70336E+02	.15196E+02	.32440E+01	.20707E-01	-.50759E+00	.12205E-01
19	21 JB	-.70336E+02	-.15196E+02	.32440E+01	.62500E-04	.41183E+00	.12205E-01
20	22 JA	.22158E+03	.10235E+04	.47886E+02	.58737E+02	.10473E+04	.29884E+01
20	21 JB	-.22158E+03	-.10235E+04	.47886E+02	.15568E+02	.10130E+04	.29884E+01
21	22 JA	.15196E+02	-.70536E+02	.32440E+01	.46050E-01	.42577E+00	.62500E-04
21	16 JB	-.15196E+02	.70536E+02	.32440E+01	.13842E+00	-.24096E+01	.62500E-04
22	16 JA	.15262E+02	.63086E+02	.20200E+01	.64090E-01	.21183E+01	.62500E-04
22	23 JB	-.15262E+02	-.63086E+02	.20200E+01	.32072E-01	-.34404E+00	.62500E-04
23	23 JA	.22254E+03	.91969E+03	.29455E+02	.40909E+02	.84624E+03	.29884E+01
23	24 JB	-.22254E+03	-.91969E+03	.29455E+02	.28303E+02	.99645E+03	.29884E+01
24	25 JA	.63086E+02	.15262E+02	.20200E+01	.12737E-01	-.31520E+00	.22252E-01
24	24 JB	-.63086E+02	-.15262E+02	.20200E+01	.62500E-04	.40510E+00	.22252E-01
25	26 JA	-.79687E+03	.10388E+03	.13727E+03	.39390E+03	.30618E+03	.11303E+02
25	25 JB	.79687E+03	.10388E+03	.13727E+03	.45679E+03	.33760E+03	.11303E+02
26	26 JA	-.47653E+03	.98612E+02	.92003E+02	.45679E+03	.33760E+03	.11303E+02
26	27 JB	.47653E+03	.98612E+02	.92003E+02	.51524E+03	.17131E+03	.11303E+02
27	27 JA	-.16702E+03	.94563E+02	.11603E+03	.26621E+03	.88512E+02	.58397E+01
27	30 JB	.16702E+03	.94563E+02	.11603E+03	.37431E+03	.17467E+03	.58397E+01
28	29 JA	.22674E+03	.22682E+03	.0	.0	.27706E+04	.11492E+04
28	28 JB	.22674E+03	.22682E+03	.0	.0	.22985E+04	.11492E+04
29	29 JA	.11044E+02	.11046E+02	.0	.0	.63372E+00	.52573E+00
29	30 JB	.11044E+02	.11046E+02	.0	.0	.10229E+01	.52573E+00
30	30 JA	.31270E+02	.0	.25340E+01	.80942E-01	.19000E-03	.61000E-03
30	31 JB	.31270E+02	.0	.25340E+01	.18450E-01	.19000E-03	.61000E-03

BEAM ELEMENT STRESSES

NOZZLE LOADS+EARTHQUAKE NO. 1+DEADWEIGHT

BEAM NO	NODE	AXIAL P/A	SHEAR V2/A	SHEAR V3/A	BENDING M2*C/I2	BENDING M3*C/I3	TORSION T*C/J
31	31 JA	.17372E+04	.0	.14078E+03	.12812E+02	.54028E+03	.10841E+03
31	32 JB	.17372E+04	.0	.14078E+03	.14153E+02	.54028E+03	.10841E+03
32	30 JA	.29782E+02	.0	.25660E+01	.78665E-01	.39500E-03	.29000E-03
32	33 JB	.29782E+02	.0	.25660E+01	.15082E-01	.39500E-03	.29000E-03
33	33 JA	.15546E+04	.0	.14256E+03	.10474E+02	.11232E+04	.51540E+02
33	34 JB	.15546E+04	.0	.14256E+03	.16611E+02	.11232E+04	.51540E+02
34	30 JA	-.11621E+03	.46955E+02	.46955E+02	.80202E+02	.80202E+02	.0
34	35 JB	.11621E+03	.46955E+02	.46955E+02	.32201E+02	.32201E+02	.0
35	35 JA	-.60329E+02	.24378E+02	.24378E+02	.62324E+02	.62324E+02	.0
35	36 JB	.60329E+02	.24378E+02	.24378E+02	.0	.0	.0
36	37 JA	.30410E+03	.51478E+02	.73635E+02	.30565E+03	.23904E+03	.44785E+02
36	16 JB	-.30410E+03	.51478E+02	.73635E+02	.19314E+03	.16038E+03	.44785E+02
37	16 JA	-.39393E+03	.51351E+02	.67857E+02	.26354E+03	.20343E+03	.55845E+01
37	36 JB	.39393E+03	.51351E+02	.67857E+02	.19463E+03	.15128E+03	.55845E+01
38	11 JA	.76774E+02	.10260E+01	.66720E+01	.20336E+00	.35957E-01	.12700E-02
38	39 JB	.76774E+02	.10260E+01	.66720E+01	.27615E-01	.44750E-03	.12700E-02
39	39 JA	.42657E+04	.0	.37067E+03	.19187E+02	.12725E+04	.15995E+03
39	40 JB	.42657E+04	.0	.37067E+03	.44153E+02	.12725E+04	.15995E+03
40	11 JA	.83746E+02	.11180E+01	.14426E+02	.53444E+00	.39322E-01	.15800E-02
40	41 JB	.83746E+02	.11180E+01	.14426E+02	.66747E-01	.58500E-03	.15800E-02
41	41 JA	.46531E+04	.0	.80144E+03	.46363E+02	.16635E+04	.12219E+03
41	42 JB	.46531E+04	.0	.80144E+03	.29580E+02	.16635E+04	.12219E+03

EARTHQUAKE 1 + NOZZLE LOADS + DEADWEIGHT

ELEMENT TOTAL STRESSES AND MAXIMUM STRESS INTENSITY

NOZZLE LOADS + DEADWEIGHT + EARTHQUAKE NO 1

BEAM	NODE	PRESSURE AXIAL	PRESSURE HOOP	PRESSURE RADIAL	TOTAL AXIAL	TOTAL SHEAR	TOTAL AXIAL	MAXIMUM INTENSITY
1	1	.59150E+04	.11830E+05	-.32500E+03	.59753E+04	.34457E+02	.58547E+04	.12155E+05
1	4	.59150E+04	.11830E+05	-.32500E+03	.60023E+04	.34457E+02	.57677E+04	.12155E+05
2	3	.61159E+04	.12232E+05	-.32500E+03	.87611E+04	.13877E+04	.34707E+04	.13043E+05
2	2	.61159E+04	.12232E+05	-.32500E+03	.86621E+04	.13877E+04	.35697E+04	.13033E+05
3	3	.0	.0	.0	.59040E+01	.61297E+01	-.59040E+01	.13607E+02
3	4	.0	.0	.0	.59040E+01	.61297E+01	-.59040E+01	.13607E+02
4	4	.0	.0	.0	.59040E+01	.61297E+01	-.59040E+01	.13607E+02
4	5	.0	.0	.0	.59040E+01	.61297E+01	-.59040E+01	.13607E+02
5	5	.61159E+04	.12232E+05	-.32500E+03	.87611E+04	.13877E+04	.34707E+04	.13043E+05
5	6	.61159E+04	.12232E+05	-.32500E+03	.86621E+04	.13877E+04	.35697E+04	.13033E+05
5	4	.59150E+04	.11830E+05	-.32500E+03	.61913E+04	.81181E+02	.56387E+04	.12156E+05
6	7	.59150E+04	.11830E+05	-.32500E+03	.63543E+04	.81181E+02	.54757E+04	.12156E+05
7	7	.33375E+04	.66750E+04	-.75000E+02	.44522E+04	.31240E+03	.20228E+04	.67971E+04
7	8	.33375E+04	.66750E+04	-.75000E+02	.49252E+04	.31240E+03	.17498E+04	.68041E+04
8	8	.33225E+04	.66450E+04	-.75000E+02	.42595E+04	.24308E+03	.23655E+04	.67445E+04
8	11	.33225E+04	.66450E+04	-.75000E+02	.45075E+04	.24308E+03	.21375E+04	.67471E+04
9	10	.11625E+04	.23250E+04	-.75000E+02	.37453E+04	.13760E+04	-.14103E+04	.46513E+04
9	9	.11625E+04	.23250E+04	-.75000E+02	.38673E+04	.13760E+04	-.13523E+04	.46165E+04
10	10	.0	.0	.0	.11044E+02	.11572E+02	-.11044E+02	.25644E+02
10	11	.0	.0	.0	.12044E+02	.11572E+02	-.12044E+02	.26090E+02
11	11	.33225E+04	.66450E+04	-.75000E+02	.46445E+04	.27094E+03	.20005E+04	.67560E+04
11	12	.33225E+04	.66450E+04	-.75000E+02	.44155E+04	.27094E+03	.22295E+04	.67525E+04
12	12	.33375E+04	.66750E+04	-.75000E+02	.56302E+04	.27239E+03	.10338E+04	.68171E+04
12	37	.33375E+04	.66750E+04	-.75000E+02	.48692E+04	.27239E+03	.18058E+04	.67902E+04
13	13	.0	.0	.0	.64445E+02	.16325E+02	-.64448E+02	.72246E+02
13	14	.0	.0	.0	.64448E+02	.16325E+02	-.64448E+02	.72249E+02
14	15	.0	.0	.0	.11747E+04	.94427E+03	-.11747E+04	.22241E+04
14	14	.0	.0	.0	.12467E+04	.94427E+03	-.12467E+04	.22629E+04
15	15	.0	.0	.0	.15958E+02	.64537E+02	-.15958E+02	.13006E+03
15	16	.0	.0	.0	.17958E+02	.64537E+02	-.17958E+02	.13032E+03

EARTHQUAKE 1 + NOZZLE LOADS + DEADWEIGHT

ELEMENT TOTAL STRESSES AND MAXIMUM STRESS INTENSITY

NOZZLE LOADS + DEADWEIGHT + EARTHQUAKE NO 1

BEAM	NODE	PRESSURE AXIAL	PRESSURE HOOP	PRESSURE RADIAL	TOTAL AXIAL	TOTAL SHEAR	TOTAL AXIAL	MAXIMUM INTENSITY
16	16	.0	.0	.0	.17892E+02	.69201E+02	-.17892E+02	.13955E+03
16	17	.0	.0	.0	.15892E+02	.69201E+02	-.15892E+02	.13931E+03
17	17	.0	.0	.0	.12817E+04	.10123E+04	-.12817E+04	.23962E+04
17	19	.0	.0	.0	.12707E+04	.10123E+04	-.12707E+04	.23903E+04
18	19	.0	.0	.0	.69174E+02	.16030E+02	-.69174E+02	.76242E+02
18	18	.0	.0	.0	.69174E+02	.16030E+02	-.69174E+02	.76242E+02
19	20	.0	.0	.0	.70536E+02	.15559E+02	-.70536E+02	.77095E+02
19	21	.0	.0	.0	.70536E+02	.15559E+02	-.70536E+02	.77095E+02
20	22	.0	.0	.0	.13276E+04	.10326E+04	-.13276E+04	.24551E+04
20	21	.0	.0	.0	.12496E+04	.10326E+04	-.12496E+04	.24139E+04
21	22	.0	.0	.0	.15196E+02	.70612E+02	-.15196E+02	.14204E+03
21	16	.0	.0	.0	.17196E+02	.70612E+02	-.17196E+02	.14227E+03
22	16	.0	.0	.0	.17262E+02	.63118E+02	-.17262E+02	.12741E+03
22	23	.0	.0	.0	.15262E+02	.63118E+02	-.15262E+02	.12716E+03
23	23	.0	.0	.0	.11095E+04	.92335E+03	-.11095E+04	.21544E+04
23	24	.0	.0	.0	.12465E+04	.92335E+03	-.12465E+04	.22240E+04
24	25	.0	.0	.0	.63086E+02	.15417E+02	-.63086E+02	.70218E+02
24	24	.0	.0	.0	.63086E+02	.15417E+02	-.63086E+02	.70218E+02
25	38	.33375E+04	.66750E+04	-.75000E+02	.46324E+04	.18344E+03	.20426E+04	.67663E+04
25	26	.33375E+04	.66750E+04	-.75000E+02	.47024E+04	.18344E+03	.19726E+04	.67669E+04
26	26	.33375E+04	.66750E+04	-.75000E+02	.43841E+04	.12039E+03	.22909E+04	.67563E+04
26	27	.33375E+04	.66750E+04	-.75000E+02	.43581E+04	.12039E+03	.23169E+04	.67562E+04
27	27	.33225E+04	.66450E+04	-.75000E+02	.37695E+04	.15553E+03	.28755E+04	.67284E+04
27	30	.33225E+04	.66450E+04	-.75000E+02	.39026E+04	.15553E+03	.27425E+04	.67285E+04
28	29	.11625E+04	.23250E+04	-.75000E+02	.41593E+04	.13760E+04	-.18343E+04	.49873E+04
28	28	.11625E+04	.23250E+04	-.75000E+02	.36873E+04	.13760E+04	-.13623E+04	.46165E+04
29	29	.0	.0	.0	.11044E+02	.11572E+02	-.11044E+02	.25644E+02
29	30	.0	.0	.0	.12044E+02	.11572E+02	-.12044E+02	.26090E+02
30	30	.0	.0	.0	.31270E+02	.25346E+01	-.31270E+02	.31674E+02
30	31	.0	.0	.0	.31270E+02	.25346E+01	-.31270E+02	.31674E+02

EARTHQUAKE 1 + NOZZLE LOADS + DEADWEIGHT

ELEMENT TOTAL STRESSES AND MAXIMUM STRESS INTENSITY

NOZZLE LOADS + DEADWEIGHT + EARTHQUAKE NO 1

BEAM	NODE	PRESSURE AXIAL	PRESSURE HOOP	PRESSURE RADIAL	TOTAL AXIAL	TOTAL SHEAR	TOTAL AXIAL	MAXIMUM INTENSITY
31	31	.0	.0	.0	.22902E+04	.24919E+03	-.22902E+04	.23438E+04
31	32	.0	.0	.0	.22912E+04	.24919E+03	-.22912E+04	.23448E+04
32	32	.0	.0	.0	.29782E+02	.25653E+01	-.29782E+02	.30221E+02
32	33	.0	.0	.0	.29782E+02	.25653E+01	-.29782E+02	.30221E+02
33	33	.0	.0	.0	.27876E+04	.19410E+03	-.27876E+04	.28145E+04
33	34	.0	.0	.0	.27936E+04	.19410E+03	-.27936E+04	.28204E+04
34	34	.33225E+04	.66450E+04	-.75000E+02	.35517E+04	.66404E+02	.30933E+04	.67214E+04
34	35	.33225E+04	.66450E+04	-.75000E+02	.34837E+04	.66404E+02	.31613E+04	.67214E+04
35	35	.33375E+04	.66750E+04	-.75000E+02	.34658E+04	.34475E+02	.31692E+04	.67504E+04
35	36	.33375E+04	.66750E+04	-.75000E+02	.33978E+04	.34475E+02	.32372E+04	.67504E+04
35	37	.16875E+04	.33750E+04	-.75000E+02	.24446E+04	.13463E+03	.93040E+03	.34691E+04
35	16	.16875E+04	.33750E+04	-.75000E+02	.23766E+04	.13463E+03	.10574E+04	.34667E+04
37	16	.16875E+04	.33750E+04	-.75000E+02	.24134E+04	.90681E+02	.96157E+03	.34585E+04
37	38	.16875E+04	.33750E+04	-.75000E+02	.23274E+04	.90681E+02	.10476E+04	.34578E+04
38	11	.0	.0	.0	.76774E+02	.67517E+01	-.76774E+02	.77952E+02
38	39	.0	.0	.0	.76774E+02	.67517E+01	-.76774E+02	.77952E+02
39	39	.0	.0	.0	.55567E+04	.53062E+03	-.55567E+04	.56571E+04
39	40	.0	.0	.0	.55817E+04	.53062E+03	-.55817E+04	.56817E+04
40	11	.0	.0	.0	.83748E+02	.14471E+02	-.83748E+02	.88609E+02
40	41	.0	.0	.0	.83748E+02	.14471E+02	-.83748E+02	.88609E+02
41	41	.0	.0	.0	.63621E+04	.92363E+03	-.63621E+04	.66249E+04
41	42	.0	.0	.0	.63401E+04	.92363E+03	-.63401E+04	.66095E+04

Appendix A.2

"HQR" OUTPUT

****** EIGENVALUE EXTRACTION HAS BEEN COMPLETED FOR 27 EIGENVALUES ******

NUMBER	EIGENVALUE (OMEGA**2)	FREQUENCY(E)	FREQUENCY(F)
1	.9276585 9E+05	.4847460057E+02	48.4746
2	.1005512 2E+06	.5046773346E+02	50.4677
3	.1527688 1E+06	.6220674513E+02	62.2067
4	.1531124 1E+06	.6227666134E+02	62.2767
5	.2198718 3E+06	.7462853750E+02	74.6285
6	.3834119 9E+06	.9854917177E+02	98.5492
7	.5231963 6E+06	.1151204551E+03	115.1205
8	.6052818 1E+06	.1238223216E+03	123.8223
9	.8784762 6E+06	.1491712557E+03	149.1713
10	.1240526 5E+07	.1772650681E+03	177.2651
11	.1263754 3E+07	.1784172172E+03	178.4172
12	.1662187 7E+07	.2051918749E+03	205.1919
13	.1662439 6E+07	.2052074392E+03	205.2074
14	.1699031 0E+07	.2073924480E+03	207.3924
15	.1999946 6E+07	.2250760833E+03	225.0761
16	.4036207 1E+07	.3197472740E+03	319.7473
17	.4711302 9E+07	.3454543327E+03	345.4543
18	.5023803 0E+07	.3567273697E+03	356.7274
19	.5827793 0E+07	.3842131197E+03	384.2131
20	.5975220 3E+07	.3890425396E+03	389.0425
21	.5977131 8E+07	.3891047654E+03	389.1048
22	.8367270 6E+07	.4603753251E+03	460.3753
23	.8757198 3E+07	.4709802803E+03	470.9803
24	.1003151 2E+08	.5040844811E+03	504.0845
25	.1391280 4E+08	.5936458794E+03	593.6459
26	.2647677 4E+08	.8189413991E+03	818.9414
27	.4325031 2E+08	.1046681994E+04	1046.6820

********** *** ENTERING PHASE 7 *** RUN DATE = 10/14/75 TIME OF DAY 17.51.30 *** **********

**** POST-PROCESS FOR ELEMENT LOADS LINK ****

MODE SHAPE (EIGENVECTOR)

MODE NUMBER 1 • FREQUENCY = 48.474601 • GENERALIZED WEIGHT = 12270.700

*MAXIMUM ROTATION IS AT NODE 1 *DOF = 4 VALUE = -.117683E-01

*MAXIMUM TRANSLATION IS AT NODE 1 *DOF = 2 VALUE = .100000E+01

NODE	********** TRANSLATIONS ********** X1	X2	X3	********** ROTATIONS (RADIANS) ********** X4	X5	X6
1	=1.000000000	1.000000000	.000000000	-.011768263	-.011768263	.001828604
2	-.644464218	.634577428	-.372525865	-.011374836	-.011374836	.001828604
3	-.677697064	.634577428	-.269469855	-.011374836	-.011374836	.001828604
4	-.634577428	.634577428	.000000000	-.011374836	-.011374836	.001828604
5	-.591257793	.634577428	.269469855	-.011374836	-.011374836	.001828604
6	-.574690638	.634577428	.372525865	-.011374836	-.011374836	.001828604
7	-.361307196	.361307196	.000000000	-.010511046	-.010511046	.001828604
8	-.220913870	.220913870	.000000000	-.009084803	-.009084803	.001828604
9	-.099977500	.099977500	-.000000000	-.007952114	-.007952114	.001828604
10	-.089865318	.089865318	-.000000000	-.007952114	-.007952114	.001828604
11	-.053421235	.053421235	.000000000	-.007952114	-.007952114	.001828604
12	.021352597	-.021352597	.000000000	-.006764658	-.006764658	.001671774
14	.000018633	-.000534137	-.000076427	.000001428	.000000042	.000000905
15	.002495511	-.006108798	-.007278965	-.000355869	-.000372862	.000196304
16	.007014269	-.007014269	.000000000	-.000372878	-.000372878	.000197760
17	.010693802	-.006108798	.007278965	-.000355869	-.000372862	.000195779
18	.000138418	-.000534137	.000076427	.000001428	.000000331	-.000000059
21	.000534137	-.000018633	.000076427	.000000042	.000001428	.000000905
22	.006108798	-.002495511	.007278965	-.000372862	-.000355869	.000196304
23	.006108798	-.010693802	-.007278965	-.000372862	-.000355869	.000185779
24	.000534137	-.000138418	-.000076427	.000000331	.000001428	-.000000059
26	.036287337	-.036287337	.000000000	.000007946	.000007946	.000094449
27	.008276154	-.008276154	.000000000	.000444102	.000444102	-.000009516
28	.000156020	-.001058642	-.021158681	.000454805	.000454805	-.000017675
29	.000256364	-.000960898	-.018128536	.000454805	.000454805	-.000017675
30	.000960631	-.000960631	.000000000	.000454805	.000454805	-.000017675
31	.000545543	-.000059812	.012593471	.000454793	.000454799	-.000018339
32	0.000000000	0.000000000	.013573563	0.000000000	0.000000000	0.000000000
33	.000059812	-.000545543	-.012593471	.000454799	.000454793	-.000018339
34	0.000000000	0.000000000	-.013573563	0.000000000	0.000000000	0.000000000
35	-.006173406	.006173406	.000000000	.000459437	.000459437	-.000017675
36	-.019980554	.019980554	.000000000	.000467431	.000467431	-.000017675
37	.024429794	-.024429794	.000000000	-.000772427	-.000772427	.000417117
38	.011897557	-.011897557	.000000000	-.000366070	-.000366070	.000190174
39	-.050518540	.004430096	-.220017765	-.007951688	-.007949304	.001838974
40	0.000000000	0.000000000	-.237148515	0.000000000	0.000000000	0.000000000
41	-.004430096	.050518540	.220017765	-.007949304	-.007951688	.001838974
42	0.000000000	0.000000000	.237148515	0.000000000	0.000000000	0.000000000

MODAL PARTICIPATION FACTOR (X1) = -6.1181022E-01 GEN.WT. TIMES MODAL PART. FACT. (X1) = -7.5073397E+03

MODAL PARTICIPATION FACTOR (X2) = 6.1181022E-01 GEN.WT. TIMES MODAL PART. FACT. (X2) = 7.5073397E+03

MODAL PARTICIPATION FACTOR (X3) = 5.7833d8E-13 GEN.WT. TIMES MODAL PART. FACT. (X3) = 7.0965617E-09

MODE SHAPE (EIGENVECTOR)

MODE NUMBER 2 , FREQUENCY = 50.467733 , GENERALIZED WEIGHT = 12001.937

*MAXIMUM ROTATION IS AT NODE 1 *DOF = 5 VALUE = .122074E-01

*MAXIMUM TRANSLATION IS AT NODE 1 *DOF = 1 VALUE = .100000E+01

	********** TRANSLATIONS **********			********** ROTATIONS (RADIANS) **********		
NODE	X1	X2	X3	X4	X5	X6
1	1.000000000	1.000000000	.000000000	-.012207433	.012207433	-.000000000
2	.619403938	.619403937	-.385827348	-.011780988	.011780988	-.000000000
3	.619403938	.619403937	-.279091599	-.011780988	.011780988	-.000000000
4	.619403938	.619403937	.000000000	-.011780988	.011780988	-.000000000
5	.619403938	.619403937	.279091599	-.011780988	.011780988	-.000000000
6	.619403938	.619403937	.385827348	-.011780988	.011780988	-.000000000
7	.335403207	.335403207	.000000000	-.010844704	.010844704	-.000000000
8	.189562863	.189562863	.000000000	-.009302761	.009302761	-.000000000
9	.017335810	.017335810	-.411739891	-.008086015	.008086015	-.000000000
10	.017335810	.017335810	-.322308564	-.008086015	.008086015	-.000000000
11	.017335810	.017335810	.000000000	-.008086015	.008086015	-.000000000
12	-.056720451	-.056720451	.000000000	-.006814365	.006814365	-.000000000
14	-.000090031	-.000612226	-.000053330	.000001573	-.000000215	-.000000553
15	-.007560613	-.007003567	-.005081398	-.000244417	.000260280	-.000006033
16	-.008041689	-.008041689	.000000000	-.000260291	.000260291	-.000000000
17	-.007560613	-.007003567	.005081398	-.000248417	.000260280	.000006033
18	-.000090031	-.000612226	.000053330	.000001573	-.000000215	.000000553
21	-.000612226	-.000090031	-.000053330	.000000215	-.000001573	.000000553
22	-.007003567	-.007560613	-.005081398	-.000260280	.000248417	.000006033
23	-.007003567	-.007560613	.005081398	-.000260280	.000248417	-.000006033
24	-.000612226	-.000090031	.000053330	.000000215	-.000001573	-.000000553
25	-.033520297	-.033520297	.000000000	.000021252	-.000021252	-.000000000
27	-.007381214	-.007381214	-.000000000	.000419018	-.000419018	.000000000
28	-.000207529	-.000207529	.000000000	.000429589	-.000429589	.000000000
29	-.000207529	-.000207529	.000000000	.000429589	-.000429589	.000000000
30	-.000207529	-.000207529	-.000000000	.000429589	-.000429589	.000000000
31	-.000186017	-.000055246	-.011895233	.000429577	-.000429583	-.000001833
32	0.000000000	0.000000000	-.012820985	0.000000000	0.000000000	0.000000000
33	-.000055246	-.000186017	-.011895233	.000429583	-.000429577	.000001833
34	0.000000000	0.000000000	-.012820985	0.000000000	0.000000000	0.000000000
35	.006249960	.006249960	-.000000000	.000434487	-.000434487	.000000000
36	.019401637	.019401637	-.000000000	.000442901	-.000442901	.000000000
37	-.031790938	-.031790938	.000000000	-.000603158	.000603158	-.000000000
38	-.011799769	-.011799769	.000000000	-.000263027	.000263027	-.000000000
39	.018219619	.005410937	.223837210	-.008083808	.008084931	.000179545
40	0.000000000	0.000000000	.241260236	0.000000000	0.000000000	0.000000000
41	.005410937	.018219619	.223837209	-.008084931	.008083808	-.000179545
42	0.000000000	0.000000000	.241260236	0.000000000	0.000000000	0.000000000

MODAL PARTICIPATION FACTOR (X1) = 5.7535386E-01 GEN.WT. TIMES MODAL PART. FACT. (X1) = 6.9053607E+03

MODAL PARTICIPATION FACTOR (X2) = 5.7535386E-01 GEN.WT. TIMES MODAL PART. FACT. (X2) = 6.9053607E+03

MODAL PARTICIPATION FACTOR (X3) = 1.3626081E-13 GEN.WT. TIMES MODAL PART. FACT. (X3) = 1.6353936E-09

MODE SHAPE (EIGENVECTOR)

MODE NUMBER 3 • FREQUENCY = 62.206745 • GENERALIZED WEIGHT = 2404.945

*MAXIMUM ROTATION IS AT NODE 36 *DOF = 5 VALUE = .143189E-01

*MAXIMUM TRANSLATION IS AT NODE 26 *DOF = 1 VALUE = .100000E+01

NODE	********** TRANSLATIONS ********** X1	X2	X3	********** ROTATIONS (RADIANS) ********** X4	X5	X6
1	.072289614	-.072289614	.000000000	.000891828	.000891828	.000058258
2	.041262614	-.043170555	.027673468	.000844991	.000844991	.000058258
3	.041790429	-.043170555	.020017846	.000844991	.000844991	.000058258
4	.043170555	-.043170555	.000000000	.000844991	.000844991	.000058258
5	.044550682	-.043170555	-.020017846	.000844991	.000844991	.000058258
6	.045074497	-.043170555	-.027673468	.000844991	.000844991	.000058258
7	.021967090	-.021967090	.000000000	.000742159	.000742159	.000058258
8	.010409555	-.010409555	.000000000	.000573341	.000573341	.000058258
9	-.003465487	.003465487	-.000000000	.000441245	.000441245	.000058258
10	-.003143321	.003143321	-.000000000	.000441245	.000441245	.000058258
11	-.001982244	.001982244	.000000000	.000441245	.000441245	.000058258
12	-.014731832	.014731832	.000000000	.000263161	.000263161	.000050837
14	.000221223	-.001467334	-.000513331	.000004486	.000000515	.000001282
15	.018491824	-.016766551	-.048869682	-.002389362	-.002503435	-.000003825
16	.019251546	-.019251546	.000000000	-.002503543	-.002503543	-.000018910
17	.017707903	-.016766551	.048869682	-.002389362	-.002503435	-.000032710
18	.000209769	-.001467334	.000513331	.000004486	.000000487	-.000001363
21	.001467334	-.000221223	.000513331	.000000515	.000004486	.000001282
22	.016766551	-.018491824	.048869682	-.002503435	-.002389362	-.000003825
23	.016766551	-.017707903	-.048869682	-.002503435	-.002389362	-.000032710
24	.001467334	-.000209769	-.000513331	.000000487	.000004486	-.000001363
26	1.000000000	-1.000000000	.000000000	-.000644736	-.000644736	-.000292862
27	.249427171	-.249427170	.000000000	.013200682	.013200682	-.000568551
28	.002866837	-.032939171	-.695623203	.013661100	.013661100	-.000590187
29	.006150373	-.029075435	-.544531439	.013661100	.013661100	-.000590187
30	.017913004	-.017913004	.000000000	.013661100	.013661100	-.000590187
31	.016056219	-.001355708	.378273290	.013660729	.013660915	-.000591075
32	0.000000000	0.000000000	.407712561	0.000000000	0.000000000	0.000000000
33	.001355708	-.016056219	-.378273290	.013660915	.013660729	-.000591075
34	0.000000000	0.000000000	-.407712561	0.000000000	0.000000000	0.000000000
35	-.174934468	.174934468	.000000000	.013902355	.013902355	-.000590187
36	-.632013246	.632013246	.000000000	.014318755	.014318755	-.000590187
37	-.012495689	.012495689	.000000000	-.001971694	-.001971694	-.000008530
38	.100279183	-.100279183	.000000000	-.003674015	-.003674015	-.000039025
39	-.001630354	.000147339	.012223621	.000441242	.000441326	.000058794
40	0.000000000	0.000000000	.013174678	0.000000000	0.000000000	0.000000000
41	-.000147339	.001630354	-.012223621	.000441326	.000441242	-.000058794
42	0.000000000	0.000000000	-.013174678	0.000000000	0.000000000	0.000000000

MODAL PARTICIPATION FACTOR (X1) = 4.567660E-01 GEN.WT. TIMES MODAL PART. FACT. (X1) = 1.099636E+04

MODAL PARTICIPATION FACTOR (X2) = -4.567660E-01 GEN.WT. TIMES MODAL PART. FACT. (X2) = -1.099636E+04

MODAL PARTICIPATION FACTOR (X3) = 5.005692E-12 GEN.WT. TIMES MODAL PART. FACT. (X3) = 1.205116 9E-07

MODE SHAPE (EIGENVECTOR)

MODE NUMBER 4 , FREQUENCY = 62.276661 , GENERALIZED WEIGHT = 24178.790

*MAXIMUM ROTATION IS AT NODE 36 *DOF = 4 VALUE = -.145669E-01

*MAXIMUM TRANSLATION IS AT NODE 26 *DOF = 2 VALUE = .100000E+01

NODE	********** TRANSLATIONS		**********	********** ROTATIONS (RADIANS)		**********
	X1	X2	X3	X4	X5	X6
1	.066816928	.066816928	.000000000	-.000810123	.000810123	.000000000
2	.040295017	.040295017	-.025110559	-.000766735	.000766735	.000000000
3	.040295017	.040295017	-.018163943	-.000766735	.000766735	.000000000
4	.040295017	.040295017	.000000000	-.000766735	.000766735	.000000000
5	.040295017	.040295017	.018163943	-.000766735	.000766735	.000000000
6	.040295017	.040295017	.025110559	-.000766735	.000766735	.000000000
7	.021009645	.021009645	.000000000	-.000671473	.000671473	.000000000
8	.010413456	.010413456	.000000000	-.000514919	.000514919	.000000000
9	-.000907300	-.000907300	-.014965732	-.000392100	.000392100	.000000000
10	-.000907300	-.000907300	-.015529106	-.000392100	.000392100	.000000000
11	-.000907300	-.000907300	.000000000	-.000392100	.000392100	.000000000
12	-.013217307	-.013217307	.000000000	-.000223675	.000223675	.000000000
14	.000216960	.001477422	.000512639	-.000004509	.000000505	.000001332
15	.018224529	.016882030	.048803883	.002386144	-.002500063	.000014542
16	.019384143	.019384143	-.000000000	.002500172	-.002500172	.000000000
17	.018224529	.016882030	-.048803883	.002386144	-.002500063	-.000014542
18	.000216980	.001477422	-.000512639	-.000004509	.000000505	-.000001332
21	.001477422	.000216960	.000512639	-.000000505	.000004509	-.000001332
22	.016882030	.018224529	.048803883	.002500063	-.002386144	-.000014542
23	.016882030	.018224529	-.048803883	.002500063	-.002386144	.000014542
24	.001477422	.000216980	-.000512639	-.000000505	.000004509	.000001332
26	1.000000000	1.000000000	-.000000000	.000571128	-.000571128	.000000000
27	.239251418	.239251418	.000000000	-.013406696	.013406696	.000000000
28	.005459122	.005459122	.000000000	-.013880227	.013880227	.000000000
29	.005459122	.005459122	.000000000	-.013880227	.013880227	.000000000
30	.005459122	.005459122	.000000000	-.013880227	.013880227	.000000000
31	.004893253	.001453270	.384340890	-.013879851	.013880039	.000048218
32	0.000000000	0.000000000	.414252374	0.000000000	0.000000000	0.000000000
33	.001453270	.004893253	.384340890	-.013880039	.013879851	-.000048218
34	0.000000000	0.000000000	.414252374	0.000000000	0.000000000	0.000000000
35	-.211728339	-.211728339	.000000000	-.014132896	.014132896	.000000000
36	-.657235854	-.657235854	.000000000	-.014566888	.014566888	.000000000
37	-.012013893	-.012013893	-.000000000	.001968674	-.001968674	.000000000
38	.100518161	.100518161	-.000000000	.003669686	-.003669686	.000000000
39	-.000683140	-.000202894	.010859539	-.000392164	.000392131	-.000006732
40	0.000000000	0.000000000	.011704582	0.000000000	0.000000000	0.000000000
41	-.000202894	-.000683140	.010859539	-.000392131	.000392164	.000006732
42	0.000000000	0.000000000	.011704582	0.000000000	0.000000000	0.000000000

MODAL PARTICIPATION FACTOR (X1) = 4.4613880E-01 GEN.WT. TIMES MODAL PART. FACT. (X1) = 1.0787096E+04

MODAL PARTICIPATION FACTOR (X2) = 4.4613860E-01 GEN.WT. TIMES MODAL PART. FACT. (X2) = 1.0787096E+04

MODAL PARTICIPATION FACTOR (X3) = 3.1173065E-14 GEN.WT. TIMES MODAL PART. FACT. (X3) = 7.5374197E-10

MODE SHAPE (EIGENVECTOR)

MODE NUMBER 5 • FREQUENCY = 74.628537 • GENERALIZED WEIGHT = 22900.282

*MAXIMUM ROTATION IS AT NODE 22 *DOF = 5 VALUE = .312944E-03

*MAXIMUM TRANSLATION IS AT NODE 36 *DOF = 3 VALUE = .100000E+01

NODE	TRANSLATIONS X1	X2	X3	ROTATIONS (RADIANS) X4	X5	X6
1	.000000000	-.000000000	.482125480	.000000000	-.000000000	-.000000000
2	.000000000	-.000000000	.473882619	.000000000	-.000000000	-.000000000
3	.000000000	-.000000000	.473882619	.000000000	-.000000000	-.000000000
4	.000000000	-.000000000	.473882619	.000000000	-.000000000	-.000000000
5	.000000000	-.000000000	.473882619	.000000000	-.000000000	-.000000000
6	.000000000	-.000000000	.473882619	.000000000	-.000000000	-.000000000
7	.000000000	-.000000000	.467390454	.000000000	-.000000000	-.000000000
8	.000000000	-.000000000	.452243694	.000000000	.000000000	-.000000000
9	.000000000	-.000000000	.433475588	.000000000	.000000000	-.000000000
10	.000000000	-.000000000	.433475588	.000000000	.000000000	-.000000000
11	.000000000	-.000000000	.433475588	.000000000	.000000000	-.000000000
12	.000000000	-.000000000	.414707481	.000000000	.000000000	-.000000000
14	-.000000000	.000050735	.001775087	-.000021695	-.000000000	-.000000000
15	-.000000000	.000007089	.209752160	-.000312944	.000000000	-.000000000
16	-.000000000	.000000000	.234627512	.000000000	.000000000	-.000000000
17	-.000000000	-.000007089	.209752160	.000312944	.000000000	-.000000000
18	-.000000000	-.000050735	.001775087	.000021695	-.000000000	.000000000
21	.000050735	.000000000	.001775087	-.000000000	.000021695	-.000000000
22	.000007089	.000000000	.209752160	.000000000	.000312944	-.000000000
23	-.000007089	.000000000	.209752160	.000000000	-.000312944	-.000000000
24	-.000050735	.000000000	.001775087	-.000000000	-.000021695	.000000000
26	-.000000000	.000000000	.669769993	.000000000	.000000000	.000000000
27	-.000000000	.000000000	.951671972	-.000000000	-.000000000	.000000000
28	-.000000000	.000000000	.967490830	-.000000000	-.000000000	.000000000
29	-.000000000	.000000000	.967490830	-.000000000	-.000000000	.000000000
30	-.000000000	.000000000	.967490830	-.000000000	-.000000000	.000000000
31	-.000000000	.000000000	.967490830	-.000000000	-.000000000	.000000000
32	0.000000000	0.000000000	.967490830	0.000000000	0.000000000	0.000000000
33	-.000000000	.000000000	.967490830	-.000000000	-.000000000	.000000000
34	0.000000000	0.000000000	.967490830	0.000000000	0.000000000	0.000000000
35	.000000000	-.000000000	.983309689	-.000000000	-.000000000	.000000000
36	.000000000	-.000000000	1.000000000	-.000000000	-.000000000	.000000000
37	.000000000	-.000000000	.261948547	.000000000	.000000000	-.000000000
38	-.000000000	.000000000	.267257574	.000000000	.000000000	-.000000000
39	.000000000	-.000000000	.433475588	.000000000	.000000000	-.000000000
40	0.000000000	0.000000000	.433475588	0.000000000	0.000000000	0.000000000
41	.000000000	-.000000000	.433475583	.000000000	.000000000	-.000000000
42	0.000000000	0.000000000	.433475588	0.000000000	0.000000000	0.000000000

MODAL PARTICIPATION FACTOR (X1) = -1.5341782E-12 GEN.WT. TIMES MODAL PART. FACT. (X1) = -3.5133113E-08

MODAL PARTICIPATION FACTOR (X2) = 1.5134753E-12 GEN.WT. TIMES MODAL PART. FACT. (X2) = 3.4659011E-08

MODAL PARTICIPATION FACTOR (X3) = 1.4833630E+00 GEN.WT. TIMES MODAL PART. FACT. (X3) = 3.3969432E+04

MODE SHAPE (EIGENVECTOR)

MODE NUMBER 6 , FREQUENCY = 98.549172 , GENERALIZED WEIGHT = 25786.370

*MAXIMUM ROTATION IS AT NODE 15 *DOF = 4 VALUE = -.193413E-03

*MAXIMUM TRANSLATION IS AT NODE 1 *DOF = 3 VALUE = .100000E+01

NODE	********** TRANSLATIONS ********** X1	X2	X3	********** ROTATIONS (RADIANS) ********** X4	X5	X6
1	-.000000000	-.000000000	1.000000000	-.000000000	.000000000	.000000000
2	-.000000000	-.000000000	.970186429	-.000000000	.000000000	.000000000
3	-.000000000	-.000000000	.970186429	-.000000000	.000000000	.000000000
4	-.000000000	-.000000000	.970186429	-.000000000	.000000000	.000000000
5	-.000000000	-.000000000	.970186429	-.000000000	.000000000	.000000000
6	-.000000000	-.000000000	.970186429	-.000000000	.000000000	.000000000
7	-.000000000	-.000000000	.946704944	.000000000	.000000000	.000000000
8	-.000000000	.000000000	.892606942	-.000000000	.000000000	.000000000
9	-.000000000	.000000000	.826175497	.000000000	.000000000	.000000000
10	-.000000000	.000000000	.826175497	.000000000	.000000000	.000000000
11	-.000000000	.000000000	.826175497	.000000000	.000000000	.000000000
12	.000000000	-.000000000	.759742052	-.000000000	.000000000	.000000000
14	-.000000000	.000031356	.001097080	-.000013408	-.000000000	-.000000000
15	-.000000000	.000004381	.129635882	-.000193413	-.000000000	-.000000000
16	-.000000000	.000000000	.145009922	-.000000000	-.000000000	-.000000000
17	-.000000000	-.000004381	.129635882	.000193413	-.000000000	-.000000000
18	-.000000000	-.000031356	.001097080	.000013408	-.000000000	.000000000
21	.000031356	.000000000	.001097080	-.000000000	.000013408	-.000000000
22	.000004381	.000000000	.129635882	-.000000000	.000193413	-.000000000
23	-.000004381	.000000000	.129635882	-.000000000	-.000193413	.000000000
24	-.000031356	.000000000	.001097080	-.000000000	-.000013408	.000000000
26	.000000000	-.000000000	-.291862752	-.000000000	-.000000000	-.000000000
27	.000000000	-.000000000	-.612782858	.000000000	.000000000	-.000000000
28	-.000000000	-.000000000	-.631078449	.000000000	.000000000	-.000000000
29	-.000000000	-.000000000	-.631078449	.000000000	.000000000	-.000000000
30	.000000000	-.000000000	-.631078449	.000000000	.000000000	-.000000000
31	.000000000	-.000000000	-.631078449	.000000000	.000000000	-.000000000
32	0.000000000	0.000000000	-.631078449	.000000000	.000000000	-.000000000
33	-.000000000	-.000000000	-.631078449	0.000000000	0.000000000	0.000000000
34	0.000000000	0.000000000	-.631078449	.000000000	.000000000	-.000000000
35	-.000000000	.000000000	-.648374040	0.000000000	0.000000000	0.000000000
36	-.000000000	.000000000	-.668840320	.000000000	.000000000	-.000000000
37	-.000000000	.000000000	.239274700	.000000000	.000000000	-.000000000
38	.000000000	-.000000000	.112250118	-.000000000	-.000000000	.000000000
39	-.000000000	-.000000000	.826175497	-.000000000	-.000000000	-.000000000
40	0.000000000	0.000000000	.826175497	.000000000	.000000000	.000000000
41	-.000000000	.000000000	.826175497	0.000000000	0.000000000	0.000000000
42	0.000000000	0.000000000	.826175497	.000000000	.000000000	.000000000
				0.000000000	0.000000000	0.000000000

MODAL PARTICIPATION FACTOR (X1) = 2.3030632E-13 GEN.WT. TIMES MODAL PART. FACT. (X1) = 5.9387639E-09

MODAL PARTICIPATION FACTOR (X2) = -3.3955277E-13 GEN.WT. TIMES MODAL PART. FACT. (X2) = -8.7556334E-09

MODAL PARTICIPATION FACTOR (X3) = 4.6689605E-01 GEN.WT. TIMES MODAL PART. FACT. (X3) = 1.2039570E+04

Appendix A.3

"STATIC" OUTPUT

B E G I N INPUT LOAD CASE NO. 1 TITLE(DEADWEIGHT LOAD CASE

NODAL POINT APPLIED FORCES FOR LOAD CASE NO. 1

NODE	X1	X2	X3	X4	X5	X6
1	-0.	-0.	-5.131000E+03	-0.	-0.	-0.
7	-0.	-0.	-6.108000E+03	-0.	-0.	-0.
8	-0.	-0.	-3.822000E+03	-0.	-0.	-0.
12	-0.	-0.	-9.792000E+03	-0.	-0.	-0.
16	-0.	-0.	-1.225200E+04	-0.	-0.	-0.
26	-0.	-0.	-1.059300E+04	-0.	-0.	-0.
27	-0.	-0.	-7.248000E+03	-0.	-0.	-0.
35	-0.	-0.	-4.007000E+03	-0.	-0.	-0.
36	-0.	-0.	-2.008000E+03	-0.	-0.	-0.

NODAL POINT APPLIED LOADS AND/OR DISPLACEMENTS FINAL SUMMARY FOR LOAD CASE NO. 1

NODE	X1	X2	X3	X4	X5	X6

NOTE IF A FINAL SUMMARY OF APPLIED NODAL LOADS AND GENERATED LOADS IS DESIRED AT THIS POINT,
CODE A 1 IN COLUMN 20 OF THE STATIC CARD.

FORCE AND MOMENT SUMMATION
ABOUT AXES PARALLEL TO SYSTEM AXES
WITH ORIGIN AT POINT (0.0.0)
SUMMATION INCLUDES LOADS APPLIED TO RESTRAINED DOF.

FX1 = 0.
FX2 = 0.
FX3 = -.60999000000E+05
MX1 = 0.
MX2 = 0.
MX3 = 0.

DEADWEIGHT LOAD CASE

BEAM ELEMENT LOADS FOR OUTPUT VECTOR 1

BEAM NO	.LOAD-LOCATION. .NODE--PERCENT.	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3	
1	1 JA 0.0	5.13100E+03	-1.28931E-13	1.89514E-11	2.48506E-13	5.54025E-09	-5.38904E-12	PIPEG
1	4 JB 100.0	-5.13100E+03	1.28931E-13	-1.89514E-11	-2.48506E-13	-6.07562E-09	1.74673E-12	
2	3 JA 0.0	1.76672E-11	-2.89821E-11	-6.27414E-13	-4.45581E-13	-1.11372E-11	8.51986E-10	PIPEG
2	2 JB 100.0	-1.76672E-11	2.89821E-11	6.27414E-13	4.45581E-13	1.68216E-11	-1.61399E-09	
3	3 JA 0.0	7.88676E-13	-4.50417E-09	-1.50149E-12	3.78424E-11	1.49954E-10	-8.99911E-08	BEAMG
3	4 JB 100.0	-7.88676E-13	4.50417E-09	1.50149E-12	-3.78424E-11	-1.14384E-10	-3.72764E-08	
4	4 JA 0.0	1.33680E-10	-1.68749E-09	-3.34743E-12	-1.88865E-11	-7.43143E-12	7.20169E-08	BEAMG
4	5 JB 100.0	-1.33680E-10	1.68749E-09	3.34743E-12	1.88865E-11	8.67320E-11	-1.01600E-07	
5	5 JA 0.0	5.22584E-11	2.77263E-11	-1.15369E-12	3.54840E-12	-6.60378E-12	2.50833E-11	PIPEG
5	6 JB 100.0	-5.22584E-11	-2.77263E-11	1.15369E-12	-3.54840E-12	1.70612E-11	1.99177E-10	
6	4 JA 0.0	5.13100E+03	3.38327E-11	-1.35543E-10	9.92492E-11	-2.84972E-08	-1.44584E-09	PIPEG
6	7 JB 100.0	-5.13100E+03	-3.38327E-11	1.35543E-10	-9.92492E-11	3.15131E-08	2.19862E-09	
7	7 JA 0.0	1.12390E+04	-2.91581E-11	-1.17768E-10	6.50710E-11	-2.41580E-08	6.53934E-09	PIPEG
7	8 JB 100.0	-1.12390E+04	2.91581E-11	1.17768E-10	-6.50710E-11	2.52909E-08	-6.81984E-09	
8	8 JA 0.0	1.50610E+04	-1.87055E-11	-1.05366E-10	6.39042E-11	-3.44169E-08	-3.92603E-09	PIPEG
8	11 JB 100.0	-1.50610E+04	1.87055E-11	1.05366E-10	-6.39042E-11	3.58921E-08	3.66415E-09	
9	10 JA 0.0	-8.73308E-13	-4.90085E-10	6.41944E-12	3.20748E-10	-4.30168E-11	2.60274E-09	PIPEG
9	9 JB 100.0	8.73308E-13	4.90085E-10	-6.41944E-12	-3.20748E-10	-7.18713E-12	-5.71302E-09	
10	10 JA 0.0	2.29694E-10	4.85248E-09	3.26978E-11	2.57145E-08	-3.04730E-10	-3.08019E-08	BEAMG
10	11 JB 100.0	-2.29694E-10	-4.85248E-09	-3.26978E-11	-2.57145E-08	-6.16865E-10	1.76260E-07	
11	11 JA 0.0	1.50610E+04	-6.93373E-10	1.90322E-09	-2.16727E-09	-1.74384E-07	-6.24087E-08	PIPEG
11	12 JB 100.0	-1.50610E+04	6.93373E-10	-1.90322E-09	2.15727E-09	1.47749E-07	5.27015E-08	
12	12 JA 0.0	2.48530E+04	-6.93331E-10	1.90308E-09	-2.16727E-09	-1.47740E-07	-5.27003E-08	PIPEG
12	37 JB 100.0	-2.48530E+04	6.93331E-10	-1.90308E-09	2.16727E-09	5.92466E-08	2.04604E-08	
13	13 JA 0.0	1.52498E+04	1.36964E+01	5.26039E-11	1.59517E-10	-2.68342E-10	-7.45180E+04	BEAMG
13	14 JB 100.0	-1.52498E+04	-1.36964E+01	-5.26039E-11	-1.59517E-10	2.16628E-12	7.45873E+04	
14	15 JA 0.0	1.36964E+01	1.52498E+04	5.60269E-11	-1.23175E-12	-3.55797E-10	7.02853E+04	BEAMG
14	14 JB 100.0	-1.36964E+01	-1.52498E+04	-5.60269E-11	1.23175E-12	-1.76458E-10	7.45873E+04	
15	15 JA 0.0	1.36964E+01	-1.52498E+04	5.53906E-11	-5.73481E-09	3.57587E-10	7.02853E+04	BEAMG
15	16 JB 100.0	-1.36964E+01	1.52498E+04	-5.53906E-11	5.73481E-09	-1.60388E-09	-4.13405E+05	
16	16 JA 0.0	1.36964E+01	1.52498E+04	-3.76973E-11	9.13642E-10	9.10178E-10	4.13405E+05	BEAMG
16	17 JB 100.0	-1.36964E+01	-1.52498E+04	3.76973E-11	-9.13642E-10	-6.19881E-11	-7.02853E+04	
17	17 JA 0.0	1.36964E+01	1.52498E+04	-3.70139E-11	1.44107E-12	6.74558E-11	7.02853E+04	BEAMG
17	18 JB 100.0	-1.36964E+01	-1.52498E+04	3.70139E-11	-1.44107E-12	2.84176E-10	7.45873E+04	
18	19 JA 0.0	1.52498E+04	1.36964E+01	-3.36395E-11	-2.66985E-10	1.72267E-10	-7.45180E+04	BEAMG
18	18 JB 100.0	-1.52498E+04	-1.36964E+01	3.36395E-11	2.66985E-10	-2.05115E-12	7.45873E+04	
19	20 JA 0.0	1.52498E+04	1.36964E+01	-4.75815E-11	-3.36306E-10	2.46840E-10	-7.45180E+04	BEAMG
19	21 JB 100.0	-1.52498E+04	-1.36964E+01	4.75815E-11	3.36306E-10	-6.07742E-12	7.45873E+04	

17	17 JA	0.0	1.36964E+01	1.52498E+04	-3.70139E-11	2.44107E-12	6.74558E-11	7.02853E+04	BEAMG		
	18 JB	100.0	-1.36964E+01	-1.52498E+04	3.70139E-11	-1.44107E-12	2.84176E-10	7.45873E+04			
18	19 JA	0.0	1.52498E+04	1.36964E+01	-3.26394E-11	-2.66993E-11	1.72267E-11	-7.45181E+04	BEAMG		
	19 JB	100.0	-1.52498E+04	-1.36964E+01	3.26394E-11	2.66993E-11	-2.13E-12	7.45873E+04			
19	20 JA	0.0	1.52498E+04	1.36964E+01	-4.75815E-11	-3.36300E-10	2.46840E-10	-7.45180E+04	BEAMG		
	21 JB	100.0	-1.52498E+04	-1.36964E+01	4.75815E-11	3.36300E-10	-6.07742E-12	7.45873E+04			
20	22 JA	0.0	1.36964E+01	1.52498E+04	-4.75177E-11	6.08723E-12	1.15236E-10	7.02853E+04	BEAMG		
	21 JB	100.0	-1.36964E+01	-1.52498E+04	4.75177E-11	-6.08723E-12	3.36181E-10	7.45873E+04			
21	22 JA	0.0	1.36964E+01	-1.52498E+04	-5.83530E-11	-1.36168E-08	-1.47818E-12	7.02853E+04	BEAMG		
	16 JB	100.0	-1.36964E+01	1.52498E+04	5.83530E-11	1.36168E-08	1.31442E-09	-4.13405E+05			
22	16 JA	0.0	1.36964E+01	1.52498E+04	7.62975E-11	1.35574E-08	-2.01427E-09	4.13405E+05	BEAMG		
	23 JB	100.0	-1.36964E+01	-1.52498E+04	-7.62975E-11	-1.35574E-08	2.97576E-10	-7.02853E+04			
23	23 JA	0.0	1.36964E+01	1.52498E+04	6.65137E-11	-6.08430E-12	-4.03451E-10	7.02853E+04	BEAMG		
	24 JB	100.0	-1.36964E+01	-1.52498E+04	-6.65137E-11	6.08430E-12	-2.28429E-10	7.45873E+04			
24	25 JA	0.0	1.52498E+04	1.36964E+01	6.65746E-11	2.28672E-10	-3.42942E-10	-7.45180E+04	BEAMG		
	24 JB	100.0	-1.52498E+04	-1.36964E+01	-6.65746E-11	-2.28672E-10	6.07471E-12	7.45873E+04			
25	38 JA	0.0	-2.38940E+09	-3.82921E-11	9.72702E-10	-7.83951E-10	-2.70188E-08	-4.35391E-10	PIPEG		
	26 JB	100.0	2.38940E+09	3.82921E-11	-9.72702E-10	7.83951E-10	-3.93097E-08	-2.17575E-09			
26	26 JA	0.0	-1.33010E+09	-2.08608E-11	8.60882E-10	-7.31066E-10	3.97086E-08	2.10303E-09	PIPEG		
	27 JB	100.0	1.33010E+09	2.08608E-11	-8.60882E-10	7.31066E-10	-1.03466E-07	-3.64946E-09			
27	27 JA	0.0	-6.01500E+09	-2.38353E-11	8.75131E-10	-7.24234E-10	9.44396E-08	6.71194E-10	PIPEG		
	30 JB	100.0	6.01500E+09	2.38353E-11	-8.75131E-10	7.24234E-10	-1.06691E-07	-1.00489E-09			
28	29 JA	0.0	-4.41245E-11	-1.37356E-09	4.69226E-12	-1.43861E-09	-2.25073E-11	2.27471E-10	PIPEG		
	28 JB	100.0	4.41245E-11	1.37356E-09	-4.69226E-12	1.43861E-09	-1.41891E-11	-1.01635E-08			
29	29 JA	0.0	-4.67620E-11	-5.31978E-09	-8.21542E-13	8.10107E-08	-7.41878E-11	-5.53148E-08	BEAMG		
	30 JB	100.0	4.67620E-11	5.31978E-09	8.21542E-13	-8.10107E-08	9.73432E-11	-1.04694E-07			
30	30 JA	0.0	-3.39218E-10	-8.31307E-09	3.37374E-10	-6.41139E-08	-1.01870E-08	7.90805E-10	BEAMG		
	31 JB	100.0	3.39218E-10	8.31307E-09	-3.37374E-10	6.41139E-08	8.45146E-10	-2.55086E-07			
31	31 JA	0.0	-2.85308E-10	-1.30967E-10	3.32754E-10	5.22773E-11	-5.00391E-10	-2.61934E-10	BEAMG		
	32 JB	100.0	2.85308E-10	1.30967E-10	-3.32754E-10	-5.22773E-11	-9.33780E-10	-2.61934E-10			
32	30 JA	0.0	5.70242E-10	-1.78759E-08	-3.29406E-10	1.47724E-08	9.33927E-09	-1.98307E-07	BEAMG		
	33 JB	100.0	-5.70242E-10	1.78759E-08	3.29406E-10	-1.47724E-08	-2.18008E-10	-2.70281E-07			
33	33 JA	0.0	6.01510E-10	0.	-3.06775E-10	-2.02473E-12	8.42080E-10	-5.82077E-11	BEAMG		
	34 JB	100.0	-6.01510E-10	0.	3.06775E-10	2.02473E-12	4.80121E-10	2.91038E-11			
34	30 JA	0.0	-6.01500E+09	-2.89513E-24	1.72054E-22	0.	-6.77626E-21	0.	PIPEG		
	35 JB	100.0	6.01500E+09	2.89513E-24	-1.72054E-22	0.	1.35525E-20	-2.11758E-22			
35	35 JA	0.0	-2.00800E+09	-1.65436E-24	7.94093E-23	2.64698E-23	-8.47033E-22	5.29396E-23	PIPEG		
	36 JB	100.0	2.00800E+09	1.65436E-24	-7.94093E-23	-2.64698E-23	0.	-5.29396E-23			
36	37 JA	0.0	2.48530E+04	-7.13971E-10	1.91679E-09	-2.16606E-09	-5.63757E-08	-1.32578E-08	PIPEG		
	16 JB	100.0	-2.48530E+04	7.13971E-10	-1.91679E-09	2.16606E-09	2.41353E-08	1.24881E-09			
37	16 JA	0.0	-2.36940E+09	-3.31750E-11	1.00646E-09	-7.73171E-10	-3.86366E-08	-9.50976E-10	PIPEG		
	32 JB	100.0	2.36940E+09	3.31750E-11	-1.00646E-09	7.73171E-10	2.73844E-08	5.80079E-10			
38	11 JA	0.0	2.91038E-10	-2.93091E-09	-1.16803E-09	-7.65184E-08	3.09821E-08	-4.62259E-08	BEAMG		
	39 JB	100.0	-2.91038E-10	2.93091E-09	1.16803E-09	7.65184E-08	1.36342E-09	-1.77458E-08			
39	39 JA	0.0	1.32153E-10	-8.73115E-11	-1.07821E-09	5.21648E-11	2.00019E-09	-2.32831E-10	BEAMG		
	40 JB	100.0	-1.32153E-10	8.73115E-11	1.07821E-09	-5.21648E-11	2.64689E-09	-2.03727E-10			
40	11 JA	0.0	-9.31323E-10	-9.08657E-09	9.91317E-10	-2.73897E-08	-2.94610E-08	-1.50118E-08	BEAMG		
	41 JB	100.0	9.31323E-10	9.08657E-09	-9.91317E-10	2.73897E-08	2.00896E-09	-2.14843E-07			
41	41 JA	0.0	-1.18473E-09	2.91038E-11	9.47173E-10	-1.07321E-11	-2.25558E-09	0.	BEAMG		

A.3-3

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
39	40	JA	0.0	1.[illegible]E-10	-8.73119E-11	-1.07[illegible]E-09	[illegible]E-11	[illegible]E-09	[illegible]E-10	BEAMG
	40	JB	100.0	-1.32159E-10	8.73119E-11	1.07[illegible]E-09	-1.21[illegible]E-11	2.[illegible]E-09	-2.03727E-10	
40	11	JA	0.0	-9.31323E-10	-9.08657E-09	9.91317E-10	-2.73897E-08	-2.94610E-08	-1.50118E-08	BEAMG
	41	JB	100.0	9.31323E-10	9.08657E-09	-9.91317E-10	2.73897E-08	2.00896E-09	-2.14843E-07	
41	41	JA	0.0	-1.10473E-09	2.91038E-11	9.47173E-10	-1.67321E-11	-2.25558E-09	0.	BEAMG
	42	JB	100.0	1.10473E-09	-2.91038E-11	-9.47173E-10	1.67321E-11	-1.82674E-09	5.82077E-11	

DEAD+EIGHT LOAD CASE

MAXIMUM LOAD SUMMARY FOR BEAM ELEMENT LOADS FOR OUTPUT VECTOR 1

	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3
MAXIMUM BEAM LOADS =	2.36940E+04	1.52498E+04	1.91679E-09	8.10107E-08	1.47739E-07	4.13405E+05
BEAM NOS. =	37.	10.	36.	29.	11.	16.
MINIMUM BEAM LOADS =	-2.48530E+04	-1.52498E+04	-1.91679E-09	-8.10107E-08	-1.74384E-07	-4.13405E+05
BEAM NOS. =	36.	10.	36.	29.	11.	15.

DEADWEIGHT LOAD CASE

BEAM END LOADS IN GLOBAL SYSTEM FOR OUTPUT VECTOR 1

BEAM	--NODES--		FX1	FX2	FX3	MX1	MX2	MX3
1	JA	1	-.129E-12	-.190E-10	-.513E+04	.554E-08	.539E-11	-.249E-12
	JB	4	.129E-12	.190E-10	.513E+04	-.608E-08	-.175E-11	.249E-12
2	JA	3	.627E-12	.177E-10	.290E-10	-.352E-09	-.446E-12	.111E-10
	JB	2	-.627E-12	-.177E-10	-.290E-10	.161E-08	.446E-12	-.168E-10
3	JA	3	-.150E-11	-.789E-12	.450E-08	-.900E-07	-.378E-10	-.150E-09
	JB	4	.150E-11	.789E-12	-.450E-08	-.373E-07	.378E-10	.114E-09
4	JA	4	-.335E-11	-.134E-09	.169E-08	.720E-07	.189E-10	.743E-11
	JB	5	.335E-11	.134E-09	-.169E-08	-.102E-06	-.189E-10	-.867E-10
5	JA	5	-.115E-11	-.523E-10	-.277E-10	.251E-10	-.355E-11	.661E-11
	JB	6	.115E-11	.523E-10	.277E-10	.198E-09	.355E-11	-.171E-10
6	JA	4	.336E-10	.136E-09	-.513E+04	-.285E-07	.145E-08	-.992E-10
	JB	7	-.336E-10	-.136E-09	.513E+04	.315E-07	-.220E-08	.992E-10
7	JA	7	-.292E-10	.118E-09	-.112E+05	-.242E-07	-.654E-08	-.651E-10
	JB	8	.292E-10	-.118E-09	.112E+05	.253E-07	.682E-08	.651E-10
8	JA	8	-.187E-10	.105E-09	-.151E+05	-.344E-07	.393E-08	-.639E-10
	JB	11	.187E-10	-.105E-09	.151E+05	.359E-07	-.366E-08	.639E-10
9	JA	10	-.516E-11	.392E-11	.490E-09	-.161E-08	.207E-08	.430E-10
	JB	9	.516E-11	-.392E-11	-.490E-09	.381E-08	-.427E-08	.719E-11
10	JA	10	-.139E-09	-.146E-09	-.485E-08	-.400E-07	.360E-08	.305E-09
	JB	11	.139E-09	.146E-09	.485E-08	.143E-06	-.106E-06	.617E-09
11	JA	11	-.693E-09	-.190E-08	-.151E+05	-.174E-06	.624E-07	.217E-08
	JB	12	.693E-09	.190E-08	.151E+05	.148E-06	-.527E-07	-.217E-08
12	JA	12	-.693E-09	-.190E-08	-.249E+05	-.148E-06	.527E-07	.217E-08
	JB	37	.693E-09	.190E-08	.249E+05	.592E-07	-.205E-07	-.217E-08
13	JA	13	.526E-10	-.137E+02	.152E+05	-.745E+05	.268E-09	.160E-09
	JB	14	-.526E-10	.137E+02	-.152E+05	.746E+05	-.217E-11	-.160E-09
14	JA	15	-.560E-10	.137E+02	-.152E+05	-.703E+05	-.123E-11	.356E-09
	JB	14	.560E-10	-.137E+02	.152E+05	-.746E+05	.123E-11	.176E-09
15	JA	15	.554E-10	-.137E+02	.152E+05	.703E+05	.573E-08	-.358E-09
	JB	16	-.554E-10	.137E+02	-.152E+05	-.413E+06	-.573E-08	.160E-08
16	JA	16	-.377E-10	-.137E+02	-.152E+05	.413E+06	-.914E-09	-.910E-09
	JB	17	.377E-10	.137E+02	.152E+05	-.703E+05	.914E-09	.620E-10
17	JA	17	-.370E-10	-.137E+02	-.152E+05	.703E+05	-.144E-11	-.675E-10
	JB	18	.370E-10	.137E+02	.152E+05	.746E+05	.144E-11	-.284E-09
18	JA	19	.336E-10	.137E+02	.152E+05	.745E+05	.172E-09	-.267E-09
	JB	18	-.336E-10	-.137E+02	-.152E+05	-.746E+05	-.205E-11	.267E-09
19	JA	20	-.137E+02	.476E-10	.152E+05	-.247E-09	.745E+05	-.336E-09
	JB	21	.137E+02	-.476E-10	-.152E+05	.608E-11	-.746E+05	.336E-09
20	JA	22	.137E+02	-.475E-10	-.152E+05	.609E-11	.703E+05	-.115E-09

	JB	17	.370E-10	.137E+02	.152E+05	.746E+05	.144E-11	-.284E-09
	JA	18	.336E-10	.137E+02	.152E+05	-.745E+05	.172E-09	-.267E-09
	JB	18	-.336E-10	-.137E+02	-.152E+05	-.746E+05	-.205E-11	.267E-09
19	JA	20	-.137E+02	.476E-10	.152E+05	-.247E-09	.745E+05	-.336E-09
	JB	21	.137E+02	-.476E-10	-.152E+05	.608E-11	-.746E+05	.336E-09
20	JA	22	.137E+02	-.475E-10	-.152E+05	.609E-11	.703E+05	-.115E-09
	JB	21	-.137E+02	.475E-10	.152E+05	-.609E-11	.746E+05	-.336E-09
21	JA	22	-.137E+02	.594E-10	.152E+05	.136E-07	-.703E+05	.148E-11
	JB	16	.137E+02	-.594E-10	-.152E+05	-.136E-07	.413E+06	-.131E-08
22	JA	15	-.137E+02	-.763E-10	-.152E+05	-.135E-07	-.413E+06	.201E-08
	JB	23	.137E+02	.763E-10	.152E+05	.136E-07	.703E+05	-.298E-09
23	JA	23	-.137E+02	-.605E-10	-.152E+05	.608E-11	-.703E+05	.403E-09
	JB	24	.137E+02	.605E-10	.152E+05	-.608E-11	-.746E+05	.228E-09
24	JA	25	.137E+02	.606E-10	.152E+05	-.343E-09	-.745E+05	.229E-09
	JB	24	-.137E+02	-.606E-10	-.152E+05	.607E-11	.746E+05	-.229E-09
25	JA	38	-.383E-10	-.973E-09	.239E+05	-.270E-07	.435E-09	.784E-09
	JB	26	.383E-10	.973E-09	-.239E+05	-.393E-07	.218E-08	-.784E-09
26	JA	26	-.209E-10	-.881E-09	.133E+05	.397E-07	-.210E-08	.731E-09
	JB	27	.209E-10	.881E-09	-.133E+05	-.103E-06	.365E-08	-.731E-09
27	JA	27	-.238E-10	-.875E-09	.601E+04	.944E-07	-.671E-09	.724E-09
	JB	30	.238E-10	.875E-09	-.601E+04	-.107E-06	.100E-08	-.724E-09
28	JA	29	-.279E-10	.345E-10	.137E-08	-.856E-09	.119E-08	.225E-10
	JB	28	.279E-10	-.345E-10	-.137E-08	-.617E-08	-.920E-08	.142E-10
29	JA	29	.330E-10	-.345E-10	.532E-08	-.102E-07	.964E-07	.742E-10
	JB	30	-.330E-10	.345E-10	-.532E-08	.131E-06	.167E-07	-.973E-10
30	JA	30	.339E-09	-.337E-09	.831E-08	.641E-07	-.791E-09	.102E-07
	JB	31	-.339E-09	.337E-09	.831E-08	-.641E-07	.255E-06	-.845E-09
31	JA	31	.285E-09	-.333E-09	.131E-09	-.523E-10	.262E-09	.500E-09
	JB	32	-.285E-09	.333E-09	-.131E-09	.523E-10	.262E-09	.934E-09
32	JA	30	-.329E-09	-.570E-09	.179E-07	-.198E-06	-.148E-07	-.934E-08
	JB	33	.329E-09	.570E-09	-.179E-07	-.270E-06	.148E-07	.218E-09
33	JA	33	-.307E-09	-.602E-09	0.	-.582E-10	.202E-11	-.842E-09
	JB	34	.307E-09	.602E-09	0.	.291E-10	-.202E-11	-.480E-09
34	JA	30	-.290E-23	-.172E-21	.601E+04	-.678E-20	0.	0.
	JB	35	.290E-23	.172E-21	-.601E+04	.136E-19	.212E-21	0.
35	JA	35	-.165E-23	-.794E-22	.201E+04	-.847E-21	-.529E-22	-.265E-22
	JB	36	.165E-23	.794E-22	-.201E+04	0.	.529E-22	.265E-22
36	JA	37	-.714E-09	-.192E-08	-.249E+05	-.964E-07	.133E-07	.217E-08
	JB	16	.714E-09	.192E-08	.249E+05	.241E-07	-.125E-08	-.217E-08
37	JA	16	-.332E-10	-.191E-08	.239E+05	-.386E-07	.951E-09	.773E-09
	JB	38	.332E-10	.191E-08	-.239E+05	.274E-07	-.590E-09	-.773E-09
38	JA	11	-.252E-09	.117E-08	.293E-08	.761E-07	.462E-07	-.320E-07
	JB	39	.252E-09	-.117E-08	-.293E-08	-.765E-07	.177E-07	-.341E-09
39	JA	39	-.132E-09	.108E-08	.873E-10	-.522E-10	.233E-09	-.200E-08
	JB	40	.132E-09	-.108E-08	-.873E-10	.522E-10	.204E-09	-.265E-08
40	JA	11	.991E-09	.105E-08	.907E-08	-.150E-07	.278E-07	.291E-07
	JB	41	-.991E-09	-.105E-08	-.907E-08	-.215E-06	-.274E-07	-.164E-08
41	JA	41	.947E-09	.110E-08	-.291E-10	0.	.167E-10	.226E-08
	JB	42	-.947E-09	-.110E-08	.291E-10	.582E-10	-.167E-10	.183E-08

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	JA	11	.991E-09	.105E-08	-.907E-08	-.150E-07	.274E-07	.291E-07	
	JB	41	-.991E-09	-.105E-08	-.907E-08	-.215E-06	-.274E-07	-.164E-08	
	JA	41	.947E-09	.110E-08	-.291E-10	0.	.167E-10	.226E-08	
	JB	42	-.947E-09	-.110E-08	.291E-10	.582E-10	-.167E-10	.183E-09	

DEADWEIGHT LOAD CASE

BEAM NO	BEAM .LOAD-LOCATION. .NODE--PERCENT.		SHEAR (V2/K3*A)	--- TRANSVERSE --- SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	BEAM STRESSES - STRESSES AT USER LOCATIONS - A	B	C	FOR OUTPUT VECTOR 1 MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED SHEAR	
1	1	JA 0.0	-1.44E-15	2.12E-13	-6.28E-17	-2.872E+01	-2.872E+01	-2.872E+01	-2.8716E+01	-2.8716E+01	1.44E+01	PIPEG
1	4	JB 100.0	-1.44E-15	2.12E-13	-6.28E-17	-2.872E+01	-2.872E+01	-2.872E+01	-2.8716E+01	-2.8716E+01	1.44E+01	
2	3	JA 0.0	-4.50E-12	-9.74E-14	5.72E-15	-1.372E-12	2.049E-11	-1.086E-12	2.0491E-11	-2.3235E-11	1.02E-11	PIPEG
2	2	JB 100.0	-4.50E-12	-9.74E-14	5.72E-15	-1.372E-12	4.004E-11	-9.405E-13	4.0043E-11	-4.2787E-11	2.00E-11	
3	3	JA 0.0	-9.01E-12	-3.00E-15	-9.46E-17	-1.577E-15	-2.266E-13	-1.952E-15	2.2378E-13	-2.2693E-13	1.12E-13	BEAMG
3	4	JB 100.0	-9.01E-12	-3.00E-15	-9.46E-17	-1.577E-15	9.161E-14	-1.863E-15	9.1899E-14	-9.5054E-14	4.59E-14	
4	4	JA 0.0	-3.37E-12	-6.69E-15	4.72E-17	-2.674E-13	-8.732E-14	-2.673E-13	-8.7300E-14	-4.4742E-13	4.37E-14	BEAMG
4	5	JB 100.0	-3.37E-12	-6.69E-15	4.72E-17	-2.674E-13	-1.336E-14	-2.671E-13	-1.3144E-14	-5.2158E-13	6.57E-15	
5	5	JA 0.0	4.30E-12	-1.79E-13	-4.55E-14	-4.059E-12	-3.415E-12	-3.889E-12	-3.3930E-12	-4.7241E-12	1.70E-12	PIPEG
5	6	JB 100.0	4.30E-12	-1.79E-13	-4.55E-14	-4.059E-12	-9.144E-12	-3.921E-12	-1.0452E-12	-9.1624E-12	5.25E-13	
6	4	JA 0.0	3.78E-13	-1.52E-12	-2.51E-14	-2.872E+01	-2.872E+01	-2.872E+01	-2.8716E+01	-2.8716E+01	1.44E+01	PIPEG
6	7	JB 100.0	3.78E-13	-1.52E-12	-2.51E-14	-2.872E+01	-2.872E+01	-2.872E+01	-2.8716E+01	-2.8716E+01	1.44E+01	
7	7	JA 0.0	-8.34E-13	-3.37E-12	-4.23E-14	-1.608E+02	-1.608E+02	-1.608E+02	-1.6079E+02	-1.6079E+02	8.04E+01	PIPEG
7	8	JB 100.0	-8.34E-13	-3.37E-12	-4.23E-14	-1.608E+02	-1.608E+02	-1.608E+02	-1.6079E+02	-1.6079E+02	8.04E+01	
8	8	JA 0.0	-3.44E-13	-1.94E-12	-2.15E-14	-1.385E+02	-1.385E+02	-1.385E+02	-1.3852E+02	-1.3852E+02	6.93E+01	PIPEG
8	11	JB 100.0	-3.44E-13	-1.94E-12	-2.15E-14	-1.385E+02	-1.385E+02	-1.385E+02	-1.3852E+02	-1.3852E+02	6.93E+01	
9	10	JA 0.0	-4.02E-11	5.27E-13	-1.75E-12	3.587E-14	2.848E-11	5.060E-13	2.8487E-11	-2.8415E-11	1.44E-11	PIPEG
9	9	JB 100.0	-4.02E-11	5.27E-13	-1.75E-12	3.587E-14	6.248E-11	-4.269E-14	6.2478E-11	-6.2407E-11	3.13E-11	
10	10	JA 0.0	9.70E-12	6.54E-14	-6.43E-14	-4.594E-13	-5.364E-13	-4.586E-13	-3.8162E-13	-5.3715E-13	2.01E-13	BEAMG
10	11	JB 100.0	9.70E-12	6.54E-14	-6.43E-14	-4.594E-13	-9.000E-13	-4.609E-13	-1.7196E-14	-9.0158E-13	6.49E-14	
11	11	JA 0.0	-1.28E-11	3.50E-11	7.28E-13	-1.385E+02	-1.385E+02	-1.385E+02	-1.3852E+02	-1.3852E+02	6.93E+01	PIPEG
11	12	JB 100.0	-1.28E-11	3.50E-11	7.28E-13	-1.385E+02	-1.385E+02	-1.385E+02	-1.3852E+02	-1.3852E+02	6.93E+01	
12	12	JA 0.0	-1.98E-11	5.44E-11	1.41E-12	-3.555E+02	-3.555E+02	-3.555E+02	-3.5555E+02	-3.5555E+02	1.78E+02	PIPEG
12	37	JB 100.0	-1.98E-11	5.44E-11	1.41E-12	-3.555E+02	-3.555E+02	-3.555E+02	-3.5555E+02	-3.5555E+02	1.78E+02	
13	13	JA 0.0	2.74E-02	1.05E-13	-3.99E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	BEAMG
13	14	JB 100.0	2.74E-02	1.05E-13	-3.99E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	
14	15	JA 0.0	4.45E+02	1.63E-12	1.47E-13	-3.994E-01	4.318E+02	-3.994E-01	4.3181E+02	-4.3261E+02	2.16E+02	BEAMG
14	14	JB 100.0	4.45E+02	1.63E-12	1.47E-13	-3.994E-01	-4.591E+02	-3.994E-01	4.5826E+02	-4.5906E+02	2.29E+02	
15	15	JA 0.0	-3.05E+01	1.11E-13	1.43E-14	-2.739E-02	1.483E-01	-2.739E-02	1.4832E-01	-2.0311E-01	7.42E-02	BEAMG
15	16	JB 100.0	-3.05E+01	1.11E-13	1.43E-14	-2.739E-02	1.006E+00	-2.739E-02	1.0061E+00	-1.0609E+00	5.03E-01	
16	16	JA 0.0	3.05E+01	-7.54E-14	-2.28E-15	-2.739E-02	1.006E+00	-2.739E-02	1.0061E+00	-1.0609E+00	5.03E-01	BEAMG
16	17	JB 100.0	3.05E+01	-7.54E-14	-2.28E-15	-2.739E-02	1.483E-01	-2.739E-02	1.4832E-01	-2.0311E-01	7.42E-02	
17	17	JA 0.0	4.45E+02	-1.09E-12	-1.72E-13	-3.994E-01	4.318E+02	-3.994E-01	4.3181E+02	-4.3261E+02	2.16E+02	BEAMG
17	18	JB 100.0	4.45E+02	-1.09E-12	-1.72E-13	-3.994E-01	-4.591E+02	-3.994E-01	4.5826E+02	-4.5906E+02	2.29E+02	
18	19	JA 0.0	2.74E-02	-6.73E-14	6.67E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	BEAMG
18	18	JB 100.0	2.74E-02	-6.73E-14	6.67E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	
19	20	JA 0.0	2.74E-02	-9.52E-14	8.41E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	BEAMG
19	21	JB 100.0	2.74E-02	-9.52E-14	8.41E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	

17	JA	0.0	4.45E+02	-1.03E-12	-1.72E-13	-3.994E-01	4.31E+02	-3.994E-01	4.3141E+02	-4.3261E+02	2.16E+02	BEAMG		
17	JB	100.0	4.45E+02	-1.03E-12	-1.72E-13	-3.994E-01	-4.591E+02	-3.994E-01	4.5826E+02	-4.5906E+02	2.29E+02			
18	JA	0.0	2.74E-02	-6.73E-14	6.67E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	BEAMG		
18	JB	100.0	2.74E-02	-6.73E-14	6.67E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01			
19	JA	0.0	2.74E-02	-9.52E-14	8.41E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	BEAMG		
19	JB	100.0	2.74E-02	-9.52E-14	8.41E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01			
20	JA	0.0	4.45E+02	-1.39E-12	-7.28E-13	-3.994E-01	4.31E+02	-3.994E-01	4.3141E+02	-4.3261E+02	2.16E+02	BEAMG		
20	JB	100.0	4.45E+02	-1.39E-12	-7.28E-13	-3.994E-01	-4.591E+02	-3.994E-01	4.5826E+02	-4.5906E+02	2.29E+02			
21	JA	0.0	-3.05E+01	-1.17E-13	3.40E-14	-2.739E-02	1.483E-01	-2.739E-02	1.4832E-01	-2.0311E-01	7.42E-02	BEAMG		
21	JB	100.0	-3.05E+01	-1.17E-13	3.40E-14	-2.739E-02	1.006E+00	-2.739E-02	1.0061E+00	-1.0609E+00	5.03E-01			
22	JA	0.0	3.05E+01	1.53E-13	-3.39E-14	-2.739E-02	1.006E+00	-2.739E-02	1.0061E+00	-1.0609E+00	5.03E-01	BEAMG		
22	JB	100.0	3.05E+01	1.53E-13	-3.39E-14	-2.739E-02	1.483E-01	-2.739E-02	1.4832E-01	-2.0311E-01	7.42E-02			
23	JA	0.0	4.45E+02	1.94E-12	7.27E-13	-3.994E-01	4.31E+02	-3.994E-01	4.3181E+02	-4.3261E+02	2.16E+02	BEAMG		
23	JB	100.0	4.45E+02	1.94E-12	7.27E-13	-3.994E-01	-4.591E+02	-3.994E-01	4.5826E+02	-4.5906E+02	2.29E+02			
24	JA	0.0	2.74E-02	1.33E-13	-5.72E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01	BEAMG		
24	JB	100.0	2.74E-02	1.33E-13	-5.72E-16	-3.050E+01	-3.069E+01	-3.050E+01	-3.0313E+01	-3.0686E+01	1.52E+01			
25	JA	0.0	-1.10E-12	2.78E-11	5.10E-13	3.418E+02	3.418E+02	3.418E+02	3.4183E+02	3.4183E+02	1.71E+02	PIPEG		
25	JB	100.0	-1.10E-12	2.79E-11	5.10E-13	3.418E+02	3.418E+02	3.418E+02	3.4183E+02	3.4183E+02	1.71E+02			
26	JA	0.0	-5.97E-13	2.40E-11	4.75E-13	1.903E+02	1.903E+02	1.903E+02	1.9028E+02	1.9028E+02	9.51E+01	PIPEG		
27	JB	100.0	-5.97E-13	2.40E-11	4.75E-13	1.903E+02	1.903E+02	1.903E+02	1.9028E+02	1.9028E+02	9.51E+01			
27	JA	0.0	-4.38E-13	1.61E-11	2.43E-13	5.532E+01	5.532E+01	5.532E+01	5.5321E+01	5.5321E+01	2.77E+01	PIPEG		
30	JB	100.0	-4.38E-13	1.61E-11	2.43E-13	5.532E+01	5.532E+01	5.532E+01	5.5321E+01	5.5321E+01	2.77E+01			
29	JA	0.0	-1.13E-10	3.85E-13	7.86E-12	1.812E-12	4.299E-12	2.058E-12	4.3107E-12	-6.8607E-13	8.15E-12	PIPEG		
28	JB	100.0	-1.13E-10	3.85E-13	7.86E-12	1.812E-12	1.129E-10	1.657E-12	1.1290E-10	-1.0927E-10	5.70E-11			
29	JA	0.0	-1.06E-11	-1.64E-15	-2.63E-13	9.352E-14	-4.476E-14	9.371E-14	2.3200E-13	-4.4949E-14	2.33E-13	BEAMG		
30	JB	100.0	-1.06E-11	-1.68E-15	-2.63E-13	9.352E-14	3.553E-13	9.377E-14	3.5550E-13	-1.6846E-13	2.69E-13			
30	JA	0.0	-1.06E-11	6.75E-13	1.60E-13	6.784E-13	6.804E-13	7.039E-13	7.0588E-13	6.5099E-13	3.88E-13	BEAMG		
31	JB	100.0	-1.06E-11	6.75E-13	1.60E-13	6.784E-13	1.316E-12	6.805E-13	1.3183E-12	3.8608E-14	6.78E-13			
31	JA	0.0	-1.46E-11	3.70E-11	-2.32E-11	3.170E-11	-1.630E-09	3.257E-11	1.8947E-09	-1.8313E-09	9.48E-10	BEAMG		
32	JB	100.0	-1.46E-11	3.70E-11	-2.32E-11	3.170E-11	1.894E-09	3.008E-11	1.8954E-09	-1.8320E-09	9.48E-10			
30	JA	0.0	-3.56E-11	-6.59E-13	-3.09E-14	-1.140E-12	-1.636E-12	-1.164E-12	-6.2137E-13	-1.6596E-12	3.13E-13	BEAMG		
33	JB	100.0	-3.56E-11	-6.59E-13	-3.09E-14	-1.140E-12	-4.648E-13	-1.141E-12	-4.6424E-13	-1.8167E-12	2.35E-13			
33	JA	0.0	0.		-3.41E-11	9.00E-13	-6.683E-11	-4.906E-10	-6.830E-11	3.4843E-10	-4.8209E-10	1.74E-10	BEAMG	
34	JB	100.0	0.		-3.41E-11	9.00E-13	-6.683E-11	-2.737E-10	-6.600E-11	1.4090E-10	-2.7457E-10	7.05E-11		
30	JA	0.0	-5.32E-26	3.10E-24	0.		5.532E+01	5.532E+01	5.532E+01	5.5321E+01	5.5321E+01	2.77E+01	PIPEG	
35	JB	100.0	-5.32E-26	3.10E-24	0.		5.532E+01	5.532E+01	5.532E+01	5.5321E+01	5.5321E+01	2.77E+01		
35	JA	0.0	-4.73E-26	2.27E-24	-1.72E-26	2.873E+01	2.873E+01	2.873E+01	2.8727E+01	2.8727E+01	1.44E+01	PIPEG		
36	JB	100.0	-4.73E-26	2.27E-24	-1.72E-26	2.873E+01	2.873E+01	2.873E+01	2.8727E+01	2.8727E+01	1.44E+01			
37	JA	0.0	-1.01E-11	2.71E-11	6.96E-13	-1.758E+02	-1.758E+02	-1.759E+02	-1.7580E+02	-1.7580E+02	8.79E+01	PIPEG		
16	JB	100.0	-1.01E-11	2.71E-11	6.96E-13	-1.758E+02	-1.758E+02	-1.758E+02	-1.7580E+02	-1.7580E+02	8.79E+01			
16	JA	0.0	-4.09E-13	1.42E-11	2.48E-13	1.690E+02	1.690E+02	1.690E+02	1.6902E+02	1.6902E+02	8.45E+01	PIPEG		
38	JB	100.0	-4.09E-13	1.42E-11	2.48E-13	1.690E+02	1.690E+02	1.690E+02	1.6902E+02	1.6902E+02	8.45E+01			
11	JA	0.0	-5.66E-12	-2.34E-12	1.91E-13	-5.821E-13	-6.976E-13	-6.595E-13	-3.8906E-13	-7.7510E-13	2.73E-13	BEAMG		
39	JB	100.0	-5.66E-12	-2.34E-12	1.91E-13	-5.821E-13	-5.377E-13	-5.787E-13	-5.3430E-13	-6.2985E-13	3.29E-13			
39	JA	0.0	-9.70E-12	-1.20E-10	-2.32E-11	-1.468E-11	-1.670E-09	-1.816E-11	1.6440E-09	-1.6734E-09	8.22E-10	BEAMG		
40	JB	100.0	-9.70E-12	-1.20E-10	-2.32E-11	-1.468E-11	1.434E-09	-1.009E-11	1.4382E-09	-1.4676E-09	7.19E-10			
11	JA	0.0	-1.82E-11	1.99E-12	6.85E-14	1.863E-12	1.825E-12	1.936E-12	1.9738E-12	1.7515E-12	9.89E-13	BEAMG		
41	JB	100.0	-1.82E-11	1.98E-12	6.85E-14	1.863E-12	2.400E-12	1.968E-12	2.4048E-12	1.3205E-12	1.20E-12			
41	JA	0.0	3.28E-12	1.05E-10	7.43E-12	1.227E-10	1.227E-10	1.267E-10	1.2566E-10	1.1863E-10	6.38E-11	BEAMG		
42	JB	100.0	3.28E-12	1.05E-10	7.43E-12	1.227E-10	-2.011E-10							

[illegible]	[illegible]	JA	0.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	40	JB	100.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	BEAM6
[illegible]	11	JA	0.0	-1.82E-11	1.98E-12	6.65E-14	1.863E-12	1.825E-12	1.936E-12	1.9738E-12	1.7515E-12	9.89E-13	BEAM6
40	41	JB	100.0	-1.82E-11	1.98E-12	6.65E-14	1.863E-12	2.400E-12	1.868E-12	2.4048E-12	1.3205E-12	1.20E-12	
41	41	JA	0.0	3.23E-12	1.05E-10	7.43E-12	1.227E-10	1.227E-10	1.267E-10	1.2665E-10	1.1883E-10	6.38E-11	BEAM6
41	42	JB	100.0	3.23E-12	1.05E-10	7.43E-12	1.227E-10	-2.911E-10	1.196E-10	5.3972E-10	-2.9422E-10	2.70E-10	

DEAD-WEIGHT LOAD CASE

MAXIMUM STRESS SUMMARY FOR

BEAM STRESSES FOR OUTPUT VECTOR 1

	--- TRANSVERSE --- SHEAR (V2/(3*A))	SHEAR (V3/(2*A))	TORSIONAL (T*C/J)	- STRESSES AT USER LOCATIONS - A	B	C	MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED STRESS
MAX. BEAM STRESSES=	4.45E+02	1.05E-10	7.86E-12	3.418E+02	4.318E+02	3.418E+02	4.5826E+02	3.4183E+02	2.29E+02
BEAM NOS. =	23.	41.	28.	25.	20.	25.	20.	25.	20.
MIN. BEAM STRESSES=	-3.05E+01	-1.20E-10	-2.32E-11	-3.555E+02	-4.591E+02	-3.555E+02	-3.5555E+02	-4.5906E+02	6.57E-15
BEAM NOS. =	15.	39.	31.	12.	23.	12.	12.	23.	4.

B E G I N INPUT LOAD CASE NO. 5 TITLE(EARTHQUAKE 1

NODAL POINT APPLIED FORCES FOR LOAD CASE NO. 5

NODE	X1	X2	X3	X4	X5	X6
1	-4.354000E+03	4.354000E+03	-5.644000E+03	-0.	-0.	-0.
7	-5.183000E+03	5.183000E+03	-6.719000E+03	-0.	-0.	-0.
8	-3.243000E+03	3.243000E+03	-4.204000E+03	-0.	-0.	-0.
12	-8.309000E+03	8.309000E+03	-1.077100E+04	-0.	-0.	-0.
15	-1.039600E+04	1.039600E+04	-1.347700E+04	-0.	-0.	-0.
26	-8.988000E+03	8.988000E+03	-1.165200E+04	-0.	-0.	-0.
27	-6.182000E+03	6.182000E+03	-8.015000E+03	-0.	-0.	-0.
35	-3.400000E+03	3.400000E+03	-4.408000E+03	-0.	-0.	-0.
36	-1.704000E+03	1.704000E+03	-2.209000E+03	-0.	-0.	-0.

NODAL POINT APPLIED LOADS AND/OR DISPLACEMENTS FINAL SUMMARY FOR LOAD CASE NO. 5

NODE	X1	X2	X3	X4	X5	X6

NOTE IF A FINAL SUMMARY OF APPLIED NODAL LOADS AND GENERATED LOADS IS DESIRED AT THIS POINT,
CODE A 1 IN COLUMN 20 OF THE STATIC CARD.

FORCE AND MOMENT SUMMATION
ABOUT AXES PARALLEL TO SYSTEM AXES
WITH ORIGIN AT POINT (0.0.0)
SUMMATION INCLUDES LOADS APPLIED TO RESTRAINED DOF.

FX1 = -.51759000000E+05
FX2 = .51759000000E+05
FX3 = -.67099000000E+05
MX1 = -.10215o00400E+08
MX2 = -.10215b00400E+08
MX3 = 0.

EARTHQUAKE 1

BEAM ELEMENT LOADS FOR OUTPUT VECTOR 5

BEAM NO	.LOAD-LOCATION. .NODE--PERCENT.	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3	
1	1 JA 0.0	5.64400E+03	-4.35400E+03	-4.35400E+03	7.45058E-09	4.47035E-08	1.49012E-08	PIPEG
1	4 JB 100.0	-5.64400E+03	4.35400E+03	4.35400E+03	-7.45058E-09	1.23000E+05	-1.23000E+05	
2	3 JA 0.0	-1.86265E-09	-2.47383E-10	-3.91083E-10	1.04774E-09	1.51340E-09	-6.98492E-10	PIPEG
2	2 JB 100.0	1.86265E-09	2.47383E-10	3.91083E-10	-1.04774E-09	1.68802E-09	-2.09548E-09	
3	3 JA 0.0	0.	-4.65661E-10	5.12227E-09	-2.98023E-08	8.94070E-08	1.19209E-07	BEAMG
3	4 JB 100.0	0.	4.65661E-10	-5.12227E-09	2.98023E-08	-2.83122E-07	-5.96046E-08	
4	4 JA 0.0	2.98023E-08	-1.25729E-08	4.19095E-09	-1.49012E-07	1.78814E-07	1.19209E-07	BEAMG
4	5 JB 100.0	-2.98023E-08	1.25729E-08	-4.19095E-09	1.49012E-07	-3.27826E-07	-4.17233E-07	
5	5 JA 0.0	1.39698E-09	1.60071E-10	2.71029E-10	-5.82077E-10	-2.61934E-10	1.39698E-09	PIPEG
5	6 JB 100.0	-1.39698E-09	-1.60071E-10	-2.71029E-10	5.82077E-10	-1.51340E-09	4.65661E-10	
6	4 JA 0.0	5.64400E+03	-4.35400E+03	-4.35400E+03	-5.21541E-08	-1.23001E+05	1.23001E+05	PIPEG
6	7 JB 100.0	-5.64400E+03	4.35400E+03	4.35400E+03	5.21541E-08	2.19877E+05	-2.19877E+05	
7	7 JA 0.0	1.23630E+04	-9.53700E+03	-9.53700E+03	-7.82311E-08	-2.19877E+05	2.19877E+05	PIPEG
7	8 JB 100.0	-1.23630E+04	9.53700E+03	9.53700E+03	7.82311E-08	3.11623E+05	-3.11623E+05	
8	8 JA 0.0	1.65670E+04	-1.27800E+04	-1.27800E+04	-5.21541E-08	-3.11623E+05	3.11623E+05	PIPEG
8	11 JB 100.0	-1.65670E+04	1.27800E+04	1.27800E+04	5.21541E-08	4.90543E+05	-4.90543E+05	
9	10 JA 0.0	8.92719E-10	-8.05438E-10	-1.66619E-09	8.38190E-09	6.98492E-09	1.14699E-09	PIPEG
9	9 JB 100.0	-8.92719E-10	8.05438E-10	1.66619E-09	-8.38190E-09	5.35510E-09	-7.20618E-09	
10	10 JA 0.0	-3.39126E-09	5.04261E-09	7.21775E-09	-5.96046E-08	-1.19209E-07	-7.86487E-08	BEAMG
10	11 JB 100.0	3.39126E-09	-5.04261E-09	-7.21775E-09	5.96046E-08	-7.45058E-08	2.68407E-07	
11	11 JA 0.0	1.65670E+04	1.08735E+04	1.08735E+04	-7.30139E+04	-4.81573E+05	4.81573E+05	PIPEG
11	12 JB 100.0	-1.65670E+04	-1.08735E+04	-1.08735E+04	7.30139E+04	3.29345E+05	-3.29345E+05	
12	12 JA 0.0	2.73360E+04	2.56447E+03	2.56447E+03	-7.30139E+04	-3.29345E+05	3.29345E+05	PIPEG
12	37 JB 100.0	-2.73360E+04	-2.56447E+03	-2.56447E+03	7.30139E+04	2.10097E+05	-2.10097E+05	
13	13 JA 0.0	1.53082E+04	6.07696E+03	1.48529E+03	1.03092E+03	-7.49409E+03	-5.02382E+04	BEAMG
13	14 JB 100.0	-1.53082E+04	-6.07696E+03	-1.48529E+03	-1.03092E+03	-2.14939E+01	8.09876E+04	
14	15 JA 0.0	6.07696E+03	1.53082E+04	1.48529E+03	2.14939E+01	-1.30794E+04	6.44399E+04	BEAMG
14	14 JB 100.0	-6.07696E+03	-1.53082E+04	-1.48529E+03	-2.14939E+01	-1.03092E+03	8.09876E+04	
15	15 JA 0.0	6.07696E+03	-1.53082E+04	1.48529E+03	2.14939E+01	1.30794E+04	6.44399E+04	BEAMG
15	16 JB 100.0	-6.07696E+03	1.53082E+04	-1.48529E+03	-2.14939E+01	-4.64985E+04	-4.08874E+05	
16	16 JA 0.0	-6.04683E+03	1.82413E+04	-2.98378E+02	-2.14714E+01	1.75004E+03	5.00618E+05	BEAMG
16	17 JB 100.0	6.04683E+03	-1.82413E+04	2.98378E+02	2.14714E+01	4.96346E+03	-9.01880E+04	
17	17 JA 0.0	-6.04683E+03	1.82413E+04	-2.98378E+02	-2.14714E+01	-4.96346E+03	9.01880E+04	BEAMG
17	18 JB 100.0	6.04683E+03	-1.82413E+04	2.98378E+02	2.14714E+01	7.79805E+03	8.31047E+04	
18	19 JA 0.0	1.82413E+04	-6.04683E+03	-2.98378E+02	-7.79805E+03	1.48832E+03	-1.13702E+05	BEAMG
18	18 JB 100.0	-1.82413E+04	6.04683E+03	2.98378E+02	7.79805E+03	2.14714E+01	8.31047E+04	
19	20 JA 0.0	1.82413E+04	-6.04683E+03	1.48529E+03	1.03092E+03	-7.49409E+03	-1.13702E+05	BEAMG

16	17 JB	100.0	6.046[illegible]E+03	-1.82413E+04	2.98378E+02	2.14714E+01	4.96346E+03	-9.01880E+04		
17	17 JA	0.0	-6.04683E+03	1.82413E+04	-2.98378E+02	2.14714E+01	-4.96346E+03	9.01880E+04	BEAMG	
17	18 JB	100.0	6.04683E+03	-1.82413E+04	2.98378E+02	2.14714E+01	7.79805E+03	8.31047E+04		
18	19 JA	0.0	1.82413E+04	-6.04683E+03	-2.98378E+02	-7.79805E+03	1.48832E+03	-1.13702E+05	BEAMG	
18	18 JB	100.0	-1.82413E+04	6.04683E+03	2.98378E+02	7.79805E+03	2.14714E+01	8.31047E+04		
19	20 JA	0.0	1.82413E+04	-6.04683E+03	1.48529E+03	1.03092E+03	-7.49409E+03	-1.13702E+05	BEAMG	
19	21 JB	100.0	-1.82413E+04	6.04683E+03	-1.48529E+03	-1.03092E+03	-2.14939E+01	8.31047E+04		
20	22 JA	0.0	-6.04683E+03	1.82413E+04	1.48529E+03	2.14939E+01	-1.30794E+04	9.01880E+04	BEAMG	
20	21 JB	100.0	6.04683E+03	-1.82413E+04	-1.48529E+03	-2.14939E+01	-1.03092E+03	8.31047E+04		
21	22 JA	0.0	-6.04683E+03	-1.82413E+04	1.48529E+03	2.14939E+01	1.30794E+04	9.01880E+04	BEAMG	
21	16 JB	100.0	6.04683E+03	1.82413E+04	-1.48529E+03	-2.14939E+01	-4.64985E+04	-5.00618E+05		
22	16 JA	0.0	6.07699E+03	1.53082E+04	-2.98378E+02	-2.14714E+01	1.75004E+03	4.08874E+05	BEAMG	
22	23 JB	100.0	-6.07699E+03	-1.53082E+04	2.98378E+02	2.14714E+01	4.96346E+03	-6.44399E+04		
23	23 JA	0.0	6.07696E+03	1.53082E+04	-2.98378E+02	-2.14714E+01	-4.96346E+03	6.44399E+04	BEAMG	
23	24 JB	100.0	-6.07696E+03	-1.53082E+04	2.98378E+02	2.14714E+01	7.79805E+03	8.09876E+04		
24	25 JA	0.0	1.53082E+04	6.07696E+03	-2.98378E+02	-7.79805E+03	1.48832E+03	-5.02382E+04	BEAMG	
24	24 JB	100.0	-1.53082E+04	-6.07596E+03	2.98378E+02	7.79805E+03	2.14714E+01	8.09876E+04		
25	38 JA	0.0	-2.62840E+04	6.07593E+03	6.07593E+03	1.64830E+04	-1.90821E+05	1.90821E+05	PIPEG	
25	26 JB	100.0	2.62840E+04	-6.07593E+03	-6.07593E+03	-1.64830E+04	-2.23497E+05	2.23497E+05		
26	26 JA	0.0	-1.46320E+04	-2.91207E+03	-2.91207E+03	1.64830E+04	2.23497E+05	-2.23497E+05	PIPEG	
26	27 JB	100.0	1.46320E+04	2.91207E+03	2.91207E+03	-1.64830E+04	-7.82859E+03	7.82859E+03		
27	27 JA	0.0	-6.61700E+03	-9.09407E+03	-9.09407E+03	1.64830E+04	7.82859E+03	-7.82859E+03	PIPEG	
27	30 JB	100.0	6.61700E+03	9.09407E+03	9.09407E+03	-1.64830E+04	1.19488E+05	-1.19488E+05		
28	29 JA	0.0	8.14907E-10	-9.53150E-10	-6.69388E-10	-2.15043E-10	4.88944E-09	6.05360E-09	PIPEG	
28	28 JB	100.0	-8.14907E-10	9.53150E-10	6.69388E-10	2.15043E-10	1.16415E-10	-1.30385E-08		
29	29 JA	0.0	9.31323E-10	9.31323E-10	2.09548E-09	8.15204E-08	7.45058E-09	-2.98023E-08	BEAMG	
29	30 JB	100.0	-9.31323E-10	-9.31323E-10	-2.09548E-09	-8.15204E-08	-7.45058E-08	0.		
30	30 JA	0.0	1.37185E+04	-2.79397E-09	-4.79527E+02	5.99516E+01	8.24150E+03	3.89691E+01	BEAMG	
30	31 JB	100.0	-1.37185E+04	2.79397E-09	4.79527E+02	-5.99516E+01	5.03659E+03	-3.89691E+01		
31	31 JA	0.0	1.37185E+04	-2.61934E-10	-4.79527E+02	5.99516E+01	-5.03659E+03	3.89691E+01	BEAMG	
31	32 JB	100.0	-1.37185E+04	2.61934E-10	4.79527E+02	-5.99516E+01	7.10335E+03	-3.89691E+01		
32	30 JA	0.0	-1.37185E+04	-2.04891E-08	-4.79527E+02	5.99516E+01	8.24150E+03	-3.89691E+01	BEAMG	
32	33 JB	100.0	1.37185E+04	2.04891E-08	4.79527E+02	-5.99516E+01	5.03659E+03	3.89691E+01		
33	33 JA	0.0	-1.37185E+04	-2.91038E-11	-4.79527E+02	5.99516E+01	-5.03659E+03	-3.89691E+01	BEAMG	
33	34 JB	100.0	1.37185E+04	2.91038E-11	4.79527E+02	-5.99516E+01	7.10335E+03	3.89691E+01		
34	30 JA	0.0	-6.61700E+03	5.10400E+03	5.10400E+03	0.	-1.19390E+05	1.19390E+05	PIPEG	
34	35 JB	100.0	6.61700E+03	-5.10400E+03	-5.10400E+03	0.	4.79335E+04	-4.79335E+04		
35	35 JA	0.0	-2.20900E+03	1.70400E+03	1.70400E+03	-4.65661E-10	-4.79335E+04	4.79335E+04	PIPEG	
35	36 JB	100.0	2.20900E+03	-1.70400E+03	-1.70400E+03	4.65661E-10	-9.31323E-10	0.		
36	37 JA	0.0	2.73360E+04	2.56447E+03	2.56447E+03	-7.30139E+04	-2.10097E+05	2.10097E+05	PIPEG	
36	16 JB	100.0	-2.73360E+04	-2.56447E+03	-2.56447E+03	7.30139E+04	1.66962E+05	-1.66962E+05		
37	16 JA	0.0	-2.62840E+04	6.07593E+03	6.07593E+03	1.64830E+04	-2.58749E+05	2.58749E+05	PIPEG	
37	38 JB	100.0	2.62840E+04	-6.07593E+03	-6.07593E+03	-1.64830E+04	1.90821E+05	-1.90821E+05		
38	11 JA	0.0	2.21645E+04	2.95306E+02	-1.54697E+03	2.16656E+02	3.65131E+04	8.26523E+03	BEAMG	
38	39 JB	100.0	-2.21645E+04	-2.95306E+02	1.54697E+03	-2.16656E+02	6.32638E+03	-8.58216E+01		
39	39 JA	0.0	2.21655E+04	-2.03727E-10	-1.54697E+03	1.32110E+02	-6.32871E+03	8.58216E+01	BEAMG	
39	40 JB	100.0	-2.21655E+04	2.03727E-10	1.54697E+03	-1.32110E+02	1.29962E+04	-8.58216E+01		
40	11 JA	0.0	-2.21645E+04	-2.95306E+02	-1.54697E+03	2.16656E+02	3.65131E+04	-8.26523E+03	BEAMG	
40	41 JB	100.0	2.21645E+04	2.95306E+02	1.54697E+03	-2.16656E+02	6.32638E+03	8.58216E+01		
41	41 JA	0.0	-2.21655E+04	9.45874E-11	-1.54697E+03	1.32110E+02	-6.32871E+03	-8.58216E+01	BEAMG	

A 3-12

[illegible]	[illegible]	JA	0.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	40	JB	100.0	-2.21065E+04	2.03747E-10	1.54697E+03	[illegible]	1.29962E+04	-8.58216E+01	
40	11	JA	0.0	-2.21045E+04	-2.95306E+02	-1.54697E+03	2.16656E+02	3.65131E+04	-8.26523E+03	BEAMG
40	41	JB	100.0	2.21045E+04	2.95306E+02	1.54697E+03	-2.16656E+02	6.32638E+03	8.58216E+01	
41	41	JA	0.0	-2.21065E+04	9.45874E-11	-1.54697E+03	1.32110E+02	-6.32871E+03	-8.58216E+01	BEAMG
41	42	JB	100.0	2.21065E+04	-9.45874E-11	1.54697E+03	-1.32110E+02	1.29962E+04	8.58216E+01	

EARTHQUAKE 1

MAXIMUM LOAD SUMMARY FOR BEAM ELEMENT LOADS FOR OUTPUT VECTOR 5

	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3
MAXIMUM BEAM LOADS =	2.62840E+04	1.82413E+04	1.27800E+04	7.30139E+04	4.90543E+05	5.00618E+05
BEAM NOS. =	37.	20.	8.	36.	8.	16.
MINIMUM BEAM LOADS =	-2.73360E+04	-1.82413E+04	-1.27800E+04	-7.30139E+04	-4.81573E+05	-5.00618E+05
BEAM NOS. =	36.	20.	8.	36.	11.	21.

EARTHQUAKE 1

BEAM END LOADS IN GLOBAL SYSTEM FOR OUTPUT VECTOR 5

BEAM	--NODE--		FX1	FX2	FX3	MX1	MX2	MX3
1	JA	1	-.435E+04	.435E+04	-.564E+04	.447E-07	-.149E-07	-.745E-08
	JB	4	.435E+04	-.435E+04	.564E+04	.123E+06	.123E+06	.745E-08
2	JA	3	.391E-09	-.186E-08	.247E-09	.698E-09	.105E-08	-.151E-08
	JB	2	-.391E-09	.186E-08	-.247E-09	.210E-08	-.105E-08	-.169E-08
3	JA	3	.512E-08	0.	.466E-09	.119E-06	.298E-07	-.894E-07
	JB	4	-.512E-08	0.	-.466E-09	-.596E-07	-.298E-07	.283E-06
4	JA	4	.419E-08	-.298E-07	.126E-07	.119E-06	.149E-06	-.179E-06
	JB	5	-.419E-08	.298E-07	-.126E-07	-.417E-06	-.149E-06	.328E-06
5	JA	5	.271E-09	-.140E-08	-.160E-09	.140E-08	.582E-09	.262E-09
	JB	6	-.271E-09	.140E-08	.160E-09	.466E-09	-.582E-09	.151E-08
6	JA	4	-.435E+04	.435E+04	-.564E+04	-.123E+06	-.123E+06	.522E-07
	JB	7	.435E+04	-.435E+04	.564E+04	.220E+06	.220E+06	-.522E-07
7	JA	7	-.954E+04	.954E+04	-.124E+05	-.220E+06	-.220E+06	.782E-07
	JB	8	.954E+04	-.954E+04	.124E+05	.312E+06	.312E+06	-.782E-07
8	JA	8	-.128E+05	.128E+05	-.166E+05	-.312E+06	-.312E+06	.522E-07
	JB	11	.128E+05	-.128E+05	.166E+05	.491E+06	.491E+06	-.522E-07
9	JA	10	.181E-08	-.547E-09	.805E-09	.512E-08	.674E-08	-.698E-08
	JB	9	-.181E-08	.547E-09	-.805E-09	-.831E-09	-.110E-07	-.536E-08
10	JA	10	.750E-08	-.271E-08	-.504E-08	-.135E-07	.978E-07	.119E-06
	JB	11	-.750E-08	.271E-08	.504E-08	.148E-06	-.232E-06	.745E-07
11	JA	11	.109E+05	-.109E+05	-.166E+05	-.482E+06	-.482E+06	.730E+05
	JB	12	-.109E+05	.109E+05	.166E+05	.329E+06	.329E+06	-.730E+05
12	JA	12	.256E+04	-.256E+04	-.273E+05	-.329E+06	-.329E+06	.730E+05
	JB	37	-.256E+04	.256E+04	.273E+05	.210E+06	.210E+06	-.730E+05
13	JA	13	.149E+04	-.608E+04	.153E+05	-.502E+05	.749E+04	.103E+04
	JB	14	-.149E+04	.608E+04	-.153E+05	.810E+05	.215E+02	-.103E+04
14	JA	15	-.149E+04	.608E+04	-.153E+05	-.644E+05	.215E+02	.131E+05
	JB	14	.149E+04	-.608E+04	.153E+05	-.810E+05	-.215E+02	.103E+04
15	JA	15	.149E+04	-.608E+04	.153E+05	.644E+05	-.215E+02	-.131E+05
	JB	16	-.149E+04	.608E+04	-.153E+05	-.409E+06	.215E+02	.465E+05
16	JA	16	-.298E+03	.605E+04	-.182E+05	.501E+06	.215E+02	-.175E+04
	JB	17	.298E+03	-.605E+04	.182E+05	-.902E+05	-.215E+02	-.496E+04
17	JA	17	-.298E+03	.605E+04	-.182E+05	.902E+05	.215E+02	.496E+04
	JB	18	.298E+03	-.605E+04	.182E+05	.831E+05	-.215E+02	-.780E+04
18	JA	19	.298E+03	-.605E+04	.182E+05	.114E+06	.149E+04	-.780E+04
	JB	18	-.298E+03	.605E+04	-.182E+05	-.831E+05	.215E+02	.780E+04
19	JA	20	.605E+04	-.149E+04	.182E+05	.749E+04	.114E+06	.103E+04
	JB	21	-.605E+04	.149E+04	-.182E+05	.215E+02	-.831E+05	-.103E+04
20	JA	22	-.605E+04	.149E+04	-.182E+05	.215E+02	.902E+05	.131E+05

	JA	19	[illegible]	-.605E+04	.190E+05	.114E+06	.149E+04	-.190E+04
	JB	18	[illegible]	.605E+04	-.190E+05	[illegible]	.151E+05	.190E+04
20	JA	20	.605E+04	-.149E+04	.182E+05	.743E+02	[illegible]	[illegible]
	JB	21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	JA	22	-.605E+04	.149E+04	-.182E+05	.215E+02	.902E+05	.131E+05
	JB	21	.605E+04	-.149E+04	.182E+05	-.215E+02	.941E+05	.104E+04
21	JA	22	.605E+04	-.149E+04	.182E+05	-.215E+02	-.902E+05	-.131E+05
	JB	16	-.605E+04	.149E+04	-.182E+05	.215E+02	.501E+06	.465E+05
22	JA	16	-.604E+04	.298E+03	-.153E+05	.215E+02	-.409E+06	-.175E+04
	JB	23	.604E+04	-.298E+03	.153E+05	-.215E+02	.644E+05	-.496E+04
23	JA	23	-.604E+04	.298E+03	-.153E+05	.215E+02	-.644E+05	.496E+04
	JB	24	.604E+04	-.298E+03	.153E+05	-.215E+02	-.810E+05	-.780E+04
24	JA	23	.604E+04	-.298E+03	.153E+05	.149E+04	-.502E+05	-.780E+04
	JB	24	-.604E+04	.298E+03	-.153E+05	.215E+02	.810E+05	.780E+04
25	JA	34	.604E+04	-.604E+04	.263E+05	-.191E+06	-.191E+06	-.165E+05
	JB	26	-.604E+04	.604E+04	-.263E+05	-.223E+06	-.223E+06	.165E+05
26	JA	25	-.291E+04	.291E+04	.149E+05	.223E+06	.223E+06	-.165E+05
	JB	27	.291E+04	-.291E+04	-.149E+05	-.783E+04	-.783E+04	.165E+05
27	JA	27	-.909E+04	.909E+04	.662E+04	.783E+04	.783E+04	-.165E+05
	JB	30	.909E+04	-.909E+04	-.662E+04	.119E+06	.119E+06	.165E+05
28	JA	29	.103E-09	-.105E-08	.953E-09	.413E-08	.443E-08	-.499E-08
	JB	28	-.103E-09	.105E-08	-.953E-09	-.907E-08	-.937E-08	-.116E-09
29	JA	29	-.214E-08	-.823E-09	-.931E-09	-.366E-07	.787E-07	-.745E-08
	JB	30	.214E-08	.823E-09	.931E-09	.576E-07	-.576E-07	.745E-07
30	JA	30	-.137E+05	.480E+03	.279E-08	-.600E+02	-.390E+02	-.824E+04
	JB	31	.137E+05	-.480E+03	-.279E-08	.600E+02	.390E+02	-.504E+04
31	JA	31	-.137E+05	.480E+03	.262E-09	-.600E+02	-.390E+02	.504E+04
	JB	32	.137E+05	-.480E+03	-.262E-09	.600E+02	.390E+02	-.710E+04
32	JA	30	-.480E+03	.137E+05	.205E-07	-.390E+02	-.600E+02	-.824E+04
	JB	33	.480E+03	-.137E+05	-.205E-07	.390E+02	.600E+02	-.504E+04
33	JA	33	-.480E+03	.137E+05	.291E-10	-.390E+02	-.600E+02	.504E+04
	JB	34	.480E+03	-.137E+05	-.291E-10	.390E+02	.600E+02	-.710E+04
34	JA	30	.510E+04	-.510E+04	.662E+04	-.119E+06	-.119E+06	0.
	JB	35	-.510E+04	.510E+04	-.662E+04	.479E+05	.479E+05	0.
35	JA	35	.170E+04	-.170E+04	.221E+04	-.479E+05	-.479E+05	.466E-09
	JB	36	-.170E+04	.170E+04	-.221E+04	-.931E-09	0.	-.466E-09
36	JA	37	.256E+04	-.256E+04	-.273E+05	-.210E+06	-.210E+06	.730E+05
	JB	16	-.256E+04	.256E+04	.273E+05	.167E+06	.167E+06	-.730E+05
37	JA	16	.604E+04	-.604E+04	.263E+05	-.259E+06	-.259E+06	-.165E+05
	JB	38	-.604E+04	.604E+04	-.263E+05	.191E+06	.191E+06	.165E+05
38	JA	11	-.221E+05	.155E+04	-.192E-08	-.704E+03	-.827E+04	-.365E+05
	JB	39	.221E+05	-.155E+04	.192E-08	.132E+03	.858E+02	-.633E+04
39	JA	39	-.221E+05	.155E+04	.204E-09	-.132E+03	-.858E+02	.633E+04
	JB	40	.221E+05	-.155E+04	-.204E-09	.132E+03	.858E+02	-.130E+05
40	JA	11	-.155E+04	.221E+05	.159E-07	-.827E+04	-.704E+03	-.365E+05
	JB	41	.155E+04	-.221E+05	-.159E-07	.858E+02	.132E+03	-.633E+04
41	JA	41	-.155E+04	.221E+05	-.940E-10	-.858E+02	-.132E+03	.633E+04
	JB	42	.155E+04	-.221E+05	.940E-10	.858E+02	.132E+03	-.130E+05

	JA	41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	JB	41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
41	JA	41	-.155E+04	.221E+05	-.946E-10	-.858E+02	-.132E+03	.633E+04	
	JB	42	.155E+04	-.221E+05	.946E-10	.858E+02	.132E+03	-.130E+05	

EARTHQUAKE 1

B E A M S T R E S S E S FOR OUTPUT VECTOR 5

BEAM NO	BEAM LOAD-LOCATION, NODE--PERCENT.		--- TRANSVERSE --- SHEAR (V2/KJ*A)	SHEAR (V3/KJ*A)	TORSIONAL (T*C/J)	- STRESSES AT USER LOCATIONS - A	B	C	MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED SHEAR	
1	1	JA 0.0	-4.87E+01	-4.87E+01	-1.08E-12	-3.159E+01	-3.159E+01	-3.159E+01	-3.1588E+01	-3.1588E+01	1.58E+01	PIPEG
1	4	JB 100.0	-4.87E+01	-4.87E+01	-1.08E-12	-3.159E+01	3.055E+01	3.055E+01	5.6283E+01	-1.1946E+02	2.81E+01	
2	3	JA 0.0	-5.64E-11	-5.07E-11	-1.34E-11	1.447E-10	1.267E-10	1.058E-10	1.8743E-10	1.0189E-10	9.47E-11	PIPEG
2	2	JB 100.0	-5.64E-11	-5.07E-11	-1.34E-11	1.447E-10	1.984E-10	1.880E-10	2.1370E-10	7.5616E-11	1.08E-10	
3	3	JA 0.0	-9.31E-13	1.02E-11	7.45E-14	0.	2.980E-13	-2.235E-13	5.2154E-13	-5.2154E-13	2.71E-13	BEAMG
3	4	JB 100.0	-9.31E-13	1.02E-11	7.45E-14	0.	1.490E-13	-7.078E-13	8.5682E-13	-8.5682E-13	4.35E-13	
4	4	JA 0.0	-2.51E-11	8.38E-12	3.73E-13	-5.960E-11	-5.931E-11	-6.005E-11	-5.8860E-11	-6.0350E-11	2.94E-11	BEAMG
4	5	JB 100.0	-2.51E-11	8.38E-12	3.73E-13	-5.960E-11	-5.856E-11	-6.042E-11	-5.7742E-11	-6.1467E-11	2.89E-11	
5	5	JA 0.0	2.49E-11	4.21E-11	7.47E-12	-1.085E-10	-7.265E-11	-1.018E-10	-7.2025E-11	-1.4496E-10	3.68E-11	PIPEG
5	6	JB 100.0	2.49E-11	4.21E-11	7.47E-12	-1.085E-10	-1.204E-10	-1.473E-10	-6.7866E-11	-1.4912E-10	3.47E-11	
6	4	JA 0.0	-4.87E+01	-4.87E+01	1.32E-11	-3.159E+01	3.055E+01	3.055E+01	5.6283E+01	-1.1946E+02	2.81E+01	PIPEG
6	7	JB 100.0	-4.87E+01	-4.87E+01	1.32E-11	-3.159E+01	7.948E+01	7.948E+01	1.2549E+02	-1.6867E+02	6.27E+01	
7	7	JA 0.0	-2.73E+02	-2.73E+02	5.09E-11	-1.769E+02	1.090E+02	1.090E+02	2.2744E+02	-5.8117E+02	1.14E+02	PIPEG
7	8	JB 100.0	-2.73E+02	-2.73E+02	5.09E-11	-1.769E+02	2.283E+02	2.283E+02	3.9614E+02	-7.4989E+02	1.98E+02	
8	8	JA 0.0	-2.35E+02	-2.35E+02	1.75E-11	-1.524E+02	5.697E+01	5.697E+01	1.4368E+02	-4.4842E+02	7.18E+01	PIPEG
8	11	JB 100.0	-2.35E+02	-2.35E+02	1.75E-11	-1.524E+02	1.772E+02	1.772E+02	3.1366E+02	-6.1840E+02	1.57E+02	
9	10	JA 0.0	-6.61E-11	-1.37E-10	-4.58E-11	-4.667E-11	-2.413E-11	-1.130E-10	4.0700E-11	-1.1403E-10	5.01E-11	PIPEG
9	9	JB 100.0	-6.61E-11	-1.37E-10	-4.58E-11	-4.667E-11	4.210E-11	2.186E-11	6.1463E-11	-1.3479E-10	5.52E-11	
10	10	JA 0.0	1.01E-11	1.44E-11	1.49E-13	6.782E-12	6.586E-12	7.081E-12	7.2771E-12	6.2879E-12	3.64E-12	BEAMG
10	11	JB 100.0	1.01E-11	1.44E-11	1.49E-13	6.782E-12	6.111E-12	6.596E-12	7.6398E-12	5.9252E-12	3.82E-12	
11	11	JA 0.0	2.00E+02	2.00E+02	2.45E+01	-1.524E+02	1.711E+02	1.711E+02	3.0514E+02	-6.0988E+02	1.55E+02	PIPEG
11	12	JB 100.0	2.00E+02	2.00E+02	2.45E+01	-1.524E+02	6.887E+01	6.887E+01	1.6052E+02	-4.6526E+02	8.39E+01	
12	12	JA 0.0	7.34E+01	7.34E+01	4.75E+01	-3.911E+02	3.712E+01	3.712E+01	2.1450E+02	-9.9670E+02	1.17E+02	PIPEG
12	37	JB 100.0	7.34E+01	7.34E+01	4.75E+01	-3.911E+02	-1.179E+02	-1.179E+02	-4.7749E+00	-7.7742E+02	4.75E+01	
13	13	JA 0.0	1.22E+01	2.97E+00	-2.58E-03	-3.062E+01	-3.074E+01	-3.060E+01	-3.0472E+01	-3.0761E+01	1.52E+01	BEAMG
13	14	JB 100.0	1.22E+01	2.97E+00	-2.58E-03	-3.062E+01	-3.062E+01	-3.062E+01	-3.0414E+01	-3.0819E+01	1.52E+01	
14	15	JA 0.0	4.46E+02	4.33E+01	-2.57E+00	-1.772E+02	2.190E+02	-1.355E+02	2.6075E+02	-6.1519E+02	1.30E+02	BEAMG
14	14	JB 100.0	4.46E+02	4.33E+01	-2.57E+00	-1.772E+02	-6.752E+02	-1.605E+02	3.2408E+02	-6.7853E+02	1.62E+02	
15	15	JA 0.0	-3.05E+01	2.97E+00	-5.37E-05	-1.215E+01	-1.199E+01	-1.219E+01	-1.1960E+01	-1.2348E+01	5.98E+00	BEAMG
15	16	JB 100.0	-3.05E+01	2.97E+00	-5.37E-05	-1.215E+01	-1.113E+01	-1.227E+01	-1.1015E+01	-1.3292E+01	5.51E+00	
16	16	JA 0.0	3.65E+01	-5.97E-01	5.37E-05	1.209E+01	1.335E+01	1.209E+01	1.3350E+01	1.0838E+01	6.67E+00	BEAMG
16	17	JB 100.0	3.65E+01	-5.97E-01	5.37E-05	1.209E+01	1.232E+01	1.211E+01	1.2332E+01	1.1856E+01	6.17E+00	
17	17	JA 0.0	5.32E+02	-8.70E+00	2.57E+00	1.763E+02	7.309E+02	1.922E+02	7.4677E+02	-3.9408E+02	3.73E+02	BEAMG
17	18	JB 100.0	5.32E+02	-8.70E+00	2.57E+00	1.763E+02	-3.347E+02	2.012E+02	7.1225E+02	-3.5956E+02	3.56E+02	
18	19	JA 0.0	-1.21E+01	-5.97E-01	1.95E-02	-3.648E+01	-3.677E+01	-3.649E+01	-3.6195E+01	-3.6771E+01	1.41E+01	BEAMG
18	18	JB 100.0	-1.21E+01	-5.97E-01	1.95E-02	-3.648E+01	-3.669E+01	-3.648E+01	-3.6275E+01	-3.6690E+01	1.41E+01	
19	20	JA 0.0	-1.21E+01	2.97E+00	-2.58E-03	-3.648E+01	-3.677E+01	-3.646E+01	-3.6180E+01	-3.6766E+01	1.41E+01	BEAMG
19	21	JB 100.0	-1.21E+01	2.97E+00	-2.58E-03	-3.648E+01	-3.669E+01	-3.648E+01	-3.6275E+01	-3.6690E+01	1.41E+01	

17	JA	0.0	5.32E+02	-8.70E+00	2.57E+00	1.763E+02	7.[illegible]E+02	1.922E+02	7.4677E+02	-3.9408E+02	3.73E+02	BEAMG	
18	JB	100.0	5.32E+02	-8.70E+00	2.57E+00	1.763E+02	-3.[illegible]E+02	2.012E+02	7.1225E+02	-3.5956E+02	3.56E+02		
19	JA	0.0	-1.21E+01	-5.97E-01	1.95E-02	-3.648E+01	-3.677E+01	-3.649E+01	-3.6195E+01	-3.6771E+01	1.81E+01	BEAMG	
18	JB	100.0	-1.21E+01	-5.97E-01	1.95E-02	-3.648E+01	-3.669E+01	-3.648E+01	-3.6275E+01	-3.6690E+01	1.81E+01		
19	JA	0.0	-1.21E+01	2.97E+00	-2.58E-03	-3.648E+01	-3.677E+01	-3.646E+01	-3.6140E+01	-3.6786E+01	1.81E+01	BEAMG	
19	JB	100.0	-1.21E+01	2.97E+00	-2.58E-03	-3.648E+01	-3.669E+01	-3.648E+01	-3.6275E+01	-3.6690E+01	1.81E+01		
20	JA	0.0	5.32E+02	4.33E+01	-2.57E+00	1.763E+02	7.309E+02	2.181E+02	7.7265E+02	-4.1996E+02	3.86E+02	BEAMG	
20	JB	100.0	5.32E+02	4.33E+01	-2.57E+00	1.763E+02	-3.347E+02	1.731E+02	6.9067E+02	-3.3794E+02	3.45E+02		
21	JA	0.0	-3.65E+01	2.97E+00	-5.37E-05	1.209E+01	1.232E+01	1.206E+01	1.2352E+01	1.1835E+01	6.18E+00	BEAMG	
21	JB	100.0	-3.65E+01	2.97E+00	-5.37E-05	1.209E+01	1.335E+01	1.198E+01	1.3461E+01	1.0726E+01	6.73E+00		
22	JA	0.0	3.06E+01	-5.97E-01	5.37E-05	-1.215E+01	-1.113E+01	-1.216E+01	-1.1127E+01	-1.3180E+01	5.56E+00	BEAMG	
22	JB	100.0	3.06E+01	-5.97E-01	5.37E-05	-1.215E+01	-1.199E+01	-1.214E+01	-1.1980E+01	-1.2327E+01	5.99E+00		
23	JA	0.0	4.46E+02	-8.70E+00	2.57E+00	-1.772E+02	2.190E+02	-1.614E+02	2.3487E+02	-5.8931E+02	1.17E+02	BEAMG	
24	JB	100.0	4.46E+02	-8.70E+00	2.57E+00	-1.772E+02	-6.752E+02	-1.524E+02	3.4566E+02	-7.0011E+02	1.73E+02		
25	JA	0.0	1.22E+01	-5.97E-01	1.95E-02	-3.062E+01	-3.074E+01	-3.062E+01	-3.0487E+01	-3.0746E+01	1.52E+01	BEAMG	
24	JB	100.0	1.22E+01	-5.97E-01	1.95E-02	-3.062E+01	-3.082E+01	-3.062E+01	-3.0414E+01	-3.0819E+01	1.52E+01		
25	JA	0.0	1.74E+02	1.74E+02	-1.07E+01	3.760E+02	6.241E+02	6.241E+02	7.2690E+02	2.5141E+01	3.64E+02	PIPEG	
26	JB	100.0	1.74E+02	1.74E+02	-1.07E+01	3.760E+02	8.542E+01	8.542E+01	7.8698E+02	-3.4944E+01	3.94E+02		
25	JA	0.0	-8.33E+01	-8.33E+01	-1.07E+01	2.093E+02	-8.127E+01	-8.127E+01	6.2029E+02	-2.0164E+02	3.10E+02	PIPEG	
27	JB	100.0	-8.33E+01	-8.33E+01	-1.07E+01	2.093E+02	1.991E+02	1.991E+02	2.2372E+02	1.9493E+02	1.12E+02		
27	JA	0.0	-1.67E+02	-1.67E+02	-5.54E+00	6.086E+01	5.560E+01	5.560E+01	6.8295E+01	5.3421E+01	3.46E+01	PIPEG	
30	JB	100.0	-1.67E+02	-1.67E+02	-5.54E+00	6.086E+01	1.411E+02	1.411E+02	1.7436E+02	-5.2659E+01	8.74E+01		
29	JA	0.0	-7.62E-11	-5.49E-11	1.18E-12	-3.347E-11	3.269E-11	-8.691E-11	5.1581E-11	-1.1852E-10	2.58E-11	PIPEG	
28	JB	100.0	-7.62E-11	-5.49E-11	1.18E-12	-3.347E-11	1.090E-10	-3.220E-11	1.0904E-10	-1.7598E-10	5.45E-11		
29	JA	0.0	1.66E-12	4.19E-12	-2.04E-13	-1.863E-12	-1.937E-12	-1.881E-12	-1.7695E-12	-1.9558E-12	9.08E-13	BEAMG	
30	JB	100.0	1.66E-12	4.19E-12	-2.04E-13	-1.863E-12	-1.863E-12	-2.049E-12	-1.6764E-12	-2.0489E-12	8.63E-13		
30	JA	0.0	-5.59E-12	-9.59E-01	-1.50E-04	-2.744E+01	-2.744E+01	-2.746E+01	-2.7416E+01	-2.7459E+01	1.37E+01	BEAMG	
31	JB	100.0	-5.59E-12	-9.59E-01	-1.50E-04	-2.744E+01	-2.744E+01	-2.742E+01	-2.7424E+01	-2.7450E+01	1.37E+01		
31	JA	0.0	-2.91E-11	-5.33E+01	-2.66E+01	-1.524E+03	-1.247E+03	-1.516E+03	-1.2385E+03	-1.8101E+03	6.20E+02	BEAMG	
32	JB	100.0	-2.91E-11	-5.33E+01	-2.66E+01	-1.524E+03	-1.247E+03	-1.512E+03	-1.2349E+03	-1.8136E+03	6.18E+02		
30	JA	0.0	-4.10E-11	-9.59E-01	-1.50E-04	2.744E+01	2.744E+01	2.742E+01	2.7458E+01	2.7416E+01	1.37E+01	BEAMG	
33	JB	100.0	-4.10E-11	-9.59E-01	-1.50E-04	2.744E+01	2.744E+01	2.745E+01	2.7450E+01	2.7424E+01	1.37E+01		
33	JA	0.0	-3.23E-12	-5.33E+01	-2.66E+01	1.524E+03	1.247E+03	1.533E+03	1.8101E+03	1.2385E+03	9.05E+02	BEAMG	
34	JB	100.0	-3.23E-12	-5.33E+01	-2.66E+01	1.524E+03	1.247E+03	1.537E+03	1.8136E+03	1.2349E+03	9.07E+02		
30	JA	0.0	9.39E+01	9.39E+01	0.	6.086E+01	1.411E+02	1.411E+02	1.7428E+02	-5.2565E+01	8.71E+01	PIPEG	
35	JB	100.0	9.39E+01	9.39E+01	0.	6.086E+01	9.306E+01	9.306E+01	1.0640E+02	1.5320E+01	5.32E+01		
35	JA	0.0	4.87E+01	4.87E+01	3.03E-13	3.160E+01	9.393E+01	9.393E+01	1.1974E+02	-5.6538E+01	5.99E+01	PIPEG	
36	JB	100.0	4.87E+01	4.87E+01	3.03E-13	3.160E+01	3.160E+01	3.160E+01	3.1602E+01	3.1602E+01	1.58E+01		
37	JA	0.0	3.63E+01	3.63E+01	2.35E+01	-1.934E+02	-5.841E+01	-5.841E+01	-2.5013E+00	-3.8425E+02	2.35E+01	PIPEG	
16	JB	100.0	3.63E+01	3.63E+01	2.35E+01	-1.934E+02	-8.612E+01	-8.612E+01	-4.1689E+01	-3.4506E+02	3.14E+01		
16	JA	0.0	8.59E+01	8.59E+01	-5.29E+00	1.859E+02	3.521E+02	3.521E+02	4.2100E+02	-4.9156E+01	2.11E+02	PIPEG	
38	JB	100.0	8.59E+01	8.59E+01	-5.29E+00	1.859E+02	3.085E+02	3.085E+02	3.5928E+02	1.2558E+01	1.80E+02		
11	JA	0.0	5.91E-01	-3.09E+00	-5.42E-04	-4.421E+01	-4.419E+01	-4.430E+01	-4.4097E+01	-4.4321E+01	2.20E+01	BEAMG	
39	JB	100.0	5.91E-01	-3.09E+00	-5.42E-04	-4.421E+01	-4.421E+01	-4.419E+01	-4.4193E+01	-4.4225E+01	2.21E+01		
39	JA	0.0	-2.26E-11	-1.72E+02	-5.87E+01	-2.456E+03	-1.846E+03	-2.445E+03	-1.8352E+03	-3.0774E+03	9.19E+02	BEAMG	
40	JB	100.0	-2.26E-11	-1.72E+02	-5.87E+01	-2.456E+03	-1.846E+03	-2.434E+03	-1.8236E+03	-3.0889E+03	9.14E+02		
11	JA	0.0	-5.91E-01	-3.09E+00	-5.42E-04	4.421E+01	4.419E+01	4.432E+01	4.4321E+01	4.4097E+01	2.22E+01	BEAMG	
41	JB	100.0	-5.91E-01	-3.09E+00	-5.42E-04	4.421E+01	4.421E+01	4.422E+01	4.4225E+01	4.4193E+01	2.21E+01		
41	JA	0.0	1.05E-11	-1.72E+02	-5.87E+01	2.456E+03	1.846E+03	2.467E+03	3.0774E+03	1.8352E+03	1.54E+03	BEAMG	
[illegible]													

						4.421E+01	4.421E+01	4.422E+01	4.422E+01	4.419E+01	2.21E+01	BEAMG
+1	41	JA	0.0	1.05E-11	-1.72E+02	-5.87E+01	2.456E+03	1.846E+03	2.467E+03	3.0774E+03	1.8352E+03	1.54E+03	BEAMG
+1	42	JB	100.0	1.05E-11	-1.72E+02	-5.87E+01	2.456E+03	1.846E+03	2.479E+03	3.0889E+03	1.8236E+03	1.55E+03	

EARTHQUAKE 1

MAXIMUM STRESS SUMMARY FOR BEAM STRESSES FOR OUTPUT VECTORS

	--- TRANSVERSE --- SHEAR (V2/K3*A)	SHEAR (V3/K2*A)	TORSIONAL (T*C/J)	- STRESSES AT USER LOCATIONS - A	B	C	MAXIMUM (P/A+MC/I)	MINIMUM (P/A-MC/I)	COMBINED STRESS
MAX. BEAM STRESSES=	5.32E+02	2.00E+02	4.75E+01	2.456E+03	1.846E+03	2.479E+03	3.0889E+03	1.8352E+03	1.55E+03
BEAM NOS. =	26.	11.	12.	41.	41.	41.	41.	41.	41.
MIN. BEAM STRESSES=	-2.73E+02	-2.73E+02	-5.87E+01	-2.456E+03	-1.846E+03	-2.445E+03	-1.8352E+03	-3.0889E+03	2.71E-13
BEAM NOS. =	7.	7.	39.	39.	39.	39.	39.	39.	3.

B E G I N INPUT LOAD CASE NO. 6 TITLE(EARTHQUAKE 2

NODAL POINT APPLIED FORCES FOR LOAD CASE NO. 6

NODE	X1	X2	X3	X4	X5	X6
1	-4.354000E+03	4.354000E+03	-5.644000E+03	-0.	-0.	-0.
7	-3.504000E+03	3.504000E+03	-6.719000E+03	-0.	-0.	-0.
8	-1.998000E+03	1.998000E+03	-4.204000E+03	-0.	-0.	-0.
12	-3.631000E+03	3.631000E+03	-1.077100E+04	-0.	-0.	-0.
16	-3.360000E+02	3.360000E+02	-1.347700E+04	-0.	-0.	-0.
26	3.263000E+03	-3.263000E+03	-1.165200E+04	-0.	-0.	-0.
27	4.488000E+03	-4.488000E+03	-8.015000E+03	-0.	-0.	-0.
35	2.931000E+03	-2.931000E+03	-4.408000E+03	-0.	-0.	-0.
36	1.704000E+03	-1.704000E+03	-2.209000E+03	-0.	-0.	-0.

NODAL POINT APPLIED LOADS AND/OR DISPLACEMENTS FINAL SUMMARY FOR LOAD CASE NO. 6

NODE	X1	X2	X3	X4	X5	X6

NOTE IF A FINAL SUMMARY OF APPLIED NODAL LOADS AND GENERATED LOADS IS DESIRED AT THIS POINT,
CODE A 1 IN COLUMN 20 OF THE STATIC CARD.

FORCE AND MOMENT SUMMATION
ABOUT AXES PARALLEL TO SYSTEM AXES
WITH ORIGIN AT POINT (0,0,0)
SUMMATION INCLUDES LOADS APPLIED TO RESTRAINED DOF.

FX1 = -.14420000000E+04
FX2 = .14420000000E+04
FX3 = -.57099000000E+05
MX1 = -.35645657400E+07
MX2 = -.35645657400E+07
MX3 = 0.

EARTHQUAKE 2

BEAM ELEMENT LOADS FOR OUTPUT VECTOR 6

BEAM NO	.LOAD-LOCATION. .NODE--PERCENT.	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3	
1	1 JA 0.0	5.64400E+03	-4.35400E+03	-4.35400E+03	0.	3.72529E-08	2.98023E-08	PIPEG
1	4 JB 100.0	-5.64400E+03	4.35400E+03	4.35400E+03	0.	1.23000E+05	-1.23000E+05	
2	3 JA 0.0	-1.86265E-09	-2.54659E-10	-7.43967E-10	9.31323E-10	3.23053E-09	-9.31323E-10	PIPEG
2	2 JB 100.0	1.86265E-09	2.54659E-10	7.43947E-10	-9.31323E-10	3.55067E-09	-2.09548E-09	
3	3 JA 0.0	1.49012E-08	-3.25963E-09	1.31549E-08	0.	1.49012E-08	5.96046E-08	BEAMG
3	4 JB 100.0	-1.49012E-08	3.25963E-09	-1.31549E-08	0.	-2.98023E-07	-5.96046E-08	
4	4 JA 0.0	3.72529E-08	-1.16415E-08	8.38190E-09	-1.49012E-07	1.71363E-07	1.78814E-07	BEAMG
4	5 JB 100.0	-3.72529E-08	1.16415E-08	-8.38190E-09	1.49012E-07	-3.42727E-07	-4.17233E-07	
5	5 JA 0.0	2.32831E-09	8.00355E-11	3.01952E-10	-6.98492E-10	6.98492E-10	1.16415E-09	PIPEG
5	6 JB 100.0	-2.32831E-09	-8.00355E-11	-3.01952E-10	6.98492E-10	-1.92085E-09	0.	
6	4 JA 0.0	5.64400E+03	-4.35400E+03	-4.35400E+03	-1.86265E-08	-1.23001E+05	1.23001E+05	PIPEG
6	7 JB 100.0	-5.64400E+03	4.35400E+03	4.35400E+03	1.86265E-08	2.19877E+05	-2.19877E+05	
7	7 JA 0.0	1.23300E+04	-7.86300E+03	-7.86300E+03	-3.53903E-08	-2.19877E+05	2.19877E+05	PIPEG
7	8 JB 100.0	-1.23300E+04	7.86300E+03	7.86300E+03	3.53903E-08	2.95519E+05	-2.95519E+05	
8	8 JA 0.0	1.65670E+04	-9.86100E+03	-9.86100E+03	-2.23517E-08	-2.95519E+05	2.95519E+05	PIPEG
8	11 JB 100.0	-1.65670E+04	9.86100E+03	9.86100E+03	2.23517E-08	4.33573E+05	-4.33573E+05	
9	10 JA 0.0	7.43932E-10	-6.42706E-10	-8.47649E-10	9.77889E-09	4.07454E-09	2.45629E-09	PIPEG
9	9 JB 100.0	-7.43932E-10	6.42706E-10	8.47649E-10	-9.77889E-09	2.56114E-09	-6.58919E-09	
10	10 JA 0.0	-2.96734E-09	6.34773E-09	2.09548E-09	-8.94070E-08	-1.49012E-08	-1.61289E-07	BEAMG
10	11 JB 100.0	2.96734E-09	-6.34773E-09	-2.09548E-09	8.94070E-08	-2.98023E-08	3.49341E-07	
11	11 JA 0.0	1.65670E+04	7.77124E+03	7.77124E+03	-5.75376E+04	-4.26835E+05	4.26835E+05	PIPEG
11	12 JB 100.0	-1.65670E+04	-7.77124E+03	-7.77124E+03	5.75376E+04	3.18038E+05	-3.18038E+05	
12	12 JA 0.0	2.73380E+04	4.14024E+03	4.14024E+03	-5.75376E+04	-3.18038E+05	3.18038E+05	PIPEG
12	37 JB 100.0	-2.73380E+04	-4.14024E+03	-4.14024E+03	5.75376E+04	1.25517E+05	-1.25517E+05	
13	13 JA 0.0	1.87368E+04	-2.43498E+03	-9.46721E+01	-3.29985E+03	4.50340E+02	-9.58192E+04	BEAMG
13	14 JB 100.0	-1.87368E+04	2.43498E+03	9.46721E+01	3.29985E+03	2.87004E+01	8.34982E+04	
14	15 JA 0.0	-2.43498E+03	1.87368E+04	-9.46721E+01	-2.87004E+01	-2.40047E+03	9.45016E+04	BEAMG
14	14 JB 100.0	2.43498E+03	-1.87368E+04	9.46721E+01	2.87004E+01	3.29985E+03	8.34982E+04	
15	15 JA 0.0	-2.43498E+03	-1.87368E+04	-9.46721E+01	-2.87004E+01	2.40047E+03	9.45016E+04	BEAMG
15	16 JB 100.0	2.43498E+03	1.87368E+04	9.46721E+01	2.87004E+01	-2.70348E+02	-5.16080E+05	
16	16 JA 0.0	2.46511E+03	1.48127E+04	6.26294E+02	2.87105E+01	-1.97726E+04	3.93412E+05	BEAMG
16	17 JB 100.0	-2.46511E+03	-1.48127E+04	-6.26294E+02	-2.87105E+01	5.68095E+03	-6.01263E+04	
17	17 JA 0.0	2.46511E+03	1.48127E+04	6.26294E+02	2.87105E+01	-5.68095E+03	6.01263E+04	BEAMG
17	18 JB 100.0	-2.46511E+03	-1.48127E+04	-6.26294E+02	-2.87105E+01	-2.68844E+02	8.05941E+04	
18	19 JA 0.0	1.48127E+04	2.46511E+03	6.26294E+02	2.68844E+02	-3.14034E+03	-6.81207E+04	BEAMG
18	18 JB 100.0	-1.48127E+04	-2.46511E+03	-6.26294E+02	-2.68844E+02	-2.87105E+01	8.05941E+04	
19	20 JA 0.0	1.48127E+04	2.46511E+03	-9.46721E+01	-3.29985E+03	4.50340E+02	-6.81207E+04	BEAMG
19	21 JB 100.0	-1.48127E+04	-2.46511E+03	9.46721E+01	3.29985E+03	2.87004E+01	8.05941E+04	

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17	17	JA	0.0	2.46511E+03	1.48127E+04	6.26294E+02	2.68710E+01	-5.68095E+03	-6.01263E+04		
17	18	JB	100.0	-2.46511E+03	-1.48127E+04	-6.26294E+02	-2.68710E+01	-2.68844E+02	8.05941E+04		
18	19	JA	0.0	1.48127E+04	2.46511E+03	6.26294E+02	2.68844E+02	-3.14034E+03	-6.81207E+04	BEAMG	
18	18	JB	100.0	-1.48127E+04	-2.46511E+03	-6.26294E+02	-2.68844E+02	-2.87105E+01	8.05941E+04		
19	20	JA	0.0	1.48127E+04	2.46511E+03	-9.46721E+01	-3.24986E+03	4.50140E+02	-6.81207E+04	BEAMG	
19	21	JB	100.0	-1.48127E+04	-2.46511E+03	9.46721E+01	3.24986E+03	2.87004E+01	8.05941E+04		
20	22	JA	0.0	2.46511E+03	1.48127E+04	-9.46721E+01	-2.87004E+01	-2.40047E+03	6.01263E+04	BEAMG	
20	21	JB	100.0	-2.46511E+03	-1.48127E+04	9.46721E+01	2.87004E+01	3.24986E+03	8.05941E+04		
21	22	JA	0.0	2.46511E+03	-1.48127E+04	-9.46721E+01	-2.87004E+01	2.40047E+03	6.01263E+04	BEAMG	
21	16	JB	100.0	-2.46511E+03	1.48127E+04	9.46721E+01	2.87004E+01	-2.70349E+02	-3.93412E+05		
22	16	JA	0.0	-2.43494E+03	1.87368E+04	6.26294E+02	2.87105E+01	-1.97726E+04	5.16080E+05	BEAMG	
22	23	JB	100.0	2.43494E+03	-1.87368E+04	-6.26294E+02	-2.87105E+01	5.68095E+03	-9.45016E+04		
23	23	JA	0.0	-2.43498E+03	1.87368E+04	6.26294E+02	2.87105E+01	-5.68095E+03	9.45016E+04	BEAMG	
23	24	JB	100.0	2.43498E+03	-1.87368E+04	-6.26294E+02	-2.87105E+01	-2.68844E+02	8.34982E+04		
24	25	JA	0.0	1.87368E+04	-2.43498E+03	6.26294E+02	2.68844E+02	-3.14034E+03	-9.58192E+04	BEAMG	
24	24	JB	100.0	-1.87368E+04	2.43498E+03	-6.26294E+02	-2.68844E+02	-2.87105E+01	8.34982E+04		
25	38	JA	0.0	-2.62840E+04	-1.81682E+03	-1.81682E+03	-1.74518E+04	4.65359E+04	-4.65359E+04	PIPEG	
25	26	JB	100.0	2.62840E+04	1.81682E+03	1.81682E+03	1.74518E+04	7.73531E+04	-7.73531E+04		
26	26	JA	0.0	-1.46320E+04	1.44618E+03	1.44618E+03	-1.74518E+04	-7.73531E+04	7.73531E+04	PIPEG	
26	27	JB	100.0	1.46320E+04	-1.44618E+03	-1.44518E+03	1.74518E+04	-2.97510E+04	2.97510E+04		
27	27	JA	0.0	-6.61700E+03	5.93418E+03	5.93418E+03	-1.74518E+04	2.97510E+04	-2.97510E+04	PIPEG	
27	30	JB	100.0	6.61700E+03	-5.93418E+03	-5.93418E+03	1.74518E+04	-1.12830E+05	1.12830E+05		
28	29	JA	0.0	-1.04774E-09	-2.96632E-09	6.05723E-10	-1.45154E-09	-4.48199E-09	-5.87897E-09	PIPEG	
28	28	JB	100.0	1.04774E-09	2.96632E-09	-6.05723E-10	1.45154E-09	-2.32831E-10	-1.66326E-08		
29	29	JA	0.0	-9.31323E-10	-1.12532E-08	-2.56114E-09	1.16676E-07	3.72529E-09	-1.37836E-07	BEAMG	
29	30	JB	100.0	9.31323E-10	1.12532E-08	2.56114E-09	-1.16676E-07	6.70552E-08	-1.88127E-07		
30	30	JA	0.0	-1.01271E+04	-1.17579E-08	4.42057E+02	-3.62852E+00	-8.72588E+03	-2.35857E+00	BEAMG	
30	31	JB	100.0	1.01271E+04	1.17579E-08	-4.42057E+02	3.62852E+00	-3.51468E+03	2.35857E+00		
31	31	JA	0.0	-1.01271E+04	-1.60071E-10	4.42057E+02	-3.62852E+00	3.51468E+03	-2.35857E+00	BEAMG	
31	32	JB	100.0	1.01271E+04	1.60071E-10	-4.42057E+02	3.62852E+00	-5.41994E+03	2.35857E+00		
32	30	JA	0.0	1.01271E+04	-2.33122E-08	4.42057E+02	-3.62852E+00	-8.72588E+03	2.35857E+00	BEAMG	
32	33	JB	100.0	-1.01271E+04	2.33122E-08	-4.42057E+02	3.62852E+00	-3.51468E+03	-2.35857E+00		
33	33	JA	0.0	1.01271E+04	-7.27596E-11	4.42057E+02	-3.62852E+00	3.51468E+03	2.35857E+00	BEAMG	
33	34	JB	100.0	-1.01271E+04	7.27596E-11	-4.42057E+02	3.62852E+00	-5.41994E+03	-2.35857E+00		
34	30	JA	0.0	-6.61700E+03	-4.63500E+03	-4.63500E+03	0.	1.12824E+05	-1.12824E+05	PIPEG	
34	35	JB	100.0	6.61700E+03	4.63500E+03	4.63500E+03	0.	-4.79335E+04	4.79335E+04		
35	35	JA	0.0	-2.20900E+03	-1.70400E+03	-1.70400E+03	4.65661E-10	4.79335E+04	-4.79335E+04	PIPEG	
35	36	JB	100.0	2.20900E+03	1.70400E+03	1.70400E+03	-4.65661E-10	4.65661E-10	0.		
36	37	JA	0.0	2.73380E+04	4.14024E+03	4.14024E+03	-5.75376E+04	-1.25517E+05	1.25517E+05	PIPEG	
36	16	JB	100.0	-2.73380E+04	-4.14024E+03	-4.14024E+03	5.75376E+04	5.58781E+04	-5.58781E+04		
37	16	JA	0.0	-2.62840E+04	-1.81682E+03	-1.81682E+03	-1.74518E+04	6.68479E+04	-6.68479E+04	PIPEG	
37	39	JB	100.0	2.62840E+04	1.81682E+03	1.81682E+03	1.74518E+04	-4.65359E+04	4.65359E+04		
38	11	JA	0.0	1.64265E+04	2.19495E+02	-1.20425E+03	1.90751E+02	2.87739E+04	6.16257E+03	BEAMG	
38	39	JB	100.0	-1.64265E+04	-2.19495E+02	1.20425E+03	-1.90751E+02	4.57471E+03	-8.42101E+01		
39	39	JA	0.0	1.64280E+04	-1.16415E-10	-1.20425E+03	1.29611E+02	-4.57685E+03	8.42101E+01	BEAMG	
39	40	JB	100.0	-1.64280E+04	1.16415E-10	1.20425E+03	-1.29611E+02	9.76716E+03	-8.42101E+01		
40	11	JA	0.0	-1.64265E+04	-2.19495E+02	-1.20425E+03	1.90751E+02	2.87739E+04	-6.16257E+03	BEAMG	
40	41	JB	100.0	1.64265E+04	2.19495E+02	1.20425E+03	-1.90751E+02	4.57471E+03	8.42101E+01		
41	41	JA	0.0	-1.64280E+04	8.73115E-11	-1.20425E+03	1.29611E+02	-4.57685E+03	-8.42101E+01	BEAMG	
41	42	JB	100.0	1.64280E+04	-8.73115E-11	1.20425E+03	-1.29611E+02	9.76716E+03	8.42101E+01		

39	JA	0.0	1.64280E+04	-1.16415E-10	-1.20425E+03	1.29611E+02	-4.57685E+03	8.42101E+01	BEAMG
40	JB	100.0	-1.64280E+04	1.16415E-10	1.20425E+03	-1.29611E+02	9.76716E+03	-8.42101E+01	
11	JA	0.0	-1.64265E+04	-2.19495E+02	-1.20425E+03	1.90751E+02	2.87739E+04	-6.16257E+03	BEAMG
41	JB	100.0	1.64265E+04	2.19495E+02	1.20425E+03	-1.90751E+02	4.57471E+03	8.42101E+01	
41	JA	0.0	-1.64280E+04	8.73115E-11	-1.20425E+03	1.29611E+02	-4.57685E+03	-8.42101E+01	BEAMG
41	JB	100.0	1.64280E+04	-8.73115E-11	1.20425E+03	-1.29611E+02	9.76716E+03	8.42101E+01	

EARTHQUAKE 2

MAXIMUM LOAD SUMMARY FOR BEAM ELEMENT LOADS FOR OUTPUT VECTOR 6

	AXIAL P	SHEAR V2	SHEAR V3	TORSION MT	BENDING M2	BENDING M3
MAXIMUM BEAM LOADS =	2.62840E+04	1.87364E+04	9.86100E+03	5.75376E+04	4.33573E+05	5.16080E+05
BEAM NOS. =	37.	15.	8.	36.	8.	22.
MINIMUM BEAM LOADS =	-2.73360E+04	-1.87308E+04	-9.86100E+03	-5.75376E+04	-4.26835E+05	-5.16080E+05
BEAM NOS. =	36.	15.	8.	36.	11.	15.

EARTHQUAKE 2

BEAM END LOADS IN GLOBAL SYSTEM FOR OUTPUT VECTOR 6

BEAM	--NODES--		FX1	FX2	FX3	MX1	MX2	MX3
1	JA	1	-.435E+04	.435E+04	-.564E+04	.373E-07	-.298E-07	0.
	JB	4	.435E+04	-.435E+04	.564E+04	.123E+06	.123E+06	0.
2	JA	3	.744E-09	-.186E-08	.255E-09	.931E-09	.931E-09	-.323E-08
	JB	2	-.744E-09	.186E-08	-.255E-09	.210E-08	-.931E-09	-.355E-08
3	JA	3	.132E-07	-.149E-07	.320E-08	.596E-07	0.	-.149E-07
	JB	4	-.132E-07	.149E-07	-.320E-08	-.596E-07	0.	.298E-06
4	JA	4	.838E-08	-.373E-07	.116E-07	.179E-06	.149E-06	-.171E-06
	JB	5	-.838E-08	.373E-07	-.116E-07	-.417E-06	-.149E-06	.343E-06
5	JA	5	.302E-09	-.233E-08	-.800E-10	.116E-08	.698E-09	-.698E-09
	JB	6	-.302E-09	.233E-08	.800E-10	0.	-.698E-09	.192E-08
6	JA	6	-.435E+04	.435E+04	-.504E+04	-.123E+06	-.123E+06	.186E-07
	JB	7	.435E+04	-.435E+04	.504E+04	.220E+06	.220E+06	-.186E-07
7	JA	7	-.786E+04	.786E+04	-.124E+05	-.220E+06	-.220E+06	.354E-07
	JB	8	.786E+04	-.786E+04	.124E+05	.296E+06	.296E+06	-.354E-07
8	JA	8	-.986E+04	.986E+04	-.166E+05	-.296E+06	-.296E+06	.224E-07
	JB	11	.986E+04	-.986E+04	.166E+05	.434E+06	.434E+06	-.224E-07
9	JA	10	.113E-08	-.733E-10	.643E-09	.518E-08	.865E-08	-.497E-08
	JB	9	-.113E-08	.733E-10	-.643E-09	-.226E-08	-.116E-07	-.256E-08
10	JA	10	.358E-08	.617E-09	-.635E-08	-.508E-07	.177E-06	.149E-07
	JB	11	-.358E-08	-.617E-09	.635E-08	.184E-06	-.310E-06	.298E-07
11	JA	11	.777E+04	-.777E+04	-.166E+05	-.427E+06	-.427E+06	.575E+05
	JB	12	-.777E+04	.777E+04	.166E+05	.318E+06	.318E+06	-.575E+05
12	JA	12	.414E+04	-.414E+04	-.273E+05	-.318E+06	-.318E+06	.575E+05
	JB	37	-.414E+04	.414E+04	.273E+05	.126E+06	.126E+06	-.575E+05
13	JA	13	-.947E+02	.243E+04	.187E+05	-.958E+05	-.450E+03	-.330E+04
	JB	14	.947E+02	-.243E+04	-.187E+05	.835E+05	-.287E+02	.330E+04
14	JA	15	.947E+02	-.243E+04	-.187E+05	-.945E+05	-.287E+02	.240E+04
	JB	14	-.947E+02	.243E+04	.187E+05	-.835E+05	.287E+02	-.330E+04
15	JA	15	-.947E+02	.243E+04	.187E+05	.945E+05	.287E+02	-.240E+04
	JB	16	.947E+02	-.243E+04	-.187E+05	-.510E+06	-.287E+02	.270E+03
16	JA	16	.626E+03	-.247E+04	-.148E+05	.393E+06	-.287E+02	.198E+05
	JB	17	-.626E+03	.247E+04	.148E+05	-.601E+05	.287E+02	-.568E+04
17	JA	17	.626E+03	-.247E+04	-.148E+05	.601E+05	-.287E+02	.568E+04
	JB	18	-.626E+03	.247E+04	.148E+05	.806E+05	.287E+02	.269E+03
18	JA	19	-.626E+03	.247E+04	-.148E+05	.681E+05	-.314E+04	.269E+03
	JB	18	.626E+03	-.247E+04	-.148E+05	-.806E+05	-.287E+02	-.269E+03
19	JA	20	-.247E+04	.947E+02	.148E+05	-.450E+03	.681E+05	-.330E+04
	JB	21	.247E+04	-.947E+02	-.148E+05	-.287E+02	-.806E+05	.330E+04
20	JA	22	.247E+04	-.947E+02	-.148E+05	-.287E+02	.601E+05	.240E+04

	JB	14	-.[illegible]E+03	.247E+04	.148E+05	.806E+05	.287E+02	.269E+03
	JA	17	-.626E+03	.247E+04	.148E+05	.601E+05	-.314E+04	.269E+03
	JB	14	.626E+03	-.247E+04	-.148E+05	-.806E+05	-.287E+02	-.269E+03
19	JA	20	-.247E+04	.947E+02	.148E+05	-.450E+03	.681E+05	-.330E+04
	JB	21	.247E+04	-.947E+02	-.148E+05	-.287E+02	-.806E+05	.330E+04
20	JA	22	.247E+04	-.947E+02	-.148E+05	-.287E+02	.601E+05	.240E+04
	JB	21	-.247E+04	.947E+02	.148E+05	.287E+02	.806E+05	-.330E+04
21	JA	22	-.247E+04	.947E+02	.148E+05	.287E+02	-.601E+05	-.240E+04
	JB	16	.247E+04	-.947E+02	-.148E+05	-.287E+02	.393E+06	.270E+03
22	JA	16	.243E+04	-.626E+03	-.187E+05	-.287E+02	-.516E+06	.198E+05
	JB	23	-.243E+04	.626E+03	.187E+05	.287E+02	.945E+05	-.568E+04
23	JA	23	.243E+04	-.626E+03	-.187E+05	-.287E+02	-.945E+05	.568E+04
	JB	24	-.243E+04	.626E+03	.187E+05	.287E+02	-.835E+05	.269E+03
24	JA	25	-.243E+04	.626E+03	.187E+05	-.314E+04	-.958E+05	.269E+03
	JB	24	.243E+04	-.626E+03	-.187E+05	-.287E+02	.835E+05	-.269E+03
25	JA	38	-.182E+04	.182E+04	.263E+05	.465E+05	.465E+05	.175E+05
	JB	26	.182E+04	-.182E+04	-.263E+05	.774E+05	.774E+05	-.175E+05
26	JA	26	.145E+04	-.145E+04	.145E+05	-.774E+05	-.774E+05	.175E+05
	JB	27	-.145E+04	.145E+04	-.145E+05	-.298E+05	-.298E+05	-.175E+05
27	JA	27	.593E+04	-.593E+04	.662E+04	.298E+05	.298E+05	.175E+05
	JB	30	-.593E+04	.593E+04	-.662E+04	-.113E+06	-.113E+06	-.175E+05
28	JA	29	-.313E-09	.117E-08	.297E-08	-.518E-08	-.313E-08	.448E-08
	JB	28	.313E-09	-.117E-08	-.297E-08	-.107E-07	-.128E-07	.233E-09
29	JA	29	.247E-08	.115E-08	.113E-07	.150E-07	.180E-06	-.373E-08
	JB	30	-.247E-08	-.115E-08	-.113E-07	.216E-06	.505E-07	-.671E-07
30	JA	30	.101E+05	-.442E+03	.118E-07	.363E+01	.236E+01	.873E+04
	JB	31	-.101E+05	.442E+03	-.118E-07	-.363E+01	-.236E+01	.351E+04
31	JA	31	.101E+05	-.442E+03	.160E-09	.363E+01	.236E+01	-.351E+04
	JB	32	-.101E+05	.442E+03	-.160E-09	-.363E+01	-.236E+01	.542E+04
32	JA	30	.442E+03	-.101E+05	.233E-07	.236E+01	.363E+01	.873E+04
	JB	33	-.442E+03	.101E+05	-.233E-07	-.236E+01	-.363E+01	.351E+04
33	JA	33	.442E+03	-.101E+05	.728E-10	.236E+01	.363E+01	-.351E+04
	JB	34	-.442E+03	.101E+05	-.728E-10	-.236E+01	-.363E+01	.542E+04
34	JA	30	-.463E+04	.463E+04	.662E+04	.113E+06	.113E+06	0.
	JB	35	.463E+04	-.463E+04	-.662E+04	-.479E+05	-.479E+05	0.
35	JA	35	-.170E+04	.170E+04	.221E+04	.479E+05	.479E+05	-.466E-09
	JB	36	.170E+04	-.170E+04	-.221E+04	.466E-09	0.	.466E-09
36	JA	37	.414E+04	-.414E+04	-.273E+05	-.120E+06	-.126E+06	.575E+05
	JB	16	-.414E+04	.414E+04	.273E+05	.559E+05	.559E+05	-.575E+05
37	JA	16	-.182E+04	.182E+04	.263E+05	.668E+05	.668E+05	.175E+05
	JB	38	.182E+04	-.182E+04	-.263E+05	-.465E+05	-.465E+05	-.175E+05
38	JA	11	-.164E+05	.120E+04	.638E-09	-.575E+03	-.616E+04	-.288E+05
	JB	39	.164E+05	-.120E+04	-.638E-09	.130E+03	.842E+02	-.458E+04
39	JA	39	-.164E+05	.120E+04	.116E-09	-.130E+03	-.842E+02	.458E+04
	JB	40	.164E+05	-.120E+04	-.116E-09	.130E+03	.842E+02	-.977E+04
40	JA	11	-.120E+04	.164E+05	.134E-07	-.616E+04	-.575E+03	-.288E+05
	JB	41	.120E+04	-.164E+05	-.134E-07	.842E+02	.130E+03	-.458E+04
41	JA	41	-.120E+04	.164E+05	-.873E-10	-.842E+02	-.130E+03	.458E+04
	JB	42	.120E+04	-.164E+05	.873E-10	.842E+02	.130E+03	-.977E+04

TAKING ALL STRESSES AS SHEAR

$$\tau = \frac{P}{A} + \frac{V_3}{A} + \frac{M_2 C_3}{I_2} + \frac{M_3 C_2}{I_3}$$

NOTE: M_T IS NEGLECTED DUE TO ITS SMALL VALUE

$$\tau = \frac{41878}{14.82} + \frac{7213}{14.82} + \frac{26705(23535)}{18.13} + \frac{235(66535)}{356}$$

$$\tau = 6784 < 21000 \text{ psi}$$

∴ WELD OK.

9.4 BOLT STRESS CALCULATION

SUPPORT BOLTS UNDER COMBINED LOADING ARE SUBJECT TO THE FOLLOWING STRESS LIMITS OF PARA XVII — 2460., REF(9)

$$\sigma_t \leq 50.0 - 1.6\,\tau \leq 40.0 \text{ KSI}$$

$$\tau \leq .19\,S_y$$
$$\sigma_t \leq .5\,S_y$$

} FOR 1 1/4" A-325 BOLTS ($\sigma_t \leq .44 S_y$ FOR 1/8" BOLTS)

$S_y = 81{,}000$ psi REF (9) P 128 TABLE 1-7.3

THE STRESSES ARE BASED ON THE NOMINAL AREA OF THE BOLT.

1.25" BOLT
AREA = 1.227 IN^2

.875" BOLT
AREA = .601 IN^2

SUPPORT BOLT STRESSES

THE FOLLOWING LOADS WERE EXTRACTED FROM "COMBINE" FOR THE BOLT BEAMS, BEAMS 13, 15, 19, 21 AT POINTS 13, 19, 20 & 25 RESPECTIVELY

	P	V_2	V_3	M_T	M_2	M_3
EQ 1	35268	7979	1693	9154	8552	204290
EQ 2	38149	7721	1816	9503	9119	205600

The maximum load of the 2 in each category is used.

∴ BOLT STRESSES

SHEAR STRESS

$$\tau = \frac{(V_2^2 + V_3^2)^{\frac{1}{2}}}{4A} + \frac{MT}{4RA}$$

$$R = \frac{1}{2}\left((6)^2 + 5.5^2\right)^{\frac{1}{2}}$$

$$R = 4.07 \text{ IN}$$

$$\tau = \left(7979^2 + 1616^2\right)^{\frac{1}{2}} / 4(1.227) + 9503 / 4(4.07)(1.227)$$

$$\tau = 2143 \text{psi} < .19 S_y = 15390 \text{ psi}$$

∴ OK

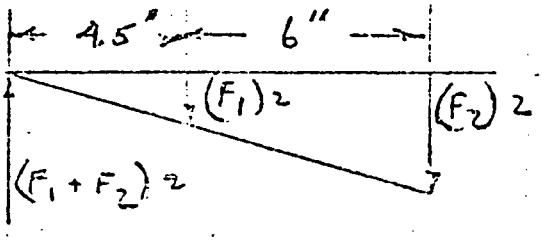
AXIAL STRESS

ASSUME P ACTS AS A TENSILE FORCE

$$\sigma_p = \frac{38144}{4A} = 7772 \text{ psi}$$

AXIAL TENSILE STRESS DUE TO M2

ASSUME THAT M_2 IS TAKEN OUT BY THE TWO COUPLES AS SHOWN BELOW:



ASSUME LINEAR FORCE DISTRIBUTION

OR

$$F_1 = \frac{4.5}{10.5} F_2$$

∴

$$M_2 = 2F_1(4.5) + 2F_2(10.5)$$

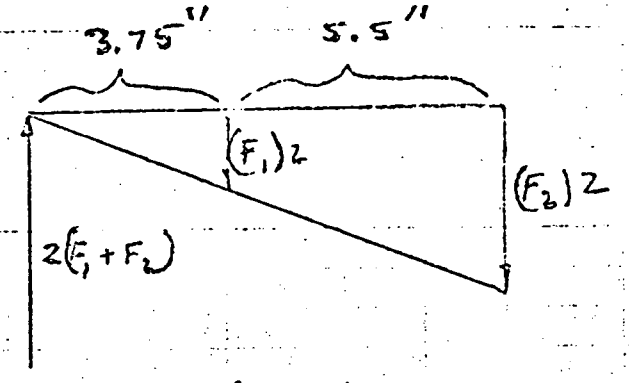
$$M_2 = \frac{2}{10} F_2 (4.5)^2 + 21(F_2) = 24.86 F_2$$

$$F_2 = \frac{9119}{24.86} = 366 \text{ LBS/BOLT}$$

$$\sigma_{M_2} = 366 / 1.227 = 298 \text{ PSI}$$

AXIAL TENSILE STRESS DUE TO M3

ASSUME THAT M3 IS TAKEN OUT BY THE TWO COUPLES AS SHOWN BELOW:



ASSUME LINEAR FORCE DISTRIBUTION

OR $F_1 = \frac{3.75}{9.25} F_2$

$\therefore M_3 = 2F_1(3.75) + 2F_2(9.25)$

$M_3 = 2F_2\frac{(3.75)^2}{9.25} + 2F_2(9.25) = 21.54\,F_2$

$\therefore F_2 = \frac{205600}{21.54} = 9545$ LBS $\quad \sigma_{M_3} = 7779$ PSI

$\therefore$ TOTAL AXIAL STRESS

$\sigma_t = \sigma_p + \sigma_{M_2} + \sigma_{M_3} = 15848$ PSI

$\sigma_t = 15848$ PSI $< .5\,S_y = 40500$ PSI

$\therefore$ OK

TOTAL COMPARISON

$\sigma_t \leq 50.0 - 1.6\,T \leq 40.0$ KSI

$15848 \leq 40000$ PSI $\quad \therefore$ BOLTS ARE ADEQUATE

$(40 \leq 50 - 1.6T)$

SEISMIC LUG BOLT STRESSES

THE FOLLOWING LOADS WERE EXTRACTED FROM "COMBINE" FOR THE SEISMIC LUG BOLTS, BEAMS 31, 33, 39 & 41, NODES 32, 34, 40, & 42 RESPECTIVELY. THE MOMENTS M_T & M_2 WILL NOT BE CONSIDERED AS BOLT LOADS AS THEY WILL BE TAKEN OUT BY THE ATTACHMENT PLATES, & LOADS

	P	V_3	M_3
EQ1	41878	7213	235
EQ2	36847	7030	234

THE MAXIMUM LOADS ARE FROM EARTHQUAKE 1 ∴ STRESSES

SHEAR STRESS

M_3 TAKEN OUT AS MOMENT

$$\tau = \frac{P}{2A} + \frac{V_3}{2A} + \frac{M_3}{6A}$$

$$\tau = \frac{41878}{2(.601)} + \frac{7213}{2(.601)} + \frac{235}{6(.601)}$$

$\tau = 40906$ psi $>$ 15390 psi ∴ LARGER BOLTS REQUIRED

∴ TRY $1\frac{1}{2}$" BOLTS AREA = 1.767 in^2

$$\therefore \tau = 40906 \frac{(.601)}{(1.767)} = 13911 < 15390 \text{ psi.}$$

∴ NEED 1.500" BOLTS (SA 325 BOLTS).

Appendix A

STARDYNE COMPUTER OUTPUT

This section contains the following output:

A.1 Geometry

A.2 "HQR" Output

A.3 "STATIC" Output

Appendix A.1

GEOMETRY

*** STARDYNE 3.0 INPUT ***

CARD IMAGE

1 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80

CARD NO					CARD TYPE
2	EFCO SHUTDOWN HEAT EXCHANGER TYPE CEU				EF
3	MATLG	1CS 250 F	27.55	+6	MATLG
4		2SS 400 F	26.6	+6	MATLG
5		3 CS 400 F	27.0	+6	MATLG
6	END				END
7	NODE	1 0.0000	0.00000	361.00	NODE
8		2 0.0000	32.7500	332.75	NODE
9		3 0.0000	23.690	332.75	NODE
10		4 0.0000	0.00000	332.75	NODE
11		5 0.0000	-23.690	332.75	NODE
12		6 0.0000	-32.750	332.75	NODE
13		7 0.0000	0.00000	310.50	NODE
14		8 0.0000	0.00000	300.88	NODE
15		9 25.460	25.4600	286.88	NODE
16		10 19.93	19.93	286.88	NODE
17		11 0.0000	0.00000	286.88	NODE
18		12 0.0000	0.00000	272.88	NODE
19		13 0.0000	32.0000	204.50	NODE
20		14 0.0000	32.0000	209.56	NODE
21		15 0.0000	22.5000	209.56	NODE
22		16 0.0000	0.00000	209.56	NODE
23		17 0.0000	-22.500	209.56	NODE
24		18 0.0000	-32.000	209.56	NODE
25		19 0.0000	-32.000	204.50	NODE
26		20 32.000	0.00000	204.50	NODE
27		21 32.000	0.00000	209.56	NODE
28		22 22.500	0.00000	209.56	NODE
29		23 -22.50	0.00000	209.56	NODE
30		24 -32.00	0.00000	209.56	NODE
31		25 -32.00	0.00000	204.50	NODE
32		26 0.0000	0.00000	130.19	NODE
33		27 0.0000	0.00000	56.130	NODE
34		28 25.460	-25.460	42.130	NODE
35		29 19.930	-19.930	42.130	NODE
36		30 0.0000	0.00000	42.130	NODE
37		31 -27.69	0.00000	42.130	NODE
38		32 -32.00	0.00000	42.130	NODE
39		33 0.0000	-27.690	42.130	NODE
40		34 0.0000	-32.000	42.130	NODE
41		35 0.0000	0.00000	28.130	NODE
42		36 0.0000	0.00000	0.0000	NODE
43		37 0.0000	0.00000	226.38	NODE
44		38 0.0000	0.00000	198.38	NODE
45		39 -27.69	0.0000	287.25	NODE
46		40 -32.00	0.0000	287.25	NODE
47		41 0.0000	-27.69	287.25	NODE
48		42 0.0000	-32.00	287.25	NODE
49	END				END
50	RESTG	13	111111		RESTG
51		19	111111		RESTG
52		20	111111		RESTG
53		25	111111		RESTG
54		32	11 111		RESTG

A.1-1

51		19	111111	RESTG
52		20	111111	RESTG
53		25	111111	RESTG
54		32	11 111	

A.

*** STARDYNE 3.0 INPUT ***

CARD IMAGE

CARD NO								CARD TYPE
55		34		11 111				RESTG
56		40		11 111				RESTG
57		42		11 111				RESTG
58	END							END
59	WGHT	1	5131.	5131.	5131.			WGHT
60		7	6108.	6108.	6108.			WGHT
61		8	3822.	3822.	3822.			WGHT
62		12	9792.	9792.	9792.			WGHT
63		16	12252.	12252.	12252.			WGHT
64		26	10593.	10593.	10593.			WGHT
65		27	7286.	7286.	7286.			WGHT
66		35	4007.	4007.	4007.			WGHT
67		36	2008.	2008.	2008.			WGHT
68	END							END
69	PIPEG	1	1	4	20	3	2	PIPEG
70		2	3	2	36	2	3	PIPEG
71	BEAMG	3	3	4	36	1	1	BEAMG
72		4	4	5	36	1	1	BEAMG
73	PIPEG	5	5	6	36	2	3	PIPEG
74		6	4	7	20	3	2	PIPEG
75		7	7	8	20	1	4	PIPEG
76		8	8	11	20	1	5	PIPEG
77		9	10	9	36	1	6	PIPEG
78	BEAMG	10	10	11	36	1	1	BEAMG
79	PIPEG	11	11	12	20	1	5	PIPEG
80		12	12	37	20	1	4	PIPEG
81	BEAMG	13	13	14	36	1	1	BEAMG
82		14	15	14	36	1	7	BEAMG
83		15	15	16	36	1	1	BEAMG
84		16	16	17	36	1	1	BEAMG
85		17	17	18	36	1	7	BEAMG
86		18	19	18	36	1	1	BEAMG
87		19	20	21	36	1	1	BEAMG
88		20	22	21	36	1	7	BEAMG
89		21	22	16	36	1	1	BEAMG
90		22	16	23	36	1	1	BEAMG
91		23	23	24	36	1	7	BEAMG
92		24	25	24	36	1	1	BEAMG
93	PIPEG	25	38	26	20	1	4	PIPEG
94		26	26	27	20	1	4	PIPEG
95		27	27	30	20	1	5	PIPEG
96		28	29	28	36	1	6	PIPEG
97	BEAMG	29	29	30	36	1	1	BEAMG
98		30	30	31	36	1	1	BEAMG
99		31	31	32	36	1	8	BEAMG
100		32	30	33	36	1	1	BEAMG
101		33	33	34	36	1	8	BEAMG
102	PIPEG	34	30	35	20	1	5	PIPEG
103		35	35	36	20	1	4	PIPEG
104		36	37	10	20	1	9	PIPEG
105		37	10	38	20	1	9	PIPEG
106	BEAMG	38	11	39	36	1	1	BEAMG
107		39	39	40	36	1	8	BEAMG
108		40	11	41	36	1	1	BEAMG

A.1-2

```
105                 37      16      38      20      1   9                   PIPEG
106  BEAMG          38      11      39      36      1   1                   BEAMG
107                 39      39      40      36      1   8                   BEAMG
108                 40      11      41      36      1   1                   BEAMG
```

A.1-2

*** STARDYNE 3.0 INPUT ***

CARD IMAGE

```
                1   4   8   12  16  20  24  28  32  36  40  44  48  52  56  60  64  68  72  76  80
CARD NO         ********************************************************************************  CARD TYPE
109                 41      41      42      36      1   8                   BEAMG
110  END                                                                    END
111  BPROP1     1 500.      4.0    +5 2.0    +5 2.0    +5 1.0      1.0      BPROP
112             7 34.29     7.32    1176.     807.      .338      .662     BPROP
113             8 9.0       1.688   108.0     .422      0.0       .833     BPROP
114  BPROP2     1 1.0       1.0     1.0       1.0       1.0                BPROP
115             7 9.925     7.5     .875      1.0       1.0                BPROP
116             8 6.0       .375    .75       1.0       1.0                BPROP
117  BPROP3     2 46.75     1.25                                           BPROP
118             3 12.75     .33                                            BPROP
119             4 45.       .5                                             BPROP
120             5 56.       .625                                           BPROP
121             6 16.       .5                                             BPROP
122             9 46.       1.0                                            BPROP
123  END                                                                    END
124  ENDGEOM                                                                ENDGE
```

A.1-3

TAPE2 CREATION DATE 10/14/75.TIME 16.15.41. STAR 3.0 VERSION AUGC28

EFCO SHUTDOWN HEAT EXCHANGER TYPE CEU

GEOMETRY PROCESSING OPTIONS---

GEOMETRY INPUT FILE	(NFILE) =	0
ACCELERATION OF GRAVITY	(G) =	.38640000E+03
DOF PER NODE	(JDOF) =	6
NODE REORDER	(IRENUM) =	-0.0
GEOMETRY PLOTS	(IGEOMP) =	0
DEFORMED PLOTS	(IVECTP) =	0
PLOT VIEW SELECTOR	(IPVIEW) =	0
PLOTTER TYPE	(PLTYPE) =	
PLOT SYMBOL	(IPSYM) =	0
CALCOMP PLOT SIZE	(PSIZE) =	1.0

****** M A T E R I A L P R O P E R T Y T A B L E ******

---MATERIAL--- NUMBER	NAME	MODULUS OF ELASTICITY E1/E2	POISSONS RATIO PR1/PR2	SHEAR MODULUS G	DENSITY	COEFFICIENT OF THERMAL EXPANSION ALPH1/ALPH2	DAMPING COEFFICIENT
MATL 1	CS 250 F	2.755000E+07	3.000000E-01	1.059615E+07	-0.	-0.	-0.
		2.755000E+07	3.000000E-01			-0.	
MATL 2	SS 400 F	2.660000E+07	3.000000E-01	1.023077E+07	-0.	-0.	-0.
		2.660000E+07	3.000000E-01			-0.	
MATL 3	CS 400 F	2.700000E+07	3.000000E-01	1.038462E+07	-0.	-0.	-0.
		2.700000E+07	3.000000E-01			-0.	

*** NODAL COORDINATE TABLE ***

	NODE	X1	X2	X3
NODES	1	0.	0.	.3610000E+03
NODES	2	0.	.3275000E+02	.3327500E+03
NODES	3	0.	.2369000E+02	.3327500E+03
NODES	4	0.	0.	.3327500E+03
NODES	5	0.	-.2369000E+02	.3327500E+03
NODES	6	0.	-.3275000E+02	.3327500E+03
NODES	7	0.	0.	.3105000E+03
NODES	8	0.	0.	.3008800E+03
NODES	9	.2546000E+02	.2546000E+02	.2868800E+03
NODES	10	.1993000E+02	.1993000E+02	.2868800E+03
NODES	11	0.	0.	.2868800E+03
NODES	12	0.	0.	.2728800E+03
NODES	13	0.	.3200000E+02	.2045000E+03
NODES	14	0.	.3200000E+02	.2095600E+03
NODES	15	0.	.2250000E+02	.2095600E+03
NODES	16	0.	0.	.2095600E+03
NODES	17	0.	-.2250000E+02	.2095600E+03
NODES	18	0.	-.3200000E+02	.2095600E+03
NODES	19	0.	-.3200000E+02	.2045000E+03
NODES	20	.3200000E+02	0.	.2045000E+03
NODES	21	.3200000E+02	0.	.2095600E+03
NODES	22	.2250000E+02	0.	.2095600E+03
NODES	23	-.2250000E+02	0.	.2095600E+03
NODES	24	-.3200000E+02	0.	.2095600E+03
NODES	25	-.3200000E+02	0.	.2045000E+03
NODES	26	0.	0.	.1301900E+03
NODES	27	0.	0.	.5613000E+02
NODES	28	.2546000E+02	-.2546000E+02	.4213000E+02
NODES	29	.1993000E+02	-.1993000E+02	.4213000E+02
NODES	30	0.	0.	.4213000E+02
NODES	31	-.2769000E+02	0.	.4213000E+02
NODES	32	-.3200000E+02	0.	.4213000E+02
NODES	33	0.	-.2769000E+02	.4213000E+02
NODES	34	0.	-.3200000E+02	.4213000E+02
NODES	35	0.	0.	.2813000E+02
NODES	36	0.	0.	0.
NODES	37	0.	0.	.2263800E+03
NODES	38	0.	0.	.1983800E+03
NODES	39	-.2769000E+02	0.	.2872500E+03
NODES	40	-.3200000E+02	0.	.2872500E+03
NODES	41	0.	-.2769000E+02	.2872500E+03
NODES	42	0.	-.3200000E+02	.2872500E+03

--- MAXIMUM ALLOWABLE NODE NUMBER BY ANALYSIS TYPE ---

STAR STATIC	2500
STAR H3R	1666
STAR INV.ITER.	1300
STAR SUBSTRUCT.	2500
DYNRE 1	1666
DYNRE 2	1300
DYNRE 3	300
DYNRE 4	1666
DYNRE 5	1300

LARGEST NODE NUMBER CODED IN THIS MODEL = 42

STAR SUBSTRUCT.	2500
DYNRE 1	1600
DYNRE 2	1300
DYNRE 3	300
DYNRE 4	1600
DYNRE 5	1300

LARGEST NODE NUMBER CODED IN THIS MODEL = 42

NEXT TABLE HEADER INESTG

*** NODAL RESTRAINT TABLE ***

	NODE	X1	X2	X3	X4	X5	X6
RESTRAINTS	13	1	1	1	1	1	1
RESTRAINTS	19	1	1	1	1	1	1
RESTRAINTS	20	1	1	1	1	1	1
RESTRAINTS	25	1	1	1	1	1	1
RESTRAINTS	32	1	1	0	1	1	1
RESTRAINTS	34	1	1	0	1	1	1
RESTRAINTS	40	1	1	0	1	1	1
RESTRAINTS	42	1	1	0	1	1	1

NEXT TABLE HEADER (WGHT)

*** INPUT NODAL WEIGHT TABLE ***

	NODE	W1	W2	W3	W4	W5	W6
WEIGHTS	1	.51310E+04	.51310E+04	.51310E+04	0.	0.	0.
WEIGHTS	7	.61080E+04	.61080E+04	.61080E+04	0.	0.	0.
WEIGHTS	8	.38220E+04	.38220E+04	.38220E+04	0.	0.	0.
WEIGHTS	12	.97920E+04	.97920E+04	.97920E+04	0.	0.	0.
WEIGHTS	16	.12252E+05	.12252E+05	.12252E+05	0.	0.	0.
WEIGHTS	26	.10593E+05	.10593E+05	.10593E+05	0.	0.	0.
WEIGHTS	27	.72860E+04	.72860E+04	.72860E+04	0.	0.	0.
WEIGHTS	35	.40070E+04	.40070E+04	.40070E+04	0.	0.	0.
WEIGHTS	36	.20080E+04	.20080E+04	.20080E+04	0.	0.	0.
SUMMATION		.60999E+05	.60999E+05	.60999E+05	0.	0.	0.

NEXT TABLE HEADER (PIPEG)

*** BEAM SECTION PROPERTY TABLE ***

NUMBER		BPROP1= A	J	I2	I3	SF2	SF3
		BPROP2= M2	M3	CTORS	SSF2	SSF3	DIST WGHT
		BPROP3= CD	T	RADIUS	FLEX FLAG	LIQ DENS	DIST WGHT
		BPROP4= XOFFA	YOFFA	ZOFFA	XOFFB	YOFFB	ZOFFB
		BPROP5= SYA	SZA	SYB	SZB	SYC	SZC
1	BPROP1	5.000000E+02	4.000000E+05	2.000000E+05	2.000000E+05	1.000000E+00	1.000000E+00
7	BPROP1	3.429000E+01	7.320000E+00	1.176000E+03	8.070000E+02	3.380000E-01	6.620000E-01
8	BPROP1	9.000000E+00	1.668000E+00	1.080000E+02	4.220000E-01	0.	8.330000E-01
1	BPROP2	1.000000E+00	1.000000E+00	1.000000E+00	1.000000E+00	1.000000E+00	-0.
7	BPROP2	9.925000E+00	7.500000E+00	8.750000E-01	1.000000E+00	1.000000E+00	-0.
8	BPROP2	6.000000E+00	3.750000E-01	7.500000E-01	1.000000E+00	1.000000E+00	-0.
2	BPROP3	4.675000E+01	1.250000E+00	-0.	-0.	-0.	-0.
3	BPROP3	1.275000E+01	2.300000E-01	-0.	-0.	-0.	-0.
4	BPROP3	4.500000E+01	5.000000E-01	-0.	-0.	-0.	-0.
5	BPROP3	5.600000E+01	6.250000E-01	-0.	-0.	-0.	-0.
6	BPROP3	1.600000E+01	5.000000E-01	-0.	-0.	-0.	-0.
9	BPROP3	4.600000E+01	1.000000E+00	-0.	-0.	-0.	-0.

*** BEAM CONNECTIVITY TABLE ***

	NO	JA	JB	JC	MATL NO	BPRP NO	PIN CODE	H2/ OD	H3/ T	LENGTH	AREA	J	I2	I3	SF2	SF3
PIPEG	1	1	4	20	3	2	000000	4.675E+01	1.250E+00	2.825E+01	1.787E+02	9.255E+04	4.627E+04	4.627E+04	.511	.511
PIPEG	2	3	2	36	2	3	000000	1.275E+01	3.300E-01	9.060E+00	1.288E+01	4.969E+02	2.485E+02	2.485E+02	.511	.511
BEAMG	3	3	4	36	1	1	000000	1.000E+00	1.000E+00	2.369E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	4	4	5	36	1	1	000000	1.000E+00	1.000E+00	2.369E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
PIPEG	5	5	6	36	2	3	000000	1.275E+01	3.300E-01	9.060E+00	1.288E+01	4.969E+02	2.485E+02	2.485E+02	.511	.511
PIPEG	6	4	7	20	3	2	000000	4.675E+01	1.250E+00	2.225E+01	1.787E+02	9.255E+04	4.627E+04	4.627E+04	.511	.511
PIPEG	7	7	8	20	1	4	000000	4.500E+01	5.000E-01	9.620E+00	6.990E+01	3.461E+04	1.730E+04	1.730E+04	.499	.499
PIPEG	8	8	11	20	1	5	000000	5.600E+01	6.250E-01	1.400E+01	1.087E+02	8.336E+04	4.168E+04	4.168E+04	.499	.499
PIPEG	9	10	9	36	1	6	000000	1.600E+01	5.000E-01	7.821E+00	2.435E+01	1.464E+03	7.319E+02	7.319E+02	.515	.515
BEAMG	10	10	11	36	1	1	000000	1.000E+00	1.000E+00	2.819E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
PIPEG	11	11	12	20	1	5	000000	5.600E+01	6.250E-01	1.400E+01	1.087E+02	8.336E+04	4.168E+04	4.168E+04	.499	.499
PIPEG	12	12	37	20	1	4	000000	4.500E+01	5.000E-01	4.650E+01	6.990E+01	3.461E+04	1.730E+04	1.730E+04	.499	.499
BEAMG	13	13	14	36	1	1	000000	1.000E+00	1.000E+00	5.060E+00	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	14	15	14	36	1	7	000000	9.925E+00	7.500E+00	9.500E+00	3.429E+01	7.320E+00	1.176E+03	8.070E+02	.338	.662
BEAMG	15	15	16	36	1	1	000000	1.000E+00	1.000E+00	2.250E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	16	16	17	36	1	1	000000	1.000E+00	1.000E+00	2.250E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	17	17	18	36	1	7	000000	9.925E+00	7.500E+00	9.500E+00	3.429E+01	7.320E+00	1.176E+03	8.070E+02	.338	.662
BEAMG	18	19	18	36	1	1	000000	1.000E+00	1.000E+00	5.060E+00	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	19	20	21	36	1	1	000000	1.000E+00	1.000E+00	5.060E+00	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	20	22	21	36	1	7	000000	9.925E+00	7.500E+00	9.500E+00	3.429E+01	7.320E+00	1.176E+03	8.070E+02	.338	.662
BEAMG	21	22	16	36	1	1	000000	1.000E+00	1.000E+00	2.250E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	22	16	23	36	1	1	000000	1.000E+00	1.000E+00	2.250E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	23	23	24	36	1	7	000000	9.925E+00	7.500E+00	9.500E+00	3.429E+01	7.320E+00	1.176E+03	8.070E+02	.338	.662
BEAMG	24	25	24	36	1	1	000000	1.000E+00	1.000E+00	5.060E+00	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
PIPEG	25	38	26	20	1	4	000000	4.500E+01	5.000E-01	6.819E+01	6.990E+01	3.461E+04	1.730E+04	1.730E+04	.499	.499
PIPEG	26	26	27	20	1	4	000000	4.500E+01	5.000E-01	7.406E+01	6.990E+01	3.461E+04	1.730E+04	1.730E+04	.499	.499
PIPEG	27	27	30	20	1	5	000000	5.600E+01	6.250E-01	1.400E+01	1.087E+02	8.336E+04	4.168E+04	4.168E+04	.499	.499
PIPEG	28	29	28	36	1	6	000000	1.600E+01	5.000E-01	7.821E+00	2.435E+01	1.464E+03	7.319E+02	7.319E+02	.515	.515
BEAMG	29	29	30	36	1	1	000000	1.000E+00	1.000E+00	2.819E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	30	30	31	36	1	1	000000	1.000E+00	1.000E+00	2.769E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	31	31	32	36	1	8	000000	6.000E+00	3.750E-01	4.310E+00	9.000E+00	1.688E+00	1.080E+02	4.220E-01	0.000	.833
BEAMG	32	30	33	36	1	1	000000	1.000E+00	1.000E+00	2.769E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	33	33	34	36	1	8	000000	6.000E+00	3.750E-01	4.310E+00	9.000E+00	1.688E+00	1.080E+02	4.220E-01	0.000	.833
PIPEG	34	30	35	20	1	5	000000	5.600E+01	6.250E-01	1.400E+01	1.087E+02	8.336E+04	4.168E+04	4.168E+04	.499	.499
PIPEG	35	35	36	20	1	4	000000	4.500E+01	5.000E-01	2.813E+01	6.990E+01	3.461E+04	1.730E+04	1.730E+04	.499	.499
PIPEG	36	37	16	20	1	9	000000	4.600E+01	1.000E+00	1.682E+01	1.414E+02	7.160E+04	3.580E+04	3.580E+04	.507	.507
PIPEG	37	16	38	20	1	9	000000	4.600E+01	1.000E+00	1.118E+01	1.414E+02	7.160E+04	3.580E+04	3.580E+04	.507	.507
BEAMG	38	11	39	36	1	1	000000	1.000E+00	1.000E+00	2.769E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	39	39	40	36	1	8	000000	6.000E+00	3.750E-01	4.310E+00	9.000E+00	1.688E+00	1.080E+02	4.220E-01	0.000	.833
BEAMG	40	11	41	36	1	1	000000	1.000E+00	1.000E+00	2.769E+01	5.000E+02	4.000E+05	2.000E+05	2.000E+05	1.000	1.000
BEAMG	41	41	42	36	1	8	000000	6.000E+00	3.750E-01	4.310E+00	9.000E+00	1.688E+00	1.080E+02	4.220E-01	0.000	.833

BEAM DATA TABLE 2

	NO	WEIGHT	CTORS	SSF2	SSF3	ELBOW RADIUS	FLEXIBILITY FACTOR	ELBOW ANGLE	BEAM X2-DIR.COSINES X1	X2	X3
PIPEG	1	0.	2.337E+01	1.999E+00	1.999E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	2	0.	6.375E+00	1.999E+00	1.999E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	3	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	4	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
PIPEG	5	0.	6.375E+00	1.999E+00	1.999E+00	0.	0.	0.	0.	0.	-1.000E+00
PIPEG	6	0.	2.337E+01	1.999E+00	1.999E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	7	0.	2.250E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	8	0.	2.400E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	9	0.	8.000E+00	1.999E+00	1.999E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	10	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
PIPEG	11	0.	2.600E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	12	0.	2.250E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
BEAMG	13	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	-1.000E+00	0.
BEAMG	14	0.	8.750E-01	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	15	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	16	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	17	0.	8.750E-01	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	18	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	1.000E+00	0.
BEAMG	19	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	-1.000E+00	0.	0.
BEAMG	20	0.	8.750E-01	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	21	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	22	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	23	0.	8.750E-01	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	24	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	25	0.	2.250E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	26	0.	2.250E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	27	0.	2.800E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	28	0.	8.000E+00	1.999E+00	1.999E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	29	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	30	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	31	0.	7.500E-01	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	32	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	33	0.	7.500E-01	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
PIPEG	34	0.	2.800E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	35	0.	2.250E+01	2.000E+00	2.000E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	36	0.	2.300E+01	1.999E+00	1.999E+00	0.	0.	0.	1.000E+00	0.	0.
PIPEG	37	0.	2.300E+01	1.999E+00	1.999E+00	0.	0.	0.	1.000E+00	0.	0.
BEAMG	38	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	-1.336E-02	0.	-9.999E-01
BEAMG	39	0.	7.500E-01	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00
BEAMG	40	0.	1.000E+00	1.000E+00	1.000E+00	0.	0.	0.	0.	-1.336E-02	-9.999E-01
BEAMG	41	0.	7.500E-01	1.000E+00	1.000E+00	0.	0.	0.	0.	0.	-1.000E+00

NOTICE

DEFAULT LOCATIONS FOR STRESS POINTS B AND C HAVE BEEN CHANGED FROM THOSE ON PAGE B1-120 TO (H2/2.0) FOR B AND (0.H3/2) FOR C. FOR PIPES, OD IS USED INSTEAD OF H2 AND H3.

B E A M D A T A T A B L E 3

	BEAM NO	BEAM C/L OFFSETS FROM NODES (GLOBAL) -- OFFSET AT A END -- X1	X2	X3	-- OFFSET AT B END -- X1	X2	X3	USER SPECIFIED STRESS LOCATIONS (ELEMENT) -- POINT A -- X2	X3	-- POINT B -- X2	X3	-- POINT C -- X2	X3
PIPEG	1	0.	0.	0.	0.	0.	0.	0.	0.	2.337E+01	0.	0.	2.34E+01
PIPEG	2	0.	0.	0.	0.	0.	0.	0.	0.	6.375E+00	0.	0.	6.38E+00
BEAMG	3	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	4	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
PIPEG	5	0.	0.	0.	0.	0.	0.	0.	0.	6.375E+00	0.	0.	6.38E+00
PIPEG	6	0.	0.	0.	0.	0.	0.	0.	0.	2.337E+01	0.	0.	2.34E+01
PIPEG	7	0.	0.	0.	0.	0.	0.	0.	0.	2.250E+01	0.	0.	2.25E+01
PIPEG	8	0.	0.	0.	0.	0.	0.	0.	0.	2.800E+01	0.	0.	2.80E+01
PIPEG	9	0.	0.	0.	0.	0.	0.	0.	0.	8.000E+00	0.	0.	8.00E+00
BEAMG	10	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
PIPEG	11	0.	0.	0.	0.	0.	0.	0.	0.	2.800E+01	0.	0.	2.80E+01
PIPEG	12	0.	0.	0.	0.	0.	0.	0.	0.	2.250E+01	0.	0.	2.25E+01
BEAMG	13	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	14	0.	0.	0.	0.	0.	0.	0.	0.	4.963E+00	0.	0.	3.75E+00
BEAMG	15	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	16	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	17	0.	0.	0.	0.	0.	0.	0.	0.	4.963E+00	0.	0.	3.75E+00
BEAMG	18	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	19	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	20	0.	0.	0.	0.	0.	0.	0.	0.	4.963E+00	0.	0.	3.75E+00
BEAMG	21	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	22	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	23	0.	0.	0.	0.	0.	0.	0.	0.	4.963E+00	0.	0.	3.75E+00
BEAMG	24	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
PIPEG	25	0.	0.	0.	0.	0.	0.	0.	0.	2.250E+01	0.	0.	2.25E+01
PIPEG	26	0.	0.	0.	0.	0.	0.	0.	0.	2.250E+01	0.	0.	2.25E+01
PIPEG	27	0.	0.	0.	0.	0.	0.	0.	0.	2.800E+01	0.	0.	2.80E+01
PIPEG	28	0.	0.	0.	0.	0.	0.	0.	0.	8.000E+00	0.	0.	8.00E+00
BEAMG	29	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	30	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	31	0.	0.	0.	0.	0.	0.	0.	0.	3.000E+00	0.	0.	1.88E-01
BEAMG	32	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	33	0.	0.	0.	0.	0.	0.	0.	0.	3.000E+00	0.	0.	1.88E-01
PIPEG	34	0.	0.	0.	0.	0.	0.	0.	0.	2.800E+01	0.	0.	2.80E+01
PIPEG	35	0.	0.	0.	0.	0.	0.	0.	0.	2.250E+01	0.	0.	2.25E+01
PIPEG	36	0.	0.	0.	0.	0.	0.	0.	0.	2.300E+01	0.	0.	2.30E+01
PIPEG	37	0.	0.	0.	0.	0.	0.	0.	0.	2.300E+01	0.	0.	2.30E+01
BEAMG	38	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	39	0.	0.	0.	0.	0.	0.	0.	0.	3.000E+00	0.	0.	1.88E-01
BEAMG	40	0.	0.	0.	0.	0.	0.	0.	0.	5.000E-01	0.	0.	5.00E-01
BEAMG	41	0.	0.	0.	0.	0.	0.	0.	0.	3.000E+00	0.	0.	1.88E-01

NEXT TABLE HEADER (END90

XXXXXXXXXXXXXXXXXXX END OF GEOMETRY DATA XXXXXXXXXXXXXXXXXXX

*** FINAL WEIGHT SUMMARY ***
(INCLUDES ELEMENT AND NODAL WEIGHTS)

	NODE	W1	W2	W3	W4	W5	W6
WEIGHTS	1	.51310E+04	.51310E+04	.51310E+04	0.	0.	0.
WEIGHTS	7	.61080E+04	.61080E+04	.61080E+04	0.	0.	0.
WEIGHTS	8	.38220E+04	.38220E+04	.38220E+04	0.	0.	0.
WEIGHTS	12	.97920E+04	.97920E+04	.97920E+04	0.	0.	0.
WEIGHTS	16	.12252E+05	.12252E+05	.12252E+05	0.	0.	0.
WEIGHTS	26	.10593E+05	.10593E+05	.10593E+05	0.	0.	0.
WEIGHTS	27	.72860E+04	.72860E+04	.72860E+04	0.	0.	0.
WEIGHTS	35	.40070E+04	.40070E+04	.40070E+04	0.	0.	0.
WEIGHTS	36	.20080E+04	.20080E+04	.20080E+04	0.	0.	0.
SUMMATION		.60999E+05	.60999E+05	.60999E+05	0.	0.	0.

CENTER OF GRAVITY BASED ON X1 WEIGHTS ONLY.
(WEIGHTS IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

X1 = 0.
X2 = 0.
X3 = .197366206E+03

CENTER OF GRAVITY BASED ON X2 WEIGHTS ONLY.
(WEIGHTS IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

X1 = 0.
X2 = 0.
X3 = .197366206E+03

CENTER OF GRAVITY BASED ON X3 WEIGHTS ONLY.
(WEIGHTS IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

X1 = 0.
X2 = 0.
X3 = .197366206E+03

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