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LOFT TECHNICAL REPORT LTR 1144-26

RE&C REPORT NUMBER RE-A-78-013

DATE January 19, 1978

LOFT PRESSURIZER PRESSURE RELIEF PIPING SYSTEM
STRESS ANALYSIS AND FATIGUE LIFE REPORT

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DEPARTMENT OF ENERGY

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MASTER

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APPLIED MECHANICS BRANCH

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✓ (LOFT PRESSURIZER PRESSURE RELIEF PIPING SYSTEM
STRESS ANALYSIS AND FATIGUE LIFE REPORT

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LOFT TECHNICAL REPORT
LOFT PROGRAMFORM EG&G-229
(Rev. 12-76)

TITLE LOFT PRESSURIZER PRESSURE RELIEF PIPING SYSTEM STRESS ANALYSIS AND FATIGUE LIFE REPORT		REPORT NO. LTR 1144-26
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SUMMARY

A stress analysis was performed on the LOFT Pressurizer Pressure Relief System to determine if it met the requirements of the ASME Boiler and Pressure Vessel Code, Section III, 1974 Edition, for Class 1 and Class 2 components. Deadweight, thermal expansion, seismic, design LOCE, and LOCA loads were considered. The results of this analysis indicate that the LOFT pressurizer pressure relief system will comply with Code specifications provided modifications are made to the hanger support configuration and one small section of pipe. The recommended changes are listed below. Note that some of these hangers were previously required based upon an analysis which subjected this same piping system to a reduced LOCE (20 millisecond valve opening). This previous analysis was reported in LTR 1144-22, Rev. 1[7].

This report will not cover the dynamic effects of relief valve operation. This omission is explained in the body of the report.

RECOMMENDATIONS

1. Addition of Snubbers as per letter HIK-12-75, LOFT Pipe Hanger Requirements on Main Feed Main Steam Pressurizer and ECC Systems.
2. The 1/2" Line 1/2"-PCS-10 between the tee and CVP-136-19 must be increased in diameter to 1.050 inches (O.D. of nominal 3/4" pipe).
3. Modification of Unibals and flat bars as per letter Muff-2-76, Required Change of Flat Bar Hangers and Unibals on Pressure Relief and Pressurizing Piping.

DESIGN ANALYSIS CERTIFICATION

I certify that the Design Analysis Report "LOFT Pressurizer Pressure Relief Piping System Stress Analysis and Fatigue Life Report", dated January 19, 1978, is complete and satisfies all stress analysis requirements set forth in the 1974 ASME Boiler and Pressure Vessel Code, Section III, Subsections NB and NC and LOFT Specification P-1, Revision 2.

J. G. Arendts, P.E.Date

JG Arendts, PE

1-26-78

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LOFT PRESSURIZER PRESSURE RELIEF PIPING SYSTEM STRESS ANALYSIS AND FATIGUE LIFE REPORT

I. INTRODUCTION

The stress analysis of the LOFT Pressurizer Pressure Relief Piping System considers the effects of deadweight, thermal expansion, safe shutdown earthquake (SSE), operating basis earthquake (OBE), loss-of-coolant accident (LOCA), and loss-of-coolant experiment (LOCE). The LOFT pressurizer, pressure relief system, as analyzed in this report, consists of portions of the primary coolant pressurizer, the primary coolant pressure relief, the primary coolant sampling, and blowdown vents and drains systems. Seven different sizes of pipe are present in this system. They are: 1/2-inch Schedule 160, 3/4-inch Schedule 160, 1-inch Schedule 160, 1-1/2-inch Schedule 40, 2-inch Schedule 40, 2-1/2-inch Schedule 160, and 4-inch Schedule 160. The piping in this system is both Class 1 and Class 2. Also, some lines originally designated Class 1 have been analyzed as Class 2 due to modification of Section III of the ASME Boiler and Pressure Vessel Code^[1] (see NB-3630).

The purpose of the analysis was to determine the hanger support configuration necessary for the piping to conform to the requirements of Subsection NC-3600 (Class 2 piping) and Subsection NB-3600 (Class 1 piping) of the ASME Code^[1]. In addition, the hangers (spring, unibal, snubber, rigid strut, and sway brace) were analyzed in accordance with the allowable stress limits set forth in the AISC Manual^[2] or the allowable load limits as specified by the manufacturer, whichever was appropriate.

The operating and design conditions used in this analysis are given in Table I. These values were listed in the Line Designation Table^[3]. The stress free temperature for the pipe line was equal to 70°F.

TABLE I
OPERATING AND DESIGN CONDITIONS

<u>Line</u>	<u>Operating</u>		<u>Design</u>	
	<u>Pressure (psi)</u>	<u>Temperature (°F)</u>	<u>Pressure (psi)</u>	<u>Temperature (°F)</u>
1/2-PCS-10	2250	653	2500	683
1/2-PC-22	2250	653	2500	683
3/4-PC-22	2250	653	2500	683
3/4-PCV-14	2250	653	2500	683
1-PC-40	2250	653	2500	680
1-1/2-PCV-41	Ambient	Ambient	300	450
1-PC-12	2250	560	2500	680
3/4-PC-13	2250	560	2500	680
1-PC-11	2250	410	2500	680
1-PC-53	2250	543	2500	650
2-1/2-PC-17	2250	680	2500	680
1-1/2-PC-48	2250	668	250	680
2-PCV-43	Ambient	Ambient	300	450
4-BS-19	300	350	350	400

The mechanical effect of relief valve discharge has been omitted from the stress analysis of this system. The Class 1 portion of this system is very heavily restrained in the vicinity of the relief valves so that the mechanical loads are not transmitted to the remaining Class 1 portions. The thermal transient effect of the relief valve discharge is included in the Class 1 analysis and it is very significant. The Class 2 portion of this system has been analyzed by Electric Boat and their analysis appears essentially correct. This analysis is available from the Applied Mechanics Branch upon request.

II. METHOD OF ANALYSIS

SAP IV^[4], a structural analysis program for the static and dynamic response of linear systems was used to determine the forces and moments in the pipe and in the hangers supporting the piping. Deadweight and thermal values were obtained using the static method of analysis. The seismic and LOCE forces and moments were acquired using the response spectrum method of dynamic analysis. Further information regarding the capability of SAP IV, or the theoretical basis of SAP IV analytical procedures, can be obtained from Reference 4.

1. COMPUTER MODEL

Figures 1, 2, 3, and 4 illustrate the computer models used for input into the SAP IV program. These Figures show the node locations on the models. Element numbers may be obtained by utilizing the sample SAP IV computer input (Appendix A). For modeling purposes, pipe elements were used to simulate pipe, fittings, and valves.

The LOFT pressurizer, pressure relief system is a very large system in terms of a computer model. So that a computer model could be generated which was more in line with the computing capabilities at the INEL, the piping system was broken into three models. The points at which the system was divided (broken) were chosen by physical characteristics, so that the three sub-models were not divided by functional criteria. The three sub-models were designated red, blue, and black. All computer runs were made on this basis. Drawings of each of the three sub-models are included in Appendix A.

2. COMPUTER RUNS

The pressurizer, pressure relief system was analyzed for the effects of deadweight, various thermal runs at appropriate temperatures, SSE seismic,

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PRESSURIZER PRESSURE RELIEF SYSTEM (AS ANALYZED)

ORIGINAL AND ADDED
RESTRAINTS AND HANGERS

VALVES

- CVP 139-S-4
- CVP 139-18
- CVP 139-10
- CVP 136-19
- CVP 136-20
- CVP 136-30
- CVP 139-S-1
- CVP 139-21
- CVP 139-9

ALL HAVE THEIR OPERATORS
RESTRAINED IN ALL 3 DIRECTIONS

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BLACK SYSTEM MODEL

RESTRAINT OR HANGER

VARIOUS NODE NUMBERS
(NOT ALL SHOWN)

LTR 1144-26

RED SYSTEM

RESTRAINTS OR HANGERS

○ VARIOUS NODE NUMBERS
(NOT ALL SHOWN)

and design LOCE. By definition, SSE stress values are twice the OBE stress values so that only SSE computer analysis was performed. The response of the system to the LOCE was greater than for LOCA so that LOCE values were used in place of LOCA values. Figure 5 illustrates the Mobile Test Assembly (MTA) seismic response spectrum and Figure 6 shows the MTA LOCE response spectrum.

3. ASME CODE SECTION III PIPING ANALYSIS

For the purposes of this piping analysis, OBE and LOCE loads were considered to be design, normal, and upset conditions. SSE was considered to be an emergency condition and the faulted condition consisted of LOCE (LOCA) plus SSE.

3.1 Class 2 Piping Portions

A "Class 2" analysis calls for the combination of the various moments produced by the different loading conditions. When the stress levels produced by the various loading conditions were acceptable, a computer program called INEL PIPE II^[8] was used to combine the moments in the proper way. Appendix C lists the tapes with the individual moment results for each loading conditions and Appendix D shows the output from INEL PIPE II. Also, a listing of INEL PIPE II is included in this report.

The highest stress calculated in the total system is 39,026 psi for the "i" end of element 29 in the "Blue model". This is an Equation (11) stress and the allowable value is 44,375 psi.

3.2 Class 1 Piping Portions

INELPIPE^[9], a computer code developed at the INEL, was used to analyze the Class 1 portion of the pressurizer, pressure relief line. This program performs a maximum total stress range check for all possible load cases and an individual stress range calculation, assuring compliance with Subsection NB-3600 of the ASME Code^[1].

FIG. 5

FIG. 6

LOCE RESPONSE SPECTRA

PRESSURIZED PRESSURE RELIEF SYSTEM
AND
PRESSURIZED SURGE LINE

INELPIPE requires the specification of various load sets which reflects the changes in load conditions that the piping experiences. The load sets agreed upon for the pressurizer, pressure relief system (in cooperation with N. E. Pace of Thermal Analysis) are as follows:

- (1) 70° - 655° step 370 cycles (21 cycles)
 - (a) Null Case - Zero pressure and moments
 - (b) 655°F thermal moments and operating pressure and appropriate ΔT 's
- (2) Heatup-Cooldown 1500 cycles (370 cycles)
 - (a) Null Case - Zero pressure and moments
 - (b) 655°F thermal moments and operating pressure
- (3) 115° step 1500 cycles
 - (a) 540 thermal moments
 - (b) 655 thermal moments and appropriate ΔT 's
- (4) LOCE thermal 26 cycles
 - (a) Zero moments and zero pressure range plus temperature gradient
- (5) LOCE mechanical 260 cycles
 - (a) Positive LOCE moments and operating pressure
 - (b) Negative LOCE moments and operating pressure
- (6) OBE
 - (a) Positive OBE moments and operating pressure
 - (b) Negative OBE moments and operating pressure.

The ΔT 's all came from Reference 5. Appendix B lists all of the moment input data generated by SAP IV computer runs. Appendix D contains a microfiche listing of the INELPIPE run and a paper copy of the INEL pipe analysis of a component.

In compliance with NB-3630(d)(1), Class 1 Piping Systems, 1-1/2 inches nominal O.D. or less may be analyzed as Class 2. This significantly reduces the amount of Class 1 analysis done. The areas receiving Class 1 analysis

are the pressure relief line from the pressurizer to the relief valves and the weld connecting the spray line to the spray piping.

The tee in the pressure relief line has the highest usage factor in the system (.9941 allowable 1.0). This tee is in compliance with ASME Code requirements only for the number of transients specified in Appendix D.

4. HANGER ANALYSIS

Hangers for Class 1 and Class 2 piping must meet the same design requirements. Appendix E contains the analysis procedure used for all of the hangers required on the pipe line. Spring hangers, snubbers, rigid struts, and sway braces must have imposed loads less than those specified as design maximums. Unibals must meet the allowable stress limits for axial tension loads as specified in the AISC Manual^[2].

III. RESULTS AND CONCLUSIONS

1. CLASS 2 PIPING

The analysis of the initial design indicated that the Class 2 portions of the system were over-stressed. When this was discovered, various hangers and/or restraints were added to the system to alleviate this problem (see Ira K. Hall letter, HIK-12-75, "LOFT Pipe Hanger Requirements on Main Feed Main Steam Pressurizer and ECC Systems"). Figure 1 shows hangers and restraints initially on the system. With the addition of these hangers and restraints, the Class 2 portion of this system meets requirements of the ASME Code.

2. CLASS 1 PIPING

The analysis of the Class 1 portions of the initial system indicated that various segments of the system were overstressed. After additional hangers and/or restraints were added at specific points, the stresses were reduced to within allowable limits.

Also, certain components were not able to comply with the fatigue life requirements of the Design Specification and the Code. Appendix D contains a Table of the permissible number of transients.

IV. COMPUTER CODE CONTROL

In order to conform with recent DOE-ID requests for computer configuration control, Appendix F contains microfiche listings or paper copies of the computer codes used for this analysis. All codes listed have not been placed under control.

V. REFERENCES

1. American Society of Mechanical Engineers, ASME Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components", Subsections NB and NC, 1974.
2. American Institute of Steel Construction, Manual of Steel Construction, Seventh Edition, pp 5-16 - 5-24, 1973.
3. Line Designation Tables, Specification P-1, Revision 2, January 1, 1973.
4. K. J. Bathe, et al, "SAP IV, A Structural Analysis Program for Static and Dynamic Response of Linear Systems", Earthquake Engineering Research Center, Berkeley, California, June 1973.
5. I. J. Ingvarsson, "LOFT Pressurizer, Pressure Relief and Sampling Piping Lines Thermal Transient Analyses", LOFT Technical Report LTR 1144-18, August 29, 1974.
6. R. A. Lindley, "LOFT Pressurizer Surge and Spray Line Thermal Analysis" LOFT Technical Report LTR 1144-15, November 2, 1973.
7. J. W. Muffett, "LOFT Pressure Relief and Pressurizing Analysis for Reduced LOCE Loads", LOFT Technical Report LTR 1144-22, January 28, 1976.
8. R. M. Fors, "INEL PIPE II, A Program for Class 2 Analysis", Applied Mechanics Branch.
9. T. K. McKay, "INELPIPE, A Program for Class 1 Analysis", Applied Mechanics Branch.

APPENDIX A
SAMPLE SAP IV COMPUTER INPUT

APPENDIX A

This Appendix shows sample input for the SAP IV program:

- A) Sample Black Model Input
- B) Sample Red Model Input
- C) . Sample Blue Model Input.

A. SAMPLE INPUT

BLACK MODEL

0 1 2 3 4 5 6 7 8
1234567890123456789012345678901234567890123456789012345678901234567890

1	BLACK	BLACK	BLACK									
2	196	1	1						1			
3	1	1	1	1	1	1	1	1	108.000	87.990	78.000	0.0
4	2	0	0	0	0	0	0	0	105.000	87.000	78.000	0.0
5	3	0	0	0	0	0	0	0	105.000	91.000	78.000	0.0
6	4	0	0	0	0	0	0	0	105.000	100.000	78.000	0.0
7	5	0	0	0	0	0	0	0	105.000	110.000	78.000	0.0
8	6	0	0	0	0	0	0	0	105.000	120.000	78.000	0.0
9	7	0	0	0	0	0	0	0	105.000	126.000	78.000	0.0
10	8	0	0	0	0	0	0	0	105.000	131.750	78.000	0.0
11	9	0	0	0	0	0	0	0	105.000	134.000	80.250	0.0
12	10	0	0	0	0	0	0	0	105.000	134.000	85.500	0.0
13	11	0	0	0	0	0	0	0	105.000	141.500	93.000	0.0
14	12	0	0	0	0	0	0	0	105.000	160.000	93.000	0.0
15	13	0	1	0	0	0	0	0	105.000	180.000	93.000	0.0
16	14	0	0	0	0	0	0	0	105.000	182.250	90.750	0.0
17	15	0	0	0	0	0	0	0	105.000	182.250	86.000	0.0
18	16	1	0	1	0	0	0	0	105.000	182.250	82.500	0.0
19	17	0	0	0	0	0	0	0	105.000	189.750	75.000	0.0
20	18	0	0	0	0	0	0	0	105.000	208.000	75.000	0.0
21	19	0	0	0	0	0	0	0	105.000	215.000	75.000	0.0
22	20	0	0	0	0	0	0	0	105.000	240.000	75.000	0.0
23	21	0	0	0	0	0	0	0	105.000	265.000	75.000	0.0
24	22	0	0	1	0	0	0	0	105.000	292.375	75.000	0.0
25	23	0	0	0	0	0	0	0	110.087	299.875	69.489	0.0
26	24	0	1	0	0	0	0	0	112.591	299.875	66.776	0.0
27	25	0	0	0	0	0	0	0	115.306	299.875	64.124	0.0
28	26	0	0	0	0	0	0	0	120.546	299.875	62.000	0.0
29	27	0	0	0	0	0	0	0	133.000	299.875	62.000	0.0
30	28	1	1	1	0	0	0	0	135.500	299.875	62.000	0.0
31	29								138.500	299.875	62.000	0.0
32	30	1	1	1					142.750	299.875	90.000	0.0
33	31	1	1	1	0	0			154.750	299.875	62.000	0.0
34	32	1	1	1					159.000	299.875	84.000	0.0
35	33				0	0			168.000	299.875	62.000	0.0
36	34	0	0	0	0	0	0	0	175.563	299.875	75.000	0.0
37	35				0	0	0	0	174.063	299.875	84.000	0.0
38	36	0	0	0	0	0	0	0	175.563	299.875	69.000	0.0
39	37	0	0	0	0	0	0	0	175.563	299.875	81.000	0.0
40	38	0	0	0	0	0	0	0	175.563	299.875	84.000	0.0
41	39				0	0	0	0	175.563	299.875	63.500	0.0
42	40	0	0	0	0	0	0	0	175.563	299.875	78.000	0.0
43	41	0	0	0	0	0	0	0	175.563	299.875	83.000	0.0
44	42	0	0	0	0	0	0	0	177.063	299.875	62.000	0.0
45	43	0	0	0	0	0	0	0	175.563	299.875	89.000	0.0
46	44	0	0	0	0	0	0	0	175.563	299.875	97.000	0.0
47	45	0	0	0	0	0	0	0	175.563	299.875	108.000	0.0
48	46	0	0	0	0	0	0	0	175.563	299.875	113.000	0.0
49	47	0	0	0	0	0	0	0	179.063	299.875	62.000	0.0
50	48				0	0	0	0	175.563	298.375	114.500	0.0
51	49	1	1	1	1	1	1	1	175.563	296.125	114.500	0.0
52	50	1	1	1					181.313	299.875	62.000	0.0
53	51	1	1	1					186.313	324.975	76.500	0.0
54	52				0	0			188.313	299.875	62.000	0.0
55	53	0	0	0	0	0	0	0	194.193	299.875	62.000	0.0

1234567890123456789012345678901234567890123456789012345678901234567890

LTR1144 20

0 1 2 3 4 5 6 7 8
123456789012345678901234567890123456789012345678901234567890

56	54	0	C	0	0	0	0	197.943	298.128	65.318	0.0
57	55	0	0	0	0	0	0	197.943	295.938	69.500	0.0
58	56	0	C	0	0	0	0	197.943	293.743	73.680	0.0
59	57	0	C	0	0	0	0	194.193	292.000	77.000	0.0
60	58	0	1	0	0	0	0	184.000	292.000	77.000	0.0
61	59	0	0	0	0	0	0	170.875	292.000	77.000	0.0
62	60	0	C	0	0	0	0	167.125	288.250	77.000	0.0
63	61	0	0	0	0	0	0	167.125	283.000	77.000	0.0
64	62	0	0	0	0	0	0	167.125	273.000	77.000	0.0
65	63	0	C	C	0	0	0	167.125	263.000	77.000	0.0
66	64	0	0	0	0	0	0	167.125	258.250	77.000	0.0
67	65	1	0	1	0	0	0	167.125	246.000	77.000	0.0
68	66	0	C	0	0	0	0	167.125	236.000	77.000	0.0
69	67	0	C	0	0	0	0	167.125	231.000	77.000	0.0
70	68	0	C	0	0	0	0	167.125	228.000	77.000	0.0
71	69	0	C	0	0	0	0	168.025	228.000	77.000	0.0
72	70	1	1	1	1	1	1	171.375	228.000	77.000	0.0
73	71	0	0	0	0	0	0	167.125	205.000	77.000	0.0
74	72	1	1	1	1	1	1	167.125	186.750	77.000	0.0
75	73	0	C	0	0	0	0	170.875	183.000	77.000	0.0
76	74	0	0	0	0	0	0	195.000	183.000	77.000	0.0
77	75	0	C	0	0	0	0	217.313	183.000	77.000	0.0
78	76	0	0	0	0	0	0	221.063	179.250	77.000	0.0
79	77	0	0	0	0	0	0	221.063	176.750	81.000	0.0
80	78	1	1	1	0	0	0	221.063	176.750	88.250	0.0
81	79	1	1	1	0	0	0	251.063	174.250	92.250	0.0
82	80	0	0	0	0	0	0	221.063	177.875	77.000	0.0
83	81	0	0	0	0	0	0	221.063	176.750	78.125	0.0
84	82	0	0	0	0	0	0	221.063	176.750	90.750	0.0
85	83	0	0	0	0	0	0	221.063	178.750	92.750	0.0
86	84	1	0	1	0	0	0	221.063	176.750	77.000	0.0
87	85	0	0	0	0	0	0	221.063	182.750	92.750	0.0
88	86	0	0	0	0	0	0	221.063	186.750	92.750	0.0
89	87	0	C	0	0	0	0	221.063	190.750	92.750	0.0
90	88	0	0	0	0	0	0	221.063	197.100	96.000	0.0
91	89	0	0	0	0	0	0	221.063	175.625	77.000	0.0
92	90	0	0	0	0	0	0	221.063	199.450	99.250	0.0
93	91	0	0	0	0	0	0	221.063	201.800	102.500	0.0
94	92	0	0	0	0	0	0	221.063	204.150	105.750	0.0
95	93	1	1	1	1	1	1	221.063	160.000	77.000	0.0
96	94	0	0	0	0	0	0	221.063	207.700	110.600	0.0
97	95	0	0	0	0	0	0	221.063	145.000	77.000	0.0
98	96	0	C	0	0	0	0	219.063	208.900	112.200	0.0
99	97	0	0	0	0	0	0	216.063	208.900	112.200	0.0
100	98	1	1	1	1	1	1	213.063	208.900	112.200	0.0
101	99	0	0	0	0	0	0	221.063	133.500	77.000	0.0
102	100	0	0	0	0	0	0	221.063	123.856	77.000	0.0
103	101	0	0	0	0	0	0	220.195	121.458	77.000	0.0
104	102	0	C	0	0	0	0	208.899	107.882	77.000	0.0
105	103	1	0	0	0	0	0	206.500	105.000	73.250	0.0
106	104	0	C	0	0	0	0	206.500	105.000	50.000	0.0
107	105	0	0	0	0	0	0	206.500	105.000	36.000	0.0
108	106	1	1	1	1	1	1	206.500	105.000	31.000	0.0
109	107	0	0	0	0	0	0	206.500	105.000	21.000	0.0
110	108	0	C	0	0	0	0	206.500	105.000	1.000	0.0

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111	109	0	0	0	0	0	0	206.500	105.000	-14.000	0.0
112	110	0	0	0	0	0	0	206.500	105.000	-24.000	0.0
113	111	0	0	0	0	0	0	206.500	105.000	-34.000	0.0
114	112	0	0	0	0	0	0	206.500	105.000	-40.000	0.0
115	113	0	0	0	0	0	0	206.500	105.000	-46.250	0.0
116	114	0	0	0	0	0	0	205.963	101.289	-50.000	0.0
117	115	0	0	0	0	0	0	205.563	98.527	-50.000	0.0
118	116	0	0	0	0	0	0	205.164	95.767	-50.000	0.0
119	117	0	0	0	0	0	0	205.125	95.230	-50.000	0.0
120	118	0	0	0	0	0	0	205.125	93.623	-50.000	0.0
121	119	0	0	0	0	0	0	205.125	91.375	-50.000	0.0
122	120					0	0	205.125	89.875	-50.000	0.0
123	121					0	0	205.125	83.875	-50.000	0.0
124	122							205.125	79.625	-20.000	0.0
125	123					0	0	205.125	92.500	-50.000	0.0
126	124							205.125	92.500	-51.125	0.0
127	125	0	0	0	0	0	0	205.125	68.125	-50.000	0.0
128	126	0	0	0	0	0	0	205.125	66.625	-51.500	0.0
129	127							205.125	66.625	-53.000	0.0
130	128	1	1	1	1	1	1	205.125	66.625	-55.000	0.0
131	129	0	0	0	0	0	0	205.125	92.500	-53.000	0.0
132	130	0	0	0	0	0	0	205.125	92.500	-59.000	0.0
133	131	0	0	0	0	0	0	205.125	92.500	-80.000	0.0
134	132	0	0	0	0	0	0	205.125	92.500	-87.000	0.0
135	133	0	0	0	0	0	0	205.125	92.500	-93.250	0.0
136	134	0	0	0	0	0	0	201.375	92.500	-97.000	0.0
137	135	0	0	0	0	0	0	200.250	92.500	-97.000	0.0
138	136	0	0	0	0	0	0	197.000	92.500	-97.000	0.0
139	137	0	0	0	0	0	0	185.000	92.500	-97.000	0.0
140	138	0	0	0	0	0	0	168.000	92.500	-97.000	0.0
141	139	0	1	0	0	0	0	160.000	92.500	-97.000	0.0
142	140	0	0	0	0	0	0	152.000	92.500	-97.000	0.0
143	141	1	1	1		0	0	139.000	92.500	-85.175	0.0
144	142	1	1	1		0	0	124.500	92.500	-84.062	0.0
145	143	0	0	0	0	0	0	143.000	92.500	-97.000	0.0
146	144		0	0	0	0	0	139.000	92.500	-90.750	0.0
147	145	0	0	0	0	0	0	140.125	92.500	-97.000	0.0
148	146							139.000	92.500	-83.000	0.0
149	147	0	0	0	0	0	0	139.000	92.500	-95.875	0.0
150	148	0	0	0	0	0	0	139.000	92.500	-80.875	0.0
151	149	0	0	0	0	0	0	139.000	92.500	-97.000	0.0
152	150	0	0	0	0	0	0	139.000	92.500	-78.375	0.0
153	151	0	0	0	0	0	0	139.000	91.375	-77.250	0.0
154	152	0	0	0	0	0	0	139.000	90.000	-77.250	0.0
155	153	0	0	0	0	0	0	137.875	92.500	-97.000	0.0
156	154	0	0	0	0	0	0	139.000	86.000	-77.250	0.0
157	155	0	0	0	0	0	0	139.000	85.000	-77.250	0.0
158	156	0	0	0	0	0	0	139.000	80.000	-77.250	0.0
159	157	0	0	0	0	0	0	139.000	73.000	-77.250	0.0
160	158	0	0	0	0	0	0	136.875	92.500	-97.000	0.0
161	159	0	0	0	0	0	0	139.000	70.000	-77.250	0.0
162	160	0	0	0	0	0	0	139.000	69.000	-77.250	0.0
163	161	0	0	0	0	0	0	139.000	68.500	-77.250	0.0
164	162	0	0	0	0	0	0	131.000	92.500	-97.000	0.0
165	163	0	0	0	0	0	0	139.000	68.000	-77.250	0.0

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166	164	0	0	0	0	0	0	139.000	67.375	-77.250	0.0
167	165	1	1	1	1	1	1	139.000	65.000	-77.250	0.0
168	166	0	0	0	0	0	0	126.000	92.500	-97.000	0.0
169	167	0	0	0	0	0	0	126.000	92.500	-97.795	0.0
170	168	0	0	0	0	0	0	127.500	92.500	-100.295	0.0
171	169							129.000	92.500	-102.795	0.0
172	170	1	1	1	1	1	1	120.000	92.500	-102.795	0.0
173	171	0	0	0	0	0	0	113.000	92.500	-97.000	0.0
174	172	0	0	0	0	0	0	110.500	95.000	-97.000	0.0
175	173	0	0	1	0	0	0	110.500	110.500	-97.000	0.0
176	174	0	0	0	0	0	0	110.500	113.000	-94.500	0.0
177	175	0	0	0	0	0	0	110.500	113.000	-88.000	0.0
178	176	0	0	0	0	0	0	110.500	113.000	-83.000	0.0
179	177	0	0	0	0	0	0	110.500	115.500	-80.500	0.0
180	178	0	0	0	0	0	0	110.500	122.000	-80.500	0.0
181	179	0	0	0	0	0	0	110.500	128.500	-80.500	0.0
182	180	1	1	1	0	0	0	110.500	134.000	-80.500	0.0
183	181	1	1	1				110.500	138.250	-50.500	0.0
184	182	0	0	0	0	0	0	110.500	142.000	-80.500	0.0
185	183	0	0	0	0	0	0	110.500	143.719	-79.834	0.0
186	184	0	0	0	0	0	0	110.500	146.734	-77.042	0.0
187	185	0	0	0	0	0	0	110.500	149.749	-74.250	0.0
188	186	0	0	0	0	0	0	110.500	152.764	-71.458	0.0
189	187	0	0	0	0	0	0	110.500	155.781	-68.666	0.0
190	188	0	0	0	0	0	0	110.500	157.480	-68.000	0.0
191	189	0	0	0	0	0	0	110.500	163.000	-68.000	0.0
192	190	0	0	0	0	0	0	110.500	169.000	-68.000	0.0
193	191	0	0	0	0	0	0	110.500	175.000	-68.000	0.0
194	192	0	0	0	0	0	0	110.500	177.000	-68.000	0.0
195	193	0	0	0	0	0	0	110.500	181.500	-68.000	0.0
196	194	0	0	0	0	0	0	110.500	184.000	-70.500	0.0
197	195	0	0	0	0	0	0	110.500	184.000	-72.500	0.0
198	196	1	1	1	1	1	1	110.500	184.000	-74.000	0.0

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199	12	195	1	10	15	0	0	0	0	0	0	1
200	1	10	SA 376									
201		0.029200000.0				.3	.00000524					
202		150.028500000.0				.3	.00000553					
203		250.028500000.0				.3	.00000587					
204		300.028300000.0				.3	.00000605					
205		400.027700000.0				.3	.00000636					
206		450.027300000.0				.3	.00000650					
207		500.027000000.0				.3	.00000666					
208		550.026500000.0				.3	.00000680					
209		600.026000000.0				.3	.00000694					
210		655.025400000.0				.3	.00000701					

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211	1	1.900	.145			0.400	.3	1.5	SCH 40
212	2	1.315	.250			0.256	.250	1	SCH 160
213	3	1.050	.218			0.172		.75	SCH 160
214	4	2.375	.154			0.425		2	SCH 40
215	5	.840	.187			0.115		.5	SCH 160
216	6	4.500	.531			2.220	✓	4	SCH 160
217	7	2.875	.375			0.960	✓	2.5	SCH 160
218	8	2.000	.750			3.000			VALVE BODY 1
219	9	2.250	1.000			3.500			VALVE BODY 2
220	10	2.500	1.250			4.000			VALVE BODY 3

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221	11	4.	1.900	3.700	RV VALVE OPERAT
222	12	4.	1.900	2.54	5.4 VALVE OPERAT
223	13	4.	1.900	6.300	18 VALVE OPERAT
224	14	4.	1.900	2.350	10 VALVE OPERAT
225	15	.1	.001	.001	FICTITIOUS MEMBER

226						
227	1.0					
228						
229						
230						
231	1	1	2	1	1	0.
232	2	2	3	1	1	0.
233	3	3	4	1	1	0.
234	4	4	5	1	1	0.
235	5	5	6	1	1	0.
236	6	6	7	1	1	0.
237	7	7	8	1	1	0.
238	88	8	9	1	1	0.
239	2.25		105.000	134.000	78.000	
240	9	9	10	1	1	0.
241	108	10	11	1	1	0.
242	7.50		105.000	134.000	93.000	
243	11	11	12	1	1	0.
244	12	12	13	1	1	0.
245	138	13	14	1	1	0.
246	2.25		105.000	182.250	93.000	
247	14	14	15	1	1	0.
248	15	15	16	1	1	0.
249	168	16	17	1	1	0.
250	7.50		105.000	182.250	75.000	
251	17	17	18	1	1	0.
252	18	18	19	1	1	0.
253	19	19	20	1	1	0.
254	20	20	21	1	1	0.
255	21	21	22	1	1	0.
256	228	22	23	1	1	0.
257	7.50		105.000	299.875	75.000	
258	23	23	24	1	1	0.
259	24	24	25	1	1	0.
260	258	25	26	1	1	0.
261	7.50		117.501	299.875	62.000	
262	26	26	27	1	1	0.
263	27	27	28	1	1	0.
264	28	28	29	1	2	0.
265	29	29	30	1	12	0.
266	30	29	31	1	2	0.
267	31	31	32	1	13	0.
268	32	31	33	1	2	0.
269	33	33	35	1	15	0.
270	34	35	38	1	2	0.
271	35	38	37	1	2	0.
272	36	37	34	1	2	0.
273	37	34	36	1	2	0.
274	38	36	39	1	2	0.
275	39	39	40	1	2	0.

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276	40	40	41	1	2	0.	0.	0.	0.	0.	0
277	41	41	43	1	2	0.	0.	0.	0.	0.	0
278	42	43	44	1	2	0.	0.	0.	0.	0.	0
279	43	44	45	1	2	0.	0.	0.	0.	0.	0
280	44	45	46	1	2	0.	0.	0.	0.	0.	0
281	45B	46	48	1	2	0.	0.	0.	0.	0.	0
282	1.50		175.563		299.875		114.500				
283	46	48	49	1	2	0.	0.	0.	0.	0.	0
284	47	38	42	1	15	0.	0.	0.	0.	0.	0
285	48	42	47	1	2	0.	0.	0.	0.	0.	0
286	49	47	50	1	3	0.	0.	0.	0.	0.	0
287	50	50	51	1	14	0.	0.	0.	0.	0.	0
288	51	50	52	1	3	0.	0.	0.	0.	0.	0
289	52	52	53	1	3	0.	0.	0.	0.	0.	0
290	53B	53	54	1	3	0.	0.	0.	0.	0.	0
291	3.75		197.943		299.875		62.000				
292	54	54	55	1	3	0.	0.	0.	0.	0.	0
293	55	55	56	1	3	0.	0.	0.	0.	0.	0
294	56B	56	57	1	3	0.	0.	0.	0.	0.	0
295	3.75		197.943		292.000		77.000				
296	57	57	58	1	3	0.	0.	0.	0.	0.	0
297	58	58	59	1	3	0.	0.	0.	0.	0.	0
298	59B	59	60	1	3	0.	0.	0.	0.	0.	0
299	3.75		167.125		292.000		77.000				
300	60	60	61	1	3	0.	0.	0.	0.	0.	0
301	61	61	62	1	3	0.	0.	0.	0.	0.	0
302	62	62	63	1	3	0.	0.	0.	0.	0.	0
303	63	63	64	1	3	0.	0.	0.	0.	0.	0
304	64	64	65	1	3	0.	0.	0.	0.	0.	0
305	65	65	66	1	3	0.	0.	0.	0.	0.	0
306	66	66	67	1	3	0.	0.	0.	0.	0.	0
307	67	67	68	1	3	0.	0.	0.	0.	0.	0
308	68	68	69	1	3	0.	0.	0.	0.	0.	0
309	69	69	70	1	3	0.	0.	0.	0.	0.	0
310	70	68	71	1	3	0.	0.	0.	0.	0.	0
311	71	71	72	1	3	0.	0.	0.	0.	0.	0
312	72B	72	73	1	3	0.	0.	0.	0.	0.	0
313	3.75		167.125		183.000		77.000				
314	73	73	74	1	3	0.	0.	0.	0.	0.	0
315	74	74	75	1	3	0.	0.	0.	0.	0.	0
316	75B	75	76	1	3	0.	0.	0.	0.	0.	0
317	3.75		221.063		183.000		77.000				
318	76	76	80	1	3	0.	0.	0.	0.	0.	0
319	77	80	84	1	3	0.	0.	0.	0.	0.	0
320	78	84	81	1	5	0.	0.	0.	0.	0.	0
321	79	81	77	1	5	0.	0.	0.	0.	0.	0
322	80	77	78	1	5	0.	0.	0.	0.	0.	0
323	81	78	79	1	14	0.	0.	0.	0.	0.	0
324	82	78	82	1	5	0.	0.	0.	0.	0.	0
325	83B	82	83	1	5	0.	0.	0.	0.	0.	0
326	2.000		221.063		176.750		92.750				
327	84	83	85	1	2	0.	0.	0.	0.	0.	0
328	85	85	86	1	2	0.	0.	0.	0.	0.	0
329	86	86	87	1	2	0.	0.	0.	0.	0.	0
330	87B	87	88	1	2	0.	0.	0.	0.	0.	0

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331	4.000	221.063	194.750	92.750						
332	88 88 90	1 2	0.	0.	0.	0.	0.	0.	0.	0
333	89 90 91	1 2	0.	0.	0.	0.	0.	0.	0.	0
334	90 91 92	1 2	0.	0.	0.	0.	0.	0.	0.	0
335	91 92 94	1 2	0.	0.	0.	0.	0.	0.	0.	0
336	928 94 96	1 2	0.	0.	0.	0.	0.	0.	0.	0
337	2.000	221.063	208.900	112.200						
338	93 96 97	1 2	0.	0.	0.	0.	0.	0.	0.	0
339	94 97 98	1 2	0.	0.	0.	0.	0.	0.	0.	0
340	95 84 89	1 3	0.	0.	0.	0.	0.	0.	0.	0
341	96 89 93	1 3	0.	0.	0.	0.	0.	0.	0.	0
342	97 93 95	1 3	0.	0.	0.	0.	0.	0.	0.	0
343	98 95 99	1 3	0.	0.	0.	0.	0.	0.	0.	0
344	99 99 100	1 3	0.	0.	0.	0.	0.	0.	0.	0
345	1008 100 101	1 3	0.	0.	0.	0.	0.	0.	0.	0
346	3.75	221.063	122.499	77.000						
347	101 101 102	1 3	0.	0.	0.	0.	0.	0.	0.	0
348	1028 102 103	1 3	0.	0.	0.	0.	0.	0.	0.	0
349	3.75	206.500	105.000	77.000						
350	103 103 104	1 3	0.	0.	0.	0.	0.	0.	0.	0
351	104 104 105	1 3	0.	0.	0.	0.	0.	0.	0.	0
352	105 105 106	1 3	0.	0.	0.	0.	0.	0.	0.	0
353	106 106 107	1 3	0.	0.	0.	0.	0.	0.	0.	0
354	107 107 108	1 3	0.	0.	0.	0.	0.	0.	0.	0
355	108 108 109	1 3	0.	0.	0.	0.	0.	0.	0.	0
356	109 109 110	1 3	0.	0.	0.	0.	0.	0.	0.	0
357	110 110 111	1 3	0.	0.	0.	0.	0.	0.	0.	0
358	111 111 112	1 3	0.	0.	0.	0.	0.	0.	0.	0
359	112 112 113	1 3	0.	0.	0.	0.	0.	0.	0.	0
360	1138 113 114	1 3	0.	0.	0.	0.	0.	0.	0.	0
361	3.75	208.500	105.000	-50.000						
362	114 114 115	1 3	0.	0.	0.	0.	0.	0.	0.	0
363	115 115 116	1 3	0.	0.	0.	0.	0.	0.	0.	0
364	1168 116 117	1 3	0.	0.	0.	0.	0.	0.	0.	0
365	3.75	205.144	95.490	-50.000						
366	117 117 118	1 3	0.	0.	0.	0.	0.	0.	0.	0
367	118 118 123	1 3	0.	0.	0.	0.	0.	0.	0.	0
368	119 123 119	1 3	0.	0.	0.	0.	0.	0.	0.	0
369	120 119 120	1 3	0.	0.	0.	0.	0.	0.	0.	0
370	121 121 121	1 5	0.	0.	0.	0.	0.	0.	0.	0
371	122 121 122	1 14	0.	0.	0.	0.	0.	0.	0.	0
372	123 121 125	1 5	0.	0.	0.	0.	0.	0.	0.	0
373	1248 125 126	1 5	0.	0.	0.	0.	0.	0.	0.	0
374	1.50	205.125	66.625	-50.000						
375	125 126 127	1 5	0.	0.	0.	0.	0.	0.	0.	0
376	126 127 128	1 3	0.	0.	0.	0.	0.	0.	0.	0
377	127 123 124	1 3	0.	0.	0.	0.	0.	0.	0.	0
378	128 124 129	1 3	0.	0.	0.	0.	0.	0.	0.	0
379	129 129 130	1 3	0.	0.	0.	0.	0.	0.	0.	0
380	130 130 131	1 3	0.	0.	0.	0.	0.	0.	0.	0
381	131 131 132	1 3	0.	0.	0.	0.	0.	0.	0.	0
382	132 132 133	1 3	0.	0.	0.	0.	0.	0.	0.	0
383	1338 133 134	1 3	0.	0.	0.	0.	0.	0.	0.	0
384	3.75	205.125	92.500	-57.000						
385	134 134 135	1 3	0.	0.	0.	0.	0.	0.	0.	0

C 1 2 3 4 5 6 7 8
1234567890123456789012345678901234567890123456789012345678901234567890

LTR1144 25

0 1 2 3 4 5 6 7 8
1234567890123456789012345678901234567890123456789012345678901234567890

386	135	135	136	1	3	0.	0.	0.	0.	0.	0
387	136	136	137	1	3	0.	0.	0.	0.	0.	0
388	137	137	138	1	3	0.	0.	0.	0.	0.	0
389	138	138	139	1	3	0.	0.	0.	0.	0.	0
390	139	139	140	1	3	0.	0.	0.	0.	0.	0
391	140	140	143	1	3	0.	0.	0.	0.	0.	0
392	141	143	145	1	3	0.	0.	0.	0.	0.	0
393	142	145	149	1	3	0.	0.	0.	0.	0.	0
394	143	149	147	1	3	0.	0.	0.	0.	0.	0
395	144	147	144	1	3	0.	0.	0.	0.	0.	0
396	145	144	141	1	3	0.	0.	0.	0.	0.	0
397	146	141	142	1	14	0.	0.	0.	0.	0.	0
398	147	141	146	1	3	0.	0.	0.	0.	0.	0
399	148	146	148	1	3	0.	0.	0.	0.	0.	0
400	149	148	150	1	3	0.	0.	0.	0.	0.	0
401	1508	150	151	1	3	0.	0.	0.	0.	0.	0
402	3.75	139.000	92.500			-77.250					
403	151	151	152	1	3	0.	0.	0.	0.	0.	0
404	152	152	154	1	3	0.	0.	0.	0.	0.	0
405	153	154	155	1	3	0.	0.	0.	0.	0.	0
406	154	155	156	1	3	0.	0.	0.	0.	0.	0
407	155	156	157	1	3	0.	0.	0.	0.	0.	0
408	156	157	159	1	3	0.	0.	0.	0.	0.	0
409	157	159	160	1	3	0.	0.	0.	0.	0.	0
410	158	160	161	1	3	0.	0.	0.	0.	0.	0
411	159	161	163	1	3	0.	0.	0.	0.	0.	0
412	160	163	164	1	3	0.	0.	0.	0.	0.	0
413	161	164	165	1	3	0.	0.	0.	0.	0.	0
414	162	149	153	1	3	0.	0.	0.	0.	0.	0
415	163	153	158	1	3	0.	0.	0.	0.	0.	0
416	164	158	162	1	5	0.	0.	0.	0.	0.	0
417	165	162	166	1	5	0.	0.	0.	0.	0.	0
418	166	166	167	1	3	0.	0.	0.	0.	0.	0
419	167	167	168	1	3	0.	0.	0.	0.	0.	0
420	168	168	169	1	3	0.	0.	0.	0.	0.	0
421	169	169	170	1	3	0.	0.	0.	0.	0.	0
422	170	166	171	1	5	0.	0.	0.	0.	0.	0
423	1718	171	172	1	5	0.	0.	0.	0.	0.	0
424	2.50	110.500	92.500			-97.000					
425	172	172	173	1	5	0.	0.	0.	0.	0.	0
426	1738	173	174	1	5	0.	0.	0.	0.	0.	0
427	2.50	110.500	113.000			-97.000					
428	174	174	175	1	5	0.	0.	0.	0.	0.	0
429	175	175	176	1	5	0.	0.	0.	0.	0.	0
430	1768	176	177	1	5	0.	0.	0.	0.	0.	0
431	2.50	110.500	113.000			-80.500					
432	177	177	178	1	5	0.	0.	0.	0.	0.	0
433	178	178	179	1	5	0.	0.	0.	0.	0.	0
434	179	179	180	1	5	0.	0.	0.	0.	0.	0
435	180	180	181	1	14	0.	0.	0.	0.	0.	0
436	181	180	182	1	5	0.	0.	0.	0.	0.	0
437	1828	182	183	1	5	0.	0.	0.	0.	0.	0
438	2.50	110.500	143.000			-80.500					
439	183	183	184	1	5	0.	0.	0.	0.	0.	0
440	184	184	185	1	5	0.	0.	0.	0.	0.	0

0 1 2 3 4 5 6 7 8
1234567890123456789012345678901234567890123456789012345678901234567890

LTR1144 26

0	1	2	3	4	5	7	8
1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890

441	185	185	186	1	5	0.	0.	0.	0.	0.	0
442	186	186	187	1	5	0.	0.	0.	0.	0.	0
443	1878	187	188	1	5	0.	0.	0.	0.	0.	0
444	2.50		110.500		156.500	-68.000					
445	188	188	189	1	5	0.	0.	0.	0.	0.	0
446	189	189	190	1	5	0.	0.	0.	0.	0.	0
447	190	190	191	1	5	0.	0.	0.	0.	0.	0
448	191	191	192	1	5	0.	0.	0.	0.	0.	0
449	192	192	193	1	5	0.	0.	0.	0.	0.	0
450	1938	193	194	1	5	0.	0.	0.	0.	0.	0
451	2.50		110.500		184.000	-68.000					
452	194	194	195	1	5	0.	0.	0.	0.	0.	0
453	195	195	196	1	5	0.	0.	0.	0.	0.	0
454											
455	1.0										
456											
457											
458											
459											

0	1	2	3	4	5	6	7	8
1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890

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B. SAMPLE INPUT
RED MODEL

1	RED	RED	RED										
2	104	1	1					1	1				
3	1	0	0	0	0	0	0	110.500	209.250	-81.500		0.0	
4	2	0	0	0	0	0	0	110.500	261.500	-74.000		0.0	
5	3	0	0	0	0	0	0	110.500	213.000	-77.750		0.0	
6	4	1	0	1	0	0	0	110.500	251.000	-74.000		0.0	
7	5	0	0	0	0	0	0	110.500	201.500	-81.500		0.0	
8	6	0	0	0	0	0	0	110.500	271.500	-74.000		0.0	
9	7	0	0	0	0	0	0	110.500	213.000	-75.500		0.0	
10	8	0	0	0	0	0	0	110.500	245.000	-74.000		0.0	
11	9							110.500	208.125	-74.000		0.0	
12	10							110.500	198.500	-81.500		0.0	
13	11	0	0	0	0	0	0	110.500	211.500	-74.000		0.0	
14	12	0	0	0	0	0	0	110.500	281.500	-74.000		0.0	
15	13	1	1					110.500	203.875	-46.000		0.0	
16	14	0		0	0	0	0	110.500	240.000	-74.000		0.0	
17	15	0	0	0	0	0	0	110.500	213.000	-74.000		0.0	
18	16	0	0	0	0	0	0	110.500	291.000	-74.000		0.0	
19	17	0	0	0	0	0	0	110.500	214.500	-74.000		0.0	
20	18	0	0	0	0	0	0	110.500	190.750	-81.500		0.0	
21	19	0	0	0	0	0	0	110.500	203.875	-74.000		0.0	
22	20	0	0	0	0	0	0	110.500	230.000	-74.000		0.0	
23	21	0	0	0	0	0	0	110.500	188.500	-74.000		0.0	
24	22	0	0	0	0	0	0	110.500	301.000	-74.000		0.0	
25	23	0	0	0	0	0	0	110.500	193.000	-74.000		0.0	
26	24	0	0	0	0	0	0	110.500	187.000	-77.750		0.0	
27	25	0	0	0	0	0	0	110.500	216.000	-74.000		0.0	
28	26	0	0	0	0	0	0	110.500	220.000	-74.000		0.0	
29	27	0	0	0	0	0	0	110.500	307.000	-74.000		0.0	
30	28	0	0	0	0	0	0	110.500	313.250	-74.000		0.0	
31	29	0	0	0	0	0	0	110.500	217.500	-74.000		0.0	
32	30	0	0	0	0	0	0	110.500	187.000	-75.500		0.0	
33	31	0	0	0	0	0	0	110.500	318.250	-69.000		0.0	
34	32	1		0	0	0	0	110.500	318.250	-46.000		0.0	
35	33	0	0	0	0	0	0	112.000	216.000	-74.000		0.0	
36	34	0	0	0	0	0	0	118.000	216.000	-74.000		0.0	
37	35	0	0	0	0	0	0	110.500	318.250	-36.000		0.0	
38	36	0	0	0	0	0	0	110.500	187.000	-74.000		0.0	
39	37	0	0	0	0	0	0	110.500	318.250	-26.000		0.0	
40	38	0	0	0	0	0	0	110.500	318.250	-16.000		0.0	
41	39	1	1	1	1	1	1	196.380	300.250	94.500		0.0	
42	40	0	0	0	0	0	0	110.500	318.250	-6.000		0.0	
43	41	0	0	0	0	0	0	123.000	211.000	-74.000		0.0	
44	42	0	0	0	0	0	0	110.500	185.500	-74.000		0.0	
45	43	0	0	0	0	0	0	110.500	318.250	4.000		0.0	
46	44	0	0	0	0	0	0	110.500	318.250	9.000		0.0	
47	45	0	0	0	0	0	0	196.380	304.250	94.500		0.0	
48	46	0	0	0	0	0	0	123.000	196.000	-74.000		0.0	
49	47	0	0	0	0	0	0	110.500	182.500	-74.000		0.0	
50	48	0	1	1	0	0	0	110.500	318.250	14.000		0.0	
51	49	0	0	0	0	0	0	110.500	318.250	20.000		0.0	
52	50	0	0	0	0	0	0	123.000	177.571	-74.000		0.0	
53	51	0	0	0	0	0	0	196.380	307.180	94.500		0.0	
54	52	0	1	0	0	0	0	110.500	318.250	30.000		0.0	
55	53	0	0	0	0	0	0	110.500	181.000	-74.000		0.0	

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LR1144 26

LRI 144 26

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166	19	21	25	1	2	0.	0.	0.	0.	0.	0.
167	20	25	25	1	2	0.	0.	0.	0.	0.	0.
168	21	29	26	1	2	0.	0.	0.	0.	0.	0.
169	22	26	20	1	2	0.	0.	0.	0.	0.	0.
170	23	25	14	1	2	0.	0.	0.	0.	0.	0.
171	24	14	8	1	2	0.	0.	0.	0.	0.	0.
172	25	8	4	1	2	0.	0.	0.	0.	0.	0.
173	26	4	2	1	2	0.	0.	0.	0.	0.	0.
174	27	2	6	1	2	0.	0.	0.	0.	0.	0.
175	28	6	12	1	2	0.	0.	0.	0.	0.	0.
176	29	12	16	1	2	0.	0.	0.	0.	0.	0.
177	30	16	22	1	2	0.	0.	0.	0.	0.	0.
178	31	22	27	1	2	0.	0.	0.	0.	0.	0.
179	32	27	28	1	2	0.	0.	0.	0.	0.	0.
180	33H	28	31	1	2	0.	0.	0.	0.	0.	0.
181	5.00		112.500			318.250		-74.000			
182	34	31	32	1	2	0.	0.	0.	0.	0.	0.
183	35	32	35	1	2	0.	0.	0.	0.	0.	0.
184	36	35	37	1	2	0.	0.	0.	0.	0.	0.
185	37	37	38	1	2	0.	0.	0.	0.	0.	0.
186	38	38	40	1	2	0.	0.	0.	0.	0.	0.
187	39	40	43	1	2	0.	0.	0.	0.	0.	0.
188	40	43	44	1	2	0.	0.	0.	0.	0.	0.
189	41	44	48	1	2	0.	0.	0.	0.	0.	0.
190	42	48	49	1	2	0.	0.	0.	0.	0.	0.
191	43	49	52	1	2	0.	0.	0.	0.	0.	0.
192	44	52	54	1	2	0.	0.	0.	0.	0.	0.
193	45	54	55	1	2	0.	0.	0.	0.	0.	0.
194	46B	55	58	1	2	0.	0.	0.	0.	0.	0.
195	5.00		110.500			318.250		50.930			
196	47	58	61	1	2	0.	0.	0.	0.	0.	0.
197	48B	61	63	1	2	0.	0.	0.	0.	0.	0.
198	5.00		110.500			307.180		62.000			
199	49	63	65	1	2	0.	0.	0.	0.	0.	0.
200	50	65	67	1	2	0.	0.	0.	0.	0.	0.
201	51	67	68	1	2	0.	0.	0.	0.	0.	0.
202	52	68	71	1	2	0.	0.	0.	0.	0.	0.
203	53	71	73	1	2	0.	0.	0.	0.	0.	0.
204	54B	73	74	1	2	0.	0.	0.	0.	0.	0.
205	5.00		175.500			307.180		62.000			
206	55	74	70	1	2	0.	0.	0.	0.	0.	0.
207	56B	70	64	1	2	0.	0.	0.	0.	0.	0.
208	5.00		175.500			307.180		94.500			
209	57	64	57	1	2	0.	0.	0.	0.	0.	0.
210	58B	57	51	1	2	0.	0.	0.	0.	0.	0.
211	1.50		197.880			307.180		94.500			
212	59	51	45	1	2	0.	0.	0.	0.	0.	0.
213	60	45	39	1	2	0.	0.	0.	0.	0.	0.
214	61	39	32	1	15	0.	0.	0.	0.	0.	0.
215	62	33	26	1	15	0.	0.	0.	0.	0.	0.
216	63	29	34	1	2	0.	0.	0.	0.	0.	0.
217	64B	34	41	1	2	0.	0.	0.	0.	0.	0.
218	5.00		123.000			216.000		-74.000			
219	65	41	46	1	2	0.	0.	0.	0.	0.	0.
220	66	46	50	1	2	0.	0.	0.	0.	0.	0.

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LTR1144 26

0 1 2 3 4 5 6 7 8
 123456789012345678901234567890123456789012345678901234567890

LTR 1144 26

C. SAMPLE INPUT
BLUE MODEL

1	2	BLUE	BLUE	BLUE	BLUE	1	1
2	126	1	1	C	C	C	C
3	1	C	C	C	C	C	C
4	2	C	C	C	C	C	C
5	3	C	C	C	C	C	C
6	4	C	C	C	C	C	C
7	5	C	C	C	C	C	C
8	6	C	C	C	C	C	C
9	7	C	C	C	C	C	C
10	8	C	C	C	C	C	C
11	9	C	C	C	C	C	C
12	10	C	C	C	C	C	C
13	11	C	C	C	C	C	C
14	12	C	C	C	C	C	C
15	13	C	C	C	C	C	C
16	14	1	1	1	1	1	1
17	15	C	C	C	C	C	C
18	16	C	C	C	C	C	C
19	17	1	1	1	1	1	1
20	18	C	C	C	C	C	C
21	19	C	C	C	C	C	C
22	20	C	C	C	C	C	C
23	21	C	C	C	C	C	C
24	22	C	C	C	C	C	C
25	23	1	1	1	1	1	1
26	24	C	C	C	C	C	C
27	25	1	1	1	1	1	1
28	26	C	C	C	C	C	C
29	27	C	C	C	C	C	C
30	28	C	C	C	C	C	C
31	29	C	C	C	C	C	C
32	30	C	C	C	C	C	C
33	31	C	C	C	C	C	C
34	32	C	C	C	C	C	C
35	33	C	C	C	C	C	C
36	34	C	C	C	C	C	C
37	35	C	C	C	C	C	C
38	36	C	C	C	C	C	C
39	37	C	C	C	C	C	C
40	38	C	C	C	C	C	C
41	39	C	C	C	C	C	C
42	40	C	C	C	C	C	C
43	41	C	C	C	C	C	C
44	42	C	C	C	C	C	C
45	43	C	C	C	C	C	C
46	44	C	C	C	C	C	C
47	45	C	C	C	C	C	C
48	46	C	C	C	C	C	C
49	47	C	C	C	C	C	C
50	48	C	C	C	C	C	C
51	49	C	C	C	C	C	C
52	50	C	C	C	C	C	C
53	51	C	C	C	C	C	C
54	52	C	C	C	C	C	C
55	53	C	C	C	C	C	C

1 2 3 4 5 6 7 8
1234567890123456789012345678901234567890123456789012345678901234567890

56	54	0	0	0	0	0	0	111.000	144.000	53.000	0.0
57	55	0	0	0	0	0	0	156.063	257.500	75.000	
58	56	0	0	0	0	0	0	156.063	268.000	75.000	0.0
59	57	0	0	0	0	0	0	156.063	280.000	75.000	0.0
60	58	0	0	0	0	0	0	111.000	134.000	83.000	0.0
61	59	0	0	0	0	0	0	156.063	293.000	75.000	0.0
62	60	0	0	1	0	0	0	111.000	134.000	81.000	0.0
63	61	0	0	0	0	0	0	146.563	293.000	75.000	0.0
64	62	0	0	0	0	0	0	138.000	263.000	75.000	0.0
65	63	0	1	1	0	0	0	133.000	263.000	75.000	0.0
66	64	0						127.000	263.000	75.000	0
67	65	0		0	0	0	0	111.000	131.000	78.000	0.0
68	66	0		0	0	0	0	117.000	253.000	75.000	0.0
69	67	0	0	0	0	0	0	117.000	243.000	75.000	0.0
70	68	0	0	0	0	0	0	117.000	233.000	75.000	0.0
71	69	0	0	0	0	0	0	111.000	111.000	78.000	0.0
72	70	1	0	1	0	0	0	117.000	223.000	75.000	0.0
73	71	0	0	0	0	0	0	117.000	219.000	75.000	0.0
74	72	0						117.000	212.000	75.000	0.0
75	73	0	0	0	0	0	0	117.000	202.000	75.000	0.0
76	74	0	0	0	0	0	0	111.000	91.000	78.000	0.0
77	75	0	0	0	0	0	0	117.000	192.250	75.000	0.0
78	76	0	0	0	0	0	0	117.000	182.250	85.000	0.0
79	77	0	0	0	0	0	0	117.000	182.250	87.000	0.0
80	78	0	0	0	0	0	0	111.000	87.000	78.000	0.0
81	79	0	0	0	0	0	0	117.000	182.250	90.000	0.0
82	80	1	1	1	1	1	1	108.000	87.000	78.000	0.0
83	81	1						117.000	179.250	93.000	0.0
84	82						0	117.000	161.625	93.000	0.0
85	83	0	0	0	0	0	0	117.000	87.000	78.000	0.0
86	84	0	0	0	0	0	0	117.000	144.000	93.000	0.0
87	85	0	0	0	0	0	0	117.000	134.000	83.000	0.0
88	86	0					0	117.000	134.000	82.200	0.0
89	87	0	0	0	0	0	0	117.000	100.000	78.000	0.0
90	88	0	0	0	0	0	0	111.000	87.000	78.000	0.0
91	89	0	0	0	0	0	0	117.000	134.000	81.700	0.0
92	90		0	0	0	0	0	121.500	87.000	78.000	0.0
93	91						0	117.000	115.000	78.000	0.0
94	92	0		0	0	0	0	117.000	134.000	81.600	0.0
95	93	0	0	0	0	0	0	117.000	131.000	78.000	0.0
96	94	0	1	1	0	0	0	127.500	87.000	72.000	0.0
97	95	0	0	0	0	0	0	127.500	87.000	60.000	0.0
98	96	0	0	0	0	0	0	127.500	87.000	33.000	0.0
99	97	0	0	0	0	0	0	127.500	87.000	30.000	0.0
100	98	0	0	0	0	0	0	127.500	87.000	20.500	0.0
101	99						0	127.500	87.000	10.500	0.0
102	100	0	0	0	0	0	0	127.500	87.000	0.0	0.0
103	101	0	0	0	0	0	0	127.500	87.000	-10.000	0.0
104	102	0	0	0	0	0	0	127.500	87.000	-25.000	0.0
105	103	0	0	0	0	0	0	127.500	87.000	-40.000	0.0
106	104	0	0	0	0	0	0	127.500	87.000	-53.000	0.0
107	105	0	0	0	0	0	0	130.285	81.683	-59.500	0.0
108	106						0	136.220	70.317	-59.000	0.0
109	107	0	0	0	0	0	0	139.000	65.000	-65.000	0.0
110	108	0	0	0	0	0	0	139.000	65.000	-72.000	0.0

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LRI 144 26

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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221	3.00	111.000	182.250	93.000						
222	48 51 53	1 4	0.	0.	0.	0.	0.	0.	0.	0.
223	49 53 54	1 4	0.	0.	0.	0.	0.	0.	0.	0.
224	50B 54 58	1 4	0.	0.	0.	0.	0.	0.	0.	0.
225	10.00	111.000	134.000	93.000						
226	51 58 60	1 4	0.	0.	0.	0.	0.	0.	0.	0.
227	52B 60 65	1 4	0.	0.	0.	0.	0.	0.	0.	0.
228	3.000	111.000	134.000	78.000						
229	53 65 69	1 4	0.	0.	0.	0.	0.	0.	0.	0.
230	54 69 74	1 4	0.	0.	0.	0.	0.	0.	0.	0.
231	55 74 78	1 4	0.	0.	0.	0.	0.	0.	0.	0.
232	56 77 41	1 7	0.	0.	0.	0.	0.	0.	0.	0.
233	57 41 45	1 7	0.	0.	0.	0.	0.	0.	0.	0.
234	58 45 47	1 1	0.	0.	0.	0.	0.	0.	0.	0.
235	59B 47 52	1 1	0.	0.	0.	0.	0.	0.	0.	0.
236	2.25	156.063	244.500	75.000						
237	60 52 55	1 1	0.	0.	0.	0.	0.	0.	0.	0.
238	61 55 56	1 1	0.	0.	0.	0.	0.	0.	0.	0.
239	62 56 57	1 8	0.	0.	0.	0.	0.	0.	0.	0.
240	63 57 59	1 11	0.	0.	0.	0.	0.	0.	0.	0.
241	64 57 61	1 8	0.	0.	0.	0.	0.	0.	0.	0.
242	65 61 62	1 4	0.	0.	0.	0.	0.	0.	0.	0.
243	66 62 63	1 4	0.	0.	0.	0.	0.	0.	0.	0.
244	67 63 64	1 4	0.	0.	0.	0.	0.	0.	0.	0.
245	68B 64 66	1 4	0.	0.	0.	0.	0.	0.	0.	0.
246	10.00	117.000	263.000	75.000						
247	69 66 67	1 4	0.	0.	0.	0.	0.	0.	0.	0.
248	70 67 68	1 4	0.	0.	0.	0.	0.	0.	0.	0.
249	71 68 70	1 4	0.	0.	0.	0.	0.	0.	0.	0.
250	72 70 71	1 4	0.	0.	0.	0.	0.	0.	0.	0.
251	73 71 72	1 4	0.	0.	0.	0.	0.	0.	0.	0.
252	74 72 73	1 4	0.	0.	0.	0.	0.	0.	0.	0.
253	75 73 75	1 4	0.	0.	0.	0.	0.	0.	0.	0.
254	76B 75 76	1 4	0.	0.	0.	0.	0.	0.	0.	0.
255	10.00	117.000	182.250	75.000						
256	77 76 77	1 4	0.	0.	0.	0.	0.	0.	0.	0.
257	78 77 79	1 4	0.	0.	0.	0.	0.	0.	0.	0.
258	79B 79 81	1 4	0.	0.	0.	0.	0.	0.	0.	0.
259	3.00	117.000	182.250	93.000						
260	80 81 82	1 4	0.	0.	0.	0.	0.	0.	0.	0.
261	81 82 84	1 4	0.	0.	0.	0.	0.	0.	0.	0.
262	82B 84 85	1 4	0.	0.	0.	0.	0.	0.	0.	0.
263	10.00	117.000	134.000	93.000						
264	83 85 86	1 4	0.	0.	0.	0.	0.	0.	0.	0.
265	84 86 89	1 4	0.	0.	0.	0.	0.	0.	0.	0.
266	85 89 92	1 4	0.	0.	0.	0.	0.	0.	0.	0.
267	86B 92 93	1 4	0.	0.	0.	0.	0.	0.	0.	0.
268	3.00	117.000	134.000	78.000						
269	87 93 91	1 4	0.	0.	0.	0.	0.	0.	0.	0.
270	88 91 87	1 4	0.	0.	0.	0.	0.	0.	0.	0.
271	89 87 83	1 4	0.	0.	0.	0.	0.	0.	0.	0.
272	90 83 88	1 6	0.	0.	0.	0.	0.	0.	0.	0.
273	91 88 90	1 6	0.	0.	0.	0.	0.	0.	0.	0.
274	92B 90 94	1 6	0.	0.	0.	0.	0.	0.	0.	0.
275	6.00	127.500	87.000	78.000						

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276	93	94	95	1	6	0.	0.	0.	0.	0.	0.
277	94	95	96	1	6	0.	0.	0.	0.	0.	0.
278	95	96	97	1	6	0.	0.	0.	0.	0.	0.
279	96	97	98	1	6	0.	0.	0.	0.	0.	0.
280	97	98	99	1	6	0.	0.	0.	0.	0.	0.
281	98	99	100	1	6	0.	0.	0.	0.	0.	0.
282	99	100	101	1	6	0.	0.	0.	0.	0.	0.
283	100	101	102	1	6	0.	0.	0.	0.	0.	0.
284	101	102	103	1	6	0.	0.	0.	0.	0.	0.
285	102	103	104	1	6	0.	0.	0.	0.	0.	0.
286	103	104	105	1	6	0.	0.	0.	0.	0.	0.
287	6.000		127.500		87.000	-55.000					
288	104	105	106	1	6	0.	0.	0.	0.	0.	0.
289	105	106	107	1	6	0.	0.	0.	0.	0.	0.
290	6.000		129.000		65.000	-59.000					
291	106	107	108	1	6	0.	0.	0.	0.	0.	0.
292	107	108	109	1	6	0.	0.	0.	0.	0.	0.
293	108	109	110	1	6	0.	0.	0.	0.	0.	0.
294	109	110	111	1	6	0.	0.	0.	0.	0.	0.
295	110	111	112	1	6	0.	0.	0.	0.	0.	0.
296	6.000		129.000		65.000	-119.000					
297	111	112	113	1	6	0.	0.	0.	0.	0.	0.
298	112	113	114	1	6	0.	0.	0.	0.	0.	0.
299	113	114	115	1	6	0.	0.	0.	0.	0.	0.
300	114	115	116	1	6	0.	0.	0.	0.	0.	0.
301	115	116	117	1	6	0.	0.	0.	0.	0.	0.
302	116	117	118	1	6	0.	0.	0.	0.	0.	0.
303	117	118	119	1	6	0.	0.	0.	0.	0.	0.
304	20.000		238.250		65.000	-119.000					
305	118	119	120	1	6	0.	0.	0.	0.	0.	0.
306	119	120	121	1	6	0.	0.	0.	0.	0.	0.
307	6.000		238.250		53.000	-173.000					
308	120	121	122	1	6	0.	0.	0.	0.	0.	0.
309	121	122	123	1	6	0.	0.	0.	0.	0.	0.
310	122	123	124	1	6	0.	0.	0.	0.	0.	0.
311	123	124	125	1	6	0.	0.	0.	0.	0.	0.
312	124	125	126	1	6	0.	0.	0.	0.	0.	0.
313	125	78	83	1	6	0.	0.	0.	0.	0.	0.
314	126	80	78	1	6	0.	0.	0.	0.	0.	0.
315											
316	1.0										
317											
318											

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APPENDIX B
MOMENT DATA

APPENDIX B

This Appendix contains the moments which were used in the analysis. These moments were generated by the various SAP IV runs:

- A) Black Model
 - (1) Dead weight moments
 - (2) Thermal expansions moments
 - (3) LOCE moments
 - (4) Seismic moments.
- B) Red Model
 - (1) Dead weight moments
 - (2) Thermal expansion moments
 - (3) LOCE moments
 - (4) Seismic moments.
- C) Blue Model
 - (1) Dead weight moments
 - (2) Thermal expansion moments
 - (3) LOCE moments
 - (4) Seismic moments.

A. BLACK MODEL MOMENTS

PIPE FORCES AND MOMENTS

BLACK WT

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
1	TANGENT	1	END-I	-0.267	18.826	2.304	62.45	-8.22	61.66
			END-J	-0.267	17.626	2.304	62.45	-1.30	6.98
2	TANGENT	1	END-I	17.626	-2.304	0.267	-1.30	-6.98	-62.45
			END-J	16.026	-2.304	0.267	-1.30	-5.91	-53.24
3	TANGENT	1	END-I	16.026	-2.304	0.267	-1.30	-5.91	-53.24
			END-J	12.426	-2.304	0.267	-1.30	-3.51	-32.50
4	TANGENT	1	END-I	12.426	-2.304	0.267	-1.30	-3.51	-32.50
			END-J	8.426	-2.304	0.267	-1.30	-0.83	-9.46
5	TANGENT	1	END-I	8.426	-2.304	0.267	-1.30	-0.83	-9.46
			END-J	4.426	-2.304	0.267	-1.30	1.84	13.58
6	TANGENT	1	END-I	4.426	-2.304	0.267	-1.30	1.84	13.58
			END-J	2.026	-2.304	0.267	-1.30	3.44	27.41
7	TANGENT	1	END-I	2.026	-2.304	0.267	-1.30	3.44	27.41
			END-J	-0.274	-2.304	0.267	-1.30	4.97	40.66
8	BEND	1	END-I	-0.274	-2.304	0.267	-1.30	4.97	40.66
			CENTER	-2.323	-0.936	0.267	2.77	4.86	43.84
			END-J	-2.304	1.687	0.267	5.57	1.90	43.20
9	TANGENT	1	END-I	-2.304	-1.687	-0.267	5.57	-1.90	-43.20
			END-J	-2.304	-3.787	-0.267	5.57	-3.31	-28.83
10	BEND	1	END-I	-2.304	-3.787	-0.267	5.57	-3.31	-28.83
			CENTER	-5.973	-2.715	-0.267	1.02	-7.70	-7.90
			END-J	-8.500	2.304	-0.267	-5.31	-7.58	-4.86
11	TANGENT	1	END-I	-8.500	-2.304	0.267	-5.31	7.58	4.86
			END-J	-15.900	-2.304	0.267	-5.31	12.52	47.49
12	TANGENT	1	END-I	-15.900	-2.304	0.267	-5.31	12.52	47.49
			END-J	-23.900	-2.304	0.267	-5.31	17.86	93.57
13	BEND	1	END-I	11.832	2.304	-0.267	-5.31	-17.86	-93.57
			CENTER	9.496	-6.238	-0.267	-16.56	-9.30	-89.75
			END-J	2.304	-10.418	-0.267	-18.46	4.71	-74.16
14	TANGENT	1	END-I	2.304	10.418	0.267	-18.46	-4.71	74.16
			END-J	2.304	8.518	0.267	-18.46	-3.44	29.18
15	TANGENT	1	END-I	2.304	8.518	0.267	-18.46	-3.44	29.18
			END-J	2.304	7.118	0.267	-18.46	-2.51	1.82
16	BEND	1	END-I	-0.693	7.118	-0.806	-18.46	-2.51	1.82
			CENTER	2.877	3.858	-0.806	-16.59	7.00	-31.55
			END-J	2.406	0.693	-0.806	-8.55	12.41	-43.93

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
17	TANGENT	1	ENC-I	2.406	0.693	-0.806	-8.55	12.41	-43.93
			ENC-J	-4.854	0.693	-0.806	-8.55	-2.30	-56.58
18	TANGENT	1	ENC-I	-4.894	0.693	-0.806	-8.55	-2.30	-56.58
			ENC-J	-7.694	0.693	-0.806	-8.55	-7.95	-61.43
19	TANGENT	1	ENC-I	-7.694	0.693	-0.806	-8.55	-7.95	-61.43
			ENC-J	-17.694	0.693	-0.806	-8.55	-28.11	-78.77
20	TANGENT	1	ENC-I	-17.694	0.693	-0.806	-8.55	-28.11	-78.77
			ENC-J	-27.694	0.693	-0.806	-8.55	-48.26	-96.10
21	TANGENT	1	ENC-I	-27.694	0.693	-0.806	-8.55	-48.26	-96.10
			ENC-J	-38.644	0.693	-0.806	-8.55	-70.34	-115.08
22	BEND	1	ENC-I	-38.644	-3.535	-2.166	-8.55	-26.37	132.27
			CENTER	-31.491	26.492	-2.166	-29.45	-24.09	62.72
			ENC-J	-3.535	43.356	-2.166	-42.62	-7.69	-153.54
23	TANGENT	1	ENC-I	-3.535	-43.356	2.166	-42.63	7.69	153.54
			ENC-J	-3.535	-44.833	2.166	-42.63	15.69	316.34
24	TANGENT	1	ENC-I	-3.418	17.284	2.346	-26.20	15.69	318.12
			ENC-J	-3.418	15.766	2.346	-26.20	24.59	255.40
25	BEND	1	ENC-I	-3.407	2.362	-15.766	-25.00	255.52	-24.59
			CENTER	-2.265	3.472	-14.606	64.71	203.14	-33.16
			ENC-J	-0.788	4.070	-13.446	128.67	124.07	-44.23
26	TANGENT	1	ENC-I	-0.806	13.446	4.067	128.11	44.23	124.65
			ENC-J	-0.806	8.464	4.067	128.11	94.88	-11.78
27	TANGENT	1	ENC-I	-0.806	8.464	4.067	128.11	94.88	-11.78
			ENC-J	-0.806	7.464	4.067	128.11	105.04	-31.69
28	TANGENT	1	ENC-I	-5.677	26.914	-40.478	128.11	105.04	-31.69
			ENC-J	-5.677	26.146	-40.478	128.11	-16.39	-111.28
29	TANGENT	1	ENC-I	-41.026	31.130	0.575	0.00	-16.28	-137.00
			ENC-J	-41.026	-40.805	0.575	0.00	0.00	0.00
30	TANGENT	1	ENC-I	1.048	-4.984	-0.002	-7.34	-0.10	-90.72
			ENC-J	1.048	-9.144	-0.002	-7.34	-0.15	24.06
31	TANGENT	1	ENC-I	0.0	70.912	-0.192	-0.00	4.30	7.42
			ENC-J	0.0	-70.250	-0.192	-0.00	-0.00	-0.00
32	TANGENT	1	ENC-I	0.092	3.405	0.335	-0.05	-4.44	22.65
			ENC-J	0.092	0.013	0.335	-0.05	-0.00	0.02
33	TANGENT	1	ENC-I	0.348	0.013	0.000	0.00	-0.00	0.06
			ENC-J	0.348	-0.010	0.000	0.00	0.00	0.03

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
34	TANGENT	1	END-I	0.092	-0.010	0.335	-0.03	0.00	0.01
			END-J	0.092	-0.394	0.335	-0.03	0.50	0.31
35	TANGENT	1	END-I	0.024	-0.404	0.117	-0.31	0.50	-0.05
			END-J	0.024	-1.172	0.117	-0.31	0.85	2.31
36	TANGENT	1	END-I	0.024	-1.172	0.117	-0.31	0.85	2.31
			END-J	0.024	-2.708	0.117	-0.31	1.55	13.95
37	TANGENT	1	END-I	0.024	-2.708	0.117	-0.31	1.55	13.95
			END-J	0.024	-4.244	0.117	-0.31	2.25	34.81
38	TANGENT	1	END-I	0.024	-4.244	0.117	-0.31	2.25	34.81
			END-J	0.024	-5.652	0.117	-0.31	2.90	62.02
39	TANGENT	1	END-I	-0.024	-5.652	-0.117	0.31	2.90	-62.02
			END-J	-0.024	-9.364	-0.117	0.31	1.20	46.84
40	TANGENT	1	END-I	-0.024	-9.364	-0.117	0.31	1.20	46.84
			END-J	-0.024	-10.644	-0.117	0.31	0.62	96.86
41	TANGENT	1	END-I	-0.024	-10.644	-0.117	0.31	0.62	96.86
			END-J	-0.024	-12.180	-0.117	0.31	-0.08	165.34
42	TANGENT	1	END-I	-0.024	-12.180	-0.117	0.31	-0.08	165.34
			END-J	-0.024	-14.228	-0.117	0.31	-1.01	270.97
43	TANGENT	1	END-I	-0.024	-14.228	-0.117	0.31	-1.01	270.97
			END-J	-0.024	-17.044	-0.117	0.31	-2.30	442.96
44	TANGENT	1	END-I	-0.024	-17.044	-0.117	0.31	-2.30	442.96
			END-J	-0.024	-18.324	-0.117	0.31	-2.88	531.38
45	BEND	1	END-I	-0.024	18.324	0.117	0.31	2.88	-531.38
			CENTER	13.153	13.187	0.117	2.31	1.94	-550.98
			END-J	18.927	0.024	0.117	3.06	-0.13	-559.23
46	TANGENT	1	END-I	18.927	-0.024	-0.117	3.06	0.13	559.23
			END-J	19.503	-0.024	-0.117	3.06	-0.13	559.29
47	TANGENT	1	END-I	-0.360	0.010	0.000	-0.00	-0.00	0.02
			END-J	-0.360	-0.012	0.000	-0.00	0.00	0.05
48	TANGENT	1	END-I	-0.024	-0.012	0.359	0.05	0.00	0.00
			END-J	-0.024	-0.524	0.359	0.05	0.72	0.54
49	TANGENT	1	END-I	-0.024	-0.524	0.359	0.05	0.72	0.54
			END-J	-0.024	-0.911	0.359	0.05	1.53	2.16
50	TANGENT	1	END-I	29.492	17.798	-1.005	0.00	29.55	-6.60
			END-J	-29.492	-18.246	-1.005	0.00	0.00	0.0

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
51	TANGENT	1	END-I	-0.748	3.551	0.116	2.03	-13.88	28.14
			END-J	-0.748	2.347	0.116	2.03	-13.07	7.50
52	TANGENT	1	END-I	-0.748	2.347	0.116	2.03	-13.07	7.50
			END-J	-0.748	1.335	0.116	2.03	-12.39	-3.32
53	BEND	1	END-I	-0.748	-0.520	-1.236	2.03	2.83	12.51
			CENTER	-0.729	0.328	-0.787	2.25	-2.09	12.77
			END-J	-0.047	0.748	-0.339	-0.58	-4.53	11.01
54	TANGENT	1	END-I	-0.047	0.339	0.748	-0.61	-11.01	-4.53
			END-J	0.330	-0.380	0.748	-0.61	-7.48	-4.43
55	TANGENT	1	END-I	0.330	-0.380	0.748	-0.60	-7.48	-4.43
			END-J	0.708	-1.099	0.748	-0.60	-3.95	-0.94
56	BEND	1	END-I	0.708	0.748	1.099	-0.60	-0.94	3.95
			CENTER	1.196	-0.138	1.547	0.29	3.30	2.92
			END-J	0.748	-1.179	1.996	4.40	6.86	4.92
57	TANGENT	1	END-I	0.748	-2.315	-0.116	4.40	-1.17	8.36
			END-J	0.748	-4.068	-0.116	4.40	-2.35	40.89
58	TANGENT	1	END-I	0.748	2.944	-0.116	4.40	-2.35	40.89
			END-J	0.748	0.687	-0.116	4.40	-3.88	17.06
59	BEND	1	END-I	0.748	-0.687	0.116	4.40	3.88	-17.06
			CENTER	0.401	-0.656	0.116	5.98	-0.06	-15.06
			END-J	0.326	-0.748	0.116	4.31	-3.97	-13.06
60	TANGENT	1	END-I	0.326	0.116	0.748	4.31	-13.06	3.97
			END-J	1.229	0.116	0.748	4.31	-9.14	3.36
61	TANGENT	1	END-I	1.229	0.116	0.748	4.31	-9.14	3.36
			END-J	2.949	0.116	0.748	4.31	-1.66	2.20
62	TANGENT	1	END-I	2.949	0.116	0.748	4.31	-1.66	2.20
			END-J	4.669	0.116	0.748	4.31	5.81	1.04
63	TANGENT	1	END-I	4.669	0.116	0.748	4.31	5.81	1.04
			END-J	5.486	0.116	0.748	4.31	9.36	0.49
64	TANGENT	1	END-I	5.486	0.116	0.748	4.31	9.36	0.49
			END-J	7.593	0.116	0.748	4.31	18.52	-0.94
65	TANGENT	1	END-I	7.593	-0.053	-1.540	4.31	18.52	-0.94
			END-J	9.313	-0.053	-1.540	4.31	3.12	-0.40
66	TANGENT	1	END-I	9.313	-0.053	-1.540	4.31	3.12	-0.40
			END-J	10.173	-0.053	-1.540	4.31	-4.58	-0.14

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
67	TANGENT	1	ENC-I	10.173	-0.053	-1.540	4.31	-4.58	-0.14
			ENC-J	10.689	-0.053	-1.540	4.31	-9.20	0.02
68	TANGENT	1	ENC-I	1.539	-4.146	-0.049	-0.10	-3.99	-9.24
			ENC-J	1.539	-4.301	-0.049	-0.10	-4.03	-5.44
69	TANGENT	1	ENC-I	1.539	-4.301	-0.049	-0.10	-4.03	-5.44
			ENC-J	1.539	-4.877	-0.049	-0.10	-4.20	9.93
70	TANGENT	1	ENC-I	6.543	-0.004	-0.001	0.32	0.04	-0.08
			ENC-J	10.499	-0.004	-0.001	0.32	0.01	0.02
71	TANGENT	1	ENC-I	10.499	-0.004	-0.001	0.32	0.01	0.02
			ENC-J	13.638	-0.004	-0.001	0.32	-0.02	0.10
72	BEND	1	ENC-I	-4.928	5.786	0.001	0.07	0.21	57.77
			CENTER	0.964	7.218	0.001	0.20	0.10	37.38
			ENC-J	5.786	3.915	0.001	0.21	-0.07	20.01
73	TANGENT	1	ENC-I	5.786	3.915	0.001	0.21	-0.07	20.01
			ENC-J	5.786	-0.234	0.001	0.21	-0.05	-24.39
74	TANGENT	1	ENC-I	5.786	-0.234	0.001	0.21	-0.05	-24.39
			ENC-J	5.786	-4.072	0.001	0.21	-0.02	23.65
75	BEND	1	ENC-I	5.786	4.072	-0.001	0.21	0.02	-23.65
			CENTER	7.329	-0.854	-0.001	0.17	-0.14	-28.73
			ENC-J	5.085	-5.786	-0.001	0.02	-0.22	-18.60
76	TANGENT	1	ENC-I	5.085	0.001	-5.786	0.02	18.60	-0.22
			ENC-J	5.322	0.001	-5.786	0.02	10.65	-0.22
77	TANGENT	1	ENC-I	5.322	0.001	-5.786	0.02	10.65	-0.22
			ENC-J	5.515	0.001	-5.786	0.02	4.14	-0.22
78	TANGENT	1	ENC-I	0.0	-1.102	0.107	0.39	-0.16	-4.09
			ENC-J	0.0	-1.231	0.107	0.39	-0.04	-2.78
79	TANGENT	1	ENC-I	0.0	-1.231	0.107	0.39	-0.04	-2.78
			ENC-J	0.0	-1.562	0.107	0.39	0.26	1.24
80	TANGENT	1	ENC-I	0.0	-1.562	0.107	0.39	0.26	1.24
			ENC-J	0.0	-2.395	0.107	0.39	1.04	15.58
81	TANGENT	1	ENC-I	-2.937	35.555	-0.014	-0.00	0.43	-0.20
			ENC-J	2.937	-35.569	-0.014	-0.00	-0.00	0.00
82	TANGENT	1	ENC-I	1.455	7.997	-0.045	0.58	0.61	15.64
			ENC-J	1.455	7.709	-0.045	0.58	0.50	-3.99
83	BEND	1	ENC-I	1.455	7.709	-0.045	0.58	0.50	-3.99
			CENTER	6.352	4.295	-0.045	0.74	-0.12	-13.92
			ENC-J	7.348	-1.455	-0.045	0.41	-0.67	-16.23

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
84	TANGENT	1	END-I	7.348	1.455	0.045	0.41	0.67	16.23
			END-J	6.324	1.455	0.045	0.41	0.85	10.42
85	TANGENT	1	END-I	6.324	1.455	0.045	0.41	0.85	10.42
			END-J	5.300	1.455	0.045	0.41	1.03	4.60
86	TANGENT	1	END-I	5.300	1.455	0.045	0.41	1.03	4.60
			END-J	4.276	1.455	0.045	0.41	1.21	-1.22
87	BEND	1	END-I	4.276	1.455	0.045	0.41	1.21	-1.22
			CENTER	3.484	-1.426	0.045	1.20	0.70	-0.95
			END-J	1.455	-2.667	0.045	1.39	-0.23	5.96
88	TANGENT	1	END-I	2.742	1.309	-0.045	1.26	-0.63	-5.96
			END-J	2.140	0.477	-0.045	1.26	-0.81	-9.55
89	TANGENT	1	END-I	2.140	0.477	-0.045	1.26	-0.81	-9.55
			END-J	1.539	-0.355	-0.045	1.26	-0.99	-9.79
90	TANGENT	1	END-I	1.539	-0.355	-0.045	1.26	-0.99	-9.79
			END-J	0.937	-1.187	-0.045	1.26	-1.18	-6.70
91	TANGENT	1	END-I	0.930	-1.192	-0.045	1.25	-1.18	-6.70
			END-J	0.021	-2.434	-0.045	1.25	-1.45	4.20
92	BEND	1	END-I	-0.007	-0.045	2.434	1.24	4.20	1.47
			CENTER	-0.207	0.144	2.756	5.33	5.78	1.43
			END-J	-0.045	0.490	3.078	9.54	4.45	0.93
93	TANGENT	1	END-I	-0.045	-2.756	-1.455	9.54	-3.41	3.00
			END-J	-0.045	-3.524	-1.455	9.54	-7.78	12.42
94	TANGENT	1	END-I	-0.045	-3.524	-1.455	9.54	-7.78	12.42
			END-J	-0.045	-4.292	-1.455	9.54	-12.14	24.15
95	TANGENT	1	END-I	4.414	0.345	-0.334	-0.14	3.75	3.87
			END-J	4.607	0.345	-0.334	-0.14	3.38	3.48
96	TANGENT	1	END-I	4.607	0.345	-0.334	-0.14	3.38	3.48
			END-J	7.295	0.345	-0.334	-0.14	-1.85	-1.91
97	TANGENT	1	END-I	-13.152	0.223	-1.666	0.18	28.06	4.46
			END-J	-10.572	0.223	-1.666	0.18	3.07	1.11
98	TANGENT	1	END-I	-10.572	0.223	-1.666	0.18	3.07	1.11
			END-J	-8.594	0.223	-1.666	0.18	-16.09	-1.46
99	TANGENT	1	END-I	-8.594	0.223	-1.666	0.18	-16.09	-1.46
			END-J	-6.935	0.223	-1.666	0.18	-32.16	-3.61
100	BEND	1	END-I	-6.935	-1.666	-0.223	0.18	-3.61	32.16
			CENTER	-6.878	0.717	-0.223	-1.11	-3.74	32.76
			END-J	-6.051	2.871	-0.223	-2.36	-3.42	30.10

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
101	TANGENT	1	END-I	-6.052	2.869	-0.223	-2.36	-3.43	30.39
			END-J	-3.717	0.926	-0.223	-2.36	-7.37	-3.12
102	BEND	1	END-I	-3.717	-0.223	-0.927	-2.36	-3.12	7.37
			CENTER	-2.511	2.195	-0.603	-4.78	-2.54	4.16
			END-J	-0.223	2.939	-0.279	-5.71	0.44	-3.88
103	TANGENT	1	END-I	-0.223	2.437	-0.100	-5.71	2.82	-2.70
			END-J	-0.223	-1.562	-0.100	-5.71	0.49	-12.86
104	TANGENT	1	END-I	-0.223	-1.562	-0.100	-5.71	0.49	-12.86
			END-J	-0.223	-3.970	-0.100	-5.71	-0.90	25.86
105	TANGENT	1	END-I	-0.223	-3.970	-0.100	-5.71	-0.90	25.86
			END-J	-0.223	-4.830	-0.100	-5.71	-1.40	47.86
106	TANGENT	1	END-I	34.263	4.783	-0.806	-8.00	27.61	36.21
			END-J	34.263	3.063	-0.806	-8.00	19.54	-3.02
107	TANGENT	1	END-I	34.263	3.063	-0.806	-8.00	19.54	-3.02
			END-J	34.263	-0.377	-0.806	-8.00	3.42	-29.89
108	TANGENT	1	END-I	34.263	-0.377	-0.806	-8.00	3.42	-29.89
			END-J	34.263	-2.957	-0.806	-8.00	-8.67	-4.89
109	TANGENT	1	END-I	34.263	-2.957	-0.806	-8.00	-8.67	-4.89
			END-J	34.263	-4.677	-0.806	-8.00	-16.74	33.28
110	TANGENT	1	END-I	34.263	-4.677	-0.806	-8.00	-16.74	33.28
			END-J	34.263	-6.397	-0.806	-8.00	-24.80	88.64
111	TANGENT	1	END-I	34.263	-6.397	-0.806	-8.00	-24.80	88.64
			END-J	34.263	-7.429	-0.806	-8.00	-29.64	130.12
112	TANGENT	1	END-I	34.263	-7.429	-0.806	-8.00	-29.64	130.12
			END-J	34.263	-8.504	-0.806	-8.00	-34.67	179.91
113	BEND	1	END-I	34.263	8.532	-0.420	-8.00	8.55	-183.02
			CENTER	30.615	-17.841	-0.492	-0.10	10.49	-168.64
			END-J	9.534	-34.263	-0.565	6.78	6.08	-87.89
114	TANGENT	1	END-I	9.534	-0.566	34.263	6.77	-87.89	-6.08
			END-J	10.009	-0.635	34.263	6.77	7.73	-4.41
115	TANGENT	1	END-I	10.009	-0.632	34.263	6.77	7.73	-4.41
			END-J	10.484	-0.701	34.263	6.77	103.28	-2.55
116	BEND	1	END-I	10.507	0.050	34.263	-0.63	103.50	-2.55
			CENTER	10.530	-0.733	34.263	7.37	112.75	-2.45
			END-J	10.493	-1.520	34.263	16.03	121.39	-2.14

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
117	TANGENT	1	ENC-I	10.572	-34.263	0.806	-10.84	2.14	121.96
			ENC-J	10.848	-34.263	0.806	-10.84	3.44	177.02
118	TANGENT	1	ENC-I	10.848	-34.263	0.806	-10.84	3.44	177.02
			ENC-J	11.041	-34.263	0.806	-10.84	4.34	215.50
119	TANGENT	1	ENC-I	17.997	-35.108	1.256	-5.75	-32.46	322.01
			ENC-J	18.190	-35.108	1.256	-5.75	-31.04	361.51
120	TANGENT	1	ENC-I	18.190	-35.108	1.256	-5.75	-31.04	361.51
			ENC-J	18.448	-35.108	1.256	-5.75	-29.16	414.17
121	TANGENT	1	ENC-I	18.448	-35.108	1.256	-5.75	-29.16	414.17
			ENC-J	19.138	-35.108	1.256	-5.75	-21.62	624.82
122	TANGENT	1	ENC-I	-9.987	70.500	0.000	0.00	-0.00	1068.06
			ENC-J	0.000	0.000	0.000	0.00	0.00	-0.00
123	TANGENT	1	ENC-I	90.342	-35.108	1.256	-5.75	-21.62	-443.24
			ENC-J	92.153	-35.108	1.256	-5.75	-1.84	109.71
124	BEND	1	ENC-I	92.153	35.108	-1.256	-5.75	1.84	-109.71
			CENTER	90.083	-40.433	-1.256	-3.32	4.03	-106.42
			ENC-J	35.108	-92.424	-1.256	-0.05	3.87	-23.88
125	TANGENT	1	ENC-I	35.108	-92.424	-1.256	-0.05	3.87	-23.88
			ENC-J	35.108	-92.597	-1.256	-0.05	1.98	114.89
126	TANGENT	1	ENC-I	35.108	-92.597	-1.256	-0.05	1.98	114.89
			ENC-J	35.108	-92.941	-1.256	-0.05	-0.53	300.43
127	TANGENT	1	ENC-I	-0.845	6.955	0.450	-36.80	5.09	106.51
			ENC-J	-0.845	6.762	0.450	-36.80	5.60	98.80
128	TANGENT	1	ENC-I	-0.845	6.762	0.450	-36.80	5.60	98.80
			ENC-J	-0.845	6.439	0.450	-36.80	6.44	86.42
129	TANGENT	1	ENC-I	-0.845	6.439	0.450	-36.80	6.44	86.42
			ENC-J	-0.845	5.407	0.450	-36.80	9.14	50.88
130	TANGENT	1	ENC-I	-0.845	5.407	0.450	-36.80	9.14	50.88
			ENC-J	-0.845	1.795	0.450	-36.80	18.59	-24.74
131	TANGENT	1	ENC-I	-0.845	1.795	0.450	-36.80	18.59	-24.74
			ENC-J	-0.845	0.591	0.450	-36.80	21.74	-33.10
132	TANGENT	1	ENC-I	-0.845	0.591	0.450	-36.80	21.74	-33.10
			ENC-J	-0.845	-0.484	0.450	-36.80	24.55	-33.43
133	BEND	1	ENC-I	-0.845	-0.450	-0.484	-36.80	33.43	24.55
			CENTER	-0.915	0.279	-0.990	-3.10	47.67	24.82
			ENC-J	-0.450	0.845	-1.497	30.24	32.57	23.07

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
134	TANGENT	1	ENC-I	-0.450	-1.497	-0.845	30.24	23.07	-32.57
			ENC-J	-0.450	-1.690	-0.845	30.24	22.12	-30.77
135	TANGENT	1	ENC-I	-0.450	-1.690	-0.845	30.24	22.12	-30.77
			ENC-J	-0.450	-2.249	-0.845	30.24	19.38	-24.37
136	TANGENT	1	ENC-I	-0.450	-2.249	-0.845	30.24	19.38	-24.37
			ENC-J	-0.450	-4.313	-0.845	30.24	9.25	15.01
137	TANGENT	1	ENC-I	-0.450	-4.313	-0.845	30.24	9.25	15.01
			ENC-J	-0.450	-7.237	-0.845	30.24	-5.11	113.19
138	TANGENT	1	ENC-I	-0.450	-7.237	-0.845	30.24	-5.11	113.19
			ENC-J	-0.450	-8.613	-0.845	30.24	-11.87	176.59
139	TANGENT	1	ENC-I	-0.450	11.123	-0.845	30.24	-11.87	176.59
			ENC-J	-0.450	9.747	-0.845	30.24	-18.62	93.11
140	TANGENT	1	ENC-I	-0.450	9.747	-0.845	30.24	-18.62	93.11
			ENC-J	-0.450	8.199	-0.845	30.24	-26.22	12.36
141	TANGENT	1	ENC-I	-0.450	8.199	-0.845	30.24	-26.22	12.36
			ENC-J	-0.450	7.704	-0.845	30.24	-28.65	-10.50
142	TANGENT	1	ENC-I	-0.450	7.704	-0.845	30.24	-28.65	-10.50
			ENC-J	-0.450	7.511	-0.845	30.24	-29.60	-19.06
143	TANGENT	1	ENC-I	1.327	6.369	1.106	20.47	-17.54	29.40
			ENC-J	1.327	6.176	1.106	20.47	-16.30	22.35
144	TANGENT	1	ENC-I	1.327	6.176	1.106	20.47	-16.30	22.35
			ENC-J	1.327	5.294	1.106	20.47	-10.63	-7.04
145	TANGENT	1	ENC-I	1.327	5.294	1.106	20.47	-10.63	-7.04
			ENC-J	1.327	4.335	1.106	20.47	-4.46	-33.89
146	TANGENT	1	ENC-I	0.0	15.654	0.297	0.00	-4.32	-20.85
			ENC-J	0.0	-18.521	0.297	0.00	0.00	0.00
147	TANGENT	1	ENC-I	0.295	-3.480	0.017	-0.31	-0.14	-32.29
			ENC-J	0.295	-3.854	0.017	-0.31	-0.10	-24.31
148	TANGENT	1	ENC-I	0.295	-3.854	0.017	-0.31	-0.10	-24.31
			ENC-J	0.295	-4.220	0.017	-0.31	-0.07	-15.74
149	TANGENT	1	ENC-I	0.295	-4.220	0.017	-0.31	-0.07	-15.74
			ENC-J	0.295	-4.650	0.017	-0.31	-0.02	-4.65
150	BEND	1	ENC-I	0.295	4.650	-0.017	-0.31	0.02	4.65
			CENTER	1.673	4.549	-0.017	-0.30	0.09	-0.41
			ENC-J	3.013	4.033	-0.017	-0.26	0.16	-5.14

LTR1166 26

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
151	TANGENT	1	END-I	5.026	0.295	0.017	-0.01	-0.30	5.14
			END-J	5.262	0.295	0.017	-0.01	-0.28	4.74
152	TANGENT	1	END-I	5.262	0.295	0.017	-0.01	-0.28	4.74
			END-J	5.950	0.295	0.017	-0.01	-0.21	3.55
153	TANGENT	1	END-I	5.950	0.295	0.017	-0.01	-0.21	3.55
			END-J	6.122	0.295	0.017	-0.01	-0.19	3.26
154	TANGENT	1	END-I	6.122	0.295	0.017	-0.01	-0.19	3.26
			END-J	6.982	0.295	0.017	-0.01	-0.11	1.78
155	TANGENT	1	END-I	6.982	0.295	0.017	-0.01	-0.11	1.78
			END-J	8.186	0.295	0.017	-0.01	0.01	-0.29
156	TANGENT	1	END-I	8.186	0.295	0.017	-0.01	0.01	-0.29
			END-J	8.702	0.295	0.017	-0.01	0.06	-1.17
157	TANGENT	1	END-I	8.702	0.295	0.017	-0.01	0.06	-1.17
			END-J	8.874	0.295	0.017	-0.01	0.08	-1.47
158	TANGENT	1	END-I	8.874	0.295	0.017	-0.01	0.08	-1.47
			END-J	8.960	0.295	0.017	-0.01	0.09	-1.62
159	TANGENT	1	END-I	8.960	0.295	0.017	-0.01	0.09	-1.62
			END-J	9.046	0.295	0.017	-0.01	0.09	-1.77
160	TANGENT	1	END-I	9.046	0.295	0.017	-0.01	0.09	-1.77
			END-J	9.154	0.295	0.017	-0.01	0.10	-1.95
161	TANGENT	1	END-I	9.154	0.295	0.017	-0.01	0.10	-1.95
			END-J	9.562	0.295	0.017	-0.01	0.14	-2.65
162	TANGENT	1	END-I	-1.556	1.142	0.482	0.83	-12.06	1.41
			END-J	-1.556	0.948	0.482	0.83	-11.52	0.24
163	TANGENT	1	END-I	-1.556	0.948	0.482	0.83	-11.52	0.24
			END-J	-1.556	0.776	0.482	0.83	-11.04	-0.63
164	TANGENT	1	END-I	-1.556	0.776	0.482	0.83	-11.04	-0.63
			END-J	-1.556	0.101	0.482	0.83	-8.20	-3.20
165	TANGENT	1	END-I	-1.556	0.101	0.482	0.83	-8.20	-3.20
			END-J	-1.556	-0.474	0.482	0.83	-5.79	-2.27
166	TANGENT	1	END-I	0.170	-2.747	1.730	-17.46	-0.80	-5.09
			END-J	0.170	-2.884	1.730	-17.46	0.57	-2.85
167	TANGENT	1	END-I	1.036	-2.884	1.396	-16.44	0.57	6.54
			END-J	1.036	-3.385	1.396	-16.44	4.64	15.68

LTR 114 26

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
168	TANGENT	1	ENC-I	1.036	-3.385	1.396	-16.44	4.64	15.68
			ENC-J	1.036	-3.887	1.396	-16.44	8.72	26.28
169	TANGENT	1	ENC-I	-1.730	-3.887	0.170	-14.08	8.72	-27.62
			ENC-J	-1.730	-5.435	0.170	-14.08	10.25	14.33
170	TANGENT	1	ENC-I	0.174	2.272	0.312	-4.25	-4.99	15.20
			ENC-J	0.174	0.777	0.312	-4.25	-0.93	-4.63
171	BEND	1	ENC-I	0.174	0.777	0.312	-4.25	-0.93	-4.63
			CENTER	0.513	0.267	0.312	-3.44	2.90	-5.68
			ENC-J	0.326	-0.174	0.312	-0.15	5.03	-5.72
172	TANGENT	1	ENC-I	0.326	-0.312	-0.174	-0.15	5.72	5.03
			ENC-J	-1.457	-0.312	-0.174	-0.15	3.02	9.87
173	BEND	1	ENC-I	-1.457	-2.043	-0.174	-0.15	3.02	9.87
			CENTER	-2.635	-0.255	-0.174	1.90	1.93	12.31
			ENC-J	-2.043	1.908	-0.174	2.59	-0.29	10.62
174	TANGENT	1	ENC-I	-2.043	-1.908	0.174	2.59	0.29	-10.62
			ENC-J	-2.043	-2.656	0.174	2.59	1.42	4.21
175	TANGENT	1	ENC-I	-2.043	-2.656	0.174	2.59	1.42	4.21
			ENC-J	-2.043	-3.231	0.174	2.59	2.29	18.93
176	BEND	1	ENC-I	-2.043	-3.231	0.174	2.59	2.29	18.93
			CENTER	-3.889	-0.999	0.174	3.58	0.10	23.33
			ENC-J	-3.682	2.043	0.174	2.73	-2.15	22.31
177	TANGENT	1	ENC-I	-3.682	-2.043	-0.174	2.73	2.15	-22.31
			ENC-J	-4.430	-2.043	-0.174	2.73	1.02	-9.03
178	TANGENT	1	ENC-I	-4.430	-2.043	-0.174	2.73	1.02	-9.03
			ENC-J	-5.177	-2.043	-0.174	2.73	-0.12	4.26
179	TANGENT	1	ENC-I	-5.177	-2.043	-0.174	2.73	-0.12	4.26
			ENC-J	-5.810	-2.043	-0.174	2.73	-1.08	15.49
180	TANGENT	1	ENC-I	4.594	34.726	-0.086	0.00	2.60	-15.87
			ENC-J	-4.594	-35.774	-0.086	0.00	-0.00	0.00
181	TANGENT	1	ENC-I	2.879	0.313	0.019	0.16	-0.71	-0.37
			ENC-J	1.957	0.313	0.019	0.16	-0.56	-2.89
182	BEND	1	ENC-I	1.957	0.313	0.019	0.16	-0.56	-2.89
			CENTER	1.836	-0.383	0.019	-0.05	-0.56	-2.85
			ENC-J	1.491	-0.954	0.019	-0.25	-0.48	-2.21
183	TANGENT	1	ENC-I	1.491	0.954	-0.019	-0.25	0.48	2.21
			ENC-J	1.145	0.633	-0.019	-0.25	0.40	-1.05

LTR 144 26

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
184	TANGENT	1	END-I	1.145	0.633	-0.019	-0.25	0.40	-1.75
			END-J	0.798	0.312	-0.019	-0.25	0.32	-2.99
185	TANGENT	1	END-I	0.798	0.312	-0.019	-0.25	0.32	-2.99
			END-J	0.451	-0.009	-0.019	-0.25	0.24	-3.61
186	TANGENT	1	END-I	0.451	-0.010	-0.019	-0.25	0.24	-3.61
			END-J	0.104	-0.331	-0.019	-0.25	0.17	-2.91
187	BEND	1	END-I	0.104	-0.331	-0.019	-0.25	0.16	-2.91
			CENTER	-0.124	-0.385	-0.019	-0.18	0.23	-2.57
			END-J	-0.363	-0.313	-0.019	-0.08	0.26	-2.23
188	TANGENT	1	END-I	-0.363	0.313	0.019	-0.09	-0.26	2.23
			END-J	-0.598	0.313	0.019	-0.09	-0.15	0.50
189	TANGENT	1	END-I	-0.598	0.313	0.019	-0.09	-0.15	0.50
			END-J	-1.688	0.313	0.019	-0.09	-0.04	-1.38
190	TANGENT	1	END-I	-1.688	0.313	0.019	-0.09	-0.04	-1.38
			END-J	-2.378	0.313	0.019	-0.09	0.08	-3.26
191	TANGENT	1	END-I	-2.378	0.313	0.019	-0.09	0.08	-3.26
			END-J	-2.608	0.313	0.019	-0.09	0.12	-3.88
192	TANGENT	1	END-I	-2.608	0.313	0.019	-0.09	0.12	-3.88
			END-J	-3.125	0.313	0.019	-0.09	0.20	-5.30
193	BEND	1	END-I	-3.125	-0.313	-0.019	-0.09	-0.20	5.30
			CENTER	-2.591	2.148	-0.019	-0.22	-0.12	3.45
			END-J	-0.313	3.577	-0.019	-0.25	0.04	-2.45
194	TANGENT	1	END-I	-0.313	-3.577	0.019	-0.25	-0.04	2.45
			END-J	-0.313	-3.807	0.019	-0.25	0.00	9.84
195	TANGENT	1	END-I	-0.313	-3.807	0.019	-0.25	0.00	9.84
			END-J	-0.313	-3.979	0.019	-0.25	0.03	15.68

STATIC SOLUTION TIME LOG

EQUATION SOLUTION = 4.18
DISPLACEMENT OUTPUT = 1.46
STRESS RECOVERY = 6.17

PIPE FORCES AND MOMENTS

BLACK
TH

(2)

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
1	TANGENT	1	END-I END-J	-0.076 -0.076	-0.008 -0.008	-0.103 -0.103	-10.20 -10.20	97.68 97.37	13.13 13.15
2	TANGENT	1	END-I END-J	-0.008 -0.008	0.103 0.103	0.076 0.076	97.37 97.37	-13.15 -12.85	10.20 9.79
3	TANGENT	1	END-I END-J	-0.008 -0.008	0.103 0.103	0.076 0.076	97.37 97.37	-12.85 -12.16	9.79 8.86
4	TANGENT	1	END-I END-J	-0.008 -0.008	0.103 0.103	0.076 0.076	97.37 97.37	-12.16 -11.40	8.86 7.83
5	TANGENT	1	END-I END-J	-0.008 -0.008	0.103 0.103	0.076 0.076	97.37 97.37	-11.40 -10.63	7.83 6.79
6	TANGENT	1	END-I END-J	-0.008 -0.008	0.103 0.103	0.076 0.076	97.37 97.37	-10.63 -10.18	6.79 6.17
7	TANGENT	1	END-I END-J	-0.008 -0.008	0.103 0.103	0.076 0.076	97.37 97.37	-10.18 -9.74	6.17 5.58
8	BEND	1	END-I CENTER END-J	-0.008 0.068 0.103	0.103 0.079 0.008	0.076 0.076 0.076	97.37 62.02 -9.56	-9.74 -75.62 -97.20	5.58 5.41 5.33
9	TANGENT	1	END-I END-J	0.103 0.103	-0.008 -0.008	-0.076 -0.076	-9.56 -9.56	97.20 96.80	-5.33 -5.29
10	BEND	1	END-I CENTER END-J	0.103 0.068 -0.008	-0.008 -0.079 -0.103	-0.076 -0.076 -0.076	-9.56 61.52 96.23	96.80 74.81 8.99	-5.29 -5.02 -4.45
11	TANGENT	1	END-I END-J	-0.008 -0.008	0.103 0.103	0.076 0.076	96.23 96.23	-8.99 -7.58	4.45 2.54
12	TANGENT	1	END-I END-J	-0.008 -0.008	0.103 0.103	0.076 0.076	96.23 96.23	-7.58 -6.05	2.54 0.47
13	BEND	1	END-I CENTER END-J	-0.008 -0.079 -0.103	-0.103 -0.068 0.008	-0.076 -0.076 -0.076	96.23 72.27 5.88	6.05 -63.89 -96.40	-0.47 -0.31 -0.26
14	TANGENT	1	END-I END-J	-0.103 -0.103	-0.008 -0.008	0.076 0.076	5.88 5.88	96.40 96.76	0.26 0.29
15	TANGENT	1	END-I END-J	-0.103 -0.103	-0.008 -0.008	0.076 0.076	5.88 5.88	96.76 97.03	0.29 0.32
16	BEND	1	END-I CENTER END-J	-0.103 -0.079 -0.008	-0.008 0.068 0.103	0.076 0.076 0.076	5.88 72.93 97.60	97.03 64.86 -5.31	0.32 0.13 -0.40

B-14

LTR1144 26

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
17	TANGENT	1	ENC-I	-0.008	0.103	0.076	97.60	-5.31	-0.40
			ENC-J	-0.008	0.103	0.076	97.60	-3.91	-2.28
18	TANGENT	1	ENC-I	-0.008	0.103	0.076	97.60	-3.91	-2.28
			ENC-J	-0.008	0.103	0.076	97.60	-3.38	-3.01
19	TANGENT	1	ENC-I	-0.008	0.103	0.076	97.60	-3.38	-3.01
			ENC-J	-0.008	0.103	0.076	97.60	-1.47	-5.59
20	TANGENT	1	ENC-I	-0.008	0.103	0.076	97.60	-1.47	-5.59
			ENC-J	-0.008	0.103	0.076	97.60	0.44	-8.18
21	TANGENT	1	ENC-I	-0.008	0.103	0.076	97.60	0.44	-8.18
			ENC-J	-0.008	0.103	0.076	97.60	2.53	-11.01
22	BEND	1	ENC-I	-0.008	0.801	1.293	97.60	-9.33	6.37
			CENTER	0.561	0.572	1.293	65.26	-68.75	2.11
			ENC-J	0.801	0.008	1.293	0.37	-87.90	0.33
23	TANGENT	1	ENC-I	0.801	-0.008	-1.293	0.37	87.90	-0.33
			ENC-J	0.801	-0.008	-1.293	0.37	83.13	-0.28
24	TANGENT	1	ENC-I	0.733	-0.008	-1.333	0.36	83.13	-0.29
			ENC-J	0.733	-0.008	-1.333	0.36	78.07	-0.26
25	BEND	1	ENC-I	0.727	-1.336	0.008	0.35	-0.27	-78.07
			CENTER	0.169	-1.512	0.008	0.23	-0.36	-73.89
			ENC-J	-0.414	-1.464	0.008	0.08	-0.40	-69.52
26	TANGENT	1	ENC-I	-0.407	-0.008	-1.466	0.09	69.52	-0.40
			ENC-J	-0.407	-0.008	-1.466	0.09	51.26	-0.30
27	TANGENT	1	ENC-I	-0.407	-0.008	-1.466	0.09	51.26	-0.30
			ENC-J	-0.407	-0.008	-1.466	0.09	47.60	-0.28
28	TANGENT	1	ENC-I	-0.407	-0.008	-1.466	0.09	47.60	-0.28
			ENC-J	-0.407	-0.008	-1.466	0.09	43.20	-0.26
29	TANGENT	1	ENC-I	-0.000	0.000	-0.000	0.00	0.00	-0.00
			ENC-J	-0.000	0.000	-0.000	0.00	-0.00	-0.00
30	TANGENT	1	ENC-I	-0.407	-0.008	-1.466	0.09	43.20	-0.26
			ENC-J	-0.407	-0.008	-1.466	0.09	19.38	-0.13
31	TANGENT	1	ENC-I	-0.000	0.000	-0.000	0.00	0.00	0.00
			ENC-J	-0.000	0.000	-0.000	0.00	-0.00	-0.00
32	TANGENT	1	ENC-I	-0.407	-0.008	-1.466	0.09	19.38	-0.13
			ENC-J	-0.407	-0.008	-1.466	0.09	-0.04	-0.02
33	TANGENT	1	ENC-I	-1.521	-0.008	0.003	0.00	-0.04	-0.09
			ENC-J	-1.521	-0.008	0.003	0.00	0.03	0.09

LTR 1144 26

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
34	TANGENT	1	END-I	-0.407	2.939	-1.466	-0.09	0.03	0.02
			END-J	-0.407	2.939	-1.466	-0.09	-2.17	-4.39
35	TANGENT	1	END-I	2.958	2.936	-0.306	4.39	-2.16	-0.12
			END-J	2.958	2.936	-0.306	4.39	-3.08	-8.93
36	TANGENT	1	END-I	2.958	2.936	-0.306	4.39	-3.08	-8.93
			END-J	2.958	2.936	-0.306	4.39	-4.91	-26.55
37	TANGENT	1	END-I	2.958	2.936	-0.306	4.39	-4.91	-26.55
			END-J	2.958	2.936	-0.306	4.39	-6.75	-44.16
38	TANGENT	1	END-I	2.958	2.936	-0.306	4.39	-6.75	-44.16
			END-J	2.958	2.936	-0.306	4.39	-8.43	-60.31
39	TANGENT	1	END-I	-2.958	2.936	0.306	-4.39	-8.43	60.31
			END-J	-2.958	2.936	0.306	-4.39	-4.07	17.74
40	TANGENT	1	END-I	-2.958	2.936	0.306	-4.39	-4.07	17.74
			END-J	-2.958	2.936	0.306	-4.39	-2.47	3.06
41	TANGENT	1	END-I	-2.958	2.936	0.306	-4.39	-2.47	3.06
			END-J	-2.958	2.936	0.306	-4.39	-0.63	-14.56
42	TANGENT	1	END-I	-2.958	2.936	0.306	-4.39	-0.63	-14.56
			END-J	-2.958	2.936	0.306	-4.39	1.81	-38.05
43	TANGENT	1	END-I	-2.958	2.936	0.306	-4.39	1.81	-38.05
			END-J	-2.958	2.936	0.306	-4.39	5.18	-70.34
44	TANGENT	1	END-I	-2.958	2.936	0.306	-4.39	5.18	-70.34
			END-J	-2.958	2.936	0.306	-4.39	6.70	-85.02
45	BEND	1	END-I	-2.958	-2.936	-0.306	-4.39	-6.70	85.02
			CENTER	-4.168	0.016	-0.306	-7.98	-1.96	86.84
			END-J	-2.936	2.958	-0.306	-7.16	3.93	84.99
46	TANGENT	1	END-I	-2.936	-2.958	0.306	-7.16	-3.93	-84.99
			END-J	-2.936	-2.958	0.306	-7.16	-3.24	-78.33
47	TANGENT	1	END-I	-1.496	0.003	0.000	0.00	-0.00	0.04
			END-J	-1.496	0.003	0.000	0.00	0.00	-0.04
48	TANGENT	1	END-I	-0.101	0.003	1.492	-0.04	0.00	-0.00
			END-J	-0.101	0.003	1.492	-0.04	2.99	-0.01
49	TANGENT	1	END-I	-0.101	0.003	1.492	-0.04	2.99	-0.01
			END-J	-0.101	0.003	1.492	-0.04	6.35	-0.02
50	TANGENT	1	END-I	-0.000	0.000	0.000	0.00	-0.00	0.00
			END-J	-0.000	0.000	0.000	0.00	-0.00	-0.00

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
51	TANGENT	1	END-I	-0.101	0.003	1.492	-0.04	6.35	-0.02
			END-J	-0.101	0.003	1.492	-0.04	16.79	-0.04
52	TANGENT	1	END-I	-0.101	0.003	1.492	-0.04	16.79	-0.04
			END-J	-0.101	0.003	1.492	-0.04	25.57	-0.06
53	BEND	1	END-I	-0.101	1.319	-0.698	-0.04	-11.97	-22.60
			CENTER	0.861	1.004	-0.698	-9.26	-10.29	-26.21
			END-J	1.319	0.101	-0.698	-14.59	-2.58	-27.92
54	TANGENT	1	END-I	1.321	0.695	0.101	-14.52	27.96	-2.58
			END-J	1.321	0.695	0.101	-14.52	28.43	-5.86
55	TANGENT	1	END-I	1.320	0.697	0.101	-14.56	28.42	-5.86
			END-J	1.320	0.697	0.101	-14.56	28.90	-9.15
56	BEND	1	END-I	1.320	0.101	-0.697	-14.55	-9.15	-28.90
			CENTER	1.005	-0.862	-0.697	-17.53	1.97	-27.72
			END-J	0.101	-1.320	-0.697	-11.77	11.94	-24.33
57	TANGENT	1	END-I	0.101	0.003	-1.492	-11.77	27.09	-0.74
			END-J	0.101	0.003	-1.492	-11.77	11.88	-0.77
58	TANGENT	1	END-I	0.101	0.003	-1.492	-11.77	11.88	-0.77
			END-J	0.101	0.003	-1.492	-11.77	-7.71	-0.82
59	BEND	1	END-I	0.101	-0.003	1.492	-11.77	7.71	0.82
			CENTER	0.069	-0.074	1.492	-1.23	17.73	0.94
			END-J	-0.003	-0.101	1.492	13.31	17.36	1.21
60	TANGENT	1	END-I	-0.003	1.492	0.101	13.31	1.21	-17.36
			END-J	-0.003	1.492	0.101	13.31	1.74	-25.20
61	TANGENT	1	END-I	-0.003	1.492	0.101	13.31	1.74	-25.20
			END-J	-0.003	1.492	0.101	13.31	2.75	-40.12
62	TANGENT	1	END-I	-0.003	1.492	0.101	13.31	2.75	-40.12
			END-J	-0.003	1.492	0.101	13.31	3.77	-55.05
63	TANGENT	1	END-I	-0.003	1.492	0.101	13.31	3.77	-55.05
			END-J	-0.003	1.492	0.101	13.31	4.25	-62.14
64	TANGENT	1	END-I	-0.003	1.492	0.101	13.31	4.25	-62.14
			END-J	-0.003	1.492	0.101	13.31	5.49	-80.42
65	TANGENT	1	END-I	-0.003	1.492	0.101	13.31	5.49	-80.42
			END-J	-0.003	1.492	0.101	13.31	6.50	-95.34
66	TANGENT	1	END-I	-0.003	1.492	0.101	13.31	6.50	-95.34
			END-J	-0.003	1.492	0.101	13.31	7.01	-102.81

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
67	TANGENT	1	END-I	-0.003	1.492	0.101	13.31	7.01	-132.81
			END-J	-0.003	1.492	0.101	13.31	7.32	-137.28
68	TANGENT	1	END-I	38.113	-29.452	1.604	92.91	-33.67	858.78
			END-J	38.113	-29.452	1.604	92.91	-32.23	885.29
69	TANGENT	1	END-I	38.113	-29.452	1.604	92.91	-32.23	885.29
			END-J	38.113	-29.452	1.604	92.91	-26.85	983.96
70	TANGENT	1	END-I	-29.456	-0.112	38.214	-20.36	-851.47	-14.37
			END-J	-29.456	-0.112	38.214	-20.36	27.45	-11.80
71	TANGENT	1	END-I	-29.456	-0.112	38.214	-20.36	27.45	-11.80
			END-J	-29.456	-0.112	38.214	-20.36	724.86	-9.76
72	BEND	1	END-I	-29.456	-38.214	-0.112	-20.36	9.76	724.86
			CENTER	-47.850	-6.193	-0.112	-7.62	21.01	793.83
			END-J	-38.214	29.456	-0.112	9.34	19.94	757.70
73	TANGENT	1	END-I	-38.214	29.456	-0.112	9.34	19.94	757.70
			END-J	-38.214	29.456	-0.112	9.34	17.25	47.08
74	TANGENT	1	END-I	-38.214	29.456	-0.112	9.34	17.25	47.08
			END-J	-38.214	29.456	-0.112	9.34	14.76	-610.17
75	BEND	1	END-I	-38.214	-29.456	0.112	9.34	-14.76	610.17
			CENTER	-47.850	6.193	0.112	-3.70	-16.75	646.30
			END-J	-29.456	38.214	0.112	-14.34	-8.93	577.32
76	TANGENT	1	END-I	-29.456	-0.112	38.214	-14.34	-577.32	-8.93
			END-J	-29.456	-0.112	38.214	-14.34	-524.78	-8.77
77	TANGENT	1	END-I	-29.456	-0.112	38.214	-14.34	-524.78	-8.77
			END-J	-29.456	-0.112	38.214	-14.34	-481.79	-8.65
78	TANGENT	1	END-I	-292.669	-325.405	-15.825	-26.26	114.41	-2527.49
			END-J	-292.669	-325.405	-15.825	-26.26	96.61	-2161.41
79	TANGENT	1	END-I	-292.669	-325.405	-15.825	-26.26	96.61	-2161.41
			END-J	-292.669	-325.405	-15.825	-26.26	51.11	-1225.88
80	TANGENT	1	END-I	-292.669	-325.405	-15.825	-26.26	51.11	-1225.88
			END-J	-292.669	-325.405	-15.825	-26.26	-63.62	1133.31
81	TANGENT	1	END-I	-0.000	-0.000	0.000	0.00	-0.00	-0.00
			END-J	-0.000	-0.000	0.000	0.00	-0.00	0.00
82	TANGENT	1	END-I	-292.669	-325.405	-15.825	-26.26	-63.62	1133.31
			END-J	-292.669	-325.405	-15.825	-26.26	-103.19	1946.82
83	BEND	1	END-I	-292.669	-325.405	-15.825	-26.26	-103.19	1946.82
			CENTER	-437.044	-23.148	-15.825	-100.80	-76.78	2235.57
			END-J	-325.405	292.669	-15.825	-134.84	-5.39	2012.29

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
84	TANGENT	1	END-I	-325.405	-292.669	15.825	-134.84	5.39	-2012.29
			END-J	-325.405	-292.669	15.825	-134.84	68.69	-841.62
85	TANGENT	1	END-I	-325.405	-292.669	15.825	-134.84	68.69	-841.62
			END-J	-325.405	-292.669	15.825	-134.84	131.99	329.06
86	TANGENT	1	END-I	-325.405	-292.669	15.825	-134.84	131.99	329.06
			END-J	-325.405	-292.669	15.825	-134.84	195.30	1499.74
87	BEND	1	END-I	-325.405	-292.669	15.825	-134.84	195.30	1499.74
			CENTER	-437.044	23.148	15.825	61.29	278.20	1946.30
			END-J	-292.669	325.405	15.825	258.60	198.14	1368.80
88	TANGENT	1	END-I	-427.834	-92.204	-15.825	93.46	-312.08	-1368.80
			END-J	-427.834	-92.204	-15.825	93.46	-375.55	-999.00
89	TANGENT	1	END-I	-427.834	-92.204	-15.825	93.46	-375.55	-999.00
			END-J	-427.834	-92.204	-15.825	93.46	-439.02	-629.21
90	TANGENT	1	END-I	-427.834	-92.204	-15.825	93.46	-439.02	-629.21
			END-J	-427.834	-92.204	-15.825	93.46	-502.49	-259.42
91	TANGENT	1	END-I	-428.362	-89.717	-15.825	90.54	-503.03	-259.42
			END-J	-428.362	-89.717	-15.825	90.54	-598.14	279.82
92	BEND	1	END-I	-429.378	-15.825	84.722	83.56	279.82	599.16
			CENTER	-314.806	292.426	84.722	336.58	258.59	370.01
			END-J	-15.825	429.378	84.722	449.26	85.88	-227.95
93	TANGENT	1	END-I	-15.825	-325.405	292.669	449.26	130.83	205.48
			END-J	-15.825	-325.405	292.669	449.26	1008.84	1181.69
94	TANGENT	1	END-I	-15.825	-325.405	292.669	449.26	1008.84	1181.69
			END-J	-15.825	-325.405	292.669	449.26	1886.85	2157.90
95	TANGENT	1	END-I	-354.861	292.558	54.039	100.07	-455.53	2518.85
			END-J	-354.861	292.558	54.039	100.07	-394.74	2189.72
96	TANGENT	1	END-I	-354.861	292.558	54.039	100.07	-394.74	2189.72
			END-J	-354.861	292.558	54.039	100.07	449.62	-2381.49
97	TANGENT	1	END-I	-30.231	22.145	-11.149	-44.94	207.08	589.40
			END-J	-30.231	22.145	-11.149	-44.94	39.84	257.23
98	TANGENT	1	END-I	-30.231	22.145	-11.149	-44.94	39.84	257.23
			END-J	-30.231	22.145	-11.149	-44.94	-88.38	2.57
99	TANGENT	1	END-I	-30.231	22.145	-11.149	-44.94	-88.38	2.57
			END-J	-30.231	22.145	-11.149	-44.94	-195.90	-210.99
100	BEND	1	END-I	-30.231	-11.149	-22.145	-44.94	-210.99	195.90
			CENTER	-32.221	-0.197	-22.145	-119.01	-211.37	203.37
			END-J	-30.365	10.778	-22.145	-188.79	-186.52	196.41

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
101	TANGENT	1	ENC-I	-30.370	10.765	-22.145	-188.71	-186.60	196.41
			ENC-J	-30.370	10.765	-22.145	-188.71	-577.70	6.29
102	BEND	1	ENC-I	-30.367	-22.145	-10.771	-188.83	6.29	577.66
			CENTER	-37.132	5.813	-10.771	-140.91	109.40	603.02
			END-J	-22.146	30.366	-10.771	-34.11	148.43	546.83
103	TANGENT	1	ENC-I	-22.145	30.231	11.149	-34.11	-235.76	515.24
			END-J	-22.145	30.231	11.149	-34.11	23.47	-187.63
104	TANGENT	1	ENC-I	-22.145	30.231	11.149	-34.11	23.47	-187.63
			ENC-J	-22.145	30.231	11.149	-34.11	179.56	-610.86
105	TANGENT	1	ENC-I	-22.145	30.231	11.149	-34.11	179.56	-610.86
			ENC-J	-22.145	30.231	11.149	-34.11	235.31	-762.01
106	TANGENT	1	ENC-I	-64.370	14.831	1.378	79.73	-138.22	472.74
			ENC-J	-64.370	14.831	1.378	79.73	-124.45	324.43
107	TANGENT	1	ENC-I	-64.370	14.831	1.378	79.73	-124.45	324.43
			END-J	-64.370	14.831	1.378	79.73	-96.89	27.81
108	TANGENT	1	ENC-I	-64.370	14.831	1.378	79.73	-96.89	27.81
			END-J	-64.370	14.831	1.378	79.73	-76.23	-194.66
109	TANGENT	1	ENC-I	-64.370	14.831	1.378	79.73	-76.23	-194.66
			END-J	-64.370	14.831	1.378	79.73	-62.45	-342.97
110	TANGENT	1	ENC-I	-64.370	14.831	1.378	79.73	-62.45	-342.97
			ENC-J	-64.370	14.831	1.378	79.73	-48.68	-491.28
111	TANGENT	1	ENC-I	-64.370	14.831	1.378	79.73	-48.68	-491.28
			ENC-J	-64.370	14.831	1.378	79.73	-40.41	-580.27
112	TANGENT	1	ENC-I	-64.370	14.831	1.378	79.73	-40.41	-580.27
			ENC-J	-64.370	14.831	1.378	79.73	-31.80	-672.96
113	BEND	1	ENC-I	-64.370	-14.876	0.761	79.73	127.85	661.47
			CENTER	-56.035	34.998	0.761	147.62	36.04	630.22
			ENC-J	-14.876	64.370	0.761	130.70	-76.88	475.87
114	TANGENT	1	ENC-I	-14.875	0.762	-64.370	130.76	475.85	76.88
			ENC-J	-14.875	0.762	-64.370	130.76	296.21	74.75
115	TANGENT	1	ENC-I	-14.876	0.759	-64.370	130.68	296.24	74.75
			END-J	-14.876	0.759	-64.370	130.68	116.73	72.63
116	BEND	1	ENC-I	-14.892	-0.306	-64.370	122.01	125.77	72.63
			CENTER	-14.874	0.795	-64.370	130.31	98.58	72.57
			END-J	-14.774	1.891	-64.370	136.57	70.86	72.19

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
117	TANGENT	1	END-I	-14.831	64.370	-1.378	117.82	-72.19	98.95
			END-J	-14.831	64.370	-1.378	117.82	-74.41	-4.49
118	TANGENT	1	END-I	-14.831	64.370	-1.378	117.82	-74.41	-4.49
			END-J	-14.831	64.370	-1.378	117.82	-75.96	-76.78
119	TANGENT	1	END-I	-1.263	47.727	16.673	-100.66	-122.55	516.59
			END-J	-1.263	47.727	16.673	-100.66	-103.79	462.90
120	TANGENT	1	END-I	-1.263	47.727	16.673	-100.66	-103.79	462.90
			END-J	-1.263	47.727	16.673	-100.66	-78.78	391.31
121	TANGENT	1	END-I	-1.263	47.727	16.673	-100.66	-78.78	391.31
			END-J	-1.263	47.727	16.673	-100.66	21.26	104.95
122	TANGENT	1	END-I	-0.000	-0.000	-0.000	-0.00	0.00	-0.00
			END-J	-0.000	-0.000	-0.000	-0.00	0.00	-0.00
123	TANGENT	1	END-I	-1.263	47.727	16.673	-100.66	21.26	104.95
			END-J	-1.263	47.727	16.673	-100.66	283.86	-646.75
124	BEND	1	END-I	-1.263	-47.727	-16.673	-100.66	-283.86	646.75
			CENTER	-34.641	-32.855	-16.673	-279.22	-147.23	696.82
			END-J	-47.727	1.263	-16.673	-308.87	75.65	716.45
125	TANGENT	1	END-I	-47.727	1.263	-16.673	-308.87	75.65	716.45
			END-J	-47.727	1.263	-16.673	-308.87	50.64	714.55
126	TANGENT	1	END-I	-47.727	1.263	-16.673	-308.87	50.64	714.55
			END-J	-47.727	1.263	-16.673	-308.87	17.30	712.03
127	TANGENT	1	END-I	-16.643	13.569	18.051	-46.59	-218.48	593.37
			END-J	-16.643	13.569	18.051	-46.59	-198.18	578.11
128	TANGENT	1	END-I	-16.643	13.569	18.051	-46.59	-198.18	578.11
			END-J	-16.643	13.569	18.051	-46.59	-164.33	552.67
129	TANGENT	1	END-I	-16.643	13.569	18.051	-46.59	-164.33	552.67
			END-J	-16.643	13.569	18.051	-46.59	-56.03	471.26
130	TANGENT	1	END-I	-16.643	13.569	18.051	-46.59	-56.03	471.26
			END-J	-16.643	13.569	18.051	-46.59	323.04	186.32
131	TANGENT	1	END-I	-16.643	13.569	18.051	-46.59	323.04	186.32
			END-J	-16.643	13.569	18.051	-46.59	449.39	91.34
132	TANGENT	1	END-I	-16.643	13.569	18.051	-46.59	449.39	91.34
			END-J	-16.643	13.569	18.051	-46.59	562.21	6.53
133	BEND	1	END-I	-16.643	-18.051	13.569	-46.59	-6.53	562.21
			CENTER	-24.532	-0.995	13.569	-22.66	64.30	591.79
			END-J	-18.051	16.643	13.569	44.35	97.47	567.48

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
134	TANGENT	1	ENC-I	-18.051	13.569	-16.643	44.35	567.48	-97.47
			ENC-J	-18.051	13.569	-16.643	44.35	548.76	-112.74
135	TANGENT	1	END-I	-18.051	1.558	-16.643	44.35	548.76	-112.74
			END-J	-18.051	1.558	-16.643	44.35	494.67	-117.80
136	TANGENT	1	END-I	-18.051	1.558	-16.643	44.35	494.67	-117.80
			END-J	-18.051	1.558	-16.643	44.35	294.95	-136.50
137	TANGENT	1	ENC-I	-18.051	1.558	-16.643	44.35	294.95	-136.50
			ENC-J	-18.051	1.558	-16.643	44.35	12.01	-163.00
138	TANGENT	1	ENC-I	-18.051	1.558	-16.643	44.35	12.01	-163.00
			ENC-J	-18.051	1.558	-16.643	44.35	-121.14	-175.47
139	TANGENT	1	ENC-I	-18.051	1.558	-16.643	44.35	-121.14	-175.47
			ENC-J	-18.051	1.558	-16.643	44.35	-254.29	-187.93
140	TANGENT	1	ENC-I	-18.051	1.558	-16.643	44.35	-254.29	-187.93
			ENC-J	-18.051	1.558	-16.643	44.35	-404.08	-201.96
141	TANGENT	1	ENC-I	-18.051	1.558	-16.643	44.35	-404.08	-201.96
			END-J	-18.051	1.558	-16.643	44.35	-451.93	-206.44
142	TANGENT	1	ENC-I	-18.051	1.558	-16.643	44.35	-451.93	-206.44
			END-J	-18.051	1.558	-16.643	44.35	-470.65	-208.15
143	TANGENT	1	ENC-I	-48.244	38.345	38.800	-334.66	-756.72	160.54
			ENC-J	-48.244	38.345	38.800	-334.66	-713.07	117.40
144	TANGENT	1	ENC-I	-48.244	38.345	38.800	-334.66	-713.07	117.40
			ENC-J	-48.244	38.345	38.800	-334.66	-514.22	-79.12
145	TANGENT	1	ENC-I	-48.244	38.345	38.800	-334.66	-514.22	-79.12
			ENC-J	-48.244	38.345	38.800	-334.66	-297.90	-292.89
146	TANGENT	1	ENC-I	-0.000	0.000	0.000	-0.00	-0.00	0.00
			END-J	-0.000	0.000	0.000	-0.00	-0.00	-0.00
147	TANGENT	1	ENC-I	-48.244	38.345	38.800	-334.66	-297.90	-292.89
			END-J	-48.244	38.345	38.800	-334.66	-213.51	-376.29
148	TANGENT	1	ENC-I	-48.244	38.345	38.800	-334.66	-213.51	-376.29
			ENC-J	-48.244	38.345	38.800	-334.66	-131.06	-457.78
149	TANGENT	1	ENC-I	-48.244	38.345	38.800	-334.66	-131.06	-457.78
			ENC-J	-48.244	38.345	38.800	-334.66	-34.06	-553.64
150	BEND	1	ENC-I	-48.244	-38.345	-38.800	-334.66	34.06	553.64
			CENTER	-57.228	-22.865	-38.800	-316.89	86.98	587.33
			ENC-J	-61.384	-5.457	-38.800	-284.67	132.56	602.92

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
151	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	-310.63	-602.92
			END-J	-38.345	-48.244	38.800	-46.03	-257.28	-536.58
152	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	-257.28	-536.58
			END-J	-38.345	-48.244	38.800	-46.03	-102.08	-343.61
153	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	-102.08	-343.61
			END-J	-38.345	-48.244	38.800	-46.03	-63.28	-295.37
154	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	-63.28	-295.37
			END-J	-38.345	-48.244	38.800	-46.03	130.73	-54.15
155	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	130.73	-54.15
			END-J	-38.345	-48.244	38.800	-46.03	402.33	283.56
156	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	402.33	283.56
			END-J	-38.345	-48.244	38.800	-46.03	518.73	428.29
157	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	518.73	428.29
			END-J	-38.345	-48.244	38.800	-46.03	557.53	476.53
158	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	557.53	476.53
			END-J	-38.345	-48.244	38.800	-46.03	576.93	500.66
159	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	576.93	500.66
			END-J	-38.345	-48.244	38.800	-46.03	596.33	524.78
160	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	596.33	524.78
			END-J	-38.345	-48.244	38.800	-46.03	620.58	554.93
161	TANGENT	1	ENC-I	-38.345	-48.244	38.800	-46.03	620.58	554.93
			END-J	-38.345	-48.244	38.800	-46.03	712.73	669.51
162	TANGENT	1	ENC-I	-56.851	-36.787	-64.887	-116.19	286.07	-542.85
			END-J	-56.851	-36.787	-64.887	-116.19	213.07	-501.46
163	TANGENT	1	ENC-I	-56.851	-36.787	-64.887	-116.19	213.07	-501.46
			END-J	-56.851	-36.787	-64.887	-116.19	148.18	-464.68
164	TANGENT	1	ENC-I	-56.851	-36.787	-64.887	-116.19	148.18	-464.68
			END-J	-56.851	-36.787	-64.887	-116.19	-233.03	-248.55
165	TANGENT	1	ENC-I	-56.851	-36.787	-64.887	-116.19	-233.03	-248.55
			END-J	-56.851	-36.787	-64.887	-116.19	-557.47	-64.62
166	TANGENT	1	ENC-I	-88.781	28.416	52.605	682.93	-270.29	95.37
			END-J	-88.781	28.416	52.605	682.93	-228.47	72.78
167	TANGENT	1	ENC-I	-49.064	28.416	90.786	623.05	-228.47	-288.96
			END-J	-49.064	28.416	90.786	623.05	36.21	-371.80

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
168	TANGENT	1	END-I	-49.064	28.416	90.786	623.05	36.21	-371.80
			END-J	-49.064	28.416	90.786	623.05	300.90	-454.65
169	TANGENT	1	END-I	-52.605	28.416	-88.781	69.30	300.90	768.18
			END-J	-52.605	28.416	-88.781	69.30	-498.14	512.43
170	TANGENT	1	END-I	-4.246	-65.203	23.894	-20.82	-287.17	-747.55
			END-J	-4.246	-65.203	23.894	-20.82	23.45	100.08
171	BEND	1	END-I	-4.246	-65.203	23.894	-20.82	23.45	100.08
			CENTER	-49.107	-43.103	23.894	19.35	73.54	212.24
			END-J	-65.203	4.246	23.894	83.18	80.56	252.48
172	TANGENT	1	END-I	-65.203	-23.894	4.246	83.18	-252.48	80.56
			END-J	-65.203	-23.894	4.246	83.18	-186.67	450.91
173	BEND	1	END-I	-65.203	-23.894	4.246	83.18	-186.67	450.91
			CENTER	-63.001	29.210	4.246	-70.06	-183.31	445.41
			END-J	-23.894	65.203	4.246	-176.05	-72.57	347.64
174	TANGENT	1	END-I	-23.894	-65.203	-4.246	-176.05	72.57	-347.64
			END-J	-23.894	-65.203	-4.246	-176.05	44.97	76.17
175	TANGENT	1	END-I	-23.894	-65.203	-4.246	-176.05	44.97	76.17
			END-J	-23.894	-65.203	-4.246	-176.05	23.75	402.19
176	BEND	1	END-I	-23.894	-65.203	-4.246	-176.05	23.75	402.19
			CENTER	-63.001	-29.210	-4.246	-110.81	133.77	499.95
			END-J	-65.203	23.894	-4.246	13.13	165.44	505.46
177	TANGENT	1	END-I	-65.203	-23.894	4.246	13.13	-165.44	-505.46
			END-J	-65.203	-23.894	4.246	13.13	-137.84	-350.15
178	TANGENT	1	END-I	-65.203	-23.894	4.246	13.13	-137.84	-350.15
			END-J	-65.203	-23.894	4.246	13.13	-110.24	-194.83
179	TANGENT	1	END-I	-65.203	-23.894	4.246	13.13	-110.24	-194.83
			END-J	-65.203	-23.894	4.246	13.13	-86.89	-63.42
180	TANGENT	1	END-I	0.000	-0.000	0.000	0.00	0.0	-0.00
			END-J	0.000	-0.000	0.000	0.00	0.00	-0.00
181	TANGENT	1	END-I	-65.203	-23.894	4.246	13.13	-86.89	-63.42
			END-J	-65.203	-23.894	4.246	13.13	-52.84	128.21
182	BEND	1	END-I	-65.203	-23.894	4.246	13.13	-52.84	128.21
			CENTER	-69.425	1.550	4.246	-6.33	-50.12	138.77
			END-J	-64.071	26.781	4.246	-23.45	-40.48	125.38
183	TANGENT	1	END-I	-64.075	-26.770	-4.246	-23.44	40.48	-125.38
			END-J	-64.075	-26.770	-4.246	-23.44	23.03	-15.38

P
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A

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSTIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
184	TANGENT	1	END-I END-J	-64.075 -64.075	-26.773 -26.770	-4.246 -4.246	-23.44 -23.44	23.03 5.59	-15.38 94.63
185	TANGENT	1	END-I END-J	-64.075 -64.075	-26.773 -26.770	-4.246 -4.246	-23.44 -23.44	5.59 -11.86	94.63 204.63
186	TANGENT	1	END-I END-J	-64.084 -64.084	-26.749 -26.749	-4.246 -4.246	-23.45 -23.45	-11.85 -29.31	204.63 314.59
187	BEND	1	END-I CENTER END-J	-64.072 -69.426 -65.201	-26.779 -1.547 23.899	-4.246 -4.246 -4.246	-23.43 -33.25 -39.94	-29.32 -22.61 -12.79	314.59 327.97 317.41
188	TANGENT	1	END-I END-J	-65.203 -65.203	-23.894 -23.894	4.246 4.246	-39.94 -39.94	12.80 36.23	-317.41 -185.52
189	TANGENT	1	END-I END-J	-65.203 -65.203	-23.894 -23.894	4.246 4.246	-39.94 -39.94	36.23 61.71	-185.52 -42.15
190	TANGENT	1	END-I END-J	-65.203 -65.203	-23.894 -23.894	4.246 4.246	-39.94 -39.94	61.71 87.18	-42.15 101.21
191	TANGENT	1	END-I END-J	-65.203 -65.203	-23.894 -23.894	4.246 4.246	-39.94 -39.94	87.18 95.67	101.21 149.00
192	TANGENT	1	END-I END-J	-65.203 -65.203	-23.894 -23.894	4.246 4.246	-39.94 -39.94	95.67 114.78	149.00 256.52
193	BEND	1	END-I CENTER END-J	-65.203 -29.210 23.894	23.894 63.001 65.203	-4.246 -4.246 -4.246	-39.94 -112.51 -125.39	-114.78 -60.42 29.33	-256.52 -346.51 -479.27
194	TANGENT	1	END-I END-J	23.894 23.894	-65.203 -65.203	4.246 4.246	-125.39 -125.39	-29.33 -20.83	479.27 609.67
195	TANGENT	1	END-I END-J	23.894 23.894	-65.203 -65.203	4.246 4.246	-125.39 -125.39	-20.83 -14.47	609.67 707.47

STATIC SOLUTION TIME LOG

EQUATION SOLUTION = 5.57
DISPLACEMENT OUTPUT = 1.33
STRESS RECOVERY = 7.37

LTR1144 26

EL NO END TX MY MZ RES-MR END TX MY MZ RFS-MR

BLACK

LOCE

(3)

B-26

LTR1144 26

1	I	1810.	729.	1970.	2773.	J	1810.	730.	2010.	2802.
2	I	730.	2010.	1810.	2802.	J	730.	1660.	1520.	2366.
3	I	730.	1660.	1520.	2366.	J	730.	892.	853.	1434.
4	I	730.	892.	853.	1434.	J	730.	193.	162.	772.
5	I	730.	193.	162.	772.	J	730.	594.	458.	1047.
6	I	730.	594.	458.	1047.	J	730.	864.	755.	1360.
7	I	730.	864.	755.	1360.	J	730.	1040.	988.	1610.
8	C	931.	893.	1030.	1651.	J	1090.	678.	1030.	1646.
9	I	1090.	678.	1030.	1646.	J	1090.	539.	1020.	1587.
10	C	839.	759.	1050.	1544.	J	342.	1020.	1030.	1489.
11	I	342.	1020.	1030.	1489.	J	342.	579.	699.	970.
12	I	342.	579.	699.	970.	J	342.	915.	1460.	1757.
13	C	781.	687.	1460.	1793.	J	1030.	229.	1300.	1674.
14	I	1030.	229.	1300.	1674.	J	1030.	280.	929.	1415.
15	I	1030.	280.	929.	1415.	J	1030.	517.	1030.	1546.
16	C	579.	839.	1450.	1772.	J	487.	688.	1460.	1686.
17	I	487.	688.	1460.	1686.	J	487.	680.	1120.	1398.
18	I	487.	680.	1120.	1398.	J	487.	881.	1210.	1574.
19	I	487.	881.	1210.	1574.	J	487.	1370.	1400.	2018.
20	I	487.	1370.	1400.	2018.	J	487.	1030.	1170.	1633.
21	I	487.	1030.	1170.	1633.	J	487.	768.	741.	1173.
22	C	445.	612.	1060.	1302.	J	624.	429.	994.	1250.
23	I	624.	429.	994.	1250.	J	624.	440.	859.	1149.
24	I	603.	440.	873.	1149.	J	603.	467.	741.	1063.
25	C	542.	691.	465.	994.	J	551.	590.	408.	905.
26	I	551.	408.	590.	905.	J	551.	611.	683.	1069.
27	I	551.	611.	683.	1069.	J	551.	726.	794.	1209.
28	I	551.	726.	794.	1209.	J	551.	113.	696.	895.
29	I	0.	112.	537.	549.	J	0.	0.	0.	0.
30	I	68.	2.	710.	713.	J	68.	4.	18.	71.
31	I	0.	197.	70.	209.	J	0.	0.	0.	0.
32	I	0.	201.	23.	202.	J	0.	0.	0.	0.
33	I	0.	0.	0.	0.	J	0.	0.	0.	0.
34	I	0.	0.	0.	0.	J	0.	21.	41.	46.
35	I	41.	21.	0.	46.	J	41.	17.	81.	92.
36	I	41.	17.	81.	92.	J	41.	211.	231.	316.
37	I	41.	211.	231.	316.	J	41.	506.	358.	621.
38	I	41.	506.	358.	621.	J	41.	814.	457.	934.
39	I	41.	814.	457.	934.	J	41.	822.	341.	891.
40	I	41.	822.	341.	891.	J	41.	744.	474.	883.
41	I	41.	744.	474.	883.	J	41.	586.	513.	780.
42	I	41.	586.	513.	780.	J	41.	269.	348.	442.
43	I	41.	269.	348.	442.	J	41.	328.	204.	388.
44	I	41.	328.	204.	388.	J	41.	614.	493.	789.
45	C	450.	501.	561.	880.	J	700.	104.	600.	928.
46	I	700.	104.	600.	928.	J	700.	229.	631.	970.
47	I	0.	0.	0.	0.	J	0.	0.	0.	0.
48	I	0.	0.	0.	0.	J	0.	36.	1.	36.
49	I	0.	36.	1.	36.	J	0.	77.	3.	77.
50	I	0.	554.	283.	622.	J	0.	0.	0.	0.
51	I	128.	322.	536.	638.	J	128.	246.	400.	487.
52	I	128.	246.	400.	487.	J	128.	453.	342.	582.
53	C	59.	139.	572.	592.	J	97.	64.	472.	486.
54	I	57.	472.	64.	486.	J	97.	285.	83.	312.
55	I	97.	285.	83.	312.	J	97.	302.	107.	335.
56	C	106.	160.	291.	417.	J	120.	108.	447.	475.
57	I	120.	401.	225.	475.	J	120.	317.	509.	612.
58	I	120.	317.	509.	612.	J	120.	137.	410.	449.
59	C	145.	113.	415.	454.	J	156.	103.	384.	427.
60	I	156.	384.	103.	427.	J	156.	305.	125.	364.

63	I	156.	195.	153.	293.	J	156.	160.	126.	257.
64	I	156.	160.	126.	257.	J	156.	225.	138.	307.
65	I	156.	225.	138.	307.	J	156.	549.	322.	655.
66	I	156.	549.	322.	655.	J	156.	123.	89.	218.
67	I	156.	123.	89.	218.	J	156.	92.	31.	184.
68	I	156.	92.	31.	184.	J	156.	221.	102.	289.
69	I	67.	147.	193.	252.	J	67.	131.	142.	205.
70	I	67.	131.	142.	205.	J	67.	99.	51.	130.
71	I	9.	29.	35.	46.	J	9.	7.	9.	15.
72	C	9.	7.	9.	15.	J	9.	17.	23.	30.
73	I	164.	184.	347.	426.	J	11.	186.	203.	276.
74	I	11.	186.	203.	276.	J	11.	304.	401.	503.
75	C	11.	304.	401.	503.	J	11.	80.	254.	266.
76	I	88.	108.	280.	313.	J	163.	73.	173.	249.
77	I	163.	173.	73.	249.	J	163.	99.	104.	217.
78	I	163.	99.	104.	217.	J	163.	39.	129.	211.
79	I	4.	124.	45.	132.	J	4.	106.	39.	113.
80	I	4.	106.	39.	113.	J	4.	59.	25.	64.
81	I	4.	59.	25.	64.	J	4.	62.	11.	63.
82	I	0.	62.	5.	63.	J	0.	0.	0.	0.
83	C	1.	0.	5.	5.	J	1.	0.	6.	6.
84	I	1.	1.	6.	6.	J	1.	1.	6.	6.
85	I	1.	1.	6.	6.	J	1.	1.	6.	6.
86	I	1.	1.	6.	6.	J	1.	1.	5.	5.
87	C	1.	1.	5.	5.	J	1.	1.	5.	5.
88	I	0.	1.	4.	4.	J	1.	1.	4.	4.
89	I	1.	1.	4.	4.	J	1.	1.	3.	3.
90	I	1.	1.	3.	3.	J	1.	0.	1.	2.
91	I	1.	0.	1.	2.	J	1.	0.	0.	1.
92	C	1.	0.	0.	1.	J	1.	1.	3.	3.
93	I	2.	2.	1.	4.	J	4.	1.	2.	4.
94	I	4.	2.	1.	4.	J	4.	2.	1.	4.
95	I	4.	2.	1.	4.	J	4.	3.	2.	5.
96	I	39.	35.	85.	99.	J	39.	31.	76.	91.
97	I	39.	31.	76.	91.	J	39.	17.	42.	60.
98	I	177.	864.	843.	1220.	J	177.	38.	68.	193.
99	I	177.	38.	68.	193.	J	177.	493.	371.	642.
100	C	177.	493.	371.	642.	J	177.	676.	455.	834.
101	I	35.	475.	673.	824.	J	152.	438.	652.	800.
102	C	152.	438.	652.	800.	J	152.	258.	48.	338.
103	I	120.	164.	411.	458.	J	154.	216.	456.	530.
104	I	154.	419.	286.	530.	J	154.	288.	259.	417.
105	I	154.	288.	259.	417.	J	154.	250.	343.	452.
106	I	154.	250.	343.	452.	J	154.	452.	543.	723.
107	I	167.	1050.	850.	1361.	J	167.	678.	394.	802.
108	I	167.	678.	394.	802.	J	167.	371.	442.	601.
109	I	167.	371.	442.	601.	J	167.	391.	540.	687.
110	I	167.	351.	540.	687.	J	167.	462.	473.	696.
111	I	167.	482.	473.	696.	J	167.	645.	399.	777.
112	I	167.	645.	399.	777.	J	167.	741.	465.	891.
113	C	167.	741.	465.	891.	J	167.	824.	649.	1062.
114	I	518.	682.	656.	1079.	J	853.	168.	526.	1016.
115	I	853.	526.	168.	1016.	J	853.	539.	189.	1027.
116	C	853.	539.	189.	1027.	J	853.	742.	234.	1155.
117	I	853.	768.	239.	1172.	J	842.	806.	245.	1191.
118	I	871.	245.	775.	1191.	J	871.	281.	940.	1312.
119	I	871.	281.	940.	1312.	J	871.	309.	1060.	1406.
120	I	1590.	413.	717.	1792.	J	1590.	415.	801.	1828.
121	I	1590.	415.	801.	1828.	J	1590.	424.	930.	1890.
122	I	1590.	424.	930.	1890.	J	1590.	516.	1540.	2273.
123	I	6.	2480.	2640.	3622.	J	0.	0.	0.	0.
124	C	875.	761.	1510.	1904.	J	875.	991.	597.	1451.
125	I	564.	1310.	701.	1589.	J	1150.	1000.	721.	1686.
126	I	1150.	1000.	721.	1686.	J	1150.	1140.	750.	1785.
127	I	1150.	1140.	750.	1785.	J	1150.	1330.	910.	1980.

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129	I	237.	907.	582.	1108.	J	257.	782.	394.	913.
130	I	257.	782.	394.	913.	J	257.	420.	593.	771.
131	I	257.	420.	593.	771.	J	257.	348.	412.	597.
132	I	257.	348.	412.	597.	J	257.	447.	134.	533.
133	C	175.	188.	511.	572.	J	94.	294.	503.	590.
134	I	94.	503.	294.	590.	J	94.	484.	331.	594.
135	I	94.	484.	331.	594.	J	94.	435.	295.	534.
136	I	94.	435.	295.	534.	J	94.	347.	381.	524.
137	I	94.	347.	381.	524.	J	94.	298.	470.	564.
138	I	94.	298.	470.	564.	J	94.	183.	359.	414.
139	I	94.	183.	359.	414.	J	94.	116.	156.	216.
140	I	94.	116.	156.	216.	J	94.	352.	231.	431.
141	I	94.	352.	231.	431.	J	94.	441.	349.	570.
142	I	94.	441.	349.	570.	J	94.	477.	398.	628.
143	I	278.	344.	142.	465.	J	278.	290.	97.	413.
144	I	278.	290.	97.	413.	J	278.	166.	187.	374.
145	I	278.	166.	187.	374.	J	278.	402.	460.	671.
146	I	0.	402.	284.	492.	J	0.	0.	0.	0.
147	I	5.	2.	438.	438.	J	5.	2.	315.	315.
148	I	5.	2.	315.	315.	J	5.	1.	194.	194.
149	I	5.	1.	194.	194.	J	5.	0.	52.	52.
150	C	5.	1.	9.	10.	J	4.	2.	63.	63.
151	I	0.	5.	63.	63.	J	0.	4.	58.	59.
152	I	0.	4.	58.	59.	J	0.	3.	45.	45.
153	I	0.	3.	45.	45.	J	0.	3.	41.	41.
154	I	0.	3.	41.	41.	J	0.	2.	23.	23.
155	I	0.	2.	23.	23.	J	0.	0.	3.	3.
156	I	0.	0.	3.	3.	J	0.	1.	15.	15.
157	I	0.	1.	15.	15.	J	0.	1.	19.	19.
158	I	0.	1.	19.	19.	J	0.	1.	21.	21.
159	I	0.	1.	21.	21.	J	0.	2.	23.	23.
160	I	0.	2.	23.	23.	J	0.	2.	25.	25.
161	I	0.	2.	25.	25.	J	0.	2.	34.	34.
162	I	80.	160.	140.	227.	J	80.	151.	139.	220.
163	I	80.	151.	139.	220.	J	80.	146.	139.	217.
164	I	80.	146.	139.	217.	J	80.	177.	149.	245.
165	I	80.	177.	149.	245.	J	80.	250.	170.	313.
166	I	190.	223.	126.	319.	J	190.	193.	100.	289.
167	I	193.	193.	93.	288.	J	193.	224.	168.	340.
168	I	193.	224.	168.	340.	J	193.	353.	278.	489.
169	I	149.	353.	304.	489.	J	149.	193.	132.	277.
170	I	107.	361.	307.	486.	J	107.	124.	236.	287.
171	C	136.	92.	250.	299.	J	118.	127.	223.	282.
172	I	118.	223.	127.	282.	J	118.	147.	177.	259.
173	C	125.	146.	187.	268.	J	165.	91.	163.	249.
174	I	165.	91.	163.	249.	J	165.	88.	135.	231.
175	I	165.	88.	135.	231.	J	165.	164.	282.	366.
176	C	165.	170.	324.	403.	J	190.	138.	304.	384.
177	I	190.	138.	304.	384.	J	190.	57.	124.	234.
178	I	150.	57.	124.	234.	J	190.	175.	74.	269.
179	I	190.	175.	74.	269.	J	190.	330.	244.	452.
180	I	0.	311.	244.	395.	J	0.	0.	0.	0.
181	I	200.	366.	0.	417.	J	200.	160.	0.	256.
182	C	149.	190.	0.	241.	J	103.	197.	0.	222.
183	I	103.	197.	0.	222.	J	103.	108.	0.	149.
184	I	103.	108.	0.	149.	J	103.	98.	0.	142.
185	I	103.	98.	0.	142.	J	103.	153.	0.	184.
186	I	103.	153.	0.	184.	J	103.	200.	0.	225.
187	C	39.	227.	0.	230.	J	75.	222.	0.	234.
188	I	75.	222.	0.	234.	J	75.	209.	0.	222.
189	I	75.	209.	0.	222.	J	75.	126.	0.	147.
190	I	75.	126.	0.	147.	J	75.	25.	0.	79.
191	I	75.	25.	0.	79.	J	75.	72.	0.	104.
192	I	75.	72.	0.	104.	J	75.	207.	0.	217.

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154	I	200.	151.	0.	318.	J	200.	212.	0.	351.
195	I	280.	212.	0.	351.	J	280.	258.	0.	381.

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EL NO END TX MY MZ RES-MR END TX MY MZ RES-MR

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S836M1C

1	I	2310.	757.	1530.	2872.	J	2310.	827.	1640.	2951.
2	I	827.	1640.	2310.	2951.	J	827.	1400.	1950.	2539.
3	I	827.	1400.	1950.	2539.	J	827.	869.	1130.	1648.
4	I	827.	869.	1130.	1648.	J	827.	299.	252.	915.
5	I	827.	299.	252.	915.	J	827.	262.	569.	1037.
6	I	827.	262.	569.	1037.	J	827.	542.	1010.	1413.
7	I	827.	542.	1010.	1413.	J	827.	789.	1400.	1807.
8	C	1150.	199.	1450.	1861.	J	876.	739.	1380.	1794.
9	I	876.	739.	1380.	1794.	J	876.	553.	1030.	1461.
10	C	941.	386.	817.	1305.	J	367.	1050.	868.	1411.
11	I	367.	1050.	868.	1411.	J	367.	1070.	1250.	1686.
12	I	367.	1070.	1250.	1686.	J	367.	751.	1710.	1903.
13	C	436.	683.	1680.	1865.	J	730.	283.	1500.	1692.
14	I	730.	283.	1500.	1692.	J	730.	145.	974.	1226.
15	I	730.	145.	974.	1226.	J	730.	188.	714.	1038.
16	C	631.	364.	793.	1077.	J	607.	341.	1120.	1319.
17	I	607.	341.	1120.	1319.	J	607.	1240.	1830.	2292.
18	I	607.	1240.	1830.	2292.	J	607.	1560.	2050.	2647.
19	I	607.	1560.	2050.	2647.	J	607.	2050.	2240.	3097.
20	I	607.	2050.	2240.	3097.	J	607.	1270.	1210.	1856.
21	I	607.	1270.	1210.	1856.	J	607.	982.	981.	1515.
22	C	835.	488.	1350.	1661.	J	869.	273.	1310.	1596.
23	I	869.	273.	1310.	1596.	J	869.	262.	1230.	1529.
24	I	849.	262.	1240.	1525.	J	849.	397.	1180.	1507.
25	C	865.	1130.	515.	1513.	J	1000.	947.	567.	1497.
26	I	1000.	587.	949.	1498.	J	1000.	867.	902.	1602.
27	I	1000.	867.	902.	1602.	J	1000.	934.	953.	1668.
28	I	1000.	934.	953.	1668.	J	1000.	146.	866.	1331.
29	I	0.	145.	921.	932.	J	0.	0.	0.	0.
30	I	96.	1.	992.	997.	J	96.	1.	13.	97.
31	I	0.	16.	98.	99.	J	0.	0.	0.	0.
32	I	0.	16.	6.	17.	J	0.	0.	0.	0.
33	I	0.	0.	0.	0.	J	0.	0.	0.	0.
34	I	0.	0.	0.	0.	J	0.	2.	0.	2.
35	I	0.	2.	0.	2.	J	0.	6.	1.	6.
36	I	0.	6.	1.	6.	J	0.	24.	2.	24.
37	I	0.	24.	2.	24.	J	0.	48.	4.	48.
38	I	0.	48.	4.	48.	J	0.	72.	5.	72.
39	I	0.	72.	5.	72.	J	0.	64.	1.	64.
40	I	0.	64.	1.	64.	J	0.	56.	3.	56.
41	I	0.	56.	3.	56.	J	0.	43.	5.	43.
42	I	0.	43.	5.	43.	J	0.	18.	8.	20.
43	I	0.	18.	8.	20.	J	0.	25.	12.	28.
44	I	0.	25.	12.	28.	J	0.	46.	14.	48.
45	C	34.	37.	1.	50.	J	52.	6.	37.	64.
46	I	52.	6.	37.	64.	J	52.	16.	113.	125.
47	I	0.	0.	0.	0.	J	0.	0.	0.	0.
48	I	0.	0.	0.	0.	J	0.	66.	0.	66.
49	I	0.	66.	0.	66.	J	0.	139.	1.	139.
50	I	0.	261.	254.	364.	J	0.	0.	0.	0.
51	I	168.	275.	294.	436.	J	168.	85.	265.	325.
52	I	168.	85.	265.	325.	J	168.	98.	233.	303.
53	C	26.	196.	236.	308.	J	112.	105.	275.	315.
54	I	113.	275.	105.	315.	J	113.	306.	31.	328.
55	I	112.	306.	31.	327.	J	112.	328.	51.	350.
56	C	49.	146.	329.	363.	J	103.	163.	325.	378.
57	I	103.	216.	292.	378.	J	103.	199.	424.	480.
58	I	103.	199.	424.	480.	J	103.	243.	727.	773.
59	C	243.	113.	761.	837.	J	250.	97.	720.	768.
60	I	250.	720.	97.	768.	J	250.	564.	94.	624.
61	I	250.	564.	94.	624.	J	250.	210.	89.	240.

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	I	250.	208.	99.	340.	J	250.	203.	123.	340.
	I	250.	203.	123.	345.	J	250.	410.	140.	500.
64	I	250.	410.	140.	500.	J	250.	962.	196.	1013.
65	I	250.	962.	196.	1013.	J	250.	213.	48.	332.
66	I	250.	213.	48.	332.	J	250.	162.	27.	299.
67	I	250.	162.	27.	299.	J	250.	387.	71.	466.
68	I	43.	234.	336.	412.	J	43.	221.	247.	334.
69	I	43.	221.	247.	334.	J	43.	174.	87.	199.
70	I	16.	51.	28.	60.	J	16.	9.	4.	19.
71	I	16.	9.	4.	19.	J	16.	26.	18.	35.
72	C	0.	0.	0.	0.	J	0.	0.	0.	0.
73	I	0.	0.	0.	0.	J	0.	0.	0.	0.
74	I	0.	0.	0.	0.	J	0.	0.	0.	0.
75	C	0.	0.	0.	0.	J	0.	0.	0.	0.
76	I	0.	0.	0.	0.	J	0.	0.	0.	0.
77	I	0.	0.	0.	0.	J	0.	0.	0.	0.
78	I	0.	0.	0.	0.	J	0.	0.	0.	0.
79	I	0.	0.	0.	0.	J	0.	0.	0.	0.
80	I	0.	0.	0.	0.	J	0.	0.	0.	0.
81	I	0.	0.	0.	0.	J	0.	0.	0.	0.
82	I	0.	0.	0.	0.	J	0.	0.	0.	0.
83	C	0.	0.	0.	0.	J	0.	0.	0.	0.
84	I	0.	0.	0.	0.	J	0.	0.	0.	0.
85	I	0.	0.	0.	0.	J	0.	0.	0.	0.
86	I	0.	0.	0.	0.	J	0.	0.	0.	0.
87	C	0.	0.	0.	0.	J	0.	0.	0.	0.
88	I	0.	0.	0.	0.	J	0.	0.	0.	0.
89	I	0.	0.	0.	0.	J	0.	0.	0.	0.
90	I	0.	0.	0.	0.	J	0.	0.	0.	0.
91	I	0.	0.	0.	0.	J	0.	0.	0.	0.
92	C	0.	0.	0.	0.	J	0.	0.	0.	0.
93	I	0.	0.	0.	0.	J	0.	0.	0.	0.
94	I	0.	0.	0.	0.	J	0.	0.	0.	0.
95	I	0.	0.	0.	0.	J	0.	0.	0.	0.
96	I	0.	0.	0.	0.	J	0.	0.	0.	0.
97	I	12.	98.	57.	114.	J	12.	1.	5.	13.
98	I	12.	1.	5.	13.	J	12.	54.	24.	60.
99	I	12.	54.	24.	60.	J	12.	75.	32.	83.
100	C	0.	34.	75.	82.	J	11.	31.	73.	80.
101	I	11.	31.	73.	80.	J	11.	9.	3.	15.
102	C	2.	20.	16.	26.	J	17.	25.	19.	36.
103	I	17.	32.	1.	36.	J	17.	9.	3.	20.
104	I	17.	9.	3.	20.	J	17.	13.	21.	30.
105	I	17.	13.	21.	30.	J	17.	21.	28.	39.
106	I	291.	2070.	1050.	2339.	J	291.	1460.	614.	1610.
107	I	291.	1460.	614.	1610.	J	291.	256.	242.	457.
108	I	291.	256.	242.	457.	J	291.	594.	719.	977.
109	I	291.	594.	719.	977.	J	291.	1090.	953.	1477.
110	I	291.	1090.	953.	1477.	J	291.	1530.	1120.	1918.
111	I	291.	1530.	1120.	1918.	J	291.	1770.	1210.	2164.
112	I	291.	1770.	1210.	2164.	J	291.	2010.	1290.	2406.
113	C	1310.	1650.	974.	2321.	J	2120.	359.	372.	2182.
114	I	2120.	372.	359.	2182.	J	2120.	1140.	432.	2446.
115	I	2120.	1140.	432.	2446.	J	2120.	2130.	519.	3050.
116	C	2120.	2230.	528.	3122.	J	2100.	2350.	537.	3197.
117	I	2180.	537.	2270.	3193.	J	2180.	593.	2850.	3637.
118	I	2180.	593.	2850.	3637.	J	2180.	633.	3260.	3972.
119	I	4000.	945.	2330.	4725.	J	4000.	946.	2700.	4918.
120	I	4000.	946.	2700.	4918.	J	4000.	947.	3190.	5203.
121	I	4000.	947.	3190.	5203.	J	4000.	944.	5160.	6597.
122	I	0.	6300.	9100.	11068.	J	0.	0.	0.	0.
123	I	2240.	1770.	4850.	5628.	J	2240.	2270.	1680.	3605.
124	C	559.	3320.	2020.	4003.	J	2650.	2590.	2040.	4230.
125	I	2650.	2590.	2040.	4230.	J	2650.	2950.	1900.	4397.
126	I	2650.	2950.	1900.	4397.	J	2650.	3430.	1870.	4721.
127	I	2650.	3430.	1870.	4721.	J	2650.	3850.	2260.	5474.

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128	I	416.	2090.	1260.	2476.	J	416.	2010.	1210.	2383.
129	I	416.	2010.	1210.	2383.	J	416.	1740.	1070.	2085.
130	I	416.	1740.	1070.	2085.	J	416.	839.	478.	1051.
131	I	416.	839.	478.	1051.	J	416.	681.	246.	835.
132	I	416.	681.	246.	835.	J	416.	714.	34.	827.
133	C	309.	278.	763.	869.	J	107.	409.	760.	870.
134	I	107.	760.	409.	870.	J	107.	745.	416.	860.
135	I	107.	745.	416.	860.	J	107.	701.	351.	810.
136	I	107.	701.	391.	810.	J	107.	523.	305.	615.
137	I	107.	523.	305.	615.	J	107.	218.	177.	301.
138	I	107.	218.	177.	301.	J	107.	135.	101.	200.
139	I	107.	135.	101.	200.	J	107.	247.	33.	271.
140	I	107.	247.	33.	271.	J	107.	455.	121.	483.
141	I	107.	455.	121.	483.	J	107.	525.	159.	559.
142	I	107.	525.	159.	559.	J	107.	553.	175.	590.
143	I	117.	338.	85.	368.	J	117.	309.	79.	340.
144	I	117.	309.	79.	340.	J	117.	194.	101.	248.
145	I	117.	194.	101.	248.	J	117.	161.	176.	266.
146	I	0.	161.	119.	200.	J	0.	0.	0.	0.
147	I	2.	1.	167.	167.	J	2.	1.	120.	120.
148	I	2.	1.	120.	120.	J	2.	0.	74.	74.
149	I	2.	0.	74.	74.	J	2.	0.	20.	20.
150	C	2.	1.	3.	4.	J	2.	1.	24.	24.
151	I	0.	2.	24.	24.	J	0.	2.	22.	22.
152	I	0.	2.	22.	22.	J	0.	1.	17.	17.
153	I	0.	1.	17.	17.	J	0.	1.	15.	15.
154	I	0.	1.	15.	15.	J	0.	1.	8.	9.
155	I	0.	1.	8.	9.	J	0.	0.	1.	1.
156	I	0.	0.	1.	1.	J	0.	0.	6.	6.
157	I	0.	0.	6.	6.	J	0.	0.	7.	7.
158	I	0.	0.	7.	7.	J	0.	1.	8.	8.
159	I	0.	1.	8.	8.	J	0.	1.	8.	8.
160	I	0.	1.	8.	8.	J	0.	1.	9.	9.
161	I	0.	1.	9.	9.	J	0.	1.	13.	13.
162	I	37.	218.	65.	231.	J	37.	207.	62.	219.
163	I	37.	207.	62.	219.	J	37.	196.	58.	208.
164	I	37.	196.	58.	208.	J	37.	142.	45.	153.
165	I	37.	142.	45.	153.	J	37.	112.	43.	126.
166	I	33.	151.	25.	157.	J	33.	106.	23.	113.
167	I	22.	106.	34.	113.	J	22.	30.	30.	48.
168	I	22.	30.	30.	48.	J	22.	163.	33.	168.
169	I	19.	163.	34.	168.	J	19.	245.	46.	250.
170	I	23.	45.	23.	55.	J	23.	15.	19.	33.
171	C	12.	21.	18.	30.	J	10.	18.	15.	25.
172	I	10.	15.	18.	25.	J	10.	19.	23.	32.
173	C	16.	15.	22.	31.	J	21.	9.	20.	30.
174	I	21.	9.	20.	30.	J	21.	7.	21.	30.
175	I	21.	7.	21.	30.	J	21.	10.	30.	38.
176	C	18.	15.	33.	40.	J	13.	19.	30.	37.
177	I	13.	19.	30.	37.	J	13.	12.	11.	21.
178	I	13.	12.	11.	21.	J	13.	12.	9.	19.
179	I	13.	12.	9.	19.	J	13.	19.	25.	34.
180	I	0.	6.	25.	26.	J	0.	0.	0.	0.
181	I	11.	19.	0.	22.	J	11.	15.	0.	18.
182	C	12.	14.	0.	18.	J	14.	12.	0.	18.
183	I	14.	12.	0.	18.	J	14.	13.	0.	19.
184	I	14.	13.	0.	19.	J	14.	16.	0.	21.
185	I	14.	16.	0.	21.	J	14.	18.	0.	23.
186	I	14.	18.	0.	23.	J	14.	19.	0.	23.
187	C	7.	22.	0.	23.	J	4.	23.	0.	23.
188	I	4.	23.	0.	23.	J	4.	18.	0.	19.
189	I	4.	16.	0.	19.	J	4.	9.	0.	10.
190	I	4.	9.	0.	10.	J	4.	4.	0.	5.
191	I	4.	8.	0.	9.	J	4.	8.	0.	9.
---	I	4.	8.	0.	9.	J	4.	20.	0.	20.

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194	1	26.	9.	0.	27.	J	26.	14.	0.	29.
195	1	26.	14.	0.	29.	J	26.	18.	0.	32.

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B. RED MODEL MOMENTS

PIPE FORCES AND MOMENTS

RED WT

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ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
1	TANGENT	1	END-I END-J	2.957 2.573	3.157 3.157	0.071 0.071	-0.55 -0.55	-3.44 -0.33	-5.47 -13.21
2	TANGENT	1	END-I END-J	-3.157 -3.157	2.573 2.189	0.071 0.071	0.33 0.33	-0.55 -0.44	-13.21 -13.78
3	TANGENT	1	END-I END-J	-1.746 -1.746	-5.334 -5.721	0.036 0.036	0.57 0.57	-0.27 -0.19	-18.82 -6.39
4	BEND	1	END-I CENTER END-J	-1.746 -5.638 -6.734	-5.721 -3.169 1.746	0.036 0.036 0.036	0.57 0.30 -0.06	-0.19 -0.44 -0.43	-6.39 7.50 9.90
5	TANGENT	1	END-I END-J	-6.734 -7.981	1.746 1.746	0.036 0.036	-0.06 -0.06	-0.43 -0.17	9.90 -2.76
6	TANGENT	1	END-I END-J	3.323 2.721	0.019 0.019	0.180 0.180	-0.06 -0.06	-0.17 0.46	-2.76 -2.82
7	TANGENT	1	END-I END-J	2.721 1.388	0.019 0.019	0.180 0.180	-0.06 -0.06	0.46 1.86	-2.82 -2.96
8	BEND	1	END-I CENTER END-J	1.388 0.636 0.019	0.019 -0.610 -0.375	0.180 0.180 0.180	-0.06 1.47 2.53	1.86 1.83 0.73	-2.96 -1.86 -0.25
9	TANGENT	1	END-I END-J	0.019 0.019	0.375 -0.012	-0.180 -0.180	2.53 2.53	-0.73 -1.14	0.25 -0.16
10	TANGENT	1	END-I END-J	0.019 0.019	-0.012 -0.270	-0.180 -0.180	2.53 2.53	-1.14 -1.41	-0.16 0.05
11	TANGENT	1	END-I END-J	0.270 4.484	0.019 0.019	-0.180 -0.180	1.41 1.41	2.53 -1.89	0.05 -0.40
12	TANGENT	1	END-I END-J	7.641 6.105	0.455 0.071	-0.035 -0.035	-0.11 -0.11	-0.27 -0.48	-5.04 -6.67
13	TANGENT	1	END-I END-J	5.940 3.156	1.412 1.412	0.035 0.035	-0.22 -0.22	0.44 0.82	6.67 -8.69
14	TANGENT	1	END-I END-J	1.412 1.412	3.156 -4.012	-0.035 -0.035	0.82 0.82	-0.22 -1.19	8.69 20.68
15	TANGENT	1	END-I END-J	5.398 -5.397	33.981 -37.139	-0.038 -0.038	0.0 0.0	1.06 0.00	-44.73 0.0
16	TANGENT	1	END-I END-J	1.458 -0.494	4.317 -2.851	0.037 -0.037	-1.23 -1.23	-2.00 -0.93	24.06 2.78
17	TANGENT	1	END-I END-J	-2.880 -3.648	-0.273 -0.273	0.037 0.037	-1.22 -1.22	0.94 1.05	2.78 3.59

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
18	TANGENT	1	END-I	3.648	-0.273	-0.037	1.22	1.05	-3.59
			END-J	10.304	-0.273	-0.037	1.22	0.09	3.49
19	TANGENT	1	END-I	-14.788	-0.254	0.217	-2.63	-1.79	-3.09
			END-J	-21.828	-0.254	0.217	-2.63	4.18	3.90
20	TANGENT	1	END-I	-21.828	-0.254	0.217	-2.63	4.18	3.90
			END-J	-22.212	-0.254	0.217	-2.63	4.51	4.28
21	TANGENT	1	END-I	-25.322	0.376	0.465	3.69	-13.89	9.33
			END-J	-25.962	0.376	0.465	3.69	-12.73	8.39
22	TANGENT	1	END-I	-25.962	0.376	0.465	3.69	-12.73	8.39
			END-J	-28.522	0.376	0.465	3.69	-8.08	4.62
23	TANGENT	1	END-I	-28.522	0.376	0.465	3.69	-8.08	4.62
			END-J	-31.082	0.376	0.465	3.69	-3.43	0.86
24	TANGENT	1	END-I	-31.082	0.376	0.465	3.69	-3.43	0.86
			END-J	-32.362	0.376	0.465	3.69	-1.10	-1.02
25	TANGENT	1	END-I	-32.362	0.376	0.465	3.69	-1.10	-1.02
			END-J	-33.898	0.376	0.465	3.69	1.68	-3.28
26	TANGENT	1	END-I	-33.898	-0.088	0.181	3.69	1.68	-3.28
			END-J	-36.458	-0.088	0.181	3.69	3.50	-2.40
27	TANGENT	1	END-I	-36.458	-0.088	0.181	3.69	3.50	-2.40
			END-J	-39.018	-0.088	0.181	3.69	5.31	-1.52
28	TANGENT	1	END-I	-39.018	-0.088	0.181	3.69	5.31	-1.52
			END-J	-41.578	-0.088	0.181	3.69	7.13	-0.63
29	TANGENT	1	END-I	-41.578	-0.088	0.181	3.69	7.13	-0.63
			END-J	-44.138	-0.088	0.181	3.69	8.94	0.25
30	TANGENT	1	END-I	-44.138	-0.088	0.181	3.69	8.94	0.25
			END-J	-46.698	-0.088	0.181	3.69	10.75	1.13
31	TANGENT	1	END-I	-46.698	-0.088	0.181	3.69	10.75	1.13
			END-J	-48.234	-0.088	0.181	3.69	11.84	1.66
32	TANGENT	1	END-I	-48.234	-0.088	0.181	3.69	11.84	1.66
			END-J	-49.834	-0.088	0.181	3.69	12.97	2.21
33	BEND	1	END-I	2.035	-0.088	0.181	3.69	12.97	2.21
			CENTER	0.666	-0.790	0.181	12.05	7.21	4.53
			END-J	-0.088	-0.024	0.181	13.88	-2.78	6.43
34	TANGENT	1	END-I	0.0	0.024	-0.181	13.88	2.78	-6.43
			END-J	0.0	-5.864	-0.181	13.88	-1.39	60.73

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
35	TANGENT	1	END-I END-J	0.0 0.0	7.409 4.849	-0.284 -0.284	13.88 13.88	-1.39 -4.22	60.73 -0.56
36	TANGENT	1	END-I END-J	0.0 0.0	4.849 2.289	-0.284 -0.284	13.88 13.88	-4.22 -7.06	-0.56 -36.25
37	TANGENT	1	END-I END-J	0.0 0.0	2.289 -0.271	-0.284 -0.284	13.88 13.88	-7.06 -9.89	-36.25 -46.33
38	TANGENT	1	END-I END-J	0.0 0.0	-0.271 -2.831	-0.284 -0.284	13.88 13.88	-9.89 -12.73	-46.33 -30.82
39	TANGENT	1	END-I END-J	0.0 0.0	-2.831 -5.391	-0.284 -0.284	13.88 13.88	-12.73 -15.57	-30.82 10.30
40	TANGENT	1	END-I END-J	0.0 0.0	-5.391 -6.671	-0.284 -0.284	13.88 13.88	-15.57 -16.98	10.30 40.45
41	TANGENT	1	END-I END-J	0.0 0.0	-6.671 -7.951	-0.284 -0.284	13.88 13.88	-16.98 -18.40	40.45 77.01
42	TANGENT	1	END-I END-J	8.924 8.924	11.974 10.438	-0.284 -0.284	13.88 13.88	-18.40 -20.10	77.01 9.77
B-37 43	TANGENT	1	END-I END-J	8.924 8.924	10.438 7.878	-0.284 -0.284	13.88 13.88	-20.10 -22.94	9.77 -81.80
44	TANGENT	1	END-I END-J	8.924 8.924	0.031 -2.273	-0.284 -0.284	13.88 13.88	-22.94 -25.49	-81.80 -71.71
45	TANGENT	1	END-I END-J	8.924 8.924	-2.273 -4.797	-0.284 -0.284	13.88 13.88	-25.49 -28.29	-71.71 -36.86
46	BEND	1	END-I CENTER END-J	8.924 10.273 10.413	4.797 1.482 -2.207	0.284 0.284 0.284	13.88 23.76 30.23	28.29 21.36 11.19	36.86 30.60 31.29
47	TANGENT	1	END-I END-J	10.413 11.967	2.207 0.653	-0.284 -0.284	30.23 30.23	-11.19 -13.62	-31.29 -43.56
48	BEND	1	END-I CENTER END-J	11.967 9.165 0.282	0.284 -8.765 -13.389	0.653 -0.058 -0.769	30.23 52.78 44.24	43.56 10.41 -31.50	-13.62 3.59 49.33
49	TANGENT	1	END-I END-J	0.284 0.284	-10.011 -12.059	8.924 8.924	44.24 44.24	12.61 84.00	57.15 145.43
50	TANGENT	1	END-I END-J	0.284 0.284	11.234 7.138	-1.923 -1.923	44.24 44.24	84.00 53.23	145.43 -1.54
51	TANGENT	1	END-I END-J	0.284 0.284	7.138 4.578	-1.923 -1.923	44.24 44.24	53.23 34.00	-1.54 -60.12

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
52	TANGENT	1	END-I	0.284	4.578	-1.923	44.24	34.00	-60.12
			END-J	0.284	2.018	-1.923	44.24	14.77	-93.10
53	TANGENT	1	END-I	0.284	2.018	-1.923	44.24	14.77	-93.10
			END-J	0.284	-0.798	-1.923	44.24	-6.38	-99.80
54	BEND	1	END-I	0.284	-1.923	0.798	44.24	-99.80	6.38
			CENTER	-1.159	-1.560	1.804	-37.61	-97.16	13.60
			END-J	-1.923	-0.284	2.809	-92.16	-33.85	17.42
55	TANGENT	1	END-I	2.418	-2.809	-0.284	-92.16	-17.42	-33.85
			END-J	2.418	-8.569	-0.284	-92.16	-23.80	94.15
56	BEND	1	END-I	2.418	0.284	-8.569	-92.16	-94.15	-23.80
			CENTER	1.910	-1.509	-9.574	-144.79	-33.58	-21.26
			END-J	0.284	-2.418	-10.580	-140.65	42.91	-13.13
57	TANGENT	1	END-I	1.192	-10.516	2.418	-139.00	-25.17	-42.91
			END-J	1.576	-14.965	2.418	-139.00	17.00	179.34
58	BEND	1	END-I	-111.423	-0.284	22.044	28.89	137.02	179.34
			CENTER	-79.201	78.800	22.044	127.00	99.84	130.61
			END-J	-0.284	112.026	22.044	170.09	4.18	12.06
59	TANGENT	1	END-I	112.026	22.044	-0.284	4.18	12.06	170.09
			END-J	112.776	22.044	-0.284	4.18	11.23	105.50
60	TANGENT	1	END-I	112.776	22.044	-0.284	4.18	11.23	105.50
			END-J	113.800	22.044	-0.284	4.18	10.09	17.32
61	TANGENT	1	END-I	-1.699	0.095	0.000	-0.00	-0.03	3.29
			END-J	-1.615	-0.094	0.000	-0.00	0.06	3.15
62	TANGENT	1	END-I	-0.073	0.885	-1.352	-1.95	2.02	1.43
			END-J	-0.075	0.883	-1.352	-1.95	-0.84	-0.44
63	TANGENT	1	END-I	-0.300	3.695	0.722	-2.57	-8.97	18.84
			END-J	0.084	1.775	0.722	-2.57	-3.44	-2.08
64	BEND	1	END-I	-0.106	-1.724	-0.722	-3.19	2.87	2.08
			CENTER	-0.583	-0.433	-0.722	-1.28	1.74	6.34
			END-J	0.287	0.106	-0.722	-0.74	-0.42	6.52
65	TANGENT	1	END-I	0.287	0.722	0.106	-0.74	-6.52	-0.42
			END-J	4.127	0.722	0.106	-0.74	-4.93	-11.25
66	TANGENT	1	END-I	4.127	0.722	0.106	-0.74	-4.93	-11.25
			END-J	8.845	0.722	0.106	-0.74	-2.99	-24.56
67	BEND	1	END-I	8.845	0.722	0.106	-0.74	-2.99	-24.56
			CENTER	8.912	-2.910	0.106	-1.78	-22.44	-22.44
			END-J	7.476	-6.454	0.106	-2.48	-1.22	-13.19

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
68	TANGENT	1	END-I	7.476	-6.454	0.106	-2.48	-1.22	-13.19
			END-J	8.262	-7.241	0.106	-2.48	-0.76	16.56
69	BEND	1	END-I	8.262	7.241	-0.106	-2.48	0.76	-16.56
			CENTER	10.868	3.722	-0.106	-2.04	1.45	-27.52
			END-J	11.967	-0.719	-0.106	-1.37	1.92	-30.57
70	TANGENT	1	END-I	11.967	0.722	0.106	-1.37	-1.92	30.57
			END-J	16.941	0.722	0.106	-1.37	0.13	16.54
71	TANGENT	1	END-I	16.941	0.722	0.106	-1.37	0.13	16.54
			END-J	19.501	0.722	0.106	-1.37	1.19	9.32
72	BEND	1	END-I	19.501	-0.571	-0.455	-1.37	3.66	-8.65
			CENTER	13.599	-14.406	-0.455	1.42	3.08	0.61
			END-J	-0.571	-20.104	-0.455	2.98	0.69	22.03
73	TANGENT	1	END-I	-0.571	4.065	-0.455	2.98	0.69	22.03
			END-J	-0.571	3.407	-0.455	2.98	-0.48	12.43
74	BEND	1	END-I	0.034	-0.074	3.407	2.96	-12.43	-0.48
			CENTER	-0.007	-0.081	2.739	-1.51	-4.61	-0.27
			END-J	-0.047	-0.067	2.071	-1.94	2.73	-0.08
75	TANGENT	1	END-I	-0.046	2.071	0.067	-1.94	-0.08	-2.73
			END-J	-0.046	0.246	0.067	-1.94	0.40	-10.98
76	TANGENT	1	END-I	-0.046	0.301	0.067	-1.94	0.40	-10.98
			END-J	-0.046	-1.363	0.067	-1.94	0.83	-7.53
77	TANGENT	1	END-I	-0.046	-1.363	0.067	-1.94	0.83	-7.53
			END-J	-0.046	-2.131	0.067	-1.94	1.03	-2.29
78	TANGENT	1	END-I	-0.046	-2.131	0.067	-1.94	1.03	-2.29
			END-J	-0.046	-2.387	0.067	-1.94	1.10	-0.04
79	TANGENT	1	END-I	-0.046	-2.387	0.067	-1.94	1.10	-0.04
			END-J	-0.046	-3.155	0.067	-1.94	1.30	8.28
80	TANGENT	1	END-I	-0.046	2.485	0.067	-1.94	1.30	8.28
			END-J	-0.046	1.333	0.067	-1.94	1.60	-0.31
81	BEND	1	END-I	-0.046	-0.855	-0.067	-1.94	-1.60	0.31
			CENTER	0.073	0.139	-0.067	-2.60	0.01	1.59
			END-J	1.155	0.046	-0.067	-1.93	1.61	0.71
82	TANGENT	1	END-I	-3.248	-0.067	-0.046	-1.93	0.71	-1.61
			END-J	3.248	-0.067	-0.046	-1.93	-0.47	0.09
83	TANGENT	1	END-I	0.115	2.904	-0.046	-0.35	1.96	0.09
			END-J	-0.333	-4.264	-0.046	-0.35	0.66	19.16

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
84	TANGENT	1	END-I	28.828	33.344	-0.013	0.01	0.75	-19.16
			END-J	70.773	-37.776	-0.013	0.01	0.31	52.87
85	BEND	1	END-I	68.492	41.770	-0.013	-0.26	0.17	52.87
			CENTER	77.395	22.196	-0.013	-0.21	0.21	10.04
			END-J	80.801	0.887	-0.013	-0.15	0.24	-5.43
86	TANGENT	1	END-I	80.802	0.826	-0.013	-0.15	0.24	-5.43
			END-J	86.272	-2.401	-0.013	-0.15	-0.09	14.11
87	BEND	1	END-I	-3.954	0.705	-0.002	-0.15	-0.09	14.11
			CENTER	-2.754	1.996	-0.002	-0.17	-0.01	10.41
			END-J	-1.402	2.435	-0.002	-0.16	0.07	4.50
88	TANGENT	1	END-I	-1.398	2.437	-0.002	-0.16	0.07	4.50
			END-J	-1.398	-0.123	-0.002	-0.16	0.04	-7.07
89	TANGENT	1	END-I	-1.398	-0.123	-0.002	-0.16	0.04	-7.07
			END-J	-1.398	-2.784	-0.002	-0.16	0.02	8.03
90	TANGENT	1	END-I	-1.398	-2.784	-0.002	-0.16	0.02	8.03
			END-J	-1.398	-3.296	-0.002	-0.16	0.01	14.11
91	TANGENT	1	END-I	2.957	-3.157	0.071	-0.55	0.44	-5.47
			END-J	3.725	-3.157	0.071	-0.55	0.65	4.00
92	TANGENT	1	END-I	3.725	-3.157	0.071	-0.55	0.65	4.00
			END-J	4.109	-3.157	0.071	-0.55	0.76	8.73
93	BEND	1	END-I	4.109	3.157	-0.071	-0.55	-0.76	-8.73
			CENTER	5.849	-1.384	-0.071	-1.03	-0.40	-12.91
			END-J	3.157	-6.120	-0.071	-1.11	0.20	2.43
94	TANGENT	1	END-I	3.157	-6.120	-0.071	-1.11	0.20	2.43
			END-J	3.157	-6.888	-0.071	-1.11	-0.01	21.94
95	BEND	1	END-I	3.157	-0.038	0.032	-1.11	0.01	-21.94
			CENTER	2.917	-1.548	0.032	-0.73	0.91	-18.86
			END-J	1.973	-3.157	0.032	0.17	1.27	-9.62
96	TANGENT	1	END-I	1.973	-3.157	0.032	0.17	1.27	-9.62
			END-J	3.381	-3.157	0.032	0.17	1.44	7.75
97	BEND	1	END-I	3.381	3.157	-0.032	0.17	-1.44	-7.75
			CENTER	5.334	-0.869	-0.032	-0.94	-1.25	-12.99
			END-J	3.157	-5.392	-0.032	-1.60	-0.33	-0.23
98	TANGENT	1	END-I	0.031	-5.392	-0.032	-1.60	-0.33	-0.23
			END-J	0.031	-6.160	-0.032	-1.60	-0.43	17.10
99	TANGENT	1	END-I	0.031	3.258	-0.032	-1.60	-0.43	17.10
			END-J	0.031	2.106	-0.032	-1.60	-0.57	5.03

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
100	TANGENT	1	END-I	0.031	2.106	-0.032	-1.60	-0.57	5.03
			END-J	0.031	0.602	-0.032	-1.60	-0.75	-2.92
101	BEND	1	END-I	0.031	0.032	0.632	-1.60	2.92	-0.75
			CENTER	0.045	0.000	-0.404	1.32	3.45	-0.82
			END-J	0.032	-0.031	-1.409	2.28	-1.79	-0.75
102	TANGENT	1	END-I	2.422	-1.409	0.031	2.28	-0.75	1.79
			END-J	2.422	-2.689	0.031	2.28	-0.60	12.04
103	BEND	1	END-I	2.422	2.689	-0.031	2.28	0.60	-12.04
			CENTER	3.828	0.402	-0.031	2.02	-1.22	-13.98
			END-J	3.292	-2.422	-0.031	0.55	-2.32	-12.77
104	TANGENT	1	END-I	3.292	-0.031	2.422	0.55	-12.77	2.32
			END-J	3.676	-0.031	2.422	0.55	-9.13	2.37
105	TANGENT	1	END-I	3.676	-0.031	2.422	0.55	-9.13	2.37
			END-J	5.468	-0.031	2.422	0.55	7.82	2.59

STATIC SOLUTION TIME LOG

EQUATION SOLUTION = 3.96
 DISPLACEMENT OUTPUT = 0.98
 STRESS RECOVERY = 3.93

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PIPE FORCES AND MOMENTS

RED TH

(2)

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
1	TANGENT	1	END-I	-4.272	-7.053	3.546	-66.62	-43.34	193.86
			END-J	-4.272	-7.053	3.546	-66.62	-38.02	234.44
2	TANGENT	1	END-I	7.053	-4.272	3.546	38.02	-66.62	234.44
			END-J	7.053	-4.272	3.546	38.02	-61.30	210.84
3	TANGENT	1	END-I	-5.027	5.968	3.372	41.49	-36.25	21.78
			END-J	-5.027	5.968	3.372	41.49	-28.67	8.35
4	BEND	1	END-I	-5.027	5.968	3.372	41.49	-28.67	8.35
			CENTER	0.666	7.774	3.372	12.77	-40.67	-12.99
			END-J	5.968	5.027	3.372	-16.02	-28.84	-32.87
5	TANGENT	1	END-I	5.968	5.027	3.372	-16.02	-28.84	-32.87
			END-J	5.968	5.027	3.372	-16.02	-4.40	-69.32
6	TANGENT	1	END-I	5.968	5.027	3.372	-16.02	-4.40	-69.32
			END-J	5.968	5.027	3.372	-16.02	7.40	-86.91
7	TANGENT	1	END-I	5.968	5.027	3.372	-16.02	7.40	-86.91
			END-J	5.968	5.027	3.372	-16.02	33.53	-125.87
8	BEND	1	END-I	5.968	5.027	3.372	-16.02	33.53	-125.87
			CENTER	7.774	-0.666	3.372	16.09	43.98	-132.64
			END-J	5.027	-5.968	3.372	46.18	28.67	-122.34
9	TANGENT	1	END-I	5.027	5.968	-3.372	46.18	-28.67	122.34
			END-J	5.027	5.968	-3.372	46.18	-36.25	108.91
10	TANGENT	1	END-I	5.027	5.968	-3.372	46.18	-36.25	108.91
			END-J	5.027	5.968	-3.372	46.18	-41.31	99.95
11	TANGENT	1	END-I	-5.968	5.027	-3.372	41.31	46.18	99.95
			END-J	-5.968	5.027	-3.372	41.31	-36.43	-23.20
12	TANGENT	1	END-I	-12.864	9.235	-0.174	-23.46	-9.44	-189.06
			END-J	-12.864	9.235	-0.174	-23.46	-19.51	-246.18
13	TANGENT	1	END-I	-10.240	-12.080	0.174	-25.31	4.51	246.18
			END-J	-10.240	-12.080	0.174	-25.31	6.40	377.54
14	TANGENT	1	END-I	-12.080	-10.240	-0.174	6.40	-25.31	-377.54
			END-J	-12.080	-10.240	-0.174	6.40	-30.18	-90.84
15	TANGENT	1	END-I	0.000	0.000	0.000	-0.00	-0.00	0.00
			END-J	0.000	0.000	0.000	-0.00	0.00	-0.00
16	TANGENT	1	END-I	17.286	17.504	-1.157	-14.11	-27.44	90.84
			END-J	17.286	17.504	-1.157	-14.11	-61.03	-417.12
17	TANGENT	1	END-I	21.431	-12.080	-1.157	-62.59	-2.42	-417.12
			END-J	21.431	-12.080	-1.157	-62.59	-5.89	-380.88

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
18	TANGENT	1	ENC-I	-21.431	-12.083	1.157	62.59	-5.89	380.88
			ENC-J	-21.431	-12.083	1.157	62.59	24.20	694.95
19	TANGENT	1	ENC-I	27.399	-7.053	2.214	-103.90	-12.23	-671.75
			ENC-J	27.399	-7.053	2.214	-103.90	48.66	-477.79
20	TANGENT	1	ENC-I	27.399	-7.053	2.214	-103.90	48.66	-477.79
			ENC-J	27.399	-7.053	2.214	-103.90	51.99	-467.21
21	TANGENT	1	ENC-I	-27.047	-5.720	5.056	-98.83	-410.57	-428.53
			ENC-J	-27.047	-5.720	5.056	-98.83	-397.93	-414.23
22	TANGENT	1	ENC-I	-27.047	-5.720	5.056	-98.83	-397.93	-414.23
			ENC-J	-27.047	-5.720	5.056	-98.83	-347.37	-357.03
23	TANGENT	1	ENC-I	-27.047	-5.720	5.056	-98.83	-347.37	-357.03
			ENC-J	-27.047	-5.720	5.056	-98.83	-296.82	-299.83
24	TANGENT	1	ENC-I	-27.047	-5.720	5.056	-98.83	-296.82	-299.83
			ENC-J	-27.047	-5.720	5.056	-98.83	-271.54	-271.23
25	TANGENT	1	ENC-I	-27.047	-5.720	5.056	-98.83	-271.54	-271.23
			ENC-J	-27.047	-5.720	5.056	-98.83	-241.21	-236.91
26	TANGENT	1	ENC-I	-27.047	-21.456	6.756	-98.83	-241.21	-236.91
			ENC-J	-27.047	-21.456	6.756	-98.83	-173.65	-22.35
27	TANGENT	1	ENC-I	-27.047	-21.456	6.756	-98.83	-173.65	-22.35
			ENC-J	-27.047	-21.456	6.756	-98.83	-106.09	192.20
28	TANGENT	1	ENC-I	-27.047	-21.456	6.756	-98.83	-106.09	192.20
			ENC-J	-27.047	-21.456	6.756	-98.83	-38.54	406.76
29	TANGENT	1	ENC-I	-27.047	-21.456	6.756	-98.83	-38.54	406.76
			ENC-J	-27.047	-21.456	6.756	-98.83	29.02	621.31
30	TANGENT	1	ENC-I	-27.047	-21.456	6.756	-98.83	29.02	621.31
			ENC-J	-27.047	-21.456	6.756	-98.83	96.57	835.87
31	TANGENT	1	ENC-I	-27.047	-21.456	6.756	-98.83	96.57	835.87
			ENC-J	-27.047	-21.456	6.756	-98.83	137.10	964.60
32	TANGENT	1	ENC-I	-27.047	-21.456	6.756	-98.83	137.10	964.60
			ENC-J	-27.047	-21.456	6.756	-98.83	179.33	1098.70
33	PEND	1	ENC-I	-27.047	-21.456	6.756	-98.83	179.33	1098.70
			CENTER	-34.296	3.953	6.756	66.81	220.57	1134.95
			ENC-J	-21.456	27.047	6.756	213.10	132.61	1070.75
34	TANGENT	1	ENC-I	-21.456	-27.047	-6.756	213.10	-132.61	-1070.75
			ENC-J	-21.456	-27.047	-6.756	213.10	-287.99	-448.67

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
35	TANGENT	1	ENC-I	-21.456	-27.047	13.988	213.10	-287.99	-448.67
			ENC-J	-21.456	-27.047	13.988	213.10	-148.11	-178.21
36	TANGENT	1	ENC-I	-21.456	-27.047	13.988	213.10	-148.11	-178.21
			ENC-J	-21.456	-27.047	13.988	213.10	-8.24	92.26
37	TANGENT	1	ENC-I	-21.456	-27.047	13.988	213.10	-8.24	92.26
			ENC-J	-21.456	-27.047	13.988	213.10	131.64	362.72
38	TANGENT	1	ENC-I	-21.456	-27.047	13.988	213.10	131.64	362.72
			ENC-J	-21.456	-27.047	13.988	213.10	271.51	633.19
39	TANGENT	1	ENC-I	-21.456	-27.047	13.988	213.10	271.51	633.19
			ENC-J	-21.456	-27.047	13.988	213.10	411.39	903.66
40	TANGENT	1	ENC-I	-21.456	-27.047	13.988	213.10	411.39	903.66
			ENC-J	-21.456	-27.047	13.988	213.10	481.32	1038.89
41	TANGENT	1	ENC-I	-21.456	-27.047	13.988	213.10	481.32	1038.89
			ENC-J	-21.456	-27.047	13.988	213.10	551.26	1174.12
42	TANGENT	1	ENC-I	-219.244	67.335	13.988	213.10	551.26	1174.12
			ENC-J	-219.244	67.335	13.988	213.10	635.19	770.11
43	TANGENT	1	ENC-I	-219.244	67.335	13.988	213.10	635.19	770.11
			ENC-J	-219.244	67.335	13.988	213.10	775.06	96.77
44	TANGENT	1	ENC-I	-219.244	78.272	13.988	213.10	775.06	96.77
			ENC-J	-219.244	78.272	13.988	213.10	900.95	-607.68
45	TANGENT	1	ENC-I	-219.244	78.272	13.988	213.10	900.95	-607.68
			ENC-J	-219.244	78.272	13.988	213.10	1038.85	-1379.36
46	BEND	1	ENC-I	-219.244	-78.272	-13.988	213.10	-1038.85	1379.36
			CENTER	-232.508	11.585	-13.988	-205.98	-1068.09	1445.68
			ENC-J	-210.378	99.678	-13.988	-604.36	-934.73	1335.03
47	TANGENT	1	ENC-I	-210.375	-99.682	13.988	-604.38	934.72	-1335.03
			ENC-J	-210.375	-99.682	13.988	-604.38	1054.79	-479.33
48	BEND	1	ENC-I	-210.375	-13.988	-99.682	-604.38	479.33	1054.79
			CENTER	-158.639	138.878	-99.682	-234.38	413.85	796.11
			ENC-J	-13.960	210.377	-99.682	-19.07	105.90	72.71
49	TANGENT	1	ENC-I	-13.988	78.272	-219.244	-19.08	126.30	-23.47
			ENC-J	-13.988	78.272	-219.244	-19.08	-1627.65	-649.64
50	TANGENT	1	ENC-I	-13.988	-9.585	39.263	-19.08	-1627.65	-649.64
			ENC-J	-13.988	-9.585	39.263	-19.08	-999.45	-496.28
51	TANGENT	1	ENC-I	-13.988	-9.585	39.263	-19.08	-999.45	-496.28
			ENC-J	-13.988	-9.585	39.263	-19.08	-606.82	-400.43

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
52	TANGENT	1	ENC-I	-13.588	-9.585	39.263	-19.08	-606.82	-400.43
			ENC-J	-13.588	-9.585	39.263	-19.08	-214.20	-304.59
53	TANGENT	1	ENC-I	-13.988	-9.585	39.263	-19.08	-214.20	-304.59
			ENC-J	-13.988	-9.585	39.263	-19.08	217.69	-199.15
54	BEND	1	ENC-I	-13.988	39.263	9.585	-19.08	-199.15	-217.69
			CENTER	17.872	37.654	9.585	-140.28	-93.44	-376.99
			ENC-J	39.263	13.988	9.585	-151.23	67.01	-483.94
55	TANGENT	1	ENC-I	-83.726	-9.585	13.988	-151.23	483.94	67.01
			ENC-J	-83.726	-9.585	13.988	-151.23	798.66	282.67
56	BEND	1	ENC-I	-83.726	-13.988	-9.585	-151.23	-282.67	798.66
			CENTER	-65.054	49.312	-9.585	-320.85	-126.83	725.50
			ENC-J	-13.988	83.726	-9.585	-330.59	103.30	449.97
57	TANGENT	1	ENC-I	-13.112	-10.752	-83.726	-368.06	419.88	-103.30
			ENC-J	-13.112	-10.752	-83.726	-368.06	-1040.68	84.26
58	BEND	1	ENC-I	-9.585	13.988	-83.726	-1005.18	456.18	84.26
			CENTER	3.113	16.668	-83.726	-424.99	944.53	65.21
			ENC-J	13.988	9.585	-83.726	330.59	879.59	48.90
59	TANGENT	1	ENC-I	9.585	-83.726	13.988	879.59	48.90	330.59
			ENC-J	9.585	-83.726	13.988	879.59	89.89	575.91
60	TANGENT	1	ENC-I	9.585	-83.726	13.988	879.59	89.89	575.91
			ENC-J	9.585	-83.726	13.988	879.59	145.84	910.81
61	TANGENT	1	ENC-I	-3.157	-0.001	0.001	0.00	-0.04	-0.05
			ENC-J	-3.157	-0.001	0.001	0.00	0.08	0.10
62	TANGENT	1	ENC-I	-0.002	1.824	-2.577	0.00	0.11	0.08
			ENC-J	-0.002	1.824	-2.577	0.00	-5.36	-3.79
63	TANGENT	1	ENC-I	-12.450	54.347	1.244	-39.91	-17.02	466.34
			ENC-J	-12.450	54.347	1.244	-39.91	-7.50	50.67
64	BEND	1	ENC-I	-1.550	-55.733	-1.244	-40.61	-0.47	-50.67
			CENTER	-40.505	-38.313	-1.244	-30.87	23.98	144.11
			ENC-J	-55.733	1.550	-1.244	-6.70	34.39	220.25
65	TANGENT	1	ENC-I	-55.733	1.244	1.550	-6.70	-220.25	34.39
			ENC-J	-55.733	1.244	1.550	-6.70	-197.00	15.72
66	TANGENT	1	ENC-I	-55.733	1.244	1.550	-6.70	-197.00	15.72
			ENC-J	-55.733	1.244	1.550	-6.70	-168.43	-7.21
67	BEND	1	ENC-I	-55.733	1.244	1.550	-6.70	-168.43	-7.21
			CENTER	-51.815	22.477	1.550	-70.05	-150.09	-30.80
			ENC-J	-38.531	40.288	1.550	-121.56	-108.89	-93.22

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
68	TANGENT	1	ENC-I	-38.530	40.289	1.550	-121.57	-108.89	-93.22
			ENC-J	-38.530	40.289	1.550	-121.57	-102.15	-268.26
69	BEND	1	ENC-I	-38.530	-40.289	-1.550	-121.57	102.15	268.26
			CENTER	-51.012	-22.483	-1.550	-73.83	137.93	330.67
			ENC-J	-55.733	-1.257	-1.550	-16.03	152.71	354.27
70	TANGENT	1	ENC-I	-55.733	1.244	1.550	-16.00	-152.72	-354.27
			ENC-J	-55.733	1.244	1.550	-16.00	-122.60	-378.45
71	TANGENT	1	ENC-I	-55.733	1.244	1.550	-16.00	-122.60	-378.45
			ENC-J	-55.733	1.244	1.550	-16.00	-107.10	-390.89
72	BEND	1	ENC-I	-55.733	-0.295	-1.966	-16.00	-104.22	391.67
			CENTER	-39.618	39.201	-1.966	-85.87	-64.47	367.50
			ENC-J	-0.295	55.733	-1.966	-107.17	13.05	308.51
73	TANGENT	1	ENC-I	-0.295	55.733	-1.966	-107.18	13.05	308.51
			ENC-J	-0.295	55.733	-1.966	-107.18	8.00	165.25
74	BEND	1	ENC-I	-7.015	-9.538	55.733	-107.40	-165.11	8.00
			CENTER	-10.836	-4.777	55.733	-138.31	49.36	27.10
			ENC-J	-11.771	1.268	55.733	-58.17	250.69	31.78
75	TANGENT	1	ENC-I	-11.774	55.733	-1.244	-58.67	31.78	-250.57
			ENC-J	-11.774	55.733	-1.244	-58.67	22.91	-647.95
76	TANGENT	1	ENC-I	-11.774	-39.243	-1.244	-58.67	22.91	-647.95
			ENC-J	-11.774	-39.243	-1.244	-58.67	14.82	-392.87
77	TANGENT	1	ENC-I	-11.774	-39.243	-1.244	-58.67	14.82	-392.87
			ENC-J	-11.774	-39.243	-1.244	-58.67	11.09	-275.14
78	TANGENT	1	ENC-I	-11.774	-39.243	-1.244	-58.67	11.09	-275.14
			ENC-J	-11.774	-39.243	-1.244	-58.67	9.84	-235.90
79	TANGENT	1	ENC-I	-11.774	-39.243	-1.244	-58.67	9.84	-235.90
			ENC-J	-11.774	-39.243	-1.244	-58.67	6.11	-118.17
80	TANGENT	1	ENC-I	-11.774	-848.279	-1.244	-58.67	6.11	-118.17
			ENC-J	-11.774	-848.279	-1.244	-58.67	0.51	3699.09
81	BEND	1	ENC-I	-11.774	-867.464	1.244	-58.67	-0.51	-3699.09
			CENTER	-621.715	-605.065	1.244	-40.03	45.52	-649.38
			ENC-J	-867.464	11.774	1.244	5.71	64.89	579.37
82	TANGENT	1	ENC-I	-31.369	1.244	-11.774	5.71	579.37	-64.89
			ENC-J	-31.369	1.244	-11.774	5.71	280.60	-96.47
83	TANGENT	1	ENC-I	3.199	31.230	-11.774	279.70	-23.20	-96.47
			ENC-J	3.199	31.230	-11.774	279.70	-353.51	-972.61

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LTR 1144 26

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
84	TANGENT	1	END-I	-17.007	26.387	11.774	-89.07	-441.90	972.61
			END-J	-17.007	26.387	11.774	-89.07	-59.16	114.84
85	BEND	1	END-I	-31.369	-1.244	11.774	5.71	-136.77	114.84
			CENTER	-30.592	7.053	11.774	-20.50	-89.03	110.95
			END-J	-27.661	14.847	11.774	-41.12	-65.03	96.30
86	TANGENT	1	END-I	-27.649	14.868	11.774	-41.17	-64.99	96.30
			END-J	-27.649	14.868	11.774	-41.17	227.07	-272.52
87	BEND	1	END-I	-27.662	14.845	11.774	-41.36	227.04	-272.52
			CENTER	-16.666	26.674	11.774	84.36	246.86	-327.50
			END-J	-1.287	31.367	11.774	203.37	201.77	-404.40
88	TANGENT	1	END-I	-1.244	31.369	11.774	203.65	201.49	-404.40
			END-J	-1.244	31.369	11.774	203.65	319.23	-718.08
89	TANGENT	1	END-I	-1.244	31.369	11.774	203.65	319.23	-718.08
			END-J	-1.244	31.369	11.774	203.65	441.62	-1044.16
90	TANGENT	1	END-I	-1.244	31.369	11.774	203.65	441.62	-1044.16
			END-J	-1.244	31.369	11.774	203.65	465.17	-1106.90
91	TANGENT	1	END-I	-4.272	7.053	3.546	-66.62	43.34	193.86
			END-J	-4.272	7.053	3.546	-66.62	53.98	172.70
92	TANGENT	1	END-I	-4.272	7.053	3.546	-66.62	53.98	172.70
			END-J	-4.272	7.053	3.546	-66.62	59.30	162.12
93	BEND	1	END-I	-4.272	-7.053	-3.546	-66.62	-59.30	-162.12
			CENTER	-8.008	-1.967	-3.546	-94.23	-7.36	-143.44
			END-J	-7.053	4.272	-3.546	-77.03	48.89	-148.21
94	TANGENT	1	END-I	-7.053	4.272	-3.546	-77.03	48.89	-148.21
			END-J	-7.053	4.272	-3.546	-77.03	38.25	-161.03
95	BEND	1	END-I	-7.053	-4.272	3.546	-77.03	-38.25	161.03
			CENTER	-8.008	1.967	3.546	-76.32	39.96	165.80
			END-J	-4.272	7.053	3.546	-20.52	94.76	147.12
96	TANGENT	1	END-I	-4.272	7.053	3.546	-20.52	94.76	147.12
			END-J	-4.272	7.053	3.546	-20.52	114.26	108.33
97	BEND	1	END-I	-4.272	-7.053	-3.546	-20.52	-114.26	-108.33
			CENTER	-8.008	-1.967	-3.546	-100.50	-78.82	-89.65
			END-J	-7.053	4.272	-3.546	-131.99	2.79	-94.42
98	TANGENT	1	END-I	-7.053	4.272	-3.546	-131.99	2.79	-94.42
			END-J	-7.053	4.272	-3.546	-131.99	-7.85	-107.24
99	TANGENT	1	END-I	-7.053	4.272	-3.546	-131.99	-7.85	-107.24
			END-J	-7.053	4.272	-3.546	-131.99	-23.80	-126.46

114426

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
100	TANGENT	1	END-I	-7.053	4.272	-3.546	-131.99	-23.80	-126.46
			END-J	-7.053	4.272	-3.546	-131.99	-44.64	-151.55
101	BEND	1	END-I	-7.053	3.546	4.272	-131.99	151.55	-44.64
			CENTER	-2.480	7.495	4.272	20.09	215.60	-67.50
			END-J	3.546	7.053	4.272	172.91	153.35	-97.63
102	TANGENT	1	END-I	-266.870	4.272	-7.053	172.91	-97.63	-153.35
			END-J	-266.870	4.272	-7.053	172.91	-132.90	-174.70
103	BEND	1	END-I	-266.870	-4.272	7.053	172.91	132.90	174.70
			CENTER	-191.726	185.685	7.053	219.34	-20.81	61.99
			END-J	-4.272	266.870	7.053	143.48	-162.33	-219.19
104	TANGENT	1	END-I	-4.272	7.053	-266.870	143.48	-219.19	162.33
			END-J	-4.272	7.053	-266.870	143.48	-619.50	151.75
105	TANGENT	1	END-I	-4.272	7.053	-266.870	143.48	-619.50	151.75
			END-J	-4.272	7.053	-266.870	143.48	-2487.59	102.38

STATIC SOLUTION TIME LOG

EQUATION SOLUTION = 5.37
DISPLACEMENT OUTPLT = 0.93
STRESS RECOVERY = 4.01

RED LOCE

(3)

LTR 1 4 4 26

EL NO	END	TX	MY	MZ	RES-MR	END	TX	MY	MZ	RES-MR
1	I	135.	159.	25.	210.	J	135.	185.	33.	231.
2	I	185.	135.	33.	231.	J	185.	110.	37.	218.
3	I	537.	552.	24.	770.	J	537.	372.	13.	653.
4	C	230.	416.	11.	475.	J	70.	255.	43.	268.
5	I	70.	255.	43.	268.	J	70.	462.	118.	482.
6	I	70.	462.	118.	482.	J	70.	359.	57.	373.
7	I	70.	359.	57.	370.	J	70.	197.	78.	223.
8	C	135.	152.	141.	247.	J	206.	77.	210.	304.
9	I	206.	77.	210.	304.	J	206.	125.	257.	352.
10	I	206.	125.	257.	352.	J	206.	155.	290.	388.
11	I	155.	206.	290.	388.	J	155.	307.	144.	373.
12	I	599.	504.	60.	785.	J	599.	144.	31.	617.
13	I	558.	260.	31.	616.	J	558.	261.	29.	625.
14	I	281.	559.	29.	625.	J	281.	1190.	13.	1223.
15	I	0.	1440.	207.	1455.	J	0.	0.	0.	0.
16	I	139.	783.	220.	825.	J	139.	248.	445.	528.
17	I	243.	147.	445.	528.	J	243.	166.	524.	601.
18	I	243.	166.	524.	601.	J	243.	687.	426.	844.
19	I	289.	615.	570.	887.	J	289.	643.	649.	958.
20	I	289.	643.	649.	958.	J	289.	692.	676.	1010.
21	I	196.	368.	739.	849.	J	196.	304.	696.	784.
22	I	196.	304.	696.	784.	J	196.	256.	476.	575.
23	I	196.	256.	476.	575.	J	196.	502.	375.	657.
24	I	196.	502.	375.	657.	J	196.	642.	496.	835.
25	I	196.	642.	496.	835.	J	196.	809.	729.	1106.
26	I	196.	809.	729.	1106.	J	196.	409.	301.	544.
27	I	196.	409.	301.	544.	J	196.	438.	458.	663.
28	I	196.	438.	458.	663.	J	196.	604.	658.	914.
29	I	196.	604.	658.	914.	J	196.	602.	592.	867.
30	I	196.	602.	592.	867.	J	196.	432.	274.	548.
31	I	196.	432.	274.	548.	J	196.	302.	178.	402.
32	I	196.	302.	178.	402.	J	196.	187.	464.	537.
33	C	122.	197.	614.	656.	J	138.	182.	592.	635.
34	I	138.	182.	592.	635.	J	138.	828.	838.	1186.
35	I	138.	828.	838.	1186.	J	138.	752.	117.	773.
36	I	138.	752.	117.	773.	J	138.	795.	683.	1057.
37	I	138.	795.	683.	1057.	J	138.	822.	893.	1222.
38	I	138.	822.	893.	1222.	J	138.	753.	594.	969.
39	I	138.	753.	594.	969.	J	138.	623.	140.	653.
40	I	138.	623.	140.	653.	J	138.	569.	551.	804.
41	I	138.	569.	551.	804.	J	138.	533.	995.	1137.
42	I	138.	533.	995.	1137.	J	138.	511.	601.	801.
43	I	138.	511.	601.	801.	J	138.	478.	760.	908.
44	I	138.	478.	760.	908.	J	138.	402.	360.	557.
45	I	138.	402.	360.	557.	J	138.	388.	386.	564.
46	C	247.	359.	420.	605.	J	362.	294.	401.	615.
47	I	362.	254.	401.	615.	J	362.	613.	234.	749.
48	C	338.	216.	684.	793.	J	259.	265.	612.	715.
49	I	259.	508.	433.	716.	J	259.	658.	546.	893.
50	I	259.	658.	546.	893.	J	259.	413.	478.	683.
51	I	259.	413.	478.	683.	J	259.	575.	475.	790.
52	I	259.	575.	475.	790.	J	259.	698.	443.	865.
53	I	259.	698.	440.	865.	J	259.	944.	437.	1072.
54	C	229.	442.	964.	1085.	J	439.	217.	782.	923.
55	I	439.	782.	217.	923.	J	439.	1100.	581.	1319.
56	C	649.	353.	1270.	1469.	J	675.	213.	1100.	1308.
57	I	677.	1100.	213.	1309.	J	677.	331.	1210.	1425.
58	C	623.	556.	871.	1207.	J	820.	256.	245.	893.
59	I	256.	245.	820.	893.	J	256.	76.	543.	605.
60	I	256.	76.	543.	605.	J	256.	357.	350.	562.

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62	I	0.	0.	J.	0.	J	0.	3.	4.	5.
63	I	331.	341.	563.	724.	J	301.	121.	542.	632.
64	C	213.	274.	673.	757.	J	181.	358.	599.	721.
65	I	181.	599.	358.	721.	J	181.	165.	304.	390.
66	I	181.	165.	304.	390.	J	181.	657.	588.	900.
67	C	323.	612.	601.	917.	J	506.	487.	596.	921.
68	I	536.	487.	596.	921.	J	506.	481.	607.	925.
69	C	338.	592.	625.	925.	J	219.	624.	632.	915.
70	I	219.	624.	632.	915.	J	219.	135.	291.	388.
71	I	219.	135.	291.	388.	J	219.	593.	372.	733.
72	C	357.	330.	597.	770.	J	455.	213.	561.	753.
73	I	455.	213.	561.	753.	J	455.	248.	411.	661.
74	C	326.	391.	238.	562.	J	225.	350.	226.	473.
75	I	225.	226.	349.	473.	J	225.	186.	399.	494.
76	I	225.	186.	399.	494.	J	225.	174.	141.	317.
77	I	225.	174.	141.	317.	J	225.	172.	26.	284.
78	I	225.	172.	26.	284.	J	225.	171.	26.	284.
79	I	225.	171.	26.	284.	J	225.	167.	141.	314.
80	I	225.	167.	141.	314.	J	225.	157.	242.	366.
81	C	138.	210.	571.	624.	J	134.	175.	772.	803.
82	I	134.	772.	175.	803.	J	134.	389.	544.	682.
83	I	392.	126.	544.	682.	J	392.	901.	266.	1018.
84	I	682.	708.	266.	1018.	J	682.	1450.	11.	1602.
85	C	539.	1430.	2.	1528.	J	158.	1430.	1.	1439.
86	I	157.	1430.	1.	1439.	J	157.	495.	1.	519.
87	C	372.	324.	0.	493.	J	475.	71.	0.	480.
88	I	475.	70.	0.	480.	J	475.	62.	0.	479.
89	I	475.	62.	0.	479.	J	475.	198.	0.	515.
90	I	475.	158.	0.	515.	J	475.	224.	0.	525.
91	I	135.	159.	25.	210.	J	135.	119.	8.	180.
92	I	135.	119.	8.	180.	J	135.	109.	0.	174.
93	C	70.	168.	16.	183.	J	151.	134.	16.	203.
94	I	151.	134.	16.	203.	J	151.	172.	13.	229.
95	C	16.	218.	15.	219.	J	158.	138.	9.	210.
96	I	158.	138.	9.	210.	J	158.	107.	24.	192.
97	C	56.	148.	33.	161.	J	54.	103.	23.	118.
98	I	54.	103.	23.	118.	J	54.	56.	34.	85.
99	I	54.	56.	34.	85.	J	54.	30.	31.	69.
100	I	54.	30.	31.	69.	J	54.	150.	29.	162.
101	C	19.	56.	195.	204.	J	30.	54.	150.	162.
102	I	30.	150.	54.	162.	J	30.	38.	57.	74.
103	C	5.	23.	54.	59.	J	3.	5.	45.	45.
104	I	3.	45.	5.	45.	J	3.	32.	40.	51.
105	I	3.	32.	40.	51.	J	3.	28.	205.	207.

IHC900I EXECUTION TERMINATING DUE TO ERROR COUNT FOR ERROR NUMBER 217

IHC217I FIOCS - END OF DATA SET ON UNIT 11

TRACEBACK ROUTINE CALLED FROM ISN REG. 14 REG. 15 REG. 0 REG. 1

IBCCM 00031A3C 00031D16 0000006A 00031A28

MAIN 00011EA8 010317D8 FD000008 000497F8

ENTRY POINT= 010317D8

LR1144 26

EL	NC	END	TX	MY	MZ	RES-MR	END	TX	MY	MZ	RES-MR
1	I		15.	27.	12.	33.	J	15.	33.	16.	39.
2	I		33.	15.	16.	39.	J	33.	9.	18.	39.
3	I		9.	17.	11.	22.	J	9.	19.	7.	22.
4	C		17.	21.	5.	28.	J	27.	20.	21.	40.
5	I		27.	20.	21.	40.	J	27.	42.	58.	77.
6	I		27.	42.	58.	77.	J	27.	41.	28.	56.
7	I		27.	41.	28.	56.	J	27.	101.	39.	112.
8	C		71.	110.	68.	148.	J	136.	62.	96.	178.
9	I		136.	62.	96.	178.	J	136.	84.	112.	195.
10	I		136.	84.	112.	195.	J	136.	99.	123.	208.
11	I		99.	136.	123.	208.	J	99.	125.	78.	177.
12	I		14.	25.	29.	41.	J	14.	35.	15.	40.
13	I		11.	36.	15.	40.	J	11.	57.	14.	59.
14	I		57.	11.	14.	59.	J	57.	57.	6.	81.
15	I		0.	57.	88.	131.	J	0.	0.	0.	0.
16	I		67.	105.	95.	156.	J	67.	172.	192.	266.
17	I		176.	56.	192.	266.	J	176.	62.	243.	306.
18	I		176.	62.	243.	306.	J	176.	142.	227.	320.
19	I		273.	74.	305.	416.	J	273.	239.	240.	435.
20	I		273.	239.	240.	435.	J	273.	251.	265.	456.
21	I		242.	212.	165.	362.	J	242.	141.	152.	319.
22	I		242.	141.	152.	319.	J	242.	258.	92.	365.
23	I		242.	258.	92.	365.	J	242.	583.	37.	632.
24	I		242.	583.	37.	632.	J	242.	746.	49.	786.
25	I		242.	746.	49.	786.	J	242.	941.	51.	976.
26	I		242.	941.	51.	976.	J	242.	618.	84.	669.
27	I		242.	618.	84.	669.	J	242.	323.	81.	412.
28	I		242.	323.	81.	412.	J	242.	141.	70.	289.
29	I		242.	141.	70.	289.	J	242.	214.	46.	326.
30	I		242.	214.	46.	326.	J	242.	288.	13.	376.
31	I		242.	288.	13.	376.	J	242.	283.	21.	373.
32	I		242.	283.	21.	373.	J	242.	239.	50.	344.
33	C		128.	267.	62.	303.	J	190.	176.	59.	266.
34	I		190.	176.	59.	266.	J	190.	922.	46.	942.
35	I		190.	922.	46.	942.	J	190.	985.	19.	1003.
36	I		190.	985.	19.	1003.	J	190.	1060.	17.	1077.
37	I		190.	1060.	17.	1077.	J	190.	1090.	41.	1107.
38	I		190.	1090.	41.	1107.	J	190.	1070.	65.	1089.
39	I		190.	1070.	65.	1089.	J	190.	567.	87.	989.
40	I		190.	567.	87.	989.	J	190.	893.	98.	918.
41	I		190.	893.	98.	918.	J	190.	803.	108.	832.
42	I		190.	803.	108.	832.	J	190.	678.	285.	760.
43	I		190.	678.	285.	760.	J	190.	458.	936.	1059.
44	I		190.	458.	936.	1059.	J	190.	350.	544.	674.
45	I		190.	350.	544.	674.	J	190.	517.	370.	664.
46	C		357.	485.	381.	713.	J	517.	389.	353.	737.
47	I		517.	389.	353.	737.	J	517.	731.	269.	935.
48	C		478.	320.	812.	995.	J	374.	352.	766.	922.
49	I		374.	726.	427.	922.	J	374.	827.	602.	1089.
50	I		374.	627.	602.	1089.	J	374.	488.	240.	660.
51	I		374.	488.	240.	660.	J	374.	673.	474.	904.
52	I		374.	673.	474.	904.	J	374.	999.	646.	1247.
53	I		374.	999.	646.	1247.	J	374.	1390.	649.	1579.
54	C		190.	655.	1360.	1519.	J	554.	281.	1040.	1211.
55	I		554.	1040.	281.	1211.	J	554.	1670.	815.	1439.
56	C		190.	391.	1920.	2218.	J	1090.	285.	1660.	2006.
57	I		190.	1920.	285.	2006.	J	1070.	511.	701.	1377.
58	C		190.	511.	701.	1377.	J	1310.	377.	348.	1407.
59	I		190.	377.	348.	1407.	J	377.	44.	831.	914.
60	I		190.	44.	831.	914.	J	377.	697.	935.	931.

RED
SEISMIC

(4)

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LTR1144
26

62	I	97.	170.	251.	318.	J	97.	90.	163.	210.
63	I	97.	170.	251.	318.	J	97.	90.	163.	210.
64	C	116.	99.	138.	206.	J	154.	62.	118.	204.
65	I	154.	118.	62.	204.	J	154.	52.	214.	269.
66	I	154.	52.	214.	269.	J	154.	107.	267.	326.
67	C	150.	115.	258.	320.	J	134.	137.	248.	313.
68	I	134.	137.	248.	313.	J	134.	146.	231.	304.
69	C	156.	124.	225.	301.	J	170.	104.	215.	293.
70	I	170.	104.	215.	293.	J	170.	72.	108.	214.
71	I	170.	72.	108.	214.	J	170.	122.	231.	312.
72	C	113.	162.	256.	323.	J	102.	177.	256.	328.
73	I	102.	177.	256.	328.	J	102.	193.	191.	290.
74	C	146.	93.	184.	253.	J	146.	88.	172.	242.
75	I	146.	172.	88.	242.	J	146.	142.	265.	334.
76	I	146.	142.	265.	334.	J	146.	120.	92.	210.
77	I	146.	120.	92.	210.	J	146.	110.	12.	183.
78	I	146.	110.	12.	183.	J	146.	106.	15.	181.
79	I	146.	106.	15.	181.	J	146.	94.	95.	198.
80	I	146.	94.	95.	198.	J	146.	74.	45.	170.
81	C	81.	119.	101.	176.	J	43.	105.	135.	176.
82	I	43.	135.	105.	176.	J	43.	73.	315.	326.
83	I	73.	44.	315.	326.	J	73.	170.	154.	241.
84	I	137.	124.	154.	241.	J	137.	292.	6.	323.
85	C	108.	267.	1.	307.	J	32.	288.	1.	290.
86	I	32.	288.	1.	290.	J	32.	100.	1.	134.
87	C	75.	65.	0.	99.	J	95.	14.	0.	96.
88	I	95.	14.	0.	96.	J	95.	12.	0.	96.
89	I	95.	12.	0.	96.	J	95.	40.	0.	103.
90	I	95.	40.	0.	103.	J	95.	45.	0.	106.
91	I	15.	27.	12.	33.	J	15.	14.	4.	21.
92	I	15.	14.	4.	21.	J	15.	8.	0.	17.
93	C	11.	3.	7.	14.	J	14.	8.	7.	17.
94	I	14.	3.	7.	17.	J	14.	21.	2.	25.
95	C	4.	21.	7.	22.	J	16.	9.	3.	18.
96	I	16.	9.	3.	18.	J	16.	4.	12.	20.
97	C	10.	10.	16.	21.	J	2.	11.	6.	12.
98	I	2.	11.	6.	12.	J	2.	7.	6.	10.
99	I	2.	7.	6.	10.	J	2.	3.	4.	5.
100	I	2.	3.	4.	5.	J	2.	5.	2.	5.
101	C	2.	1.	7.	8.	J	2.	2.	6.	6.
102	I	2.	6.	2.	6.	J	2.	1.	4.	4.
103	C	1.	1.	4.	4.	J	0.	1.	3.	3.
104	I	0.	3.	1.	3.	J	0.	2.	1.	3.
105	I	0.	2.	1.	3.	J	0.	2.	7.	7.

IPC5001 EXECUTION TERMINATING DUE TO ERROR COUNT FOR ERROR NUMBER 217

—IPC2171-FICCS - END OF DATA SET ON UNIT 11

TRACEBACK ROUTINE CALLED FROM ISN REG. 14 REG. 15 REG. 0 REG. 1

IBCCM 001C545C 001C5038 0000006A 001C5448

MAIN 000114C0 011C57F8 FD000008 001007F8

ENTRY PCINT= 011C57F8

LTR1144 26

C. BLUE MODEL MOMENTS

PIPE FORCES AND MOMENTS

BLUE
WT.

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
1	TANGENT	1	END-I	8.282	4.180	-8.987	-56.02	109.80	-93.65
			END-J	8.282	-2.000	-8.987	-56.02	51.96	-100.67
2	TANGENT	1	END-I	8.282	-2.000	-8.987	-56.02	51.96	-100.67
			END-J	8.282	-10.764	-8.987	-56.02	-30.09	-42.40
3	BEND	1	END-I	8.282	8.987	-10.764	-56.02	42.40	-30.09
			CENTER	12.211	0.498	-13.592	-22.51	-37.10	-44.82
			END-J	8.987	-8.282	-16.419	-5.67	2.16	-32.73
4	TANGENT	1	END-I	8.987	-16.419	0.778	-5.67	-32.73	-2.16
			END-J	8.987	-24.219	0.778	-5.67	-26.41	162.94
5	TANGENT	1	END-I	8.987	-24.219	0.778	-5.67	-26.41	162.94
			END-J	8.987	-28.059	0.778	-5.67	-23.30	267.49
6	TANGENT	1	END-I	8.987	-28.059	0.778	-5.67	-23.30	267.49
			END-J	8.987	-37.217	0.778	-5.67	-20.09	402.13
7	TANGENT	1	END-I	37.217	-8.987	-0.778	20.09	-5.67	-402.13
			END-J	46.374	-8.987	-0.778	20.09	2.46	-365.06
8	TANGENT	1	END-I	46.374	-8.987	-0.778	20.09	2.46	-365.06
			END-J	73.014	-8.987	-0.778	20.09	-6.87	-257.22
9	TANGENT	1	END-I	73.014	-8.987	-0.778	20.09	-6.87	-257.22
			END-J	108.534	-8.987	-0.778	20.09	-19.31	-113.43
10	TANGENT	1	END-I	108.534	-8.987	-0.778	20.09	-19.31	-113.43
			END-J	144.054	-8.987	-0.778	20.09	-31.75	30.35
11	TANGENT	1	END-I	144.054	-8.987	-0.778	20.09	-31.75	30.35
			END-J	159.772	-8.987	-0.778	20.09	-37.26	93.98
12	TANGENT	1	END-I	8.282	-4.180	4.123	-56.02	-109.80	-93.65
			END-J	8.282	-9.940	4.123	-56.02	-85.07	-51.29
13	TANGENT	1	END-I	8.282	-9.940	4.123	-56.02	-85.07	-51.29
			END-J	8.282	-13.780	4.123	-56.02	-68.57	-3.85
14	BEND	1	END-I	8.282	13.780	-4.123	-56.02	68.57	-3.85
			CENTER	22.265	10.552	-4.123	-6.22	51.66	-127.00
			END-J	32.630	-8.282	-4.123	17.04	4.49	-150.49
15	TANGENT	1	END-I	-60.719	-4.123	8.282	17.04	-150.49	-4.49
			END-J	-52.199	-4.123	8.282	17.04	-76.98	32.11
16	TANGENT	1	END-I	-52.199	-4.123	8.282	17.04	-76.98	32.11
			END-J	-43.679	-4.123	8.282	17.04	-3.48	68.70
17	TANGENT	1	END-I	-43.679	20.999	-1.425	17.04	-3.48	68.70
			END-J	-35.159	20.999	-1.425	17.04	-16.12	-117.67

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
18	BEND	1	END-I	-35.159	-20.999	1.425	17.04	16.12	117.67
			CENTER	-33.046	3.348	1.425	28.66	11.94	197.32
			END-J	-20.999	16.309	1.425	33.93	0.77	90.67
19	TANGENT	1	END-I	1.545	16.309	1.425	33.93	0.77	90.67
			END-J	1.545	8.629	1.425	33.93	12.17	-9.08
20	TANGENT	1	END-I	-16.200	-0.000	-0.000	-0.00	-0.00	7.70
			END-J	-15.781	-0.000	-0.000	-0.00	-0.00	7.70
21	TANGENT	1	END-I	-15.685	1.738	-0.000	-0.00	-0.00	7.70
			END-J	-14.909	1.652	-0.000	-0.00	-0.00	-0.00
22	TANGENT	1	END-I	-15.000	-0.000	-0.000	0.00	-0.00	-0.00
			END-J	-0.000	-0.000	-0.000	0.00	0.0	0.00
23	TANGENT	1	END-I	2.803	-7.160	-1.614	-5.41	11.33	-33.82
			END-J	3.147	-8.883	-1.614	-5.41	-5.15	48.08
24	TANGENT	1	END-I	-26.917	-57.782	-15.313	-285.76	57.28	-484.02
			END-J	-28.837	-67.777	-15.313	-285.76	-105.08	181.59
25	TANGENT	1	END-I	-19.034	-72.000	10.654	101.76	-157.10	301.06
			END-J	-19.034	-73.536	10.654	101.76	-140.05	417.49
26	TANGENT	1	END-I	-19.034	-73.536	10.654	101.76	-140.05	417.49
			END-J	-19.034	-76.416	10.654	101.76	-108.08	642.42
27	TANGENT	1	END-I	125.437	-1.314	2.363	-8.77	-37.01	-63.90
			END-J	124.387	-1.314	2.363	-8.77	-30.80	-60.45
28	TANGENT	1	END-I	124.387	-1.314	2.363	-8.77	-30.80	-60.45
			END-J	121.437	-1.314	2.363	-8.77	-13.37	-50.76
29	TANGENT	1	END-I	121.437	-1.314	2.363	-8.77	-13.37	-50.76
			END-J	120.037	-1.314	2.363	-8.77	-5.10	-46.16
30	TANGENT	1	END-I	120.037	-1.314	2.363	-8.77	-5.10	-46.16
			END-J	105.037	-1.314	2.363	-8.77	6.72	-39.59
31	TANGENT	1	END-I	111.000	-0.640	2.446	0.0	-73.37	-19.21
			END-J	0.000	-0.640	2.446	0.0	0.00	-0.00
32	TANGENT	1	END-I	0.082	-5.963	0.674	20.37	-8.77	-80.08
			END-J	0.082	-34.463	0.674	20.37	-2.37	111.94
33	TANGENT	1	END-I	0.082	10.881	0.189	20.37	-2.37	111.94
			END-J	0.082	1.182	0.189	20.37	1.93	-25.70
34	BEND	1	END-I	0.082	0.189	-1.182	20.37	-25.70	-1.93
			CENTER	0.165	0.123	1.033	4.30	-32.67	-2.76
			END-J	0.204	0.024	3.247	-10.18	-19.70	-3.15

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TR 1144 26

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
35	TANGENT	1	END-I	0.204	-3.247	0.024	-10.19	3.15	-19.69
			END-J	0.204	-4.126	0.024	-10.19	3.20	-12.07
36	TANGENT	1	END-I	0.204	-4.126	0.024	-10.19	3.20	-12.07
			END-J	0.204	-5.435	0.024	-10.19	3.27	-2.66
37	BEND	1	END-I	0.204	5.435	-0.024	-10.19	-3.27	-2.66
			CENTER	4.695	4.407	-0.024	-9.54	4.84	-15.01
			END-J	7.437	-0.203	-0.024	-3.35	10.12	-20.53
38	TANGENT	1	END-I	-35.259	-0.189	0.082	-3.35	-1.60	-22.83
			END-J	-31.434	-0.189	0.082	-3.35	-0.86	-21.14
39	TANGENT	1	END-I	-31.434	-0.189	0.082	-3.35	-0.86	-21.14
			END-J	-22.934	-0.189	0.082	-3.35	0.78	-17.36
40	TANGENT	1	END-I	-22.934	-0.189	0.082	-3.35	0.78	-17.36
			END-J	-18.684	-0.189	0.082	-3.35	1.61	-15.48
41	TANGENT	1	END-I	-18.684	-0.189	0.082	-3.35	1.61	-15.48
			END-J	-14.859	-0.189	0.082	-3.35	2.35	-13.78
42	TANGENT	1	END-I	-14.859	-0.189	0.082	-3.35	2.35	-13.78
			END-J	-13.159	-0.189	0.082	-3.35	2.68	-13.03
43	TANGENT	1	END-I	-13.159	-0.189	0.082	-3.35	2.68	-13.03
			END-J	-11.459	-0.189	0.082	-3.35	3.01	-12.27
44	TANGENT	1	END-I	-11.459	-1.187	-0.039	-3.35	3.01	-12.27
			END-J	-6.465	-1.187	-0.039	-3.35	2.56	1.68
45	BEND	1	END-I	-6.465	-1.187	-0.039	-3.35	2.56	1.68
			CENTER	-3.051	1.372	-0.039	-0.67	3.90	-2.42
			END-J	-1.187	-0.211	-0.039	2.17	2.96	-8.61
46	TANGENT	1	END-I	0.294	-0.211	-0.039	2.17	2.96	-8.61
			END-J	0.294	-2.336	-0.039	2.17	2.77	-2.24
47	BEND	1	END-I	0.294	2.336	0.039	2.17	-2.77	2.24
			CENTER	2.567	2.152	0.039	-0.39	-3.41	-3.46
			END-J	4.338	0.294	0.039	-2.65	-2.05	-6.07
48	TANGENT	1	END-I	-20.536	0.294	-0.039	-2.65	2.05	6.07
			END-J	-10.642	0.294	-0.039	-2.65	1.16	-0.77
49	TANGENT	1	END-I	-10.642	0.294	-0.039	-2.65	1.16	-0.77
			END-J	-5.555	0.294	-0.039	-2.65	0.69	-4.29
50	BEND	1	END-I	-5.555	-0.294	0.039	-2.65	-0.69	4.29
			CENTER	-1.775	1.360	0.039	-2.25	1.66	-3.45
			END-J	-0.294	-1.121	0.039	-0.31	3.04	-5.82

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LR1144 26

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
51	TANGENT	1	END-I	-0.294	-1.121	0.039	-0.31	3.04	-5.82
			END-J	-0.294	-1.971	0.039	-0.31	3.11	-2.73
52	BEND	1	END-I	0.254	1.971	-0.039	-0.31	-3.11	2.73
			CENTER	2.282	1.922	-0.039	-2.46	-2.07	-2.23
			END-J	3.574	-0.254	-0.039	-3.23	0.19	-4.61
53	TANGENT	1	END-I	-15.069	-0.254	-0.039	-3.23	0.19	-4.61
			END-J	-6.565	-0.254	-0.039	-3.23	-0.58	0.48
54	TANGENT	1	END-I	-6.565	-0.254	-0.039	-3.23	-0.58	0.48
			END-J	1.931	-0.254	-0.039	-3.23	-1.35	5.57
55	TANGENT	1	END-I	1.931	-0.254	-0.039	-3.23	-1.35	5.57
			END-J	3.631	-0.254	-0.039	-3.23	-1.50	6.58
56	TANGENT	1	END-I	2.126	71.159	8.291	64.76	-99.31	706.32
			END-J	2.126	68.279	8.291	64.76	-74.44	497.16
57	TANGENT	1	END-I	2.126	68.279	8.291	64.76	-74.44	497.16
			END-J	2.126	64.439	8.291	64.76	-41.27	231.72
58	TANGENT	1	END-I	2.126	64.439	8.291	64.76	-41.27	231.72
			END-J	2.126	63.339	8.291	64.76	-18.47	56.03
59	BEND	1	END-I	2.126	63.339	8.291	64.76	-18.47	56.03
			CENTER	45.790	42.784	8.291	38.19	-45.66	-42.81
			END-J	61.925	-2.126	8.291	0.18	-46.10	-80.54
60	TANGENT	1	END-I	61.925	-2.126	8.291	0.18	-46.10	-80.54
			END-J	57.625	-2.126	8.291	0.18	43.03	-57.69
61	TANGENT	1	END-I	57.625	-2.126	8.291	0.18	43.03	-57.69
			END-J	53.425	-2.126	8.291	0.18	130.09	-35.37
62	TANGENT	1	END-I	53.425	-2.126	8.291	0.18	130.09	-35.37
			END-J	17.425	-2.126	8.291	0.18	229.58	-9.86
63	TANGENT	1	END-I	48.100	0.000	-0.000	0.0	-0.00	0.00
			END-J	0.000	0.000	-0.000	0.0	0.0	-0.00
64	TANGENT	1	END-I	-29.655	-11.404	2.126	5.97	-7.86	-229.58
			END-J	-68.659	-39.904	2.126	5.97	26.37	183.49
65	TANGENT	1	END-I	-45.264	4.257	0.244	-24.47	-11.49	183.49
			END-J	-32.514	0.658	0.244	-24.47	-3.89	106.18
66	TANGENT	1	END-I	-8.291	31.446	0.244	-10.46	22.46	106.18
			END-J	-8.291	28.046	0.244	-10.46	24.41	-131.79
67	TANGENT	1	END-I	-8.291	-8.288	-10.785	-10.46	24.41	-131.79
			END-J	-8.291	-9.563	-10.785	-10.46	-7.94	-105.01

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
68	BEND	1	END-I	0.198	9.563	-0.614	-10.46	7.94	105.01
			CENTER	9.263	8.982	-0.614	-3.58	8.66	26.82
			END-J	16.239	-0.198	-0.614	1.80	4.31	-12.89
69	TANGENT	1	END-I	-36.586	-0.614	0.198	1.80	-12.89	-4.31
			END-J	-32.336	-0.614	0.198	1.80	-10.91	1.83
70	TANGENT	1	END-I	-32.336	-0.614	0.198	1.80	-10.91	1.83
			END-J	-28.086	-0.614	0.198	1.80	-8.92	7.97
71	TANGENT	1	END-I	-28.086	-0.614	0.198	1.80	-8.92	7.97
			END-J	-23.836	-0.614	0.198	1.80	-6.94	14.12
72	TANGENT	1	END-I	-23.836	-0.614	0.198	1.80	-6.94	14.12
			END-J	-22.136	-0.614	0.198	1.80	-6.14	16.57
73	TANGENT	1	END-I	-22.136	-0.614	0.198	1.80	-6.14	16.57
			END-J	-19.161	-0.614	0.198	1.80	-4.76	20.87
74	TANGENT	1	END-I	-19.161	-0.614	0.198	1.80	-4.76	20.87
			END-J	-14.911	-0.614	0.198	1.80	-2.77	27.02
75	TANGENT	1	ENC-I	-14.911	-0.614	0.198	1.80	-2.77	27.02
			ENC-J	-10.768	-0.614	0.198	1.80	-0.84	33.00
76	BEND	1	ENC-I	-10.768	-0.614	0.198	1.80	-0.84	33.00
			CENTER	-5.688	4.819	0.198	1.26	-0.46	12.26
			END-J	-0.614	4.092	0.198	1.15	0.19	-26.03
77	TANGENT	1	ENC-I	-0.614	4.092	0.198	1.15	0.19	-26.03
			END-J	-0.614	3.242	0.198	1.15	0.58	-33.36
78	TANGENT	1	END-I	-0.614	3.242	0.198	1.15	0.58	-33.36
			END-J	-0.614	1.967	0.198	1.15	1.18	-41.18
79	BEND	1	END-I	-3.091	-1.967	-0.198	1.15	-1.18	41.18
			CENTER	-2.868	1.503	-0.198	-0.20	-2.07	41.63
			END-J	0.036	3.091	-0.198	-1.78	-1.74	35.62
80	TANGENT	1	END-I	0.036	-3.091	-0.056	-1.78	1.74	-35.62
			END-J	7.527	-3.091	-0.056	-1.78	0.76	18.86
81	TANGENT	1	END-I	7.527	-3.091	-0.056	-1.78	0.76	18.86
			END-J	15.017	-3.091	-0.056	-1.78	0.22	73.34
82	BEND	1	END-I	15.017	3.091	0.056	-1.78	0.22	-73.34
			CENTER	15.165	-10.793	0.056	-0.94	1.80	-44.76
			END-J	3.091	-21.693	0.056	0.77	2.33	88.42
83	TANGENT	1	END-I	3.091	-21.693	0.056	0.77	2.33	88.42
			END-J	3.091	-22.033	0.056	0.77	2.38	105.91

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
84	TANGENT	1	END-I	0.023	-22.033	-0.173	0.77	2.38	105.91
			END-J	0.023	-22.246	-0.173	0.77	2.29	116.98
85	TANGENT	1	END-I	0.023	-22.246	-0.173	0.77	2.29	116.98
			END-J	0.023	-22.543	-0.173	0.77	2.17	132.66
86	BEND	1	END-I	0.023	-47.332	0.173	0.77	-2.17	-132.66
			CENTER	-32.744	-32.777	0.173	-0.84	-1.71	-33.24
			END-J	-45.329	-0.023	0.173	-1.65	-0.25	7.22
87	TANGENT	1	END-I	-36.598	-0.023	0.173	-1.65	-0.25	7.22
			END-J	-29.798	-0.023	0.173	-1.65	2.51	7.60
88	TANGENT	1	END-I	-29.798	-0.023	0.173	-1.65	2.51	7.60
			END-J	-23.423	-0.023	0.173	-1.65	5.09	7.95
89	TANGENT	1	END-I	-23.423	-0.023	0.173	-1.65	5.09	7.95
			END-J	-17.898	-0.023	0.173	-1.65	7.34	8.25
90	TANGENT	1	END-I	0.056	45.265	2.455	322.78	-6.37	-71.45
			END-J	0.056	31.945	2.455	322.78	8.36	-303.07
91	TANGENT	1	END-I	-0.056	31.945	-2.455	-322.78	8.36	303.07
			END-J	-0.056	8.635	-2.455	-322.78	-17.42	90.03
92	BEND	1	END-I	1.843	2.455	8.635	-322.78	-50.03	-17.42
			CENTER	3.039	0.433	-1.827	-282.99	177.80	-24.60
			END-J	2.455	-1.843	-12.288	-83.84	294.67	-21.09
93	TANGENT	1	END-I	3.334	-5.922	1.843	-83.84	-21.09	-294.67
			END-J	3.334	-32.562	1.843	-83.84	1.02	-63.76
94	TANGENT	1	END-I	3.334	-32.562	1.843	-83.84	1.02	-63.76
			END-J	3.334	-92.502	1.843	-83.84	50.78	1624.61
95	TANGENT	1	END-I	3.334	-92.502	1.843	-83.84	50.78	1624.61
			END-J	3.334	-99.162	1.843	-83.84	56.30	1912.11
96	TANGENT	1	END-I	3.334	-99.162	1.843	-83.84	56.30	1912.11
			END-J	3.334	-120.252	1.843	-83.84	73.81	2954.33
97	TANGENT	1	END-I	3.334	-120.252	1.843	-83.84	73.81	2954.33
			END-J	3.334	-142.452	1.843	-83.84	92.24	4267.85
98	TANGENT	1	END-I	3.334	181.527	-0.941	-83.84	92.24	4267.85
			END-J	3.334	158.217	-0.941	-83.84	82.36	2484.20
99	TANGENT	1	END-I	3.334	158.217	-0.941	-83.84	82.36	2484.20
			END-J	3.334	136.017	-0.941	-83.84	72.95	1013.03
100	TANGENT	1	END-I	3.334	136.017	-0.941	-83.84	72.95	1013.03
			END-J	3.334	102.717	-0.941	-83.84	58.84	-777.47

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
101	TANGENT	1	END-I	3.334	102.717	-0.941	-83.84	58.84	-777.47
			END-J	3.334	69.417	-0.941	-83.84	44.72	-2068.47
102	TANGENT	1	END-I	3.334	69.417	-0.941	-83.84	44.72	-2068.47
			END-J	3.334	40.557	-0.941	-83.84	32.49	-2783.29
103	BEND	1	END-I	3.334	-36.376	-17.958	-83.84	-1318.40	2451.44
			CENTER	-16.809	-21.524	-13.110	-1020.20	-938.31	2593.05
			END-J	-17.835	-3.334	-8.263	-1405.01	13.13	2649.28
104	TANGENT	1	END-I	-17.953	8.041	-3.243	-1402.94	-2637.17	264.61
			END-J	7.280	-5.192	-3.243	-1402.94	-2678.80	246.33
105	BEND	1	END-I	7.414	3.334	-4.938	-1404.19	8.18	-2689.43
			CENTER	14.156	-9.440	-9.786	-998.71	966.89	-2679.80
			END-J	3.335	-25.956	-14.633	-42.60	1337.53	-2594.13
106	TANGENT	1	END-I	3.334	-29.781	-0.941	-42.58	-16.67	-2918.60
			END-J	3.334	-45.321	-0.941	-42.58	-23.26	-2655.74
107	TANGENT	1	END-I	3.334	-45.321	-0.941	-42.58	-23.26	-2655.74
			END-J	3.334	-94.161	-0.941	-42.58	-43.96	-1121.43
108	TANGENT	1	END-I	3.334	-94.161	-0.941	-42.58	-43.96	-1121.43
			END-J	3.334	-109.701	-0.941	-42.58	-50.54	-407.91
109	TANGENT	1	END-I	3.334	-109.701	-0.941	-42.58	-50.54	-407.91
			END-J	3.334	-136.341	-0.941	-42.58	-61.83	1068.35
110	BEND	1	END-I	3.334	36.081	-47.324	-42.58	1068.35	61.83
			CENTER	27.871	23.156	-36.863	648.41	608.18	-85.39
			END-J	36.081	-3.334	-26.401	830.02	-161.44	-134.65
111	TANGENT	1	END-I	-5.286	26.401	-3.334	830.02	134.65	-161.44
			END-J	-5.286	4.201	-3.334	830.02	101.31	-314.45
112	TANGENT	1	END-I	-5.286	4.201	-3.334	830.02	101.31	-314.45
			END-J	-5.286	-29.099	-3.334	830.02	51.30	-127.72
113	TANGENT	1	END-I	-5.286	-29.099	-3.334	830.02	51.30	-127.72
			END-J	-5.286	-51.299	-3.334	830.02	17.96	274.27
114	TANGENT	1	END-I	-5.286	-51.299	-3.334	830.02	17.96	274.27
			END-J	-5.286	-73.499	-3.334	830.02	-15.39	898.26
115	TANGENT	1	END-I	-5.286	-73.499	-3.334	830.02	-15.39	898.26
			END-J	-5.286	-91.259	-3.334	830.02	-42.06	1557.29
116	TANGENT	1	END-I	-5.286	100.454	3.806	830.02	-42.06	1557.29
			END-J	-5.286	55.499	3.806	830.02	35.01	-21.73

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
117	BEND	1	END-I	-5.286	-14.913	53.593	830.02	14.23	38.67
			CENTER	-9.314	-1.837	19.437	842.82	-73.68	171.63
			END-J	-0.857	5.286	-14.719	589.62	-627.94	129.05
118	TANGENT	1	END-I	195.654	25.722	-5.286	589.62	129.06	627.94
			END-J	208.693	-37.621	-5.286	589.62	-24.94	801.25
119	BEND	1	END-I	175.140	249.960	105.990	589.62	-801.25	-24.98
			CENTER	304.911	48.585	95.743	30.48	-556.74	-768.22
			END-J	249.958	-183.359	85.496	-210.00	-31.95	-433.78
120	TANGENT	1	END-I	0.0	46.797	196.823	-210.00	-431.32	-56.11
			END-J	0.0	37.362	196.823	-210.00	405.17	-234.95
121	TANGENT	1	END-I	0.0	37.362	196.823	-210.00	405.17	-234.95
			END-J	0.0	28.204	196.823	-210.00	1217.07	-370.18
122	TANGENT	1	END-I	0.0	-7.076	-81.663	-210.00	1217.07	-370.18
			END-J	0.0	-26.779	-81.663	-210.00	492.31	-219.95
123	TANGENT	1	END-I	0.0	-26.779	-81.663	-210.00	492.31	-219.95
			END-J	0.0	-46.759	-81.663	-210.00	-242.66	110.97
124	TANGENT	1	END-I	0.0	-46.759	-81.663	-210.00	-242.66	110.97
			END-J	0.0	-53.419	-81.663	-210.00	-487.65	261.24
125	TANGENT	1	END-I	0.116	40.687	-2.432	-314.53	6.57	268.27
			END-J	0.116	27.367	-2.432	-314.53	-8.02	64.11
126	TANGENT	1	END-I	0.078	50.978	-2.177	-307.95	9.87	412.72
			END-J	0.078	44.318	-2.177	-307.95	3.34	269.77

STATIC SOLUTION TIME LOG

EQUATION SOLUTION = 2.66
DISPLACEMENT OUTPUT = 1.05
STRESS RECOVERY = 3.01

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BLUE
TH

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT	TH.
1	TANGENT	1	END-I END-J	-670.162 -670.162	-231.796 -231.796	347.489 347.489	-1058.07 -1058.07	2464.23 4701.01	-6124.47 -4632.40	
2	TANGENT	1	END-I END-J	-670.162 -670.162	-231.796 -231.796	347.489 347.489	-1058.07 -1058.07	4701.01 7873.58	-4632.40 -2516.10	
3	BEND	1	END-I CENTER END-J	-670.162 -719.588 -347.489	-347.489 28.165 70.162	-231.796 -231.796 -231.796	-1058.07 776.39 1646.86	2516.10 1012.68 88.83	7873.58 8058.93 6663.56	
4	TANGENT	1	END-I END-J	-347.489 -347.489	-231.796 -231.796	-670.162 -670.162	1646.86 1646.86	5663.56 1218.49	-188.83 1694.51	
5	TANGENT	1	END-I END-J	-347.489 -347.489	-231.796 -231.796	-670.162 -670.162	1646.86 1646.86	1218.49 -1462.16	1694.51 2621.70	
6	TANGENT	1	END-I END-J	-347.489 -347.489	-231.796 -231.796	-670.162 -670.162	1646.86 1646.86	-1462.16 -1462.16	2621.70 3577.85	
7	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	-1646.86 1117.56	-3577.85 -5011.24	
8	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	1117.56 9159.50	-5011.24 -9181.11	
9	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	9159.50 19882.10	-9181.11 -14740.92	
10	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	19882.10 20604.70	-14740.92 -20300.74	
11	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	20604.70 20604.70	-20300.74 -20300.74	
12	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	20604.70 20604.70	-20300.74 -20300.74	
13	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	20604.70 20604.70	-20300.74 -20300.74	
14	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	20604.70 20604.70	-20300.74 -20300.74	
15	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	20604.70 20604.70	-20300.74 -20300.74	
16	TANGENT	1	END-I END-J	231.796 231.796	347.489 347.489	670.162 670.162	4226.58 4226.58	20604.70 20604.70	-20300.74 -20300.74	
 	

PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
18	BEND	1	END-I	-231.796	-633.028	-456.627	-5354.26	4879.96	-3835.34
			CENTER	-611.523	-283.714	-456.627	-2007.17	3203.64	911.25
			END-J	-633.028	231.796	-456.627	-827.87	-353.57	1180.06
19	TANGENT	1	END-I	-633.028	231.796	-456.627	-827.87	-353.57	1180.06
			END-J	-633.028	231.796	-456.627	-827.87	-4006.59	-674.31
20	TANGENT	1	END-I	0.000	-0.000	-0.000	-0.00	0.00	-0.00
			END-J	0.000	-0.000	-0.000	-0.00	0.00	-0.00
21	TANGENT	1	END-I	0.000	-0.000	-0.000	0.00	0.00	-0.00
			END-J	0.000	-0.000	-0.000	0.00	0.00	-0.00
22	TANGENT	1	END-I	-0.000	-0.000	-0.000	0.0	0.00	-0.00
			END-J	-0.000	-0.000	-0.000	0.0	0.00	-0.00
23	TANGENT	1	END-I	-461.627	144.165	655.041	164.94	-4052.79	860.51
			END-J	-461.627	144.165	655.041	164.94	2635.36	-611.45
24	TANGENT	1	END-I	-1208.189	-830.310	-360.447	-28.26	2604.09	751.11
			END-J	-1208.189	-830.310	-360.447	-28.26	-1217.50	9554.35
25	TANGENT	1	END-I	-633.028	-1043.313	888.724	9232.51	-1200.98	2467.20
			END-J	-633.028	-1043.313	888.724	9232.51	220.98	4136.50
26	TANGENT	1	END-I	-633.028	-1043.313	888.724	9232.51	220.98	4136.50
			END-J	-633.028	-1043.313	888.724	9232.51	2887.16	7266.44
27	TANGENT	1	END-I	-1103.916	309.332	1045.791	665.10	-7302.96	5034.90
			END-J	-1103.916	309.332	1045.791	665.10	-4557.76	4222.90
28	TANGENT	1	END-I	-1103.916	309.332	1045.791	665.10	-4557.76	4222.90
			END-J	-1103.916	309.332	1045.791	665.10	3154.95	1941.58
29	TANGENT	1	END-I	-1103.916	309.332	1045.791	665.10	3154.95	1941.58
			END-J	-1103.916	309.332	1045.791	665.10	6815.22	858.91
30	TANGENT	1	END-I	-1103.916	77.415	7.518	665.10	6815.22	858.91
			END-J	-1103.916	77.415	7.518	665.10	6852.81	471.84
31	TANGENT	1	END-I	-0.000	-0.000	0.000	-0.00	-0.00	-0.00
			END-J	-0.000	-0.000	0.000	-0.00	-0.00	-0.00
32	TANGENT	1	END-I	-7.518	-1103.916	-77.415	-471.84	665.10	-6852.81
			END-J	-7.518	-1103.916	-77.415	-471.84	-70.34	3634.40
33	TANGENT	1	END-I	-7.518	122.141	1.739	-471.84	-70.34	3634.40
			END-J	-7.518	122.141	1.739	-471.84	-30.65	847.03
34	BEND	1	END-I	-7.518	1.739	-122.141	-471.84	847.03	30.65
			CENTER	-5.655	5.250	-122.141	-149.68	361.54	12.02
			END-J	-2.251	7.369	-122.141	-111.92	-219.88	-21.61

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
35	TANGENT	1	END-I	-2.286	122.141	7.370	-112.06	21.61	-219.81
			END-J	-2.286	122.141	7.370	-112.06	36.85	-472.37
36	TANGENT	1	END-I	-2.285	122.141	7.370	-112.13	36.85	-472.35
			END-J	-2.285	122.141	7.370	-112.13	59.56	-848.61
37	BEND	1	END-I	-2.285	-122.141	-7.370	-112.17	-59.56	848.60
			CENTER	-87.974	-84.759	-7.370	-127.91	21.56	1105.67
			END-J	-122.141	2.261	-7.370	-81.69	90.05	1208.17
38	TANGENT	1	END-I	-122.141	-1.739	-7.518	-81.67	686.44	998.29
			END-J	-122.141	-1.739	-7.518	-81.67	618.78	1013.95
39	TANGENT	1	END-I	-122.141	-1.739	-7.518	-81.67	618.78	1013.95
			END-J	-122.141	-1.739	-7.518	-81.67	468.42	1048.73
40	TANGENT	1	END-I	-122.141	-1.739	-7.518	-81.67	468.42	1048.73
			END-J	-122.141	-1.739	-7.518	-81.67	393.24	1066.12
41	TANGENT	1	END-I	-122.141	-1.739	-7.518	-81.67	393.24	1066.12
			END-J	-122.141	-1.739	-7.518	-81.67	325.57	1081.77
42	TANGENT	1	END-I	-122.141	-1.739	-7.518	-81.67	325.57	1081.77
			END-J	-122.141	-1.739	-7.518	-81.67	295.50	1088.72
43	TANGENT	1	END-I	-122.141	-1.739	-7.518	-81.67	295.50	1088.72
			END-J	-122.141	-1.739	-7.518	-81.67	265.43	1095.68
44	TANGENT	1	END-I	-122.141	-1.739	-7.518	-81.67	265.43	1095.68
			END-J	-122.141	-1.739	-7.518	-81.67	177.09	1116.11
45	BEND	1	END-I	-122.141	-1.739	-7.518	-81.67	177.09	1116.11
			CENTER	-87.596	85.137	-7.518	45.46	129.81	770.67
			END-J	-1.739	122.141	-7.518	101.91	6.49	-87.90
46	TANGENT	1	END-I	-0.640	122.141	-7.518	101.91	6.49	-87.90
			END-J	-0.640	122.141	-7.518	101.91	-31.10	-698.61
47	BEND	1	END-I	-0.640	-122.141	7.518	101.91	31.10	698.61
			CENTER	-86.819	-85.914	7.518	100.66	-34.12	957.14
			END-J	-122.141	0.640	7.518	53.66	-79.36	1063.11
48	TANGENT	1	END-I	-122.141	-0.640	-7.518	53.66	79.36	-1063.11
			END-J	-122.141	-0.640	-7.518	53.66	-95.67	-1048.20
49	TANGENT	1	END-I	-122.141	-0.640	-7.518	53.66	-95.67	-1048.20
			END-J	-122.141	-0.640	-7.518	53.66	-185.65	-1040.53
50	BEND	1	END-I	-122.141	0.640	7.518	53.66	185.65	1040.53
			CENTER	-85.914	86.819	7.518	191.24	146.49	678.26
			END-J	0.640	122.141	7.518	260.83	21.52	-187.28

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
51	TANGENT	1	END-I	0.640	122.141	7.518	267.83	21.52	-187.28
			END-J	0.640	122.141	7.518	267.83	36.56	-431.56
52	BEND	1	END-I	-31.548	-122.141	-7.518	267.83	-36.56	431.56
			CENTER	-108.675	-64.058	-7.518	151.98	-226.23	662.94
			END-J	-122.141	31.548	-7.518	-59.11	-283.38	703.34
53	TANGENT	1	END-I	-122.141	31.548	-7.518	-59.11	-283.38	703.34
			END-J	-122.141	31.548	-7.518	-59.11	-433.74	72.37
54	TANGENT	1	END-I	-122.141	31.548	-7.518	-59.11	-433.74	72.37
			END-J	-122.141	31.548	-7.518	-59.11	-584.10	-558.60
55	TANGENT	1	END-I	-122.141	31.548	-7.518	-59.11	-584.10	-558.60
			END-J	-122.141	31.548	-7.518	-59.11	-614.18	-684.79
56	TANGENT	1	END-I	-323.696	60.603	-157.066	1929.55	2222.06	2231.54
			END-J	-323.696	60.603	-157.066	1929.55	1750.86	2749.73
57	TANGENT	1	END-I	-323.696	60.603	-157.066	1929.55	1750.86	2749.73
			END-J	-323.696	60.603	-157.066	1929.55	1122.59	1807.31
58	TANGENT	1	END-I	-323.696	60.603	-157.066	1929.55	1122.59	1807.31
			END-J	-323.696	60.603	-157.066	1929.55	690.66	1640.65
59	BEND	1	END-I	-323.696	60.603	-157.066	1929.55	690.66	1640.65
			CENTER	-186.034	271.741	-157.066	1749.26	-1125.92	1330.91
			END-J	60.603	323.696	-157.066	337.26	-2282.95	775.98
60	TANGENT	1	END-I	60.603	31.051	85.348	337.26	-2282.95	775.98
			END-J	60.603	31.051	85.348	337.26	-1365.46	442.18
61	TANGENT	1	END-I	60.603	31.051	85.348	337.26	-1365.46	442.18
			END-J	60.603	31.051	85.348	337.26	-469.30	116.15
62	TANGENT	1	END-I	60.603	31.051	85.348	337.26	-469.30	116.15
			END-J	60.603	31.051	85.348	337.26	554.88	-256.46
63	TANGENT	1	END-I	-0.000	0.000	0.000	-0.00	-0.00	0.00
			END-J	-0.000	0.000	0.000	-0.00	0.00	-0.00
64	TANGENT	1	END-I	-1.426	104.666	-31.051	423.61	-8.07	-554.88
			END-J	-1.426	104.666	-31.051	423.61	-508.03	-2240.14
65	TANGENT	1	END-I	-81.702	-65.437	-31.051	140.53	646.37	-2240.14
			END-J	-81.702	-65.437	-31.051	140.53	-322.36	-198.64
66	TANGENT	1	END-I	-85.348	60.603	-31.051	-271.41	-223.61	-198.64
			END-J	-85.348	60.603	-31.051	-271.41	-472.01	-683.47
67	TANGENT	1	END-I	-85.348	173.074	35.227	-271.41	-472.01	-683.47
			END-J	-85.348	173.074	35.227	-271.41	-366.33	-1202.69

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
68	BEND	1	ENC-I	-85.348	-173.074	-35.227	-271.41	366.33	1202.69
			CENTER	-182.732	-62.632	-35.227	-36.05	201.86	2176.53
			ENC-J	-173.074	85.348	-35.227	14.07	-80.86	2079.95
69	TANGENT	1	ENC-I	-173.074	-35.227	-85.348	14.07	2079.95	80.86
			ENC-J	-173.074	-35.227	-85.348	14.07	1226.47	433.13
70	TANGENT	1	ENC-I	-173.074	-35.227	-85.348	14.07	1226.47	433.13
			ENC-J	-173.074	-35.227	-85.348	14.07	372.98	785.39
71	TANGENT	1	ENC-I	-173.074	-35.227	-85.348	14.07	372.98	785.39
			ENC-J	-173.074	-35.227	-85.348	14.07	-480.50	1137.66
72	TANGENT	1	ENC-I	-173.074	-2.445	8.460	14.07	-480.50	1137.66
			ENC-J	-173.074	-2.445	8.460	14.07	-446.66	1147.44
73	TANGENT	1	ENC-I	-173.074	-2.445	8.460	14.07	-446.66	1147.44
			ENC-J	-173.074	-2.445	8.460	14.07	-387.44	1164.55
74	TANGENT	1	ENC-I	-173.074	-2.445	8.460	14.07	-387.44	1164.55
			ENC-J	-173.074	-2.445	8.460	14.07	-302.85	1189.00
75	TANGENT	1	ENC-I	-173.074	-2.445	8.460	14.07	-302.85	1189.00
			ENC-J	-173.074	-2.445	8.460	14.07	-220.37	1212.84
76	BEND	1	ENC-I	-173.074	-2.445	8.460	14.07	-220.37	1212.84
			CENTER	-124.111	120.653	8.460	-121.10	-105.95	723.20
			ENC-J	-2.445	173.074	8.460	-135.77	70.53	-493.46
77	TANGENT	1	ENC-I	-2.445	173.074	8.460	-135.77	70.53	-493.46
			ENC-J	-2.445	173.074	8.460	-135.77	87.45	-839.61
78	TANGENT	1	ENC-I	-2.445	173.074	8.460	-135.77	87.45	-839.61
			ENC-J	-2.445	173.074	8.460	-135.77	112.83	-1358.83
79	BEND	1	ENC-I	-2.445	-173.074	-8.460	-135.77	-112.83	1358.83
			CENTER	-124.111	-120.653	-8.460	-183.22	-1.72	1723.83
			ENC-J	-173.074	2.445	-8.460	-138.21	110.39	187.72
80	TANGENT	1	ENC-I	-173.074	-2.445	1.722	-138.21	-110.39	-1870.72
			ENC-J	-173.074	-2.445	1.722	-138.21	-80.04	-1827.63
81	TANGENT	1	ENC-I	-173.074	-2.445	1.722	-138.21	-80.04	-1827.63
			ENC-J	-173.074	-2.445	1.722	-138.21	-49.70	-1784.54
82	BEND	1	ENC-I	-173.074	2.445	-1.722	-138.21	49.70	1784.54
			CENTER	-120.653	124.111	-1.722	-67.63	120.69	1260.33
			ENC-J	2.445	173.074	-1.722	32.48	120.99	29.35
83	TANGENT	1	ENC-I	2.445	173.074	-1.722	32.48	120.99	29.35
			ENC-J	2.445	173.074	-1.722	32.48	119.61	-109.11

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
84	TANGENT	1	ENC-I	2.445	173.074	-1.722	32.48	119.61	-179.11
			ENC-J	2.445	173.074	-1.722	32.48	118.75	-195.65
85	TANGENT	1	ENC-I	2.445	173.074	-1.722	32.48	118.75	-195.65
			ENC-J	2.445	173.074	-1.722	32.48	117.54	-316.80
86	BEND	1	ENC-I	2.445	-173.074	1.722	32.48	-117.54	316.80
			CENTER	-120.653	-124.111	1.722	-58.64	-102.43	686.10
			ENC-J	-173.074	-2.445	1.722	-112.38	-27.31	843.36
87	TANGENT	1	ENC-I	-173.074	-2.445	1.722	-112.38	-27.31	843.36
			ENC-J	-173.074	-2.445	1.722	-112.38	0.24	882.48
88	TANGENT	1	ENC-I	-173.074	-2.445	1.722	-112.38	0.24	882.48
			ENC-J	-173.074	-2.445	1.722	-112.38	26.06	919.15
89	TANGENT	1	ENC-I	-173.074	-2.445	1.722	-112.38	26.06	919.15
			ENC-J	-173.074	-2.445	1.722	-112.38	48.45	950.93
90	TANGENT	1	ENC-I	341.645	-201.763	-2181.201	-6569.52	-695.62	3728.86
			ENC-J	341.645	-201.763	-2181.201	-6569.52	-13782.83	4939.43
91	TANGENT	1	ENC-I	-341.645	-201.763	2181.201	6569.52	-13782.83	-4939.43
			ENC-J	-341.645	-201.763	2181.201	6569.52	9119.78	-2820.93
92	BEND	1	ENC-I	-341.645	-2181.201	-201.763	6569.52	2820.93	9119.78
			CENTER	-1783.921	-1300.763	-201.763	6285.48	-3506.66	17773.44
			ENC-J	-2181.201	341.645	-201.763	1610.35	-7780.10	20157.12
93	TANGENT	1	ENC-I	-1440.775	199.834	-341.645	1610.35	20157.12	7780.10
			ENC-J	-1440.775	199.834	-341.645	1610.35	16057.39	5382.09
94	TANGENT	1	ENC-I	-1440.775	199.834	-341.645	1610.35	16057.39	5382.09
			ENC-J	-1440.775	199.834	-341.645	1610.35	6832.98	-13.43
95	TANGENT	1	ENC-I	-1440.775	199.834	-341.645	1610.35	6832.98	-13.43
			ENC-J	-1440.775	199.834	-341.645	1610.35	5808.05	-612.93
96	TANGENT	1	ENC-I	-1440.775	199.834	-341.645	1610.35	5808.05	-612.93
			ENC-J	-1440.775	199.834	-341.645	1610.35	2562.42	-2511.35
97	TANGENT	1	ENC-I	-1440.775	199.834	-341.645	1610.35	2562.42	-2511.35
			ENC-J	-1440.775	199.834	-341.645	1610.35	-854.02	-4509.69
98	TANGENT	1	ENC-I	-1440.775	199.834	-341.645	1610.35	-854.02	-4509.69
			ENC-J	-1440.775	199.834	-341.645	1610.35	-4441.29	-6607.95
99	TANGENT	1	ENC-I	-1440.775	199.834	-341.645	1610.35	-4441.29	-6607.95
			ENC-J	-1440.775	199.834	-341.645	1610.35	-7857.74	-8606.29
100	TANGENT	1	ENC-I	-1440.775	199.834	-341.645	1610.35	-7857.74	-8606.29
			ENC-J	-1440.775	199.834	-341.645	1610.35	-12982.41	-11603.80

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
1C1	TANGENT	1	END-I	-1440.775	199.834	-341.645	1610.35	-12982.41	-11603.80
			END-J	-1440.775	199.834	-341.645	1610.35	-18107.08	-14671.31
1C2	TANGENT	1	END-I	-1440.775	199.834	-341.645	1610.35	-18107.08	-14601.31
			END-J	-1440.775	199.834	-341.645	1610.35	-22548.46	-17199.15
1C3	BEND	1	END-I	-1440.775	-335.387	210.168	1610.35	12012.94	25689.17
			CENTER	-1255.936	781.627	210.168	10002.46	8247.41	24580.13
			END-J	-335.387	1440.775	210.168	13273.94	-349.34	19056.84
1C4	TANGENT	1	END-I	-278.963	-101.654	1464.354	13253.84	-19066.02	552.53
			END-J	-278.963	-101.654	1464.354	13253.84	-272.04	1857.18
1C5	BEND	1	END-I	-335.387	-1440.775	-210.168	13172.34	-2346.78	-411.83
			CENTER	-1255.936	-781.637	-210.168	7285.58	-11865.27	5111.43
			END-J	-1440.780	335.365	-210.168	-3607.56	-14433.38	6220.53
1C6	TANGENT	1	END-I	-1440.775	199.834	-341.645	-3607.78	-9908.31	12200.06
			END-J	-1440.775	199.834	-341.645	-3607.78	-12299.82	10801.22
1C7	TANGENT	1	END-I	-1440.775	199.834	-341.645	-3607.78	-12299.82	10801.22
			END-J	-1440.775	199.834	-341.645	-3607.78	-19816.00	6404.87
1C8	TANGENT	1	END-I	-1440.775	199.834	-341.645	-3607.78	-19816.00	6404.87
			END-J	-1440.775	199.834	-341.645	-3607.78	-22207.51	5006.03
1C9	TANGENT	1	END-I	-1440.775	199.834	-341.645	-3607.78	-22207.51	5006.03
			END-J	-1440.775	199.834	-341.645	-3607.78	-26307.25	2608.02
11C	BEND	1	END-I	-1440.775	-1723.445	-138.266	-3607.78	2608.02	26307.25
			CENTER	-2237.441	-199.878	-138.266	-949.92	3808.63	31087.25
			END-J	-1723.445	1440.775	-138.266	1778.43	2778.19	28003.27
111	TANGENT	1	END-I	-1723.445	138.266	1440.775	1778.43	-28003.27	2778.19
			END-J	-1723.445	138.266	1440.775	1778.43	-13595.52	1395.53
112	TANGENT	1	END-I	-1723.445	138.266	1440.775	1778.43	-13595.52	1395.53
			END-J	-1723.445	138.266	1440.775	1778.43	8016.10	-678.46
113	TANGENT	1	END-I	-1723.445	138.266	1440.775	1778.43	8016.10	-678.46
			END-J	-1723.445	138.266	1440.775	1778.43	22423.85	-2061.12
114	TANGENT	1	END-I	-1723.445	138.266	1440.775	1778.43	22423.85	-2061.12
			END-J	-1723.445	138.266	1440.775	1778.43	36831.60	-3443.78
115	TANGENT	1	END-I	-1723.445	138.266	1440.775	1778.43	36831.60	-3443.78
			END-J	-1723.445	138.266	1440.775	1778.43	48357.80	-4549.90
116	TANGENT	1	END-I	-1723.445	195.168	528.174	1778.43	48357.80	-4549.90
			END-J	-1723.445	195.168	528.174	1778.43	59053.31	-8502.05

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PIPE FORCES AND MOMENTS

ELEMENT NUMBER	ELEMENT TYPE	LOAD CASE	STATION	AXIAL FORCE	Y-AXIS SHEAR	Z-AXIS SHEAR	TORSIONAL MOMENT	Y-AXIS MOMENT	Z-AXIS MOMENT
117	BEND	1	ENC-I	-1723.445	-556.670	84.712	1778.43	-3574.36	59555.04
			CENTER	-1612.285	825.034	84.712	-773.69	-2586.99	57331.84
			ENC-J	-556.670	1723.445	84.712	-1880.13	-84.20	36219.55
118	TANGENT	1	ENC-I	-556.673	84.696	-1723.445	-1881.12	36219.50	84.20
			ENC-J	-556.673	84.696	-1723.445	-1881.12	-13986.09	-2383.09
119	BEND	1	ENC-I	-556.666	1723.445	84.739	-1882.19	2383.09	-13985.95
			CENTER	825.046	1612.277	84.739	503.12	3375.52	-22276.22
			ENC-J	1723.451	556.647	84.739	2891.55	2393.60	-27666.65
120	TANGENT	1	ENC-I	1723.445	195.168	-528.174	2891.52	-26617.47	-7916.36
			ENC-J	1723.445	195.168	-528.174	2891.52	-28862.21	-8745.83
121	TANGENT	1	ENC-I	1723.445	195.168	-528.174	2891.52	-28862.21	-8745.83
			ENC-J	1723.445	195.168	-528.174	2891.52	-31040.93	-9550.89
122	TANGENT	1	ENC-I	1723.445	195.168	-528.174	2891.52	-31040.93	-9550.89
			ENC-J	1723.445	195.168	-528.174	2891.52	-35728.47	-11283.01
123	TANGENT	1	ENC-I	1723.445	195.168	-528.174	2891.52	-35728.47	-11283.01
			ENC-J	1723.445	195.168	-528.174	2891.52	-40482.04	-13039.52
124	TANGENT	1	ENC-I	1723.445	195.168	-528.174	2891.52	-40482.04	-13039.52
			ENC-J	1723.445	195.168	-528.174	2891.52	-42066.56	-13625.02
125	TANGENT	1	ENC-I	-335.923	-374.837	2183.646	7520.45	-13909.88	-6026.33
			ENC-J	-335.923	-374.837	2183.646	7520.45	-808.00	-3777.31
126	TANGENT	1	ENC-I	-347.441	-496.978	2152.098	6835.66	-20425.28	-6903.05
			ENC-J	-347.441	-496.978	2152.098	6835.66	-13968.99	-5412.15

STATIC SOLUTION TIME LOG

EQUATION SOLUTION = 3.58
 DISPLACEMENT CUTPLY = 1.28
 STRESS RECOVERY = 5.27

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RESPONSE SPECTRUM STRESS COMPONENTS

BLUE

SQUARE ROOT OF THE SUM OF THE SQUARES OF THE MODAL STRESSES
(FOR ALL ELEMENTS)

LOCE

3

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (1)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.15450 03	0.45220 03	0.12560 03	0.18580 04	0.25940 04	0.32420 04	0.19490 03	0.45220 03	0.12560 03	0.18580 04	0.24830 04	0.63100 03

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (2)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.15760 03	0.48360 03	0.12710 03	0.18580 04	0.24830 04	0.63100 03	0.15760 03	0.48360 03	0.12710 03	0.18580 04	0.23920 04	0.41710 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (3)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.15450 03	0.14190 03	0.45300 03	0.18580 04	0.41710 04	0.23920 04	0.60580 02	0.20090 03	0.49300 03	0.45560 04	0.33580 04	0.22980 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (3)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.14190 03	0.15450 03	0.45300 03	0.60030 04	0.12140 04	0.22430 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (4)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.17460 03	0.45480 03	0.18010 03	0.60030 04	0.22430 04	0.12140 04	0.17460 03	0.45480 03	0.18010 03	0.60030 04	0.24360 04	0.45310 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (5)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.21360 03	0.45370 03	0.21500 03	0.60030 04	0.24360 04	0.45310 04	0.21360 03	0.45370 03	0.21500 03	0.60030 04	0.28370 04	0.64560 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (6)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.26330 03	0.45270 03	0.26340 03	0.60030 04	0.28370 04	0.64560 04	0.26330 03	0.49270 03	0.26340 03	0.60030 04	0.35030 04	0.84590 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (7)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.45300 03	0.33890 03	0.34100 03	0.35030 04	0.60030 04	0.84590 04	0.45300 03	0.33890 03	0.34100 03	0.35030 04	0.54230 04	0.76560 04

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ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (8)																				
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.49350	03	0.48110	03	0.49350	03	0.35030	04	0.54230	04	0.76560	04	0.49350	03	0.48110	03	0.49350	03	0.35030	04	0.60280	04	0.67440	04

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (9)																				
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.49410	03	0.65810	03	0.68440	03	0.35030	04	0.60280	04	0.67440	04	0.49410	03	0.65810	03	0.68440	03	0.35030	04	0.14950	05	0.13790	05

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (10)																				
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.49460	03	0.74590	03	0.77950	03	0.35030	04	0.14950	05	0.13790	05	0.49460	03	0.74590	03	0.77950	03	0.35030	04	0.26910	05	0.24910	05

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (11)																				
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.49470	03	0.75340	03	0.78750	03	0.35030	04	0.26910	05	0.24910	05	0.49470	03	0.75340	03	0.78750	03	0.35030	04	0.32370	05	0.30080	05

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (12)																				
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.23950	03	0.41540	03	0.13290	03	0.18580	04	0.25940	04	0.32420	04	0.23950	03	0.41540	03	0.13290	03	0.18580	04	0.27520	04	0.57140	04

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (13)																				
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.28040	03	0.37900	03	0.14150	03	0.18580	04	0.27520	04	0.57140	04	0.28040	03	0.37900	03	0.14150	03	0.18580	04	0.29010	04	0.72240	04

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (14)																				
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)												
0.38620	03	0.29390	03	0.17590	03	0.18580	04	0.29010	04	0.72240	04	0.47410	03	0.10360	03	0.17590	03	0.23810	04	0.29470	04	0.83850	04

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (14)								
PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)						
0.29390	03	0.38620	03	0.17590	03	0.37150	04	0.24540	04	0.62220	04

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (15)																				
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.24460	03	0.20730	03	0.48780	03	0.37190	04	0.62220	04	0.24540	04	0.24460	03	0.20730	03	0.48780	03	0.37190	04	0.27530	04	0.36660	04

ELEMENT TYPE (3/D P I P E) / / /			ELEMENT NUMBER (16)								
PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)

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ELEMENT TYPE (3/C P I P E

EMENT NUMBER (17)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.2946D 03	0.3751D 03	0.1844D 03	0.3719D 04	0.3940D 04	0.5264D 04	0.2946D 03	0.3751D 03	0.1844D 03	0.3719D 04	0.3333D 04	0.5253D 04

ELEMENT TYPE (3/C PIPE) / / / ELEMENT NUMBER (18)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)												
0.39580	03	0.36490	03	0.21780	03	0.37190	04	0.33330	04	0.52530	04	0.52120	03	0.13480	03	0.21780	03	0.41320	04	0.22350	04	0.57580	04

ELEMENT TYPE (3/C	P I P E	/ / /	ELEMENT NUMBER (18)
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PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	PZ(J)
0.3649D 03	0.3958D 03	0.2178D 03	0.3809D 04	0.2509D 04	0.3893D 04

ELEMENT TYPE (2/D	P I P E	1 / / /	ELEMENT NUMBER (19)
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PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.35990 03	0.51740 03	0.25010 03	0.38090 04	0.25090 04	0.38930 04	0.35990 03	0.51740 03	0.25010 03	0.38090 04	0.30730 04	0.36070 04

ELEMENT TYPE (3/C PIPE) 1 / 1 / ELEMENT NUMBER (20)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	PZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	PZ(J)
0.1763D 03	0.4316D 03	0.1263D 03	0.6794D 02	0.1396D 04	0.4244D 04	0.1703D 03	0.4316D 03	0.1363D 03	0.6794D 02	0.1064D 04	0.3192D 04

ELEMENT TYPE (3/D	P I P E	/ / /	ELEMENT NUMBER (21)
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PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.1981D 03	0.4110C 03	0.1359C 03	0.4971C 02	0.1065D 04	0.3192C 04	0.1981D 03	0.4110D 03	0.1359D 03	0.4971D 02	0.4485D 03	0.1327D 04

ELEMENT TYPE (3/0	P I P E	/ / /	ELEMENT NUMBER (22)
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PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.79640 02	0.26540 03	0.90260 02	0.45720-11	0.45130 03	0.13270 04	0.79640 02	0.26540 03	0.90260 02	0.45720-11	0.63690-10	0.10800-09

ELEMENT TYPE (3/D PIPE) / / ELEMENT NUMBER (23)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	PZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	PZ(J)
0.4186D 03	0.6807D 03	0.5923D 03	0.3964D 03	0.3171D 04	0.3388D 04	0.4186D 03	0.6807D 03	0.5923D 03	0.3964D 03	0.2969D 04	0.3644D 04

ELEMENT TYPE (3/C	P I P E	1 / 1 /	ELEMENT NUMBER (24)
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.42070 03	0.20810 03	0.69230 03	0.76710 03	0.29910 04	0.35660 04	0.42070 03	0.20810 03	0.69230 03	0.76710 03	0.71840 04	0.24220 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (25)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.7751D 03	0.2241D 03	0.2205D 03	0.2328D 04	0.7064D 04	0.1657D 04	.7751D 03	0.2241D 03	0.2205D 03	0.2328D 04	0.6713D 04	0.1718D 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (26)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.7742D 03	0.2263D 03	0.2221D 03	0.2328D 04	0.6713D 04	0.1718D 04	.7742D 03	0.2263D 03	0.2221D 03	0.2328D 04	0.6051D 04	0.2726D 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (27)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.6338D 03	0.1967D 03	0.3042D 03	0.1918D 03	0.1658D 04	0.3233D 04	.6338D 03	0.1967D 03	0.3042D 03	0.1918D 03	0.1842D 04	0.2741D 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (28)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.6418D 03	0.1972D 03	0.3016D 03	0.1918D 03	0.1842D 04	0.2741D 04	.6418D 03	0.1972D 03	0.3016D 03	0.1918D 03	0.3445D 04	0.1446D 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (29)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.6504D 03	0.1987D 03	0.2971D 03	0.1918D 03	0.3445D 04	0.1446D 04	.6504D 03	0.1987D 03	0.2971D 03	0.1918D 03	0.4381D 04	0.9913D 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (30)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.6833D 03	0.2026D 03	0.2837D 03	0.1918D 03	0.4381D 04	0.9913D 03	.6833D 03	0.2026D 03	0.2837D 03	0.1918D 03	0.5703D 04	0.1031D 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (31)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.1159D 03	0.4972D 02	0.1519D 03	0.1393D 12	0.1975D 04	0.6464D 03	.1159D 03	0.4972D 02	0.1519D 03	0.1393D 12	0.2760D 10	0.8722D 11

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (32)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.1172D 03	0.9834D 03	0.4132D 03	0.1020D 04	0.1918D 03	0.3843D 04	.1172D 03	0.9834D 03	0.4132D 03	0.1020D 04	0.3804D 04	0.5963D 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (33)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
.1172D 03	0.2293D 03	0.1577D 03	0.1020D 04	0.3804D 04	0.5963D 04	.1172D 03	0.2293D 03	0.1577D 03	0.1020D 04	0.1149D 04	0.2022D 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (34)

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PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.11720 03 0.12950 03 0.21780 03 0.10200 04 0.20220 04 0.11490 04 0.14320 03 0.10000 03 0.21780 03 0.12710 04 0.17850 04 0.11830 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (34)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.14860 03 0.91840 02 0.21780 03 0.20000 04 0.14130 04 0.11270 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (35)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.13870 03 0.20330 03 0.87620 02 0.20010 04 0.11270 04 0.14120 04 0.13870 03 0.20330 03 0.87620 02 0.20010 04 0.10730 04 0.16890 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (36)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.13480 03 0.19660 03 0.86050 02 0.20010 04 0.10730 04 0.16890 04 0.13480 03 0.19660 03 0.86050 02 0.20010 04 0.10380 04 0.21690 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (37)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.12900 03 0.11840 03 0.83840 02 0.20010 04 0.10380 04 0.21690 04 0.19600 03 0.11980 03 0.83840 02 0.14650 04 0.16370 04 0.24200 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (37)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.18460 03 0.12900 03 0.83840 02 0.10500 04 0.17800 04 0.23650 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (38)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.16160 03 0.83580 02 0.11800 03 0.10500 04 0.26130 04 0.13960 04 0.16160 03 0.83580 02 0.11800 03 0.10500 04 0.16490 04 0.12200 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (39)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.11860 03 0.60260 02 0.11190 03 0.10500 04 0.16490 04 0.12200 04 0.11860 03 0.60260 02 0.11190 03 0.10500 04 0.11320 04 0.13550 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (40)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.91930 02 0.54850 02 0.85570 02 0.10500 04 0.11320 04 0.13550 04 0.91930 02 0.54850 02 0.85570 02 0.10500 04 0.17640 04 0.13960 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (41)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.92240 02 0.62210 02 0.66670 02 0.10500 04 0.22270 04 0.14

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ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (42)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.10080 03	0.67650 02	0.55220 02	0.10500 04	0.22270 04	0.14490 04	0.10080 03	0.67650 02	0.55220 02	0.10500 04	0.23760 04	0.15020 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (43)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.10880 03	0.70970 02	0.50950 02	0.10500 04	0.23760 04	0.15020 04	0.10880 03	0.70970 02	0.50950 02	0.10500 04	0.24870 04	0.15810 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (44)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.12870 03	0.76930 02	0.52100 02	0.10500 04	0.24870 04	0.15810 04	0.12870 03	0.76930 02	0.52100 02	0.10500 04	0.26200 04	0.19850 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (45)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)
0.17150 03	0.79800 02	0.77190 02	0.10500 04	0.26200 04	0.19850 04	0.15530 03	0.10800 03	0.77190 02	0.20310 04	0.17240 04	0.18510 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (45)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.79800 02	0.17150 03	0.77190 02	0.25220 04	0.45090 03	0.10770 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (46)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.57380 02	0.19880 03	0.79680 02	0.25220 04	0.45090 03	0.10770 04	0.57380 02	0.19880 03	0.79680 02	0.25220 04	0.50260 03	0.93540 03

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (47)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)
0.57380 02	0.20930 03	0.79490 02	0.25220 04	0.50260 03	0.93540 03	0.11670 03	0.18300 03	0.79490 02	0.21050 04	0.14700 04	0.11830 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (47)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.20930 03	0.57380 02	0.79490 02	0.66760 03	0.24310 04	0.13620 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (48)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.23580 03	0.53440 02	0.90040 02	0.66760 03	0.24310 04	0.13620 04	0.23580 03	0.53440 02	0.90040 02	0.66760 03	0.18440 04	0.21530 04

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PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)												
0.27010	03	0.29380	02	0.81180	02	0.66760	03	0.18440	04	0.21530	04	0.27010	03	0.29380	02	0.81180	02	0.66760	03	0.18380	04	0.23740	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (50)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)												
0.29740	03	0.20180	02	0.82710	02	0.66760	03	0.18380	04	0.23740	04	0.21420	03	0.20730	03	0.82710	02	0.14530	04	0.11460	04	0.15380	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (50)

PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)						
0.20180	02	0.29740	03	0.82710	02	0.17570	04	0.86320	03	0.57090	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (51)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)												
0.20180	02	0.3320	03	0.87410	02	0.17570	04	0.86320	03	0.57090	03	0.20180	02	0.33320	03	0.87410	02	0.17570	04	0.98640	03	0.11680	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (52)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)												
0.61070	02	0.3440	03	0.92990	02	0.17570	04	0.98640	03	0.11680	04	0.25810	03	0.17260	03	0.92990	02	0.15970	04	0.13070	04	0.17570	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (52)

PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)						
0.30440	03	0.61070	02	0.92990	02	0.11990	04	0.16580	04	0.18990	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (53)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)												
0.30470	03	0.64070	02	0.12600	03	0.11990	04	0.16580	04	0.18990	04	0.30470	03	0.64070	02	0.12600	03	0.11990	04	0.19970	04	0.62510	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (54)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)												
0.30500	03	0.73010	02	0.16090	03	0.11990	04	0.19970	04	0.62510	03	0.30500	03	0.73010	02	0.16090	03	0.11990	04	0.47250	04	0.85920	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (55)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)												
0.30510	03	0.73360	02	0.16090	03	0.11990	04	0.47250	04	0.85920	03	0.30510	03	0.73360	02	0.16090	03	0.11990	04	0.53360	04	0.11500	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (56)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)														
0.59760	03	0.57860	02	0.52660	03	0.07630	02	0.15630	04	0.59760	03	0.57860	02	0.52660	03	0.07630	02	0.15630	04	0.59760	03	0.57860	02	0.52660	03

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (57)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.59620 03	0.56150 03	0.52840 03	0.87570 03	0.24430 04	0.83960 03	0.59620 03	0.56150 03	0.52840 03	0.87570 03	0.24430 04	0.83960 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (58)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.59510 03	0.54590 03	0.52890 03	0.87570 03	0.24430 04	0.83960 03	0.59510 03	0.54590 03	0.52890 03	0.87570 03	0.10160 04	0.87180 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (59)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)
0.59460 03	0.53520 03	0.52850 03	0.87570 03	0.10160 04	0.87180 03	0.78340 03	0.16190 03	0.52850 03	0.95730 03	0.72100 03	0.13020 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (59)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.53520 03	0.59460 03	0.52850 03	0.37480 03	0.19190 04	0.84260 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (60)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.51970 03	0.60150 02	0.37330 03	0.37480 03	0.19190 04	0.84260 03	0.51970 03	0.60150 02	0.37330 03	0.37480 03	0.22070 04	0.59910 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (61)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.47440 03	0.59190 02	0.34950 03	0.37480 03	0.22070 04	0.59910 03	0.47440 03	0.59190 02	0.34950 03	0.37480 03	0.58420 04	0.87110 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (62)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.30590 03	0.53560 02	0.20970 03	0.37480 03	0.58420 04	0.87110 03	0.30590 03	0.53560 02	0.20970 03	0.37480 03	0.83340 04	0.12960 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (63)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.21410 03	0.39030 02	0.28630 03	0.48730-11	0.37220 04	0.59740 03	0.21410 03	0.39030 02	0.28630 03	0.48730-11	0.18010-09	0.44790-13

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (64)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.14480 03	0.76810 03	0.70880 02	0.83450 03	0.60580 03	0.46810 04	0.14480 03	0.76810 03	0.70880 02	0.83450 03	0.97740 03	0.79670 04

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ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (65)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.16590	03	0.24840	03	0.85030	02	0.90740	03	0.91010	03	0.79670	04
0.16590	03	0.24840	03	0.85030	02	0.90740	03	0.17710	04	0.14320	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (66)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.99370	02	0.21470	03	0.25090	02	0.17320	04	0.97960	03	0.14320	04
0.99370	02	0.21470	03	0.25090	02	0.17320	04	0.96500	03	0.17830	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (67)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.73160	02	0.22610	03	0.24710	02	0.17320	04	0.96520	03	0.17830	04
0.73160	02	0.22610	03	0.24710	02	0.17320	04	0.93360	03	0.22310	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (68)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	PY(C)	MZ(C)
0.48400	02	0.18770	03	0.55060	02	0.17320	04	0.93360	03	0.22310	04
0.48400	02	0.18770	03	0.55060	02	0.17320	04	0.14760	03	0.12560	03

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (68)

PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.18770	03	0.48400	02	0.55060	02
0.18770	03	0.48400	02	0.81990	03
0.13280	04	0.37060	04		

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (69)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.15340	03	0.10170	03	0.91830	02	0.81990	03	0.37060	04	0.13280	04
0.15340	03	0.10170	03	0.91830	02	0.81990	03	0.28570	04	0.77950	03

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (70)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.13010	03	0.12590	03	0.13550	03	0.81990	03	0.28570	04	0.77950	03
0.13010	03	0.12590	03	0.13550	03	0.81990	03	0.15850	04	0.13860	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (71)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.11190	03	0.13590	03	0.16090	03	0.81990	03	0.15850	04	0.13860	04
0.11190	03	0.13590	03	0.16090	03	0.81990	03	0.65990	03	0.26120	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (72)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
0.10370	03	0.11760	03	0.11050	03	0.81990	03	0.65990	03	0.26120	04
0.10370	03	0.11760	03	0.11050	03	0.81990	03	0.71050	03	0.22710	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (73)

PX(I)	VY(I)	VZ(I)	TX(I)	PY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	PY(J)	MZ(J)
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0.1990 03 0.71050 03 0.22710 04 0.10350 03 0.11670 03 0.10450 03 0.81990 03 0.12140 04 0.18080 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (74)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.10220	03	0.11160	03	0.79770	02	0.81990	03	0.12140	04	0.18080	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (75)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.11320	03	0.94110	02	0.33630	02	0.81990	03	0.12140	04	0.18080	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (76)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)
0.13800	03	0.64810	02	0.74840	02	0.81990	03	0.21780	04	0.19190	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (76)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)						
0.64810	02	0.13800	03	0.74840	02	0.16830	04	0.14140	03	0.13550	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (77)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.48490	02	0.15490	03	0.11290	03	0.16830	04	0.14140	03	0.13550	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (78)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.46660	02	0.15950	03	0.11290	03	0.16830	04	0.14140	03	0.13550	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (79)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)
0.7000	02	0.16610	03	0.11810	03	0.16830	04	0.50470	03	0.14050	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (79)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)						
0.610	03	0.470	02	0.11810	03	0.85200	03	0.14820	04	0.15920	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (80)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.470	03	0.62760	02	0.12190	03	0.85200	03	0.14820	04	0.15920	04

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (74)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.10220	03	0.11060	03	0.79770	02	0.81990	03	0.12140	04	0.18080	04
0.10220	03	0.11060	03	0.79770	02	0.81990	03	0.19270	04	0.16280	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (75)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.11320	03	0.94110	02	0.33630	02	0.81990	03	0.19270	04	0.16280	04
0.11320	03	0.94110	02	0.33630	02	0.81990	03	0.21780	04	0.19190	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (76)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.13800	03	0.64810	02	0.74840	02	0.81990	03	0.21780	04	0.19190	04
0.12430	03	0.88370	02	0.74840	02	0.10640	04	0.15840	04	0.17960	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (76)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.64810	02	0.13800	03	0.74840	02
0.16830	04	0.14140	03	0.13550	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (77)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.48490	02	0.15490	03	0.10620	03	0.16830	04	0.19640	03	0.13160	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (78)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.46660	02	0.15950	03	0.11290	03	0.16830	04	0.19640	03	0.13160	04
0.46660	02	0.15950	03	0.11290	03	0.16830	04	0.50470	03	0.14050	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (79)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.47000	02	0.16610	03	0.11810	03	0.16830	04	0.50470	03	0.14050	04
0.12920	03	0.11440	03	0.11810	03	0.15090	04	0.95080	03	0.15510	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (79)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.16610	03	0.47000	02	0.11810	03
0.65200	03	0.14820	04	0.15920	04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (80)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.16430	03	0.62760	02	0.12190	03	0.85200	03	0.14820	04	0.15920	04
0.18430	03	0.62760	02	0.12190	03	0.85200	03	0.85650	03	0.11570	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (81)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.21550	03	0.60490	02	0.74940	02	0.85200	03	0.85650	03	0.11570	04	0.21550	03	0.60490	02	0.74940	02	0.85200	03	0.21030	04	0.15050	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (82)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)												
0.24680	03	0.36180	02	0.11770	02	0.85200	03	0.21030	04	0.15050	04	0.19320	03	0.15770	03	0.11770	02	0.15570	04	0.16210	04	0.13580	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (82)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)						
0.36180	02	0.24680	03	0.11770	02	0.20550	04	0.94520	03	0.19420	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (83)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.59630	02	0.25090	03	0.44390	02	0.20550	04	0.94520	03	0.19420	04	0.59630	02	0.25090	03	0.44390	02	0.20550	04	0.94920	03	0.20900	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (84)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.62240	02	0.25120	03	0.47380	02	0.20550	04	0.94520	03	0.20900	04	0.62240	02	0.25120	03	0.47380	02	0.20550	04	0.95230	03	0.21870	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (85)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.64700	02	0.25140	03	0.50130	02	0.20550	04	0.95230	03	0.21870	04	0.64700	02	0.25140	03	0.50130	02	0.20550	04	0.95720	03	0.23270	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (86)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(C)	VY(C)	VZ(C)	TX(C)	MY(C)	MZ(C)												
0.76240	02	0.25210	03	0.62600	02	0.20550	04	0.95720	03	0.23270	04	0.22720	03	0.13320	03	0.62600	02	0.16940	04	0.14460	04	0.27140	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (86)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)						
0.25210	03	0.76240	02	0.62600	02	0.99360	03	0.18680	04	0.27540	04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (87)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.25240	03	0.12400	03	0.10890	03	0.99360	03	0.18680	04	0.27540	04	0.25240	03	0.12400	03	0.10890	03	0.99360	03	0.27190	03	0.87850	03

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (88)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.25280 03 0.17170 03 0.14940 03 0.99360 03 0.27190 03 0.87850 03 0.25280 03 0.17170 03 0.14940 03 0.99360 03 0.21540 04 0.18980 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (89)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.25300 03 0.18510 03 0.15980 03 0.99360 03 0.21540 04 0.18980 04 0.25300 03 0.18510 03 0.15980 03 0.99360 03 0.42250 04 0.42680 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (90)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.64890 03 0.82450 03 0.17920 04 0.15770 05 0.55100 04 0.86790 04 0.64890 03 0.82450 03 0.17920 04 0.15770 05 0.53340 04 0.13380 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (91)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.64880 03 0.82470 03 0.17910 04 0.15770 05 0.53340 04 0.13380 05 0.64880 03 0.82470 03 0.17910 04 0.15770 05 0.13540 05 0.54480 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (92)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.64870 03 0.17890 04 0.82170 03 0.15770 05 0.54480 04 0.13540 05 0.17130 04 0.82900 03 0.82170 03 0.13490 05 0.11090 05 0.20920 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (92)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.17890 04 0.64870 03 0.82170 03 0.34320 04 0.20430 05 0.20520 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (93)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.62470 03 0.67910 03 0.64270 03 0.34320 04 0.20520 05 0.20430 05 0.62470 03 0.67910 03 0.64270 03 0.34320 04 0.13320 05 0.12850 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (94)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.62450 03 0.63570 03 0.59110 03 0.34320 04 0.13320 05 0.12850 05 0.62450 03 0.63570 03 0.59110 03 0.34320 04 0.64990 04 0.76540 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (95)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.62400 03 0.53070 03 0.47200 03 0.34320 04 0.64990 04 0.76540 04 0.62400 03 0.53070 03 0.47200 03 0.34320 04 0.72430 04 0.87090 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (96)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.62380 03 0.48880 03 0.42360 03 0.34320 04 0.72430 04 0.87090 04 0.62380 03 0.48880 03 0.42360 03 0.34320 04 0.99520 04 0.12 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (97)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.62340 03	0.42110 03	0.34530 03	0.34320 04	0.99520 04	0.12250 05	0.62340 03	0.42110 03	0.34530 03	0.34320 04	0.12440 05	0.15610 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (98)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.62280 03	0.35910 03	0.27700 03	0.34320 04	0.12440 05	0.15610 05	0.62280 03	0.35910 03	0.27700 03	0.34320 04	0.14220 05	0.18400 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (99)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.62220 03	0.31500 03	0.24230 03	0.34320 04	0.14220 05	0.18400 05	0.62220 03	0.31500 03	0.24230 03	0.34320 04	0.15060 05	0.20330 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (100)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.62130 03	0.29130 03	0.25700 03	0.34320 04	0.15060 05	0.20330 05	0.62130 03	0.29130 03	0.25700 03	0.34320 04	0.14990 05	0.21980 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (101)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.62010 03	0.27980 03	0.30490 03	0.34320 04	0.14990 05	0.21980 05	0.62010 03	0.27980 03	0.30490 03	0.34320 04	0.13850 05	0.22330 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (102)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.61870 03	0.27140 03	0.34770 03	0.34320 04	0.13850 05	0.22330 05	0.61870 03	0.27140 03	0.34770 03	0.34320 04	0.12410 05	0.21620 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (103)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.61760 03	0.27940 03	0.38390 03	0.34320 04	0.18050 05	0.17190 05	0.60920 03	0.44740 03	0.38390 03	0.12360 05	0.12960 05	0.16540 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (103)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.27540 03	0.61760 03	0.38390 03	0.17580 05	0.5330 04	0.16770 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (104)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.34120 03	0.38700 03	0.61780 03	0.17570 05	0.16640 05	0.26610 04	0.34120 03	0.38700 03	0.61780 03	0.17570 05	0.20400 05	0.52190 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (105)

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (113)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.13360 03 0.30350 03 0.49640 03 0.92640 04 0.84080 04 0.12850 05 0.13360 03 0.30350 03 0.49640 03 0.92640 04 0.60790 04 0.15370 05

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (114)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.12110 03 0.26130 03 0.50810 03 0.92640 04 0.60790 04 0.15370 05 0.12110 03 0.26130 03 0.50810 03 0.92640 04 0.72700 04 0.17580 05

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (115)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.11370 03 0.23950 03 0.51280 03 0.92640 04 0.72700 04 0.17580 05 0.11370 03 0.23950 03 0.51280 03 0.92640 04 0.10150 05 0.19210 05

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (116)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.96330 02 0.70370 03 0.24820 03 0.92640 04 0.10150 05 0.19210 05 0.96330 02 0.70370 03 0.24820 03 0.92640 04 0.55780 04 0.50720 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (117)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(C) VY(C) VZ(C) TX(C) MY(C) MZ(C)
0.80550 02 0.24970 03 0.39710 03 0.92640 04 0.50560 04 0.55930 04 0.13550 03 0.22470 03 0.39710 03 0.80470 04 0.47830 04 0.19530 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (117)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.24970 03 0.80550 02 0.39710 03 0.41930 04 0.10640 05 0.12010 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (118)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.27080 03 0.38500 03 0.80130 02 0.41930 04 0.12010 04 0.10640 05 0.27080 03 0.38500 03 0.80130 02 0.41930 04 0.27670 04 0.33010 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (119)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(C) VY(C) VZ(C) TX(C) MY(C) MZ(C)
0.28600 03 0.79720 02 0.67250 03 0.41930 04 0.33010 04 0.27670 04 0.24460 03 0.16840 03 0.67250 03 0.12170 04 0.70040 04 0.26130 04

ELEMENT TYPE (3/C P I P E) / / / ELEMENT NUMBER (119)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.79720 02 0.28600 03 0.67250 03 0.62730 04 0.80550 04 0.17460 04

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (120)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.79730 02	0.72080 03	0.33570 03	0.62630 04	0.18130 04	0.62780 04	0.79730 02	0.72080 03	0.33570 03	0.62630 04	0.23430 04	0.94840 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (121)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.79740 02	0.75140 03	0.34240 03	0.62630 04	0.23430 04	0.94840 04	0.79740 02	0.75140 03	0.34240 03	0.62630 04	0.34270 04	0.12350 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (122)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.79750 02	0.78650 03	0.35030 03	0.62630 04	0.34270 04	0.12350 05	0.79750 02	0.78650 03	0.35030 03	0.62630 04	0.63020 04	0.19080 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (123)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.79750 02	0.80440 03	0.35440 03	0.62630 04	0.63020 04	0.19080 05	0.79750 02	0.80440 03	0.35440 03	0.62630 04	0.94120 04	0.26200 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (124)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.79750 02	0.80530 03	0.35470 03	0.62630 04	0.94120 04	0.26200 05	0.79750 02	0.80530 03	0.35470 03	0.62630 04	0.10460 05	0.28600 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (125)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.66760 03	0.84120 03	0.17960 04	0.15980 05	0.53350 04	0.13380 05	0.66760 03	0.84120 03	0.17960 04	0.15980 05	0.55510 04	0.90810 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (126)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.68830 03	0.93760 03	0.17590 04	0.15870 05	0.10760 05	0.16370 05	0.68830 03	0.93760 03	0.17990 04	0.15870 05	0.54270 04	0.14070 05

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RESPONSE SPECTRUM STRESS COMPONENTS

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (1)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.13510	02	0.18057	02	0.95260	01	0.82210	02	0.70050	03	0.25910	03

~~ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (2)~~

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.24420	02	0.23570	02	0.20070	02	0.82210	02	0.64880	03	0.16530	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (3)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.35430	02	0.30440	02	0.29320	02	0.82210	02	0.17450	03	0.50240	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (3)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.30440	02	0.35430	02	0.29320	02

~~ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (4)~~

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.40060	02	0.33770	02	0.45630	02	0.25900	03	0.29910	03	0.14600	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (5)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.48420	02	0.35640	02	0.54040	02	0.25900	03	0.12940	03	0.40230	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (6)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.57770	02	0.36680	02	0.63210	02	0.25900	03	0.31650	03	0.54230	03

~~ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (7)~~

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.55640	02	0.70970	02	0.75830	02	0.56930	03	0.25900	03	0.69190	03

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (6)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.36700 02 0.93890 02 0.97880 02 0.56930 03 0.43180 03 0.96880 03 0.36700 02 0.93890 02 0.97880 02 0.56930 03 0.15470 04 0.20760 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (9)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.36720 02 0.11970 03 0.12310 03 0.56930 03 0.15470 04 0.20760 04 0.36720 02 0.11970 03 0.12310 03 0.56930 03 0.35050 04 0.39830 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (10)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.36730 02 0.13140 03 0.13460 03 0.56930 03 0.35050 04 0.39830 04 0.36730 02 0.13140 03 0.13460 03 0.56930 03 0.56570 04 0.60830 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (11)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.36740 02 0.13230 03 0.13560 03 0.56930 03 0.56570 04 0.60830 04 0.36740 02 0.13230 03 0.13560 03 0.56930 03 0.66160 04 0.70190 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (12)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.69950 01 0.14680 02 0.39560 01 0.82210 02 0.70050 03 0.25910 03 0.69950 01 0.14680 02 0.39560 01 0.82210 02 0.70630 03 0.34450 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (13)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.82640 01 0.13950 02 0.78750 01 0.82210 02 0.70600 03 0.34450 03 0.82640 01 0.13950 02 0.78750 01 0.82210 02 0.68820 03 0.39830 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (14)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.23740 02 0.20730 02 0.22790 02 0.82210 02 0.68820 03 0.39830 03 0.31400 02 0.26200 01 0.22790 02 0.46640 03 0.33150 03 0.46590 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (14)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.20730 02 0.23740 02 0.22790 02 0.52060 03 0.29720 03 0.38100 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (15)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.41890 02 0.31680 02 0.36300 02 0.52060 03 0.38100 03 0.29720 03 0.41890 02 0.31680 02 0.36300 02 0.52060 03 0.31180 03 0.56940 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (16)

~~PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)~~
~~0.55520 02 0.10040 03 0.49780 02 0.52060 03 0.11190 03 0.95330 03 0.69260 02 0.10040 03 0.49780 02 0.52060 03 0.11190 03 0.95330 03~~

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (17)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.69260 02 0.10040 03 0.49780 02 0.52060 03 0.11190 03 0.95330 03 0.69260 02 0.10040 03 0.49780 02 0.52060 03 0.11190 03 0.95330 03

~~ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (18)~~

~~PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)~~
~~0.91420 02 0.10040 03 0.49780 02 0.52060 03 0.11190 03 0.95330 03 0.13410 03 0.30310 02 0.54180 02 0.50990 03 0.19710 03 0.13110 04~~

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (18)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.10260 03 0.51420 02 0.54180 02 0.60030 03 0.36360 03 0.83920 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (19)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.10960 03 0.10800 03 0.57120 02 0.60030 03 0.36360 03 0.83920 03 0.10960 03 0.10800 03 0.57120 02 0.60030 03 0.73660 03 0.11170 03

~~ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (20)~~

~~PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)~~
~~0.16040 02 0.22850 02 0.97620 01 0.48800 01 0.10030 03 0.22540 03 0.16040 02 0.22850 02 0.97620 01 0.48800 01 0.76490 02 0.16970 03~~

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (21)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.14480 02 0.23040 02 0.97600 01 0.35750 01 0.76560 02 0.16970 03 0.14480 02 0.23040 02 0.97600 01 0.35750 01 0.32260 02 0.65190 02

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (22)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.75300 01 0.13040 02 0.64920 01 0.81520 12 0.32460 02 0.65190 02 0.75300 01 0.13040 02 0.64920 01 0.81520 12 0.55710 11 0.10660 11

~~ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (23)~~

~~PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)~~
~~0.83040 02 0.11400 03 0.13530 03 0.48970 02 0.76100 03 0.52470 03 0.83040 02 0.11400 03 0.13530 03 0.48970 02 0.63620 03 0.64710 03~~

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (24)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.60300 02 0.60720 02 0.97610 02 0.17190 03 0.61670 03 0.64510 03 0.60300 02 0.60720 02 0.97610 02 0.17190 03 0.10390 04 0.10390 04

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ELEMENT (25)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1100 03 0.6630 02 0.3754 02 0.5399 03 0.1120 04 0.2286 03 0.1100 03 0.6630 02 0.3754 02 0.5399 03 0.9690 03 0.2872 03

ELEMENT TYPE (3/0) P I P E (26)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1100 03 0.6630 02 0.3754 02 0.5399 03 0.1100 03 0.6630 02 0.3754 02 0.5399 03 0.8616 03 0.4478 03

ELEMENT TYPE (3/0) P I P E (27)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1120 13 0.4634 02 0.4085 02 0.4393 02 0.4240 03 0.4629 03 0.1112 03 0.4634 02 0.4085 02 0.4393 02 0.3748 03

ELEMENT TYPE (3/0) P I P E (28)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1190 03 0.4636 02 0.4051 02 0.4393 02 0.4393 03 0.3748 03 0.1180 03 0.4636 02 0.4051 02 0.4393 02 0.5917 03 0.3023 03

ELEMENT TYPE (3/0) P I P E (29)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1125 03 0.4645 02 0.3990 02 0.4393 02 0.4393 02 0.5917 02 0.1125 03 0.4645 02 0.3990 02 0.4393 02 0.6957 03 0.3873 03

ELEMENT TYPE (3/0) P I P E (30)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1149 03 0.4664 02 0.3814 02 0.4393 02 0.6957 03 0.3870 03 0.1149 03 0.4664 02 0.3814 02 0.4393 02 0.8526 03 0.5698 03

ELEMENT TYPE (3/0) P I P E (31)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1493 12 0.3326 01 0.1874 02 0.3843 03 0.2436 03 0.4324 02 0.1493 02 0.3326 01 0.1874 02 0.3843 03 0.6068 03 0.2319 03

ELEMENT TYPE (3/0) P I P E (32)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1441 03 0.1418 03 0.1855 03 0.5660 03 0.4393 02 0.6236 03 0.1401 03 0.1418 03 0.1855 03 0.5660 03 0.1730 04 0.1153 04

ELEMENT TYPE (3/0) P I P E (33)

PX(1) VY(1) VZ(1) TX(1) MY(1) WZ(1) PX(J) VY(J) VZ(J) TX(J) MY(J) WZ(J)
0.1441 03 0.5010 12 0.4331 02 0.5660 03 0.1730 04 0.1150 04 0.1401 03 0.9001 02 0.4331 02 0.5660 03 0.1060 04 0.2491 04

ELEMENT TYPE (3/0) P I P E (34)

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PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.14010 03 0.36690 02 0.88740 02 0.56600 03 0.24910 04 0.19600 04 0.11710 03 0.85210 02 0.88740 02 0.18250 04 0.22990 04 0.81410 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (34)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I)
0.67830 02 0.12800 03 0.88740 02 0.28360 04 0.15080 04 0.36130 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (35)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.67150 02 0.88280 02 0.12710 03 0.28370 04 0.36130 03 0.15060 04 0.67150 02 0.88280 02 0.12700 03 0.28370 04 0.30110 03 0.16830 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (36)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.66920 02 0.28140 02 0.12660 03 0.28370 04 0.30110 03 0.16830 04 0.66920 02 0.88140 02 0.12660 03 0.28370 04 0.53430 03 0.19490 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (37)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.66650 02 0.87990 02 0.12580 03 0.28370 04 0.53430 03 0.19490 04 0.10780 03 0.23640 02 0.12580 03 0.24370 04 0.14460 04 0.20770 04

3-90 ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (37)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I)
0.87990 02 0.16630 02 0.12580 03 0.87350 03 0.24620 04 0.20190 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (38)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.88060 02 0.25190 02 0.13800 03 0.87350 03 0.31390 04 0.53300 03 0.88060 02 0.25190 02 0.13800 03 0.87350 03 0.19030 04 0.59940 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (39)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.89480 02 0.17940 02 0.13050 03 0.87350 03 0.19030 04 0.59940 03 0.89480 02 0.17940 02 0.13050 03 0.87350 03 0.74980 03 0.79920 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (40)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.92650 02 0.12770 02 0.11000 03 0.87350 03 0.74980 03 0.79920 03 0.92650 02 0.12770 02 0.11000 03 0.87350 03 0.18250 04 0.86210 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (41)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.95470 02 0.12390 02 0.93330 02 0.87350 03 0.26560 04 0.10300 04

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (42)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.97740 02 0.13070 02 0.80040 02 0.87350 03 0.25560 04 0.87320 03 0.97740 02 0.13070 02 0.80040 02 0.87350 03 0.29720 04 0.90130 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (43)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.99260 02 0.13740 02 0.71510 02 0.87350 03 0.29720 04 0.90130 03 0.99260 02 0.13740 02 0.71510 02 0.87350 03 0.32530 04 0.90690 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (44)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.10250 03 0.15310 02 0.54400 02 0.87350 03 0.32530 04 0.90690 03 0.10250 03 0.15310 02 0.54400 02 0.87350 03 0.38670 04 0.91770 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (45)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(C) VY(C) VZ(C) TX(C) MY(C) MZ(C)
0.10890 03 0.16700 02 0.27270 02 0.87350 03 0.38670 04 0.91770 03 0.77170 02 0.78650 02 0.27270 02 0.33750 04 0.22760 04 0.62250 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (45)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.16700 02 0.10890 03 0.27270 02 0.40420 04 0.66080 03 0.33280 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (46)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.11140 02 0.11240 03 0.24030 02 0.40420 04 0.66080 03 0.33280 03 0.11140 02 0.11240 03 0.24030 02 0.40420 04 0.71430 03 0.79850 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (47)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(C) VY(C) VZ(C) TX(C) MY(C) MZ(C)
0.11140 02 0.11370 03 0.31990 02 0.40420 04 0.71430 03 0.79850 03 0.81670 02 0.79860 02 0.31990 02 0.33790 04 0.23100 04 0.10240 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (47)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.11370 03 0.11140 02 0.31990 02 0.79330 03 0.39700 04 0.11130 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (48)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.11670 03 0.10670 02 0.65360 02 0.79330 03 0.39700 04 0.11130 04 0.11670 03 0.10670 02 0.65360 02 0.79330 03 0.25400 04 0.10450 04

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PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.12060 03 0.08300 01 0.10210 03 0.79330 03 0.25400 04 0.10450 04 0.12060 03 0.88300 01 0.10210 03 0.79330 03 0.13660 04 0.98820 03

ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (50)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.12390 03 0.88980 01 0.12730 03 0.79330 03 0.13660 04 0.98820 03 0.83310 02 0.92140 02 0.12730 03 0.39850 03 0.59110 03 0.58310 03

ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (50)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.83920 01 0.12390 03 0.12730 03 0.37400 03 0.55050 03 0.32270 03

ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (51)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.88980 01 0.12460 03 0.13880 03 0.37400 03 0.55050 03 0.32270 03 0.88980 01 0.12460 03 0.13880 03 0.37400 03 0.81600 03 0.56810 03

ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (52)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.31190 02 0.12470 03 0.14310 03 0.37400 03 0.81600 03 0.56810 03 0.10920 03 0.67770 02 0.14310 03 0.82140 03 0.84010 03 0.80480 03

8.9 ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (52)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.12470 03 0.31190 02 0.14310 03 0.12380 04 0.52150 03 0.85070 03

ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (53)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.12480 03 0.31420 02 0.15700 03 0.12380 04 0.52150 03 0.85070 03 0.12480 03 0.31420 02 0.15700 03 0.12380 04 0.35160 04 0.30640 03

ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (54)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.12480 03 0.32270 02 0.16530 03 0.12380 04 0.35160 04 0.31640 03 0.12480 03 0.32270 02 0.16530 03 0.12380 04 0.68080 04 0.51220 03

ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (55)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.12480 03 0.32270 02 0.16550 03 0.12380 04 0.68080 04 0.51220 03 0.12480 03 0.32270 02 0.16550 03 0.12380 04 0.74680 04 0.52920 03

ELEMENT TYPE (3/D P I P F) / / / ELEMENT NUMBER (56)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (57)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.91080 02 0.73040 02 0.75130 02 0.13830 03 0.64890 03 0.40940 03 0.91080 02 0.73040 02 0.75130 02 0.13830 03 0.35090 03 0.13640 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (58)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.91020 02 0.71150 02 0.75180 02 0.13830 03 0.35090 03 0.13640 03 0.91020 02 0.71150 02 0.75180 02 0.13830 03 0.15200 03 0.11820 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (59)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.90990 02 0.70040 02 0.75140 02 0.13830 03 0.15200 03 0.11820 03 0.10410 03 0.48370 02 0.75140 02 0.14210 03 0.10230 03 0.16780 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (59)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.70040 02 0.50990 02 0.75140 02 0.69500 02 0.25330 03 0.15420 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (60)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.67350 02 0.12410 02 0.49670 02 0.69500 02 0.25330 03 0.15420 03 0.67350 02 0.12410 02 0.49670 02 0.69500 02 0.32210 03 0.10770 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (61)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.63410 02 0.12250 02 0.46760 02 0.69500 02 0.32210 03 0.10770 03 0.63410 02 0.12250 02 0.46760 02 0.69500 02 0.80190 03 0.18010 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (62)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.46740 02 0.11250 02 0.30130 02 0.69500 02 0.80190 03 0.18010 03 0.46740 02 0.11250 02 0.30130 02 0.69500 02 0.11570 04 0.28890 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (63)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.26930 02 0.48580 01 0.35280 02 0.12250 11 0.48580 03 0.63150 02 0.26930 02 0.48580 01 0.35280 02 0.12250 11 0.22680 10 0.11870 10

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (64)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40830 02 0.47990 02 0.12920 02 0.18850 03 0.10390 03 0.26510 03

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (65)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.45500	02	0.33900	02	0.15300	02	0.15180	03	0.15270	03	0.96510	03	0.45500	02	0.30900	02	0.15300	02	0.15180	03	0.33150	03	0.35780	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (66)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.20730	02	0.45330	02	0.78300	01	0.34910	03	0.10540	03	0.35780	03	0.20730	02	0.45330	02	0.78300	01	0.34910	03	0.10710	03	0.35350	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (67)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.19610	02	0.44370	02	0.58460	01	0.34910	03	0.10710	03	0.35350	03	0.19610	02	0.44370	02	0.58460	01	0.34910	03	0.11210	03	0.43250	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (68)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.19650	02	0.42490	02	0.62590	01	0.34910	03	0.11210	03	0.43250	03	0.42350	02	0.19940	02	0.62590	01	0.22780	03	0.28560	03	0.62160	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (68)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.42490	02	0.19650	02	0.62590	01
0.12690	03	0.33990	03	0.62750	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (69)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.33480	02	0.13410	02	0.23720	02	0.12690	03	0.62750	03	0.33990	03	0.33480	02	0.13410	02	0.23720	02	0.12690	03	0.41660	03	0.28150	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (70)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.37740	02	0.17840	02	0.27770	02	0.12690	03	0.41660	03	0.28150	03	0.37740	02	0.17840	02	0.27770	02	0.12690	03	0.19640	03	0.27580	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (71)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.36600	02	0.20010	02	0.30290	02	0.12690	03	0.19640	03	0.27580	03	0.36600	02	0.20010	02	0.30290	02	0.12690	03	0.24380	03	0.37910	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (72)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.36190	02	0.22420	02	0.13540	02	0.12690	03	0.24380	03	0.37910	03	0.36190	02	0.22420	02	0.13540	02	0.12690	03	0.23730	03	0.33580	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (73)

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0.36110 0.22160 02 0.12860 02 0.12690 03 0.23730 03 0.33580 03 0.36110 02 0.22160 02 0.12860 02 0.12690 03 0.25140 03 0.33760 03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (74)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.36390	02	0.21090	02	0.10130	02	0.12690	03	0.25140	03	0.30930	03	0.36390	02	0.21090	02	0.10130	02	0.12690	03	0.29140	03	0.37670	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (75)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.37330	02	0.18980	02	0.60450	01	0.12690	03	0.29140	03	0.37670	03	0.37330	02	0.18980	02	0.60450	01	0.12690	03	0.29880	03	0.49180	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (76)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.39440	02	0.15930	02	0.11130	02	0.12690	03	0.29880	03	0.49180	03	0.37280	02	0.20470	02	0.11130	02	0.15350	03	0.21850	03	0.46160	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (76)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)						
0.15930	02	0.39440	02	0.11130	02	0.23330	03	0.36740	02	0.28430	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (77)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.14150	02	0.41040	02	0.14680	02	0.23330	03	0.36740	02	0.28430	03	0.14150	02	0.41040	02	0.14680	02	0.23330	03	0.41010	02	0.25370	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (78)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.13840	02	0.41500	02	0.15450	02	0.23330	03	0.41010	02	0.25370	03	0.13840	02	0.41500	02	0.15450	02	0.23330	03	0.75730	02	0.25670	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (79)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)												
0.13530	02	0.42170	02	0.16030	02	0.23330	03	0.75730	02	0.25670	03	0.36400	02	0.25230	02	0.16030	02	0.20470	03	0.14380	03	0.28830	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (79)

PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)						
0.42170	02	0.13530	02	0.16030	02	0.12040	03	0.21170	03	0.29430	03

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (80)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)										
0.44140	02	0.12500	02	0.12500	02	0.21170	03	0.29430	03	0.44140	02	0.12500	02	0.12500	02	0.12040	03	0.21170	03	0.29430	03

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ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (81)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.47630 02 0.11260 02 0.11860 02 0.12040 03 0.13740 03 0.22430 03 0.47630 02 0.10260 02 0.11860 02 0.12040 03 0.33490 03 0.28550 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (82)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.51290 02 0.97610 01 0.42840 01 0.12040 03 0.33490 03 0.28530 03 0.41260 02 0.31990 02 0.42840 01 0.24220 03 0.27090 03 0.26240 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (82)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I)
0.97610 01 0.51290 02 0.42840 01 0.34620 03 0.13000 03 0.47080 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (83)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.14980 02 0.51660 02 0.73000 01 0.34620 03 0.13000 03 0.47080 03 0.14980 02 0.51660 02 0.73000 01 0.34620 03 0.13020 03 0.50420 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (84)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.15470 02 0.51690 02 0.76810 01 0.34620 03 0.13020 03 0.50420 03 0.15470 02 0.51690 02 0.76810 01 0.34620 03 0.13040 03 0.52560 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (85)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.15930 02 0.51700 02 0.80400 01 0.34620 03 0.13040 03 0.52560 03 0.15930 02 0.51700 02 0.80400 01 0.34620 03 0.13070 03 0.55630 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (86)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.18060 02 0.51740 02 0.97300 01 0.34620 03 0.13070 03 0.55630 03 0.47770 02 0.26850 02 0.97300 01 0.25230 03 0.26410 03 0.53940 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (86)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.51740 02 0.18060 02 0.97300 01 0.13450 03 0.32650 03 0.64860 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (87)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.51640 02 0.26540 02 0.16430 02 0.13450 03 0.32650 03 0.64860 03 0.51640 02 0.26640 02 0.16430 02 0.13450 03 0.20570 03 0.34910 03

ELEMENT TYPE (3/D) P I P E) / / / ELEMENT NUMBER (88)

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PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.51580 0.35030 0.22400 0.13450 0.38730 0.48680 0.51580 0.35030 0.22400 0.13450 0.38730 0.48680

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (89)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.51470 0.37480 0.23960 0.13450 0.38730 0.48680 0.51470 0.37480 0.23960 0.13450 0.66930 0.91130

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (90)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.61620 0.15610 0.20200 0.30880 0.61880 0.16890 0.61620 0.15610 0.20200 0.30880 0.59400 0.26170

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (91)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.61620 0.15610 0.20190 0.30880 0.59400 0.26170 0.61620 0.15610 0.20190 0.30880 0.15270 0.99560

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (92)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.61610 0.20180 0.15570 0.30880 0.99560 0.21520 0.61610 0.20180 0.15570 0.30880 0.21520 0.22750

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (92)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I)
0.20180 0.61610 0.15570 0.29620 0.40140 0.23690

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (93)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40390 0.11840 0.61330 0.29620 0.23690 0.40140 0.40390 0.11840 0.61330 0.29620 0.16360 0.25940

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (94)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40390 0.11400 0.58730 0.29620 0.16360 0.25940 0.40390 0.11400 0.58730 0.29620 0.17420 0.49300

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (95)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40380 0.10150 0.51510 0.29620 0.17420 0.49300 0.40380 0.10150 0.51510 0.29620 0.20020 0.79450

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (96)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40370 0.09110 0.58240 0.29620 0.20020 0.79450 0.40370 0.09110 0.58240 0.29620 0.58980 0.17130

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (97)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40370 03 0.25150 03 0.41910 03 0.29620 04 0.58980 04 0.17030 05 0.40370 03 0.25050 03 0.41910 03 0.29620 04 0.59640 04 0.25520 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (98)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40360 03 0.71510 03 0.34010 03 0.29620 04 0.99640 04 0.25520 05 0.40360 03 0.71510 03 0.34010 03 0.29620 04 0.13460 05 0.33020 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (99)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40340 03 0.56060 03 0.25080 03 0.29620 04 0.13460 05 0.33020 05 0.40340 03 0.56060 03 0.25080 03 0.29620 04 0.15890 05 0.38610 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (100)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40350 03 0.35470 03 0.13880 03 0.29620 04 0.15890 05 0.38610 05 0.40350 03 0.35470 03 0.13880 03 0.29620 04 0.17730 05 0.43930 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (101)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40300 03 0.54480 02 0.93480 02 0.29620 04 0.17730 05 0.43900 05 0.40300 03 0.94480 02 0.93480 02 0.29620 04 0.17220 05 0.45150 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (102)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40280 03 0.19280 03 0.21820 03 0.29620 04 0.17220 05 0.45150 05 0.40280 03 0.18280 03 0.21820 03 0.29620 04 0.14930 05 0.42900 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (103)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.40260 03 0.35700 03 0.34890 03 0.29620 04 0.30530 05 0.33620 05 0.44470 03 0.31470 03 0.34890 03 0.20090 05 0.21400 05 0.32160 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (103)

PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.36700 03 0.40260 03 0.34890 03 0.28720 05 0.15570 04 0.31430 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (104)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.51940 03 0.47260 03 0.43670 03 0.28680 05 0.31200 05 0.43930 04 0.51940 03 0.47260 03 0.43670 03 0.28680 05 0.31400 05 0.91090 04

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PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.64380 03	0.40150 03	0.63280 03	0.28940 05	0.62360 04	0.31860 05	0.63870 03	0.47000 03	0.63280 03	0.25850 05	0.13790 05	0.31020 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (105)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)
0.40150 03	0.48380 03	0.63280 03	0.99900 04	0.25470 05	0.28310 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (106)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.40470 03	0.83340 03	0.59560 03	0.99900 04	0.14470 05	0.35230 05	0.40470 03	0.88840 03	0.59560 03	0.99900 04	0.10860 05	0.29020 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (107)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.41590 03	0.10830 04	0.68520 03	0.99900 04	0.10860 05	0.29020 05	0.41590 03	0.10830 04	0.68520 03	0.99900 04	0.85690 04	0.54280 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (108)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.43360 03	0.11760 04	0.72350 03	0.99900 04	0.85690 04	0.54280 04	0.43360 03	0.11760 04	0.72350 03	0.99900 04	0.12640 05	0.35470 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (109)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.44840 03	0.12140 04	0.73850 03	0.99900 04	0.12540 05	0.35470 04	0.44840 03	0.12140 04	0.73850 03	0.99900 04	0.20830 05	0.17740 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (110)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.46770 03	0.13600 03	0.13650 03	0.99900 04	0.17740 05	0.20300 05	0.39290 03	0.27510 03	0.13650 03	0.82030 04	0.18750 05	0.20300 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (110)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)
0.10600 03	0.46770 03	0.13650 03	0.17980 05	0.97380 04	0.18540 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (111)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
0.10710 03	0.13150 03	0.48880 03	0.17980 05	0.18540 05	0.97380 04	0.10710 03	0.13150 03	0.48880 03	0.17980 05	0.14180 05	0.93050 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (112)

PX(I)	VY(I)	VZ(I)	TX(I)	MY(I)	MZ(I)	PX(J)	VY(J)	VZ(J)	TX(J)	MY(J)	MZ(J)
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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (113)

~~PX(I)~~ ~~VY(I)~~ ~~VZ(I)~~ ~~TX(I)~~ ~~MY(I)~~ ~~MZ(I)~~ ~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
0.11130 03 0.13100 03 0.53440 03 0.17980 05 0.88540 04 0.86800 04 0.11130 03 0.13100 03 0.53440 03 0.17980 05 0.80790 04 0.83290 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (114)

~~PX(I)~~ ~~VY(I)~~ ~~VZ(I)~~ ~~TX(I)~~ ~~MY(I)~~ ~~MZ(I)~~ ~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
0.11350 03 0.13260 03 0.54410 03 0.17980 05 0.80790 04 0.83290 04 0.11350 03 0.13260 03 0.54410 03 0.17980 05 0.10550 05 0.80880 04

~~ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (115)~~

~~PX(I)~~ ~~VY(I)~~ ~~VZ(I)~~ ~~TX(I)~~ ~~MY(I)~~ ~~MZ(I)~~ ~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
~~0.11560 03 0.13340 03 0.54760 03 0.17980 05 0.10550 05 0.80880 04 0.11560 03 0.13340 03 0.54760 03 0.17980 05 0.13850 05 0.80180 04~~

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (116)

~~PX(I)~~ ~~VY(I)~~ ~~VZ(I)~~ ~~TX(I)~~ ~~MY(I)~~ ~~MZ(I)~~ ~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
0.11940 03 0.13900 03 0.26800 03 0.17980 05 0.13850 05 0.80180 04 0.11940 03 0.13900 03 0.26800 03 0.17980 05 0.86450 04 0.77370 03

0013 ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (117)

~~PX(I)~~ ~~VY(I)~~ ~~VZ(I)~~ ~~TX(I)~~ ~~MY(I)~~ ~~MZ(I)~~ ~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
0.12750 03 0.13320 03 0.28180 03 0.17980 05 0.12180 04 0.85940 04 0.16400 03 0.32210 03 0.28180 03 0.15220 05 0.78740 04 0.33850 04

~~ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (117)~~

~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
~~0.33820 03 0.12750 03 0.28180 03 0.68470 04 0.12350 05 0.11880 04~~

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (118)

~~PX(I)~~ ~~VY(I)~~ ~~VZ(I)~~ ~~TX(I)~~ ~~MY(I)~~ ~~MZ(I)~~ ~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
0.34940 03 0.24490 03 0.13370 03 0.68470 04 0.11880 04 0.12350 05 0.34940 03 0.24490 03 0.13370 03 0.68470 04 0.41610 04 0.52130 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (119)

~~PX(I)~~ ~~VY(I)~~ ~~VZ(I)~~ ~~TX(I)~~ ~~MY(I)~~ ~~MZ(I)~~ ~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
0.35600 03 0.13370 03 0.24110 03 0.68470 04 0.52130 04 0.41610 04 0.33420 03 0.18260 03 0.24110 03 0.15800 04 0.75050 04 0.41200 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (119)

~~PX(J)~~ ~~VY(J)~~ ~~VZ(J)~~ ~~TX(J)~~ ~~MY(J)~~ ~~MZ(J)~~
~~0.15500 03 0.35600 04 0.24110 03 0.37670 04 0.54010 04 0.33170 04~~

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ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (120)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.13370 03 0.29850 03 0.31240 03 0.37670 04 0.18700 04 0.58970 04 0.13370 03 0.29850 03 0.31240 03 0.37670 04 0.12000 04 0.45460 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (121)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.13370 03 0.29860 03 0.31340 03 0.37670 04 0.12000 04 0.46460 04 0.13370 03 0.29860 03 0.31340 03 0.37670 04 0.16810 04 0.34430 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (122)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.13370 03 0.29880 03 0.31470 03 0.37670 04 0.16810 04 0.34430 04 0.13370 03 0.29880 03 0.31470 03 0.37670 04 0.41530 04 0.11010 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (123)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.13370 03 0.29900 03 0.31540 03 0.37670 04 0.41530 04 0.11010 04 0.13370 03 0.29900 03 0.31540 03 0.37670 04 0.69210 04 0.21900 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (124)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.13370 03 0.29900 03 0.31540 03 0.37670 04 0.69210 04 0.21900 04 0.13370 03 0.29900 03 0.31540 03 0.37670 04 0.78550 04 0.30350 04

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (125)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.61650 03 0.15410 04 0.20180 04 0.30820 05 0.59020 04 0.25750 05 0.61650 03 0.15410 04 0.20180 04 0.30820 05 0.62160 04 0.16600 05

ELEMENT TYPE (3/D P I P E) / / / ELEMENT NUMBER (126)

PX(I) VY(I) VZ(I) TX(I) MY(I) MZ(I) PX(J) VY(J) VZ(J) TX(J) MY(J) MZ(J)
0.63720 03 0.15420 04 0.20230 04 0.30430 05 0.12000 05 0.30800 05 0.63720 03 0.15420 04 0.20230 04 0.30430 05 0.59760 04 0.26300 05

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APPENDIX C
CLASS 2 RESULTS (INEL PIPE II)

APPENDIX C

INEL PIPE II (SAPPER) Results:

- A) Black Model Class 2 Results
- B) Red Model Class 2 Results
- C) Blue Model Class 2 Results.

A. RESULTS OF INEL PIPE II (SAPPER)
FOR THE BLACK MODEL

TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 1

MATERIAL NO. 1
SECTION NO. 1

STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.326

EQUATION (8) STRESS
STRESS (S8R) AT I END OF ELEMENT NO. 24= 8350.
STRESS (S8Q) AT J END OF ELEMENT NO. 23= 8350.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

EQUATION (9) STRESS
STRESS (S9R) AT I END OF ELEMENT NO. 24= 8350.
STRESS (S9Q) AT J END OF ELEMENT NO. 23= 8350.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.2 * S SUB H = 20040.

TANGENT POINT STRESSES

EQUATION (10) STRESS
STRESS (S10R) AT I END OF ELEMENT NO. 1= 304.
STRESS (S10Q) AT J END OF ELEMENT NO. 1= 303.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

EQUATION (11) STRESS
STRESS (S11R) AT I END OF ELEMENT NO. 24= 1283.
STRESS (S11Q) AT J END OF ELEMENT NO. 23= 1283.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS
STRESS (S9R) AT I END OF ELEMENT NO. 24= 8350.
STRESS (S9Q) AT J END OF ELEMENT NO. 23= 8350.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.8 * S SUB H = 30060.

FAULTED CONDITIONS

STRESS AT I END = 8350.
STRESS AT J END = 7371.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 2

MATERIAL NO. 1
SECTION NO. 2

STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.190

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 46 = 5897.
STRESS (S8Q) AT J END OF ELEMENT NO. 46 = 5898.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 46 = 5897.
STRESS (S9Q) AT J END OF ELEMENT NO. 46 = 5898.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S$ SUB H = 20040.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 84 = 10592.
STRESS (S10Q) AT J END OF ELEMENT NO. 94 = 15323.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 84 = 13531.
STRESS (S11Q) AT J END OF ELEMENT NO. 94 = 18262.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 46 = 5897.
STRESS (S9Q) AT J END OF ELEMENT NO. 46 = 5898.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S$ SUB H = 30060.

FAULTED CONDITIONS

STRESS AT I END = 5397.
STRESS AT J END = 2959.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 3

MATERIAL NO. 1
SECTION NO. 3

STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.100

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO.120= 6325.

STRESS (S8Q) AT J END OF ELEMENT NO.120= 6847.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO.120= 6325.

STRESS (S9Q) AT J END OF ELEMENT NO.120= 6847.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 95= 25446.

STRESS (S10Q) AT J END OF ELEMENT NO. 96= 24228.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 95= 29061.

STRESS (S11Q) AT J END OF ELEMENT NO. 96= 28366.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO.120= 6325.

STRESS (S9Q) AT J END OF ELEMENT NO.120= 6847.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS AT I END = 6325.

STRESS AT J END = 2709.

STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 4

MATERIAL NO. 1
SECTION NO. 5

STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.053

EQUATION (8) STRESS
STRESS (S8R) AT I END OF ELEMENT NO.123= 10952.
STRESS (S8Q) AT J END OF ELEMENT NO.121= 14396.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S \text{ SUB H} = 16700$.

TANGENT POINT STRESSES

EQUATION (9) STRESS
STRESS (S9R) AT I END OF ELEMENT NO.123= 10952.
STRESS (S9Q) AT J END OF ELEMENT NO.121= 14396.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

TANGENT POINT STRESSES

2-5
EQUATION (10) STRESS
STRESS (S10R) AT I END OF ELEMENT NO.170= 15207.
STRESS (S10Q) AT J END OF ELEMENT NO.125= 14809.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S \text{ SUB A} = 27675$.

TANGENT POINT STRESSES

EQUATION (11) STRESS
STRESS (S11R) AT I END OF ELEMENT NO.121= 23632.
STRESS (S11Q) AT J END OF ELEMENT NO.125= 26678.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S \text{ SUB A PLUS } S \text{ SUB H} = 44375$.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS
STRESS (S9R) AT I END OF ELEMENT NO.123= 10952.
STRESS (S9Q) AT J END OF ELEMENT NO.121= 14396.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS AT I END = 10952.
STRESS AT J END = 2527.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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ELEOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 1

MATERIAL NO. 1
SECTION NO. 1

STRESS INTENSIFICATION FACTOR = 1.363
SECTION MODULUS = 0.326

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 25= 8179.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 25= 8047.
STRESS (S8S) AT J END OF ELEMENT NO. 25= 7948.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 25= 8179.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 25= 8047.
STRESS (S9S) AT J END OF ELEMENT NO. 25= 7948.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.2 * S SUB H = 20040.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 22= 410.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 8= 409.
STRESS (S10S) AT J END OF ELEMENT NO. 8= 409.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 25= 8589.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 25= 8456.
STRESS (S11S) AT J END OF ELEMENT NO. 25= 8356.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 25= 8179.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 25= 8047.
STRESS (S9S) AT J END OF ELEMENT NO. 25= 7948.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.8 * S SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 25= 8179.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 25= 8047.
STRESS (S9S) AT J END OF ELEMENT NO. 25= 7948.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 2

MATERIAL NO. 1
SECTION NO. 2

STRESS INTENSIFICATION FACTOR = 0.622
SECTION MODULUS = 0.190

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 45= 5751.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 45= 5854.
STRESS (S8S) AT J END OF ELEMENT NO. 45= 5897.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 45= 5751.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 45= 5854.
STRESS (S9S) AT J END OF ELEMENT NO. 45= 5897.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 83= 6373.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 83= 7319.
STRESS (S10S) AT J END OF ELEMENT NO. 83= 6592.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 83= 12124.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 83= 13173.
STRESS (S11S) AT J END OF ELEMENT NO. 83= 12490.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 45= 5751.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 45= 5854.
STRESS (S9S) AT J END OF ELEMENT NO. 45= 5897.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 45= 5751.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 45= 5854.
STRESS (S9S) AT J END OF ELEMENT NO. 45= 5897.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 3

MATERIAL NO. 1
SECTION NO. 3

STRESS INTENSIFICATION FACTOR = 0.570
SECTION MODULUS = 0.100

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 113= 4537.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 113= 4393.
STRESS (S8S) AT J END OF ELEMENT NO. 116= 3930.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 113= 4537.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 113= 4393.
STRESS (S9S) AT J END OF ELEMENT NO. 116= 3930.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S$ SUB H = 20040.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 72= 3894.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 72= 4311.
STRESS (S10S) AT J END OF ELEMENT NO. 72= 4135.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 72= 8430.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 72= 8704.
STRESS (S11S) AT J END OF ELEMENT NO. 72= 8065.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 113= 4537.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 113= 4393.
STRESS (S9S) AT J END OF ELEMENT NO. 116= 3930.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S$ SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 113= 4537.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 113= 4393.
STRESS (S9S) AT J END OF ELEMENT NO. 116= 3930.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 4

MATERIAL NO. 1
SECTION NO. 5

STRESS INTENSIFICATION FACTOR = 0.530
SECTION MODULUS = 0.053

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 124= 4612.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 124= 4549.
STRESS (S8S) AT J END OF ELEMENT NO. 124= 2986.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 124= 4612.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 124= 4549.
STRESS (S9S) AT J END OF ELEMENT NO. 124= 2986.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.2 * S SUB H = 20040.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 124= 7184.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 124= 7703.
STRESS (S10S) AT J END OF ELEMENT NO. 124= 7893.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 124= 11796.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 124= 12252.
STRESS (S11S) AT J END OF ELEMENT NO. 124= 10879.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 124= 4612.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 124= 4549.
STRESS (S9S) AT J END OF ELEMENT NO. 124= 2986.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.8 * S SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 124= 4612.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 124= 4549.
STRESS (S9S) AT J END OF ELEMENT NO. 124= 2986.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

IEF1421 STEP WAS EXECUTED - COND CODE 0000

IEF2851 PERM.RMF5APPB

KEPT

IEF2851 VOL SER NOS= PERM02.

IEF2851 SYS76254.T130655.RV000.JWMXABFA.F1

DELETED

IEF2851 VOL SER NOS= DSK002.

IEF2851 SYS76254.T130655.RV000.JWMXABFA.F2

DELETED

IEF2851 VOL SER NOS= DSK005.

IEF2851 SYS76254.T130655.RV000.JWMXABFA.F3

DELETED

IEF2851 VOL SER NOS= DSK002.

IEF2851 SYS76254.T130655.RV000.JWMXABFA.F4

DELETED

IEF2851 VOL SER NOS= DSK004.

IEF2851 SYS76254.T123456.I0007.JWMXABFA.S0000048

SYSIN

IEF2851 VOL SER NOS= SPOL03.

IEF2851 SYS76254.T123456.I0007.JWMXABFA.S0000048

DELETED

IEF2851 VOL SER NOS= SPOL03.

IEF2851 SYS76254.T130655.SV000.JWMXABFA.R0000260

SYSOUT

IEF2851 VOL SER NOS= SPOL04.

IEF2851 L.JWMSTES

KEPT

IEF2851 VOL SER NOS= T9H187.

IEF2851 L.JWMSTES

KEPT

IEF2851 VOL SER NOS= T9H096.

IEF2851 L.JWMSTOS

KEPT

IEF2851 VOL SER NOS= T94880.

IEF2851 L.JWMSTOS

KEPT

IEF2851 VOL SER NOS= T9E283.

IEF3731 STEP /S / START 76254.1514

IEF3741 STEP /S / STOP 76254.1616 CPU 3MIN 33.10SEC MAIN 698K LCS OK

WAIT 0004MIN 8.83SEC SYSIN 00296REC UNUSED CORE 062K EXCPS 002632 SYSHRS .124037

232 000000X:230 000991X:231 000106X:230 000048X:131 000041X:136 000033X:236 001327X:000 000003X:000 000003X:001 000040X

001 000040X

IEF3751 JOB /JWMXABFA/ START 76254.1514

IEF3761 JOB /JWMXABFA/ STOP 76254.1616 CPU 3MIN 33.10SEC

WAIT 0004MIN 8.83SEC SYSIN 00296REC

EXCPS 002632 SYSHRS .124037 DPSU .8251 REL 21.8

2-10

LTR1144 26

B. RESULTS OF INEL PIPE II (SAPPER)
FOR THE RED MODELS

TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 1

MATERIAL NO. 1
SECTION NO. 1STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.326

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. *** = 7371.

STRESS (S8Q) AT J END OF ELEMENT NO. *** = 7371.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 61 = 7371.

STRESS (S9Q) AT J END OF ELEMENT NO. 61 = 7371.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 61 = -0.

STRESS (S10Q) AT J END OF ELEMENT NO. 61 = -0.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 61 = -0.

STRESS (S11Q) AT J END OF ELEMENT NO. 61 = -0.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 61 = 7371.

STRESS (S9Q) AT J END OF ELEMENT NO. 61 = 7371.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS AT I END = 7371.

STRESS AT J END = 7371.

STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

LTR114426

TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 2

MATERIAL NO. 1
SECTION NO. 2

STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = C.190

EQUATION (8) STRESS
STRESS (S8R) AT I END OF ELEMENT NO. 50= 3871.
STRESS (S8Q) AT J END OF ELEMENT NO. 57= 4154.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

EQUATION (9) STRESS
STRESS (S9R) AT I END OF ELEMENT NO. 50= 3871.
STRESS (S9Q) AT J END OF ELEMENT NO. 57= 4154.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

TANGENT POINT STRESSES

2-13
EQUATION (10) STRESS
STRESS (S10R) AT I END OF ELEMENT NO. 50= 9210.
STRESS (S10Q) AT J END OF ELEMENT NO. 80= 19440.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

EQUATION (11) STRESS
STRESS (S11R) AT I END OF ELEMENT NO. 47= 10122.
STRESS (S11Q) AT J END OF ELEMENT NO. 80= 20636.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS
STRESS (S9R) AT I END OF ELEMENT NO. 50= 3871.
STRESS (S9Q) AT J END OF ELEMENT NO. 57= 4154.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS AT I END = 3871.
STRESS AT J END = 2959.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

LTR1144 26

TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 3

MATERIAL NO. 1
SECTION NO. 3STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.100

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 3= 2897.

STRESS (S8Q) AT J END OF ELEMENT NO. 3= 2773.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S_{SUB H} = 16700$.

TANGENT POINT STRESSES

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 3= 2897.

STRESS (S9Q) AT J END OF ELEMENT NO. 3= 2773.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S_{SUB H} = 20040$.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 9= 1334.

STRESS (S10Q) AT J END OF ELEMENT NO. 7= 1308.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S_{SUB A} = 27675$.

TANGENT POINT STRESSES

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 9= 1522.

STRESS (S11Q) AT J END OF ELEMENT NO. 7= 1372.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S_{SUB A} + S_{SUB H} = 44375$.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 3= 2897.

STRESS (S9Q) AT J END OF ELEMENT NO. 3= 2773.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S_{SUB H} = 30060$.

FAULTED CONDITIONS

STRESS AT I END = 2897.

STRESS AT J END = 2773.

STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

LFR114426

ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 1

MATERIAL NO. 1
SECTION NO. 1

STRESS INTENSIFICATION FACTOR = 1.363
SECTION MODULUS = 0.326

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 61= 7371.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 61= 7371.
STRESS (S8S) AT J END OF ELEMENT NO. 12= 7371.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 61= 7371.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 61= 7371.
STRESS (S9S) AT J END OF ELEMENT NO. 61= 7371.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.2 * S SUB H = 20040.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 62= -0.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 62= -0.
STRESS (S10S) AT J END OF ELEMENT NO. 61= -0.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 62= 7371.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 62= 7371.
STRESS (S11S) AT J END OF ELEMENT NO. 61= 7371.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 61= 7371.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 61= 7371.
STRESS (S9S) AT J END OF ELEMENT NO. 61= 7371.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.8 * S SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 61= 7371.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 61= 7371.
STRESS (S9S) AT J END OF ELEMENT NO. 61= 7371.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 2

MATERIAL NO. 1
SECTION NO. 2

STRESS INTENSIFICATION FACTOR = 0.622
SECTION MODULUS = 0.190

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 58= 4154.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 58= 4050.
STRESS (S8S) AT J END OF ELEMENT NO. 58= 3855.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 58= 4154.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 58= 4050.
STRESS (S9S) AT J END OF ELEMENT NO. 58= 3855.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.2 * S SUB H = 20040.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 81= 12099.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 46= 5917.
STRESS (S10S) AT J END OF ELEMENT NO. 46= 5684.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 81= 16253.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 46= 9967.
STRESS (S11S) AT J END OF ELEMENT NO. 46= 9539.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 58= 4154.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 58= 4050.
STRESS (S9S) AT J END OF ELEMENT NO. 58= 3855.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.8 * S SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 58= 4154.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 58= 4050.
STRESS (S9S) AT J END OF ELEMENT NO. 58= 3855.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

UTR114426

ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 3

MATERIAL NO. 1
SECTION NO. 3

STRESS INTENSIFICATION FACTOR = 0.570
SECTION MODULUS = 0.100

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 4= 2773.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 4= 2784.
STRESS (S8S) AT J END OF ELEMENT NO. 4= 2808.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 4= 2773.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 4= 2784.
STRESS (S9S) AT J END OF ELEMENT NO. 4= 2808.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 8= 745.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 8= 799.
STRESS (S10S) AT J END OF ELEMENT NO. 8= 760.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 8= 3519.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 8= 3583.
STRESS (S11S) AT J END OF ELEMENT NO. 8= 3568.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 4= 2773.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 4= 2784.
STRESS (S9S) AT J END OF ELEMENT NO. 4= 2808.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 4= 2773.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 4= 2784.
STRESS (S9S) AT J END OF ELEMENT NO. 4= 2808.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

LTR 1144 26

IEF142I - JEP WAS EXECUTED - COND CODE CCCC

IEF285I TEMP.RMF\$APPB

KEPT

IEF285I VOL SER NOS= TEMP03.

IEF285I SYS76141.T124847.RV000.JWMREBFA.F1

DELETED

IEF285I VOL SER NOS= DSK003.

IEF285I SYS76141.T124847.PV000.JWMREBFA.F2

DELETED

IEF285I VOL SER NOS= DSK006.

IEF285I SYS76141.T124847.RVCC0.JWMREBFA.F3

DELETED

IEF285I VOL SER NOS= DSK003.

IEF285I SYS76141.T124847.RV000.JWMREBFA.F4

DELETED

IEF285I VOL SER NOS= DSK003.

IEF285I SYS76141.T123456.I0007.JWMREBFA.S0000337

SYSIN

IEF285I VOL SER NOS= SPOL02.

IEF285I SYS76141.T123456.I0007.JWMREBFA.S0000337

DELETED

IEF285I VOL SER NOS= SPOL02.

IEF285I SYS76141.T124847.SV000.JWMREBFA.R0001817

SYSOUT

IEF285I VOL SER NOS= SPOL31.

IEF285I L.JWMSTAS

KEPT

IEF285I VOL SER NOS= T9C907.

IEF285I L.JWMSTAS

KEPT

IEF285I VOL SER NOS= T9D007.

IEF285I L.JWMSTOS

KEPT

IEF285I VOL SER NOS= T9B970.

IEF285I L.JWMSTOS

KEPT

IEF285I VOL SER NOS= T9F452.

IEF373I STEP /S / START 76141.17C3

IEF374I STEP /S / STOP 76141.1737 CPU 2MIN 03.15SEC MAIN 698K LCS OK

WAIT 0004MIN 15.52SEC SYSIN 00199REC CAUSED CCRE 062K EXCPS 001553 SYSHRS .071976

333 000000X;330 000634X;331 000064X;330 CC0034X;330 000027X;235 000023X;354 000721X;001 000003X;002 000003X;001 000022X

COO CCC022X

IEF375I JOB /JWMREBFA/ START 76141.17C3

IEF376I JOB /JWMREBFA/ STOP 76141.1737 CPU 2MIN 03.15SEC

WAIT 0004MIN 15.52SEC SYSIN 00199REC

EXCPS 001553

SYSHRS

.071976

DPSU

.4388 REL 21.8

LTR1144 26

C. RESULTS OF INEL PIPE II (SAPPER)
FOR THE BLUE MODEL

TANGENT POINT STRESSES

FCR MATERIAL/SECTION TYPE NO. 1

MATERIAL NO. 1
SECTION NO. 1STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.325

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 58= 8119.

STRESS (S8Q) AT J END OF ELEMENT NO. 61= 7784.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 58= 8119.

STRESS (S9Q) AT J END OF ELEMENT NO. 61= 7784.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S$ SUB H = 20040.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 27= 27804.

STRESS (S10Q) AT J END OF ELEMENT NO. 29= 38612.

STRESS AT BOTH ENDS EXCEED ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO.***=

TANGENT POINT STRESSES

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 27= 28552.

STRESS (S11Q) AT J END OF ELEMENT NO. 29= 39028.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 58= 8119.

STRESS (S9Q) AT J END OF ELEMENT NO. 61= 7784.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S$ SUB H = 30060.

FAULTED CONDITIONS

STRESS AT I END = 8119.
STRESS AT J END = 7784.

LTR 1144 26

STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

C-21

LTR1144 26

TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 2

MATERIAL NO. 1
SECTION NO. 3

STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.100

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 23= 3069.

STRESS (S8Q) AT J END OF ELEMENT NO. 23= 3194.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S_{SUB H} = 16700$.

TANGENT POINT STRESSES

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 23= 3069.

STRESS (S9Q) AT J END OF ELEMENT NO. 23= 3194.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S_{SUB H} = 20040$.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 23= 34293.

STRESS (S10Q) AT J END OF ELEMENT NO. 23= 27630.

STRESS AT I END EXCEEDS ALLOWABLE STRESS LIMIT, $S_{SUB A} = 27675$.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO.***=

TANGENT POINT STRESSES

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 23= 34653.

STRESS (S11Q) AT J END OF ELEMENT NO. 23= 28115.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S_{SUB A} \text{ PLUS } S_{SUB H} = 44375$.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 23= 3069.

STRESS (S9Q) AT J END OF ELEMENT NO. 23= 3194.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S_{SUB H} = 30060$.

FALLTIE CONDITIONS

STRESS AT I END = 3069.

LTR1144 26

STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

Q-23

LTR1144 26

TANGENT POINT STRESSES

FCR MATERIAL/SECTION TYPE NO. 3

MATERIAL NO. 1
SECTION NO. 4STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 0.561

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 65= 9006.

STRESS (S8Q) AT J END OF ELEMENT NO. 66= 8915.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 65= 9006.

STRESS (S9Q) AT J END OF ELEMENT NO. 66= 8915.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 33= 12259.

STRESS (S10Q) AT J END OF ELEMENT NO. 33= 3953.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 33= 12590.

STRESS (S11Q) AT J END OF ELEMENT NO. 33= 4193.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 65= 9006.

STRESS (S9Q) AT J END OF ELEMENT NO. 66= 8915.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS AT I END = 9006.

STRESS AT J END = 8675.

STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

LTR1144 26

TANGENT POINT STRESSES

FOR MATERIAL/SECTION TYPE NO. 4

MATERIAL NO. 1
SECTION NO. 6

STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 5.858

ECLATION (8) STRESS
STRESS (S8R) AT I END OF ELEMENT NO. 98= 5491.
STRESS (S8Q) AT J END OF ELEMENT NO. 97= 5491.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

ECLATION (9) STRESS
STRESS (S9R) AT I END OF ELEMENT NO. 98= 5491.
STRESS (S9Q) AT J END OF ELEMENT NO. 97= 5491.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

TANGENT POINT STRESSES

5-25
ECLATION (10) STRESS
STRESS (S10R) AT I END OF ELEMENT NO.116= 8240.
STRESS (S10Q) AT J END OF ELEMENT NO.116= 10119.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

ECLATION (11) STRESS
STRESS (S11R) AT I END OF ELEMENT NO.116= 8964.
STRESS (S11Q) AT J END OF ELEMENT NO.116= 10843.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

ECLATION (9) STRESS - EMERGENCY CONDITIONS
STRESS (S9R) AT I END OF ELEMENT NO. 98= 5491.
STRESS (S9Q) AT J END OF ELEMENT NO. 97= 5491.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS AT I END = 5491.
STRESS AT J END = 4767.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

LTR114426

TANGENT POINT STRESSES

FCR MATERIAL/SECTION TYPE NO. 5

MATERIAL NO. 1
SECTION NO. 7STRESS INTENSIFICATION FACTOR = 1.000
SECTION MODULUS = 1.637

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 56= 4750.

STRESS (S8Q) AT J END OF ELEMENT NO. 26= 4715.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

TANGENT POINT STRESSES

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 56= 4750.

STRESS (S9Q) AT J END OF ELEMENT NO. 26= 4715.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S \text{ SUB H} = 20040$.

TANGENT POINT STRESSES

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 25= 14094.

STRESS (S10Q) AT J END OF ELEMENT NO. 24= 14094.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

TANGENT POINT STRESSES

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 25= 14532.

STRESS (S11Q) AT J END OF ELEMENT NO. 24= 14497.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A PLUS S SUB H = 44375.

TANGENT POINT STRESSES

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 56= 4750.

STRESS (S9Q) AT J END OF ELEMENT NO. 26= 4715.

STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S \text{ SUB H} = 30060$.

FAULTED CONDITIONS

STRESS AT I END = 4750.

STRESS AT J END = 4315.

STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 1

MATERIAL NO. 1
SECTION NO. 1

STRESS INTENSIFICATION FACTOR = 1.363
SECTION MODULUS = 0.326

EQUATION (8) STRESS
STRESS (S8R) AT I END OF ELEMENT NO. 59= 7645.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 59= 7600.
STRESS (S8S) AT J END OF ELEMENT NO. 59= 7661.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S_{SUB H} = 16700$.

EQUATION (9) STRESS
STRESS (S9R) AT I END OF ELEMENT NO. 59= 7645.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 59= 7600.
STRESS (S9S) AT J END OF ELEMENT NO. 59= 7661.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S_{SUB H} = 20040$.

EQUATION (10) STRESS
STRESS (S10R) AT I END OF ELEMENT NO. 59= 29994.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 59= 18416.
STRESS (S10S) AT J END OF ELEMENT NO. 59= 8543.
STRESSES AT ONE OR MORE POINTS EXCEED ALLOWABLE STRESS LIMIT
, $S_{SUB A} = 27675$.
MAXIMUM ALLOWABLE MOMENT = 6624.

EQUATION (11) STRESS
STRESS (S11R) AT I END OF ELEMENT NO. 59= 37639.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 59= 26016.
STRESS (S11S) AT J END OF ELEMENT NO. 59= 16204.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $S_{SUB H} \text{ PLUS } S_{SUB A} = 44375$.

EQUATION (9) STRESS - EMERGENCY CONDITIONS
STRESS (S9R) AT I END OF ELEMENT NO. 59= 7645.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 59= 7600.
STRESS (S9S) AT J END OF ELEMENT NO. 59= 7661.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S_{SUB H} = 30060$.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 59= 7645.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 59= 7600.
STRESS (S9S) AT J END OF ELEMENT NO. 59= 7661.

STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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ELECH STRESSES

FOR MATERIAL/SECTION TYPE NO. 2

MATERIAL NO. 1
SECTION NO. 3

STRESS INTENSIFICATION FACTOR = 0.570
SECTION MODULUS = 0.100

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 20= 2709.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 20= 2709.
STRESS (S8S) AT J END OF ELEMENT NO. 20= 2709.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 20= 2709.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 20= 2709.
STRESS (S9S) AT J END OF ELEMENT NO. 20= 2709.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.2 * S$ SUB H = 20040.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 20= 0.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 20= 0.
STRESS (S10S) AT J END OF ELEMENT NO. 20= 0.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 20= 2709.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 20= 2709.
STRESS (S11S) AT J END OF ELEMENT NO. 20= 2709.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 20= 2709.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 20= 2709.
STRESS (S9S) AT J END OF ELEMENT NO. 20= 2709.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, $1.8 * S$ SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 20= 2709.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 20= 2709.
STRESS (S9S) AT J END OF ELEMENT NO. 20= 2709.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40000.

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ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 3

MATERIAL NO. 1
SECTION NO. 4

STRESS INTENSIFICATION FACTOR = 1.544
SECTION MODULUS = 0.561

ECLATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 86= 8949.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 82= 8767.
STRESS (S8S) AT J END OF ELEMENT NO. 82= 8858.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

ECLATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 86= 8949.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 82= 8767.
STRESS (S9S) AT J END OF ELEMENT NO. 82= 8858.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.2 * S SUB H = 20040.

ECLATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 34= 6195.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 79= 5395.
STRESS (S10S) AT J END OF ELEMENT NO. 79= 5725.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 34= 15054.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 79= 14163.
STRESS (S11S) AT J END OF ELEMENT NO. 79= 14583.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 86= 8949.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 82= 8767.
STRESS (S9S) AT J END OF ELEMENT NO. 82= 8858.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.8 * S SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 86= 8949.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 82= 8767.
STRESS (S9S) AT J END OF ELEMENT NO. 82= 8858.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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ELBOW STRESSES

FOR MATERIAL/SECTION TYPE NO. 4

MATERIAL NO. 1
SECTION NO. 6

STRESS INTENSIFICATION FACTOR = 0.958
SECTION MODULUS = 5.898

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 105= 5281.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 105= 5279.
STRESS (S8S) AT J END OF ELEMENT NO. 103= 5275.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 105= 5281.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 105= 5279.
STRESS (S9S) AT J END OF ELEMENT NO. 103= 5275.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.2 * S SUB H = 20040.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 117= 9698.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 117= 9325.
STRESS (S10S) AT J END OF ELEMENT NO. 117= 5893.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 117= 14979.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 117= 14604.
STRESS (S11S) AT J END OF ELEMENT NO. 117= 11168.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 105= 5281.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 105= 5279.
STRESS (S9S) AT J END OF ELEMENT NO. 103= 5275.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.8 * S SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 105= 5281.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 105= 5279.
STRESS (S9S) AT J END OF ELEMENT NO. 103= 5275.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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FLBCH STRESSES

FOR MATERIAL/SECTION TYPE NO. 5

MATERIAL NO. 1
SECTION NO. 7

STRESS INTENSIFICATION FACTOR = 0.880
SECTION MODULUS = 1.637

EQUATION (8) STRESS

STRESS (S8R) AT I END OF ELEMENT NO. 18= 4386.
STRESS (S8Q) AT CENTER OF ELEMENT NO. 18= 4435.
STRESS (S8S) AT J END OF ELEMENT NO. 14= 4405.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H = 16700.

EQUATION (9) STRESS

STRESS (S9R) AT I END OF ELEMENT NO. 18= 4386.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 18= 4435.
STRESS (S9S) AT J END OF ELEMENT NO. 14= 4405.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.2 * S SUB H = 20040.

EQUATION (10) STRESS

STRESS (S10R) AT I END OF ELEMENT NO. 14= 4503.
STRESS (S10Q) AT CENTER OF ELEMENT NO. 14= 4664.
STRESS (S10S) AT J END OF ELEMENT NO. 14= 3438.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB A = 27675.

EQUATION (11) STRESS

STRESS (S11R) AT I END OF ELEMENT NO. 14= 8889.
STRESS (S11Q) AT CENTER OF ELEMENT NO. 14= 9098.
STRESS (S11S) AT J END OF ELEMENT NO. 14= 7843.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, S SUB H PLUS S SUB A = 44375.

EQUATION (9) STRESS - EMERGENCY CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 18= 4386.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 18= 4435.
STRESS (S9S) AT J END OF ELEMENT NO. 14= 4405.
STRESSES SATISFY ALLOWABLE STRESS LIMIT, 1.8 * S SUB H = 30060.

FAULTED CONDITIONS

STRESS (S9R) AT I END OF ELEMENT NO. 18= 4386.
STRESS (S9Q) AT CENTER OF ELEMENT NO. 18= 4435.
STRESS (S9S) AT J END OF ELEMENT NO. 14= 4405.
STRESSES SATISFY ALLOWABLE STRESS LIMIT = 40080.

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IEF1421 - EP WAS EXECUTED - CCNC CODE CCCC

IEF2851 IEMP.RMFSAAPP

KEPT

IEF2851 VOL SER NCS= TEMPO3.

IEF2851 SYS76139.T07511C.RV000.JWMREBFA.F1

DELETED

IEF2851 VOL SER NCS= CSK003.

IEF2851 SYS76139.T07511C.RV000.JWMREBFA.F2

DELETED

IEF2851 VOL SER NCS= CSK001.

IEF2851 SYS76139.T07511C.RV000.JWMREBFA.F3

DELETED

IEF2851 VOL SER NCS= CSK006.

IEF2851 SYS76139.T07511C.RV000.JWMREBFA.F4

DELETED

IEF2851 VOL SER NCS= CSK004.

IEF2851 SYS76139.T123456.I0007.JWMREBFA.SC000089

SYSLN

IEF2851 VOL SER NCS= SPCL04.

IEF2851 SYS76139.T123456.I0007.JWMREBFA.SC000089

DELETED

IEF2851 VOL SER NCS= SPCL04.

IEF2851 SYS76139.T07511C.SV000.JWMREBFA.RC000309

SYSCUT

IEF2851 VOL SER NCS= SPCL04.

IEF2851 L.JWMSTAS

KEPT

IEF2851 VOL SER NCS= T9E034.

IEF2851 L.JWMSTAS

KEPT

IEF2851 VOL SER NCS= T9E262.

IEF2851 L.JWMSTCS

KEPT

IEF2851 VOL SER NCS= T9E273.

IEF2851 L.JWMSTCS

KEPT

IEF2851 VOL SER NCS= T9F360.

IEF3731 STEP /S / START 76139.1208

IEF3741 STEP /S / STOP 76139.1304 CPU 4MIN 49.24SEC MAIN 698K LCS OK

WAIT 0002MIN 13.98SEC SYSIN 00219REC UNUSED CORE 062K EXCPS 001816 SYSHRS .070911 (ECM ADJ CPU 1MIN 55SEC)

333 CC000X;330 CC0692X;130 CC0076X;331 CC0034X;131 CC0027X;236 CC0025X;236 CC00902X;000 CC0003X;900 CC0003X;001 CC00027X

0C1 CC0027X

IEF3751 JCB /JWMREBFA/ START 76139.1208

IEF3761 JCB /JWMREBFA/ STOP 76139.1304 CPU 4MIN 49.24SEC

WAIT 0002MIN 13.98SEC SYSIN 00219REC EXCPS 001816 SYSHRS .070911 DPSU .4315 REL 21.8

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APPENDIX D
CLASS 1 ANALYSIS AND TABLE OF
PERMISSIBLE NUMBER OF CYCLES

APPENDIX D

This Appendix contains the analysis of the Class 1 portion of the system using INELPIPE. This analysis shows the allowable number of cycles for each component. The allowable cycles are tabulated at the end of the Appendix. Also, a paper copy of a sample output is included.

0000000001111111112222222222333333333344444444445555555555666666666677777777778
 12345678901234567890123456789012345678901234567890123456789012345678901234567890

TEE ON PRESSURE RELIEF 2-1/2X2-1/2X1-1/2
 PRINT

13 2.875.375 1.9 .281

650.016600.257.21

2500.

RU1 .101 .1 .108 .29 .642 .29
 RU2 .065 .03 -.1 .012 .706 .009
 BR3 -.065 .062 -.1 .023 .71 .017

NULL CASE

655 TH

*ALL 19 0. 0. 0.
 *RU1 2500. 9.3 2.89 7.3 326.2 108.7
 RU2 2500. 1.99 2.22 2.23 226.2 108.7
 BR3 2500. -7.3 -.67 5.0 326.2 108.7

NULL CASE

655 TH

*ALL 370 0. 0. 0.
 *RU1 2500. 9.3 2.89 7.3 36.0 12.0
 RU2 2500. 1.99 2.22 2.23 36.0 12.0
 BR3 2500. -7.3 -.67 5.0 336.0 112.0

540 TH

*RU1 1500 7.527 2.32 5.0
 RU2 1.51 1.76 1.82
 BR3 -6.3 .56 4.13

655 TH

*RU1 9.3 2.89 7.3 65.42 21.7
 RU2 1.99 2.22 2.23
 BR3 -7.3 -.67 5.0

LCCE TH

LCCE MECH +

ALL 26 0. 0. 0. 20.9 2.4
 *RU1 2602500. 1.54 .74 2.0
 RU2 2500. .23 .60 1.66
 BR3 2500. 1.31 .167 1.1

LCCE MECH +

*RU1 2500. -1.54 -.74 -2.0
 RU2 2500. -.23 -.60 -1.66
 BR3 2500. -1.31 -.167 -1.1

CBE +

*RU1 100 .1 .291 .29
 RU2 .031 .012 .009
 BR3 .291 .015 .009

CBE -

*RU1 -.1 -.291 -.29
 RU2 -.031 -.012 -.009
 BR3 -.291 -.015 -.009

LOCE

R1 1.54 .74 2.0
 R2 .23 .68 1.5
 B3 1.31 .167 1.1

EMERGENCY

R1 .2 .582 .58
 R2 .062 .023 .017
 B3 .084 .03 .018

FAULTED

SEISMIC

RU1 .2 .582 .59
 RU2 .062 .023 .017
 BR3 .08 .03 .018

LOCE

RU1 1.54 .74 2.0
 RU2 .23 .68 1.5
 BR3 1.31 .167 1.1

END OF CASE

WELD TO TEE BRANCH3

PRINT

0000000001111111112222222222333333333344444444445555555555666666666677777777778
 12345678901234567890123456789012345678901234567890123456789012345678901234567890

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TEE CN PRESSURE RELIEF 2-1/2X2-1/2X1-1/2

DIMENSIONS

RUN

BRANCH

C.D. DCR	WALL TR	C.D. DOB	WALL TR	RM	RM	RP	ZR	ZP	TR
2.9	0.38	1.9	0.281	1.25	0.809	0.67	1.3	0.6	0.0

MATERIAL PROPERTIES (AUSTENITIC STAINLESS STEEL)

	TEMP	SM	EA	AA	M	N	EAB
DESIGN	650.	16600.	257.8	1.00	1.7	0.3	0.0

STRESS INDICES

PRESSURE						MOMENT				THERMAL	
B1	C1	K1	B2R	B2B	C2R	C2B	K2R	K2B	C3	K3	C3*
1.00	1.50	4.00	1.50	1.50	2.00	2.00	1.00	1.00	1.00	1.00	0.50

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TEE CN PRESSURE RELIEF 2-1/2X2-1/2X1-1/2

CALCULATION OF MOMENTS

LEG	MOMENT	MOMENTS IN 1000 IN-LB.			COMBINED	
		WEIGHT W	EARTHQUAKE ZMAX	ZMIN	W+ZMAX	W+ZMIN
RU1	MX1	0.1	0.1	-0.1	0.2	0.0
	MY1	0.1	0.3	-0.3	0.4	-0.2
	MZ1	0.6	0.3	-0.3	0.9	0.4
RU2	MX2	0.1	0.0	-0.0	0.1	0.0
	MY2	-0.1	0.0	-0.0	-0.1	-0.1
	MZ2	0.7	0.0	-0.0	0.7	0.7
BR3	MX3	-0.1	0.1	-0.1	-0.0	-0.1
	MY3	-0.1	0.0	-0.0	-0.1	-0.1
	MZ3	0.7	0.0	-0.0	0.7	0.7
MI	MXR					0.1
	MYR					0.1
	MXR					0.7
	MR					0.7
	MB					0.7

ADDITIONAL CONSTANTS

DMAX	DMIN	DESIGN PRESSURE	YIELD STRENGTH	V	INTERNAL PRESSURE	MODULUS OF ELASTICITY	TENSILE STRENGTH	TB RANGE
0.0	0.0	2500.	0.0	0.30	0.	0.	0.	0.

***PRIMARY STRESS INTENSITY IS 12118.2. 1.50 SM= 24900.0

TEE ON PRESSURE RELIEF 2-1/2X2-1/2X1-1/2

CALCULATION OF MOMENTS

LEG	MOMENT	MOMENTS IN 1000 IN-LB.			COMBINED	
		WEIGHT W	LOCE ZMAX	ZMIN	W+ZMAX	W+ZMIN
R1	MX1	0.1	1.5	-1.5	1.6	-1.4
	MY1	0.1	0.7	-0.7	0.8	-0.6
	MZ1	0.6	2.0	-2.0	2.6	-1.4
R2	MX2	0.1	0.2	-0.2	0.3	-0.2
	MY2	-0.1	0.7	-0.7	0.6	-0.8
	MZ2	0.7	1.5	-1.5	2.2	-0.8
B3	MX3	-0.1	1.3	-1.3	1.2	-1.4
	MY3	-0.1	0.2	-0.2	0.1	-0.3
	MZ3	0.7	1.1	-1.1	1.8	-0.4
M1	MXR				0.3	
	MYR				0.8	
	MXR				2.2	
	MYR				2.4	
	MB				2.3	

***PRIMARY STRESS INTENSITY IS

17439.6. 1.50 SM=

24500.0

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TEE ON PRESSURE RELIEF 2-1/2X2-1/2X1-1/2

CALCULATION OF MOMENTS

LEG	MOMENT	MOMENTS IN 1000 IN-LB.			COMBINED	
		WEIGHT W	EMERGENCY ZMAX	ZMIN	W+ZMAX	W+ZMIN
R1	MX1	0.1	0.2	-0.2	0.3	-0.1
	MY1	0.1	0.6	-0.6	0.7	-0.5
	MZ1	0.6	0.6	-0.6	1.2	0.1
R2	MX2	0.1	0.1	-0.1	0.1	0.0
	MY2	-0.1	0.0	-0.0	-0.1	-0.1
	MZ2	0.7	0.0	-0.0	0.7	0.7
B3	MX3	-0.1	0.1	-0.1	0.0	-0.1
	MY3	-0.1	0.0	-0.0	-0.1	-0.1
	MZ3	0.7	0.0	-0.0	0.7	0.7
MI	MXR				0.1	
	MYR				0.1	
	MXR				0.7	
	MR				0.7	
	MB				0.8	

***STRESS INTENSITY IS 12145.9. 2.25 SM= 37350.0

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TEE ON PRESSURE RELIEF 2-1/2X2-1/2X1-1/2

CALCULATION OF MOMENTS

		MOMENTS IN 1000 IN-LB.								
		WEIGHT	SEISMIC		LOCAL		COMBINED			
LEG	MOMENT	W	ZMAX	ZMIN	LMAX	LMIN	W+ZMAX +LMAX	W+ZMAX +LMIN	W+ZMIN +LMAX	W+ZMIN +LMIN
RU1	MX1	0.1	0.2	-0.2	1.5	-1.5	1.8	-1.2	1.4	-1.6
	MY1	0.1	0.6	-0.6	0.7	-0.7	1.4	-0.1	0.3	-1.2
	MZ1	0.6	0.6	-0.6	2.0	-2.0	3.2	-0.8	2.1	-1.9
RU2	MX2	0.1	0.1	-0.1	0.2	-0.2	0.4	-0.1	0.2	-0.2
	MY2	-0.1	0.0	-0.0	0.7	-0.7	0.6	-0.8	0.6	-0.8
	MZ2	0.7	0.0	-0.0	1.5	-1.5	2.2	-0.8	2.2	-0.8
BR3	MX3	-0.1	0.1	-0.1	1.3	-1.3	1.3	-1.3	1.2	-1.5
	MY3	-0.1	0.0	-0.0	0.2	-0.2	0.1	-0.2	0.0	-0.3
	MZ3	0.7	0.0	-0.0	1.1	-1.1	1.8	-0.4	1.8	-0.4
MI	MXR									0.4
	MYR									0.8
	MZR									2.2
	MR									2.4
	MP									2.4

*** STRESS INTENSITY IS 17638.1 3.0 SM= 49800.0

 * THE MAXIMUM PRIMARY STRESS INTENSITY OF 17439.6 OCCURRED WITH PRIMARY LOADS INPUT UNDER THE TITLE OF LOCE *

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SUMMARY OF LOAD SETS
TEE ON PRESSURE RELIEF 2-1/2X2-1/2X1-1/2

LOAD SET NO.	LOAD SET DESCRIPTION	TEE I.D.	NO. OF TRANSIENTS	P	MX	MY	MZ	DT1	TA-TB	DT2
1. 1	NULL CASE	* ALL	19	0.	0.0	0.0	0.0	0.0	0.	0.0
1. 2	655 TH	* RU1	19	2500.	9.3	2.9	7.3	326.2	C.	108.7
		RU2			2.0	2.2	2.2			
		BR3			-7.3	-0.7	5.0			
2. 1	NULL CASE	* ALL	370	0.	0.0	0.0	0.0	0.0	0.	0.0
2. 2	655 TH	* RU1	370	2500.	9.3	2.9	7.3	36.0	0.	12.0
		RU2			2.0	2.2	2.2			
		BR3			-7.3	-0.7	5.0			
3. 1	540 TH	* RU1	1500	0.	7.6	2.3	5.9	0.0	0.	0.0
		RU2			1.5	1.8	1.8			
		BR3			-6.3	0.6	4.1			
3. 2	655 TH	* RU1	1500	0.	9.3	2.9	7.3	65.4	0.	21.7
		RU2			2.0	2.2	2.2			
		BR3			-7.3	-0.7	5.0			
4. 1	LOCE TH	ALL	26	0.	0.0	0.0	0.0	20.9	0.	2.4
5. 1	LOCE MECH +	+ RU1	260	2500.	1.5	0.7	2.0	0.0	0.	0.0
		RU2			0.2	0.6	1.6			
		BR3			1.3	0.2	1.1			
5. 2	LOCE MECH +	+ RU1	260	2500.	-1.5	-0.7	-2.0	0.0	0.	0.0
		RU2			-0.2	-0.6	-1.6			
		BR3			-1.3	-0.2	-1.1			
6. 1	OBE +	+ RU1	100	0.	0.1	0.3	0.3	0.0	0.	0.0
		RU2			0.0	0.0	0.0			
		BR3			0.3	0.0	0.0			
6. 2	OBE -	+ RU1	100	0.	-0.1	-0.3	-0.3	0.0	0.	0.0
		RU2			-0.0	-0.0	0.0			
		BR3			-0.3	-0.0	0.0			
MAXIMUM LOAD RANGES				2500.	0.0	0.0	0.0	326.2	0.	108.7
					9.6	1.2	6.1			
THERMAL MOMENTS					0.0	0.0	0.0			
					7.3	1.2	5.0			
TOTAL TRANSIENTS			2275							

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THE MAX. TOTAL STRESS RANGE CHECK FAILED WITH THE FOLLOWING VALUES;
SN= 111172.9, SP= 194332.1, KE= 3.333, SALT= 323886.7, NO. CYCLES= 45

EQ. 12 = 30885.1

EQ. 13 = 24850.0

3SM = 49800.0

D
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LTR1144 26

SP FOR ALL LOAD SET PAIRS
TEE ON PRESSURE RELIEF 2-1/2X2-1/2X1-1/2

LOAD SET PAIR		SP	SN	KE	SP*KE/2
1. 2	6. 0	193171.	110912.	3.233	321951.
1. 2	2. 1	188282.	105123.	3.233	313804.
1. 1	1. 2	189282.	105123.	3.233	313804.
1. 2	4. 1	183550.	101274.	3.233	305916.
1. 2	3. 1	163906.	80747.	3.071	251712.
1. 2	5. 0	142379.	102345.	3.333	237298.
3. 2	5. 0	119814.	68697.	2.265	135661.
1. 2	3. 2	137565.	62398.	1.843	126780.
2. 2	6. 0	104116.	56571.	1.453	75652.
2. 1	2. 2	99228.	51683.	1.126	55867.
1. 1	2. 2	99228.	51683.	1.126	55867.
1. 2	2. 2	89055.	53440.	1.244	55377.
3. 1	5. 0	94343.	51218.	1.095	51648.
2. 2	4. 1	94495.	47834.	1.000	47247.
2. 2	3. 1	74851.	27307.	1.000	37426.
4. 1	5. 0	70948.	26039.	1.000	35024.
2. 2	3. 2	66490.	19793.	1.000	33245.
5. 0	6. 0	66128.	23003.	1.000	32064.
2. 1	5. 0	65316.	22191.	1.000	32658.
1. 1	5. 0	65316.	22191.	1.000	32658.
3. 2	6. 0	55606.	47614.	1.000	27803.
2. 2	5. 0	53324.	48904.	1.000	26662.
2. 1	3. 2	50718.	42726.	1.000	25359.
1. 1	3. 2	50718.	42726.	1.000	25359.
3. 2	4. 1	45985.	38877.	1.000	22593.
3. 1	4. 1	30792.	29908.	1.000	15396.
3. 1	6. 0	30125.	30125.	1.000	15062.
3. 1	3. 2	26341.	18349.	1.000	13171.
2. 1	3. 1	26060.	26060.	1.000	13030.
1. 1	3. 1	26060.	26060.	1.000	13030.
5. 0	5. 0	15631.	15631.	1.000	7816.
4. 1	6. 0	5776.	4892.	1.000	2888.
2. 1	4. 1	4733.	3849.	1.000	2366.
1. 1	4. 1	4733.	3849.	1.000	2366.
6. 0	6. 0	2087.	2087.	1.000	1044.
2. 1	6. 0	1044.	1044.	1.000	522.
1. 1	6. 0	1044.	1044.	1.000	522.
1. 1	2. 1	0.	0.	1.000	0.

SUMMARY OF CALCULATIONS OF CUMULATIVE USAGE FACTOR
TEE ON PRESSURE RELIEF 2-1/2X2-1/2X1-1/2

LOAD SET PAIR		SP	SN	KE	SP*KE/2	OCCURENCES		N	SET ELIMINATED	N'	N/N'
I	J					NI	NJ				
1. 2	6. 0	193171.	110012.	3.333	321951.	19 0	100 81	19	1	46	0.4130
3. 2	5. 0	119814.	68697.	2.265	135681.	1500 1240	260 0	260	5	493	0.5274
2. 2	6. 0	104116.	56571.	1.453	75652.	370 289	81 0	81	6	3557	0.0228
2. 1	2. 2	99228.	51683.	1.126	55867.	289 0	289 0	289	2	13133	0.0220
3. 2	4. 1	45985.	38877.	1.000	22993.	1240 1214	26 0	26	4	1000000	0.0
3. 1	3. 2	26341.	18349.	1.000	13171.	1214 0	1214 0	1214	3	1000000	0.0

SUM OF ALL N/N' = 0.9852

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ALLOWABLE CYCLES PRESSURE RELIEF SYSTEM

LOCE	26
70° - 655° Step Transients*	19
70° - 655° Undrained Line	370
115° Step	1500
Heat up	10 ⁶

*Transients as defined in LTR 1144-18 (Ref. 5) (see Table VI).

JWM INEL PIPE PR. RE.

NO. 1

INEL PIPE
FOR
SYSTEM

CLASSIWELDSANDTEE NO. 1

INELPIPE
FOR
TEE AND WELDS
TO TEE

INELPIPE WFLD
SPRAY PIPING TO NOZZLE

APPENDIX E
HANGER ANALYSIS

APPENDIX E

All hangers added to system were analyzed to comply with AISC at the time of their design and these various hanger analyses are not part of this report.

This Appendix contains data pertinent to the original hangers and restraints.

The four original flat bar hangers H-5, H-6, H-10, and H-40 are analyzed using SUPAN (flat bar analysis program; see Appendix F for listing). All original unibals are listed with their various loads. Appendix E contents are:

1. Designation and location of original unibals
2. Loads on original unibals
3. SUPAN analysis of 4 original flat bar hangers.

UNIBAL RESTRAINTS [ORIGINALLY ON SYSTEM]

"BLACK" MODEL

H-DESIGNATION	EB DESIGNATION	PIPING SEGMENT	SYSTEM
H-2	C ₁ , C ₂	P8-1	PRIMARY COOLANT PRESSURE RELIEF
H-8	C ₈	P5-4	"
H-9	C ₉	P5-5	"
H-16	C ₁₀	P9-1	"
H-41	C ₂₁	P8-2	COOLANT SAMPLING

"BLUE" MODEL

H-3	C ₁₂ C ₁₃	P6-2	PRIMARY COOLANT PRESSURE RELIEF
H-4	C ₁₅ C ₁₆	P7-1	"
H-1	C ₁₇ C ₁₈	P1-3	"
H-2	C ₁₉ C ₂₀	P4-1	BLOWDOWN VENTS & DRAIN

"RED" MODEL

H-4	C ₂₃ C ₂₂	P1-4	PRIMARY COOLANT PRESSURIZER
H-3	C ₂₄ C ₂₅	P1-5	"
H-2	C ₂₆ C ₂₁	P1-5	"
H-1	C ₃₀ C ₃₁	P1-5	"
H-5	C ₂₉	P1-1	"

LOADS ON ORIGINAL UNIBALS

"BLACK" MODEL

H-2
(X & Z RESTRAINT)

	F_x	F_y	F_z
WT	3		3
TH	23		7
LOCE	62		62
SEISMIC	10		10

H-8
(Y RESTRAINT)

	F_x	F_y	F_z
WT		9	
TH		0	
LOCE		30	
SEISMIC		10	

E-2

H-9
(Y RESTRAINT)

	F_x	F_y	F_z
WT		2	
TH		2	
LOCE		30	
SEISMIC		13	

H-16
(X RESTRAINT)

	F_x	F_y	F_z
WT	0		
TH	2		
LOCE	12	12	
SEISMIC	6	6	

H-41

X RESTRAINT

	F_x	F_y	F_z
WT	2		
TH	3		
LØCE	3		
SEISMIC	34		

"RED" MODEL

H-4

(X & Z RESTRAINT)

WT	1	16
TH	3	84
LØCE	4	4
SEISMIC	70	70

H-3

(X & Y RESTRAINTS)

WT	1	43
TH	12	196
LØCE	24	24
SEISMIC	7	7

H-2

(X & Y RESTRAINT)

WT	4	19
TH	40	55
LØCE	12	12
SEISMIC	81	50

H-1 (Y & Z RESTRAINT)

	F_x	F_y	F_z
WT		9	23
TH		12	117
LØCE		30	30
SEISMIC		20	40

H-5 (Y RESTRAINT)

WT	134
TH	114
LØCE	33
SEISMIC	10

"BLUE" MODEL

H-3

H-3 (X & Z RESTRAINT)

WT	4	4
TH	0	3
LØCE	17	17
SEISMIC	90	90

H-4 (X & Z RESTRAINT)

WT	1	3
TH	4	1
LØCE	110	110
SEISMIC	3	3

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H-1

(Y & X RESTRAINT)

	F_x	F_y	F_z
WT	7	132	
TH	215	260	
L/DCE	107	400	
SEISMIC	115	10	

H-2

(Y & Z RESTRAINT)

NOTE: THIS RESTRAINT
STRENGTHEN PER MUFF-2-76

WT		132	19
TH		260	1200
L/DCE		400	400
SEISMIC		10	10

E-5

*** PIPE SUPPORT ANALYSIS PROGRAM - WRITTEN ON MAY 10, 1976 ***

THERE ARE 5 SUPPORTS TO BE ANALYZED IN THIS RUN

4 LOAD CASES WILL BE READ

THE HEADING FOR THIS RUN IS:

PRESSURIZER PRESSURE RELIEF FLAT BARS

THE FOLLOWING MATERIAL PROPERTIES ARE READY FOR USE:

MATERIAL	E	SY	SU
1	278C0000.0	36000.0G0	58000.000
2	278CCCC0.0	50000.CC0	70000.000

NOTE:

PER LTR 1144-59

ALL WELDS COMPLY

WITH ALLOWABLES

E-6

LTR 1144 26

THE FOLLOWING GEOMETRIES ARE READY FOR USE

GEOMETRY	AREA	ZS	ZW	RS	RW
1	0.2500	0.04167	0.01042	0.28900	0.07230
2	0.7500	0.25000	0.04687	0.57800	0.10840
3	1.5000	0.75000	0.12500	0.14450	0.14450

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LR1144 26

SUPPORT DATA FOLLOWS:

LENGTH IS IN INCHES

SUPPORT	LENGTH	FIXITY	MATERIAL	GEOMETRY
H-5-1	19.0000	1.2C00	2	2
H-6-2	19.0000	1.2C00	2	2
H-10-3	15.0000	1.2C00	2	3
H-40-4	8.0000	1.2C00	2	3
H-40-5	8.0000	1.2C00	2	3

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LTR1144 26

THE FOLLOWING LOADS WERE INPUT

P1,SV,WV ARE IN UNITS OF LBS.
T1,SM,WM ARE IN UNITS OF IN.-LB.

SUPPORT	LCAD CASE	P1	SV	WV	T1	SM	WM
1	1	0.0	33.00	1.00	0.0	70.00	7.00
1	2	40.00	99.00	7.00	528.00	1071.00	128.00
1	3	60.00	37.00	80.00	713.00	620.00	580.00
1	4	58.00	53.00	41.00	260.00	360.00	239.00
2	1	0.0	5.00	1.00	20.00	31.00	12.00
2	2	19.00	29.00	8.00	40.00	111.00	39.00
2	3	40.00	10.00	40.00	408.00	131.00	688.00
2	4	40.00	10.00	40.00	164.00	600.00	494.00
3	1	37.00	312.00	7.00	2366.00	11.00	73.00
3	2	55.00	331.00	97.00	224.00	3207.00	868.00
3	3	3.00	60.00	600.00	1685.00	83.00	570.00
3	4	345.00	45.00	1290.00	4297.00	742.00	1360.00
4	1	49.00	16.00	0.0	78.00	164.00	164.00
4	2	99.00	28.00	127.00	310.00	395.00	442.00
4	3	57.00	44.00	57.00	352.00	182.00	352.00
4	4	19.00	19.00	19.00	87.00	32.00	87.00
5	1	16.00	49.00	0.0	164.00	78.00	164.00
5	2	28.00	99.00	127.00	395.00	310.00	442.00
5	3	44.00	57.00	57.00	182.00	352.00	352.00
5	4	19.00	19.00	19.00	32.00	87.00	87.00

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LTR 1144 26

COMBINED LCAC DATA FOLLOWS

COMBINED LCAC SET 1
LIMIT CONDITION NUMBER IS 1
LOAD CASES COMBINED FOR THIS SET ARE 1 3 0 0 0

COMBINED LCAC SET 2
LIMIT CONDITION NUMBER IS 2
LOAD CASES COMBINED FOR THIS SET ARE 1 2 3 0 0

COMBINED LCAC SET 3
LIMIT CONDITION NUMBER IS 3
LOAD CASES COMBINED FOR THIS SET ARE 1 4 0 0 0

COMBINED LCAC SET 4
LIMIT CONDITION NUMBER IS 4
LOAD CASES COMBINED FOR THIS SET ARE 1 2 3 4 0

THE FOLLOWING TABLE LISTS THE COMBINED LOADS

SUPPORT	COMBINATION	P1	SV	WV	T1	SM	WM
1	1	60.000	70.000	81.000	713.000	690.000	587.000
1	2	100.000	169.000	88.000	1241.000	1761.000	715.000
1	3	58.000	86.000	42.000	260.000	430.000	246.000
1	4	158.000	222.000	129.000	1501.000	2121.000	954.000
2	1	40.000	15.000	41.000	428.000	162.000	700.000
2	2	59.000	44.000	49.000	468.000	273.000	739.000
2	3	40.000	15.000	41.000	184.000	631.000	506.000
2	4	99.000	54.000	89.000	632.000	873.000	1233.000
3	1	40.000	372.000	607.000	4051.000	94.000	643.000
3	2	95.000	703.000	704.000	4275.000	3301.000	1511.000
3	3	382.000	357.000	297.000	6663.000	753.000	1433.000
3	4	440.000	748.000	1994.000	8572.000	4043.000	2871.000
4	1	106.000	60.000	57.000	430.000	346.000	516.000
4	2	205.000	88.000	184.000	740.000	741.000	958.000
4	3	68.000	35.000	19.000	165.000	156.000	251.000
4	4	224.000	107.000	203.000	827.000	773.000	1045.000
5	1	60.000	106.000	57.000	346.000	430.000	516.000
5	2	88.000	205.000	184.000	741.000	740.000	958.000
5	3	35.000	68.000	19.000	196.000	165.000	251.000
5	4	107.000	224.000	203.000	773.000	827.000	1045.000

E-10

LTR 114 26

THE LIMIT FACTORS USED IN THE CALCULATIONS FOLLOW

THERE ARE FOUR LIMIT CONDITIONS PROGRAMED:

1. DESIGN, NORMAL, AND UPSET CONDITIONS
2. RESTRAINT OF FREE END DISPLACEMENTS
3. EMERGENCY CONDITIONS
4. FAULTED CONDITIONS

MATERIAL	LIMIT CONDITION	FACTOR
1	1	1.0000
1	2	3.0000
1	3	1.3330
1	4	1.8796
2	1	1.0000
2	2	3.0000
2	3	1.3330
2	4	1.6333

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LTR1144 26

THE FOLLOWING TABLE LISTS TENSION STRESS VALUES

NOTE - CLS = COMBINED LOAD SET
 LCADS ARE IN UNITS OF LB. EXCEPT WHEN TABLE IS FOR BENDING VALUES, THEN IN.-LB.
 STRESSES AND LIMITS ARE IN PSI.

SUPPORT	CLS	LOAD	STRESS	LIMIT	RATIO
1	1	60.000	80.000	29999.996	0.0027
1	2	100.000	133.333	85999.938	C.C015
1	3	58.000	77.333	39989.969	C.C019
1	4	158.000	210.667	48999.988	0.0043
2	1	40.000	53.333	25555.596	C.C018
2	2	59.000	78.667	85999.938	C.C009
2	3	40.000	53.333	39989.969	0.0013
2	4	99.000	132.000	48599.988	0.0027
3	1	40.000	26.667	25555.596	C.C009
3	2	95.000	63.333	85999.938	C.C007
3	3	382.000	254.667	39989.969	0.0064
3	4	440.000	293.333	48599.988	C.C060
4	1	106.000	70.667	29999.996	C.C024
4	2	205.000	136.667	85999.938	0.0015
4	3	68.000	45.333	35989.969	C.C011
4	4	224.000	149.333	48599.988	C.C030
5	1	60.000	40.000	25999.996	0.0013
5	2	88.000	58.667	85999.938	0.0007
5	3	35.000	23.333	35989.969	C.0006
5	4	107.000	71.333	48999.988	0.0015

LTR 144 26

THE FOLLOWING TABLE LISTS SHEAR STRESSES DUE TO LOADS IN THE DIRECTION OF THE WEAK BENDING AXIS

NOTE - CLS = COMBINED LOAD SET

LOADS ARE IN UNITS OF LB. EXCEPT WHEN TABLE IS FOR BENDING VALUES, THEN IN.-LB.
STRESSES AND LIMITS ARE IN PSI.

SUPPORT	CLS	LOAD	STRESS	LIMIT	RATIO
1	1	81.000	108.000	19999.996	0.0054
1	2	88.000	117.333	59999.988	0.0020
1	3	42.000	56.000	26659.977	0.0021
1	4	129.000	172.000	32666.656	0.0053
2	1	41.000	54.667	19999.996	0.0027
2	2	49.000	65.333	59999.988	0.0011
2	3	41.000	54.667	26659.977	0.0021
2	4	89.000	118.667	32666.656	0.0036
3	1	607.000	404.667	19999.996	0.0202
3	2	704.000	469.333	59999.988	0.0078
3	3	1297.000	864.667	26659.977	0.0324
3	4	1994.000	1229.333	32666.656	0.0407
4	1	57.000	38.000	19999.996	0.0019
4	2	184.000	122.667	59999.988	0.0020
4	3	19.000	12.667	26659.977	0.0005
4	4	203.000	135.333	32666.656	0.0041
5	1	57.000	38.000	19999.996	0.0019
5	2	184.000	122.667	59999.988	0.0020
5	3	19.000	12.667	26659.977	0.0005
5	4	203.000	135.333	32666.656	0.0041

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THE FOLLOWING TABLE LISTS SHEAR STRESSES DUE TO LOADS IN THE DIRECTION OF THE STRONG BENDING AXIS

NOTE - CLS = COMBINED LOAD SET

LOADS ARE IN UNITS OF LB. EXCEPT WHEN TABLE IS FOR BENDING VALUES, THEN IN.-LB.

STRESSES AND LIMITS ARE IN PSI.

SUPPORT	CLS	LOAD	STRESS	LIMIT	RATIO
1	1	70.000	93.333	19999.996	0.0047
1	2	169.000	225.333	59999.988	0.0038
1	3	86.000	114.667	26659.977	0.0043
1	4	222.000	296.000	32666.656	0.0091
2	1	15.000	20.000	19999.996	0.0010
2	2	44.000	58.667	59999.988	0.0010
2	3	15.000	20.000	26659.977	0.0009
2	4	54.000	72.000	32666.656	0.0022
3	1	372.000	248.000	19999.996	0.0124
3	2	703.000	468.667	59999.988	0.0078
3	3	357.000	238.000	26659.977	0.0089
3	4	748.000	498.667	32666.656	0.0153
4	1	60.000	40.000	19999.996	0.0020
4	2	88.000	58.667	59999.988	0.0010
4	3	35.000	23.333	26659.977	0.0009
4	4	107.000	71.333	32666.656	0.0022
5	1	106.000	70.667	19999.996	0.0035
5	2	205.000	136.667	59999.988	0.0023
5	3	68.000	45.333	26659.977	0.0017
5	4	224.000	149.333	32666.656	0.0046

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THE FOLLOWING TABLE LISTS COMPRESSIVE STRESSES

NOTE - CLS = COMBINED LOAD SET
LOADS ARE IN UNITS OF LB. EXCEPT WHEN TABLE IS FOR BENDING VALUES, THEN IN.-LB.
STRESSES AND LIMITS ARE IN PSI.

SUPPORT	CLS	LOAD	STRESS	LIMIT	RATIO
1	1	60.000	80.000	3235.840	0.0247
1	2	100.000	133.333	9707.520	0.0137
1	3	58.000	77.333	4313.371	0.0179
1	4	158.000	210.667	5285.203	0.0399
2	1	40.000	53.333	3235.840	0.0165
2	2	59.000	78.667	9707.520	0.0081
2	3	40.000	53.333	4313.371	0.0124
2	4	99.000	132.000	5285.203	0.0250
3	1	40.000	26.667	9225.469	0.0029
3	2	95.000	63.333	27676.406	0.0023
3	3	382.000	254.667	12297.539	0.0207
3	4	440.000	293.333	15068.262	0.0195
4	1	106.000	70.667	21331.824	0.0033
4	2	205.000	136.667	63995.473	0.0021
4	3	68.000	45.333	28435.305	0.0016
4	4	224.000	149.333	34841.977	0.0043
5	1	60.000	40.000	21331.824	0.0019
5	2	88.000	58.667	63995.473	0.0009
5	3	35.000	23.333	28435.305	0.0008
5	4	107.000	71.333	34841.977	0.0020

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THE FOLLOWING TABLE LISTS BENDING STRESSES DUE TO MOMENTS ABOUT THE WEAK AXIS

NOTE - CLS = COMBINED LOAD SET

LCADS ARE IN UNITS OF LB. EXCEPT WHEN TABLE IS FOR BENDING VALUES, THEN IN.-LB.

STRESSES AND LIMITS ARE IN PSI.

SUPPORT	CLS	LCAD	STRESS	LIMIT	RATIO
1	1	587.000	12524.000	37500.000	0.3340
1	2	715.000	15254.961	112500.000	0.1356
1	3	246.000	5248.559	49987.469	0.1050
1	4	954.000	20354.172	61249.992	0.3323
2	1	700.000	14934.926	37500.000	0.3983
2	2	739.000	15767.016	112500.000	0.1402
2	3	506.000	10795.816	49987.469	0.2160
2	4	1233.000	26306.805	61249.992	0.4295
3	1	643.000	5144.000	37500.000	0.1372
3	2	1511.000	12088.000	112500.000	0.1074
3	3	1433.000	11464.000	49987.469	0.2293
3	4	2871.000	22968.000	61249.992	0.3750
4	1	516.000	4128.000	37500.000	0.1101
4	2	958.000	7664.000	112500.000	0.0681
4	3	251.000	2008.000	49987.469	0.0402
4	4	1045.000	8360.000	61249.992	0.1365
5	1	516.000	4128.000	37500.000	0.1101
5	2	958.000	7664.000	112500.000	0.0681
5	3	251.000	2008.000	49987.469	0.0402
5	4	1045.000	8360.000	61249.992	0.1365

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THE FOLLOWING TABLE LISTS BENDING STRESSES DUE TO MOMENTS ABOUT THE STRONG AXIS

NOTE - CLS = COMBINED LOAD SET
 LOADS ARE IN UNITS OF LB. EXCEPT WHEN TABLE IS FOR BENDING VALUES, THEN IN.-LB.
 STRESSES AND LIMITS ARE IN PSI.

SUPPORT	CLS	LOAD	STRESS	LIMIT	RATIO
1	1	690.000	2760.000	29999.996	0.0920
1	2	1761.000	7044.000	89999.938	0.0783
1	3	430.000	1720.000	39989.969	0.0430
1	4	2121.000	8484.000	48999.988	0.1731
2	1	162.000	648.000	29999.996	0.0216
2	2	273.000	1092.000	89999.938	0.0121
2	3	631.000	2524.000	39989.969	0.0631
2	4	873.000	3492.000	48999.988	0.0713
3	1	94.000	125.333	29999.996	0.0042
3	2	3301.000	4401.332	89999.938	0.0489
3	3	753.000	1004.000	39989.969	0.0251
3	4	4043.000	5390.664	48999.988	0.1100
4	1	346.000	461.333	29999.996	0.0154
4	2	741.000	988.000	89999.938	0.0110
4	3	196.000	261.333	39989.969	0.0065
4	4	773.000	1030.667	48999.988	0.0210
5	1	430.000	573.333	29999.996	0.0191
5	2	740.000	986.667	89999.938	0.0110
5	3	165.000	220.000	39989.969	0.0055
5	4	827.000	1102.667	48999.988	0.0225

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COMBINED STRESS - COMPRESSIVE - EQUATION 21 USED

ASTERISKS INDICATE WHERE THE COMPRESSIVE STRESS RATIO WAS GREATER THAN 0.15 AND EQUATIONS 19 AND 20 WERE USED

SUPPORT	CLS	TERM 1	TERM 2	TERM 3	TOTAL	LIMIT
1	1	0.0247	0.3340	0.0920	0.4507	1.0000
1	2	0.0137	0.1356	0.0783	0.2276	1.0000
1	3	0.0179	0.1050	0.0430	0.1659	1.0000
1	4	0.0399	0.3323	0.1731	0.5453	1.0000
2	1	0.0165	0.3983	0.0216	0.4363	1.0000
2	2	0.0081	0.1402	0.0121	0.1604	1.0000
2	3	0.0124	0.2160	0.0631	0.2915	1.0000
2	4	0.0250	0.4295	0.0713	0.5257	1.0000
3	1	0.0029	0.1372	0.0042	0.1442	1.0000
3	2	0.0023	0.1074	0.0489	0.1586	1.0000
3	3	0.0207	0.2293	0.0251	0.2752	1.0000
3	4	0.0195	0.3750	0.1100	0.5045	1.0000
4	1	0.0033	0.1101	0.0154	0.1288	1.0000
4	2	0.0021	0.0681	0.0110	0.0812	1.0000
4	3	0.0016	0.0402	0.0065	0.0483	1.0000
4	4	0.0043	0.1365	0.0210	0.1618	1.0000
5	1	0.0019	0.1101	0.0191	0.1311	1.0000
5	2	0.0009	0.0681	0.0110	0.0800	1.0000
5	3	0.0008	0.0402	0.0055	0.0465	1.0000
5	4	0.0020	0.1365	0.0225	0.1610	1.0000

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COMBINED STRESS - TENSION - EQUATION 20 USED

SUPPORT	CLS	TERM 1	TERM 2	TERM 3	TOTAL	LIMIT
1	1	0.0027	0.3340	0.0920	0.4286	1.0000
1	2	0.0015	0.1356	0.0783	0.2153	1.0000
1	3	0.0019	0.1050	0.0430	0.1499	1.0000
1	4	0.0043	0.3323	0.1731	0.5098	1.0000
2	1	0.0018	0.3983	0.0216	0.4216	1.0000
2	2	0.0009	0.1402	0.0121	0.1532	1.0000
2	3	0.0013	0.2160	0.0631	0.2804	1.0000
2	4	0.0027	0.4295	0.0713	0.5035	1.0000
3	1	0.0009	0.1372	0.0042	0.1422	1.0000
3	2	0.0007	0.1074	0.0489	0.1571	1.0000
3	3	0.0064	0.2293	0.0251	0.2608	1.0000
3	4	0.0060	0.3750	0.1100	0.4910	1.0000
4	1	0.0024	0.1101	0.0154	0.1278	1.0000
4	2	0.0015	0.0681	0.0110	0.0806	1.0000
4	3	0.0011	0.0402	0.0065	0.0478	1.0000
4	4	0.0030	0.1365	0.0210	0.1606	1.0000
5	1	0.0013	0.1101	0.0191	0.1305	1.0000
5	2	0.0007	0.0681	0.0110	0.0797	1.0000
5	3	0.0006	0.0402	0.0055	0.0463	1.0000
5	4	0.0015	0.1365	0.0225	0.1604	1.0000

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APPENDIX F
COMPUTER CODES USED

APPENDIX F

This Appendix gives source listings of all programs used:

Page 1: INEL PIPE II (SAPPER)

Page 2: INELPIPE

Page 3: SAP IV

Page 4 thru 13: SUPAN (Hanger Analysis)

INEL PIPE II

INEL - PIPE II; VERSION 1; RELEASE 1. 9976 RMFGGBFA 001
09/10/76. 5

INELPIPE

INEL-PIPE RELEASE 1 VERSION 1
SOURCE LISTING

TKMAABFA 001
08/27/76 4

SAP IV

CDC SAPIV SOURCE LISTING - VERSION 1 10/5/76 JRO BFA 001
10/08/76 5

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C **** PROGRAM S U P A N ****
C *** DEVELOPED FOR THE APPLIED MECHANICS BRANCH BY M.E. NITZEL MAY, 1976
C *** PRESENT VERSION PERFORMS FLAT BAR TYPE SUPPORT ANALYSIS
C *** APPENDIX 17 EQUATIONS FOR TENSION, SHEAR, COMPRESSION, BENDING,
C *** AND COMBINED STRESS ARE USED.
C *** NSUP = NUMBER OF SUPPORTS
C *** MLC = NUMBER OF LOAD CASES
C *** NECESSARY PROPERTIES OF A242 AND A36 CARBON STEEL ARE IN MATERIAL
C *** BANK
C *** CERTAIN GEOMETRIC PROPERTIES OF 1/4 X 1 AND 3/8 X 2 FLAT BARS ARE
C *** IN PROGRAM

```

```

0001 DIMENSION A(10),RS(10),RW(10),ZS(10),ZW(10),SL(100),SK(100),
1 P1(100,10),SV(100,10),WV(100,10),T1(100,10),SM(100,10),
2 WH(100,10),E(10),SY(10),SU(10),MAT(100),NGEC(100),
3 CP1(100,10),CSV(100,10),CWV(100,10),CT1(100,10),CSM(100,10),
4 CWM(100,10),NLC(100,10),LCC(100,10),FAC(10,4),TENS(100,10,4),
5 SVS(100,10,4),WVS(100,10,4),NCI4(1000),COMPS(100,10,4),NCM(100),
6 BEADS(100,10,4),BENDW(100,10,4),NCT3(1000),NCNT(1000,2),
7 NCNT2(1000),TOTC(100,10),TOTT(100,10),T19C(100,10),T219(100,10),
8 T122(100,10),T120T(100,10),T319(100,10),T20C(100,10),HED(16)

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0002 PI=3.141593
C *** PROPERTY BANK
C *** SUBSCRIPT 1 IMPLIES A36 MATERIAL AND 1/4X1 GEOMETRY
C *** SUBSCRIPT 2 IMPLIES A242 MATERIAL AND 3/8X2 GEOMETRY

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```

0003 E(1)= 27800000.
0004 E(2)= 27800000.
0005 SY(1)= 36000.
0006 SY(2)= 57000.
0007 SU(1)= 58000.
0008 SU(2)= 70000.
0009 A(1)= 0.250
0010 A(2)= 0.750
0011 RS(1)= 0.289
0012 RS(2)= 0.5780
0013 RW(1)= 0.9723
0014 RW(2)= 0.1084
0015 ZS(1)= 0.04167
0016 ZS(2)= 0.250
0017 ZW(1)= 0.01042
0018 ZW(2)= 0.04687
0019 I=2
0020 AN=2

```

```

C *** TITLE PRINT
0021 WRITE(6,6)
0022 6 FORMAT('1'//////T15,'*** PIPE SUPPORT ANALYSIS PROGRAM - WRITTEN 0
IN MAY 10, 1976 ***'////)

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C *** READ CONTROL CARD
0023 READ(5,1)NSUP,MLC,(HED(I),I=1,16)
0024 1 FORMAT(2I5,16A4)
0025 WRITE(6,1053)NSUP,MLC,(HED(I),I=1,16)
0026 1053 FORMAT(1//T15,'THERE ARE',I5,' SUPPORTS TO BE ANALYZED IN THIS RUN'
1//T15,I5,' LOAD CASES WILL BE READ'////T15,'THE HEADING FOR THIS RU
2N IS:'//T25,16A4//)

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C *** READ MATERIAL AND SUPPORT INFORMATION AND LOAD SETS
0027 DO 10 I=1,NSUP
0028 READ(5,2)MAT(I),NGEC(I),NCP(I),SL(I),SK(I)

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0029      2 FORMAT(3I5,2F10.0)
0030      IF(MAT(1).LE.N)GO TO 20
0031      N=N+1
0032      READ(5,3)E(N),SY(N),SU(N)
0033      3 FORMAT(3F10.0)
0034      20 IF(NGEO(1).LE.NN)GO TO 30
0035      NN=NN+1
0036      READ(5,4) A(NN),ZS(NN),ZW(NN),RS(NN),RW(NN)
0037      4 FORMAT(5F10.0)
0038      30 IF(IN.GT.10)GO TO 40
0039      IF(INN.GT.10)GO TO 50
0040      GO TO 60
0041      40 WRITE(6,41)N
0042      41 ECRMAT(////T15,'MATERIAL NO.',I5,' WAS INPUT - MAX. NO. OF MATERI
1ALS IS 10. PROGRAM TERMINATING'//)
0043      GO TO 20000
0044      50 WRITE(6,51)NN
0045      51 FORMAT(////T15,'GEOMETRY NO.',I5,' WAS INPUT - MAX. NO. OF GEOMETR
1IES IS 10. PROGRAM TERMINATING'//)
0046      GO TO 20000
0047      60 DO 5 J=1,MLC
0048      READ(5,61) P1(I,J),SV(I,J),WV(I,J),T1(I,J),SM(I,J),WM(I,J)
0049      61 FORMAT(6E10.0)
0050      5 CONTINUE
0051      10 CCONTINUE
C *** INTERMEDIATE PRINT STEP
0052      WRITE(6,70)
0053      70 FORMAT(////T15,'THE FOLLOWING MATERIAL PROPERTIES ARE READY FOR USE
1'//T15,'MATERIAL      E      SY      SU'//)
0054      DO 71 K=1,N
0055      71 WRITE(6,72)K,E(K),SY(K),SU(K)
0056      72 FORMAT(I7,13,T24,F10.1,T36,F10.3,T48,F10.3)
0057      WRITE(6,73)
0058      73 FORMAT('1'////T15,'THE FOLLOWING GEOMETRIES ARE READY FOR USE'///
1T15,'GEOMETRY      AREA      ZS      ZW      RS
2 R'//)
0059      DO 75 K=1,NN
0060      75 WRITE(6,74) K,A(K),ZS(K),ZW(K),RS(K),RW(K)
0061      74 FORMAT(I8,13,T24,F10.4,T36,F10.5,T48,F10.5,T60,F10.5,T72,F10.5)
0062      WRITE(6,1043)
0063      1043 FORMAT('1'////T15,'SUPPORT DATA FOLLOWS:'//T15,'LENGTH IS IN INCHE
1S'//T20,'SUPPORT      LENGTH      FIXITY      MATERIAL      GEOMETRY'//
2)
0064      DO 1041 MN=1,NSUP
0065      1041 WRITE(6,1045)MN,SL(MN),SK(MN),MAT(MN),NGEO(MN)
0066      1045 FORMAT(I22,13,T29,F10.4,T41,F10.4,T56,13,T68,13)
0067      WRITE(6,76)
0068      76 FORMAT('1'////T15,'THE FOLLOWING LOADS WERE INPUT'//T15,'P1,SV,WV
1 ARE IN UNITS OF LBS.'//T15,'T1,SM,WM ARE IN UNITS OF IN.-LB.'//T15
2,'SUPPORT LOAD CASE      P1      SV      WV      T1
3      SM      WM')
0069      DO 83 I=1,NSUP
0070      83 DO 78 J=1,MLC
0071      78 WRITE(6,77)I,J,P1(I,J),SV(I,J),WV(I,J),T1(I,J),SM(I,J),WM(I,J)
0072      77 FORMAT(I18,13,T27,13,T35,F10.2,T47,F10.2,T59,F10.2,T71,F10.2,T83,F
110.2,T95,F10.2)

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C *** PRINT COMBINED LOADS
0121 WRITE(6,181)
0122 181 FORMAT(/T15,'THE FOLLOWING TABLE LISTS THE COMBINED LOADS'//T15,'S
      SUPPORT COMBINATION P1 SV WV T1
      2 SM NM1/1
0123 DO 204 I=1,NSUP
0124 DO 203 J=1,NCOM
0125 203 WRITE(6,202)I,J,CP1(I,J),CSV(I,J),CWV(I,J),CT1(I,J),CSM(I,J),CWM(I
      I,J)
0126 202 FORMAT(T17,I3,T27,I3,T37,F10.3,T49,F10.3,T61,F10.3,T73,F10.3,T85,F
      110.3,T97,F10.3)
0127 204 CONTINUE
C *** CALCULATE LIMIT FACTORS
0128 DO 215 I=1,N
0129 FAC(I,1)=1.0
0130 FAC(I,2)=3.0
0131 FAC(I,3)=1.333
0132 FT1=0.60*SY(I)
0133 FT2=0.50*SU(I)
0134 IF(FT1.LE.FT2)GO TO 212
0135 FT=FT2
0136 GO TO 213
0137 212 FT=FT1
0138 213 FF1=1.2*SY(I)/FT
0139 FF2=0.7*SU(I)/FT
0140 IF(FF1.LE.FF2)GO TO 218
0141 FAC(I,4)=FF2
0142 GO TO 215
0143 218 FAC(I,4)=FF1
0144 215 CONTINUE
C *** CALCULATE STRESSES
0145 MCAT1=0
0146 MCAT2=0
0147 MCAT3=0
0148 MCAT4=0
0149 DO 300 I=1,NSUP
0150 KK=MAT(I)
0151 KLEN=NCG(K)
C *** TENSION STRESSES
0152 DO 290 J=1,NCOM
0153 ET1=0.6*SY(KK)
0154 FT2=0.5*SU(KK)
0155 IF(ET1.LE.FT2)GO TO 221
0156 ET=ET2
0157 GO TO 222
0158 221 FT=ET1
0159 222 JK=LCC(J,J)
0160 FLIM= FT*FAC(KK,JK)
0161 TENS(I,J,3)=FLIM
0162 SIG=CP1(I,J)/A(KK)
0163 TENS(I,J,1)=CP1(I,J)
0164 TENS(I,J,2)=SIG
0165 TENS(I,J,4)= SIG/FLIM
C *** SHEAR STRESSES
0166 VLIM= 0.45*SY(KK)*FAC(KK,JK)
0167 SVS(I,J,3)=VLIM

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0168      WVS(I,J,3)=VLIM
0169      SVS(I,J,1)=CSV(I,J)
0170      WVS(I,J,1)=CWV(I,J)
0171      SVS(I,J,2)=CSV(I,J)/A(KL)
0172      WVS(I,J,2)=CWV(I,J)/A(KL)
0173      SVS(I,J,4)= SVS(I,J,2)/VLIM
0174      WVS(I,J,4)= WVS(I,J,2)/VLIM
      C *** BENDING STRESSES
0175      BLIMS=0.60*SY(KK)*FAC(KK,JK)
0176      BLIMW=0.75*SY(KK)*FAC(KK,JK)
0177      BENDS(I,J,3)=BLIMS
0178      BENDW(I,J,3)=BLIMW
0179      BEADS(I,J,1)=CSM(I,J)
0180      BENDL(I,J,1)=CWM(I,J)
0181      BENDS(I,J,2)=CSM(I,J)/ZS(KL)
0182      BEADS(I,J,4)=BENDS(I,J,2)/BLIMS
0183      BENDWL(I,J,2)=CWM(I,J)/ZW(KL)
0184      BEENDL(I,J,4)=BENDW(I,J,2)/BLIMW
      C *** COMPRESSIVE STRESSES
0185      CCMP(S,I,J,1)=CPI(I,J)
0186      CCMP(S,I,J,2)=CPI(I,J)/A(KL)
0187      CSC= SQRT((2.*PI**2.*E(KK))/SY(KK))
0188      XX=SK(I)*SL(I)/RW(KL)
0189      IF(XX.LT.CSC)GO TO 250
0190      FA=(12.*PI**2.*E(KK))/(23.*XX**2.)
0191      GO TO 260
0192      250 FNUM = (1.0 - (XX**2./(2.*CSC**2.)))*Sf(KK)
0193      DENOM = (5./3.) + (3.*XX/18.*CSC) - [XX**3./18.*CSC**3.]
0194      FA= FNUM/DENOM
0195      260 CCMP(S,I,J,3)= FA*FAC(KK,JK)
0196      CCMP(S,I,J,4)= CCMP(S,I,J,2)/CCMP(S,I,J,3)
0197      IF(CCMP(S,I,J,4).LE.0.15) GO TO 265
0198      MCNT1=MCNT1+1
0199      NCNT(MCNT1,1)=I
0200      NCNT(MCNT1,2)=J
0201      265 CONTINUE
0202      IF(JK.NE.4) GO TO 270
0203      PCR=(PI**2.*E(KK)*A(KL)*SK(I)*RW(KL)**2./SL(I)**2.)
0204      RAT= CPI(I,J)/PCR
0205      IF(RAT.LE.0.67) GO TO 270
0206      MCNT2=MCNT2+1
0207      NCNT2(MCNT2)=I
0208      270 CONTINUE
      C *** COMBINED STRESS - COMPRESSIVE
      C *** EQUATION 21 TEST
0209      IF(CCMP(S,I,J,4).LE.0.15) GO TO 280
      C *** CALCULATE EQ.19 AND 21
0210      FPES=((12.*PI**2.*E(KK))/(23.*(SK(I)*SL(I)/RW(KL))**2.))
      1 *FAC(KK,JK)
0211      EPEW=((12.*PI**2.*E(KK))/(23.*(SK(I)*SL(I)/RW(KL))**2.))
      1 *FAC(KK,JK)
0212      IF(INCM(I).EQ.1)GO TO 274
0213      IF(INCM(I).EQ.2)GO TO 275
0214      WRITE(6,271)I
0215      271 FORMAT(/T15,'AN INCORRECT OPTION NUMBER FOR C SUB M WAS ENTERED IN
      1. SUPPORT',I5/)

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0216      GO TO 20009
0217      274 CM=0.85
0218      GO TO 276
      C *** NOTE - IN THE FOLLOWING EQUATION FOR CM THE 2ND TERM IS + BECAUSE
      C A SIMPLE FLAT BAR IS ASSUMED TO HAVE A SINGLE CURVATURE AS THE
      C FIRST BUCKLING MODE
0219      275 R1=CM*(I,J)/CSP(I,J)
0220      R2=1./R1
0221      IF(R1.LT.R2)GO TO 277
0222      RM=R2
0223      GO TO 278
0224      277 RM=R1
0225      278 CM=0.60 + 0.40*RM
0226      276 T219(I,J)=CM*BENDW(I,J,2)/(1.-(COMPS(I,J,2)/FPEX))*BENDW(I,J,3)
0227      T319(I,J)=CM*BENDS(I,J,2)/(1.-(COMPS(I,J,2)/FPES))*BENDS(I,J,3)
0228      IF(CMPS(I,J,4).LE.1.0)GO TO 3051
0229      T219(I,J)=COMPS(I,J,4)
0230      T319(I,J)=COMPS(I,J,4)
0231      3051 T15C(I,J)=COMPS(I,J,4)+T219(I,J)+T319(I,J)
0232      T125(I,J)=COMPS(I,J,2)/(0.60*SY(KK))
0233      T2CC(I,J)=T125(I,J)+BENDW(I,J,4)+BENDS(I,J,4)
0234      TOTC(I,J)=1000000.
0235      IF(T15C(I,J).GT.1.0.OR.T2UC(I,J).GT.1.0) GO TO 279
0236      GO TO 285
0237      279 MCNT3=MCNT3+1
0238      NCT3(MCNT3)=I
0239      GO TO 285
      C *** EQUATION 21
0240      280 TOTC(I,J)=COMPS(I,J,4) + BENDW(I,J,4) + BENDS(I,J,4)
0241      IF(TOTC(I,J).LE.1.0) GO TO 285
0242      MCNT3=MCNT3+1
0243      NCT3(MCNT3)=I
      C *** COMBINED STRESS-TENSION
0244      285 T120T(I,J)=TENS(I,J,2)/(0.60*SY(KK))
0245      TOT(I,J)=T120T(I,J)+BENDW(I,J,4)+BENDS(I,J,4)
0246      IF(TOT(I,J).LE.1.0)GO TO 290
0247      MCNT4=MCNT4+1
0248      NCT4(MCNT4)=I
0249      290 CONTINUE
0250      300 CONTINUE
      C *** END OF CURRENTLY PROGRAMMED CALCULATIONS
      C *** BEGIN FINAL PRINT SECTION
0251      305 CSL=1.0
0252      WRITE(6,306)
0253      306 FORMAT('1.////T15,'THE LIMIT FACTORS USED IN THE CALCULATIONS FOLL
1CM'////T15,'THERE ARE FOUR LIMIT CONDITIONS PROGRAMED:'//T20,'1. DE
2SIGN, NCRMAL, AND UPSET CONDITIONS'//T22,'2. RESTRAINT OF FREE END D
3ISPLACEMENTS'//T20,'3. EMERGENCY CONDITIONS'//T20,'4. FAULTED COND
4ITIONS'////T15,'MATERIAL LIMIT CONDITION FACTOR'//
0254      GO 310 I=1,N
0255      DO 307 J=1,4
0256      307 WRITE(6,308)I,J,FAC(I,J)
0257      308 FORMAT(I7,I3,I32,I3,I42,F10,4)
0258      310 CONTINUE
0259      311 FORMAT('T15,'NOTE - CLS = COMBINED LOAD SET'//T22,'LOADS ARE IN UNI
ITS OF LB. EXCEPT WHEN TABLE IS FOR BENDING VALUES, THEN IN.-LB.'//

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2722, 'STRESSES AND LIMITS ARE IN PSI.' /// T15, 'SUPPORT CLS
3 STRESS LIMIT RATIO' //)
0260 312 FORMAT(T18,I3,T24,I3,T29,F10.3,T41,F10.3,T53,F10.3,T65,F10.4)
0261 WRITE(6,313)
0262 313 FORMAT('1' /// T15, 'THE FOLLOWING TABLE LISTS TENSION STRESS VALUES
1' //)
0263 WRITE(6,311)
0264 DO 315 I=1, NSUP
0265 DO 316 J=1, NCOM
0266 316 WRITE(6,312) I, J, (TENS(I, J, M), M=1, 4)
0267 315 CONTINUE
0268 WRITE(6,317)
0269 317 FORMAT('1' /// T15, 'THE FOLLOWING TABLE LISTS SHEAR STRESSES DUE TO
1 LCACS IN THE DIRECTION OF THE WEAK BENDING AXIS' //)
0270 WRITE(6,311)
0271 DO 320 I=1, NSUP
0272 DO 321 J=1, NCOM
0273 321 WRITE(6,312) I, J, (WVS(I, J, M), M=1, 4)
0274 320 CONTINUE
0275 WRITE(6,323)
0276 323 FORMAT('1' /// T15, 'THE FOLLOWING TABLE LISTS SHEAR STRESSES DUE TO
1 LCACS IN THE DIRECTION OF THE STRONG BENDING AXIS' //)
0277 WRITE(6,311)
0278 DO 330 I=1, NSUP
0279 DO 329 J=1, NCOM
0280 329 WRITE(6,312) I, J, (SVS(I, J, M), M=1, 4)
0281 330 CONTINUE
0282 WRITE(6,331)
0283 331 FORMAT('1' /// T15, 'THE FOLLOWING TABLE LISTS COMPRESSIVE STRESSES'
1' //)
0284 WRITE(6,311)
0285 DO 340 I=1, NSUP
0286 DO 339 J=1, NCOM
0287 339 WRITE(6,312) I, J, (COMPS(I, J, M), M=1, 4)
0288 340 CONTINUE
0289 IF (MCNT1.EQ.0) GO TO 350
0290 WRITE(6,341) MCNT1
0291 341 FORMAT('1' /// T15, 'THE COMPRESSIVE STRESS RATIO IS GREATER THAN 0.15'
1, I4, ' TIMES. THE SUPPORTS ARE: ' //)
0292 WRITE(6,342) (MCNT(I, 1), I=1, MCNT1)
0293 342 FORMAT(T25, I4, I5)
0294 350 IF (MCNT2.EQ.0) GO TO 360
0295 WRITE(6,351) MCNT2
0296 351 FORMAT('1' /// T15, 'THE AXIAL COMPRESSIVE LOAD EXCEEDS 0.67*CRITICAL B
1UCKLING LOAD', I4, ' TIMES. THE SUPPORTS ARE: ' //)
0297 WRITE(6,342) (MCNT2(I, 1), I=1, MCNT2)
0298 360 WRITE(6,361)
0299 361 FORMAT('1' /// T15, 'THE FOLLOWING TABLE LISTS BENDING STRESSES DUE
1 TO MOMENTS ABOUT THE WEAK AXIS' //)
0300 WRITE(6,311)
0301 DO 370 I=1, NSUP
0302 DO 369 J=1, NCOM
0303 369 WRITE(6,312) I, J, (BENDW(I, J, M), M=1, 4)
0304 370 CONTINUE
0305 WRITE(6,371)
0306 371 FORMAT('1' /// T15, 'THE FOLLOWING TABLE LISTS BENDING STRESSES DUE

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      ITO MCMENTS ABOUT THE STRONG AXIS'//)
0307      WRITE(6,311)
0308      DO 380 I=1,NSUP
0309      DO 379 J=1,NCOM
0310      379 WRITE(6,312)I,J,BENDS(I,J,M),M=1,4)
0311      380 CONTINUE
0312      381 FORMAT('///T15,'SUPPORT CLS      TERM 1      TERM 2      TERM 3
      1      TOTAL      LIMIT'//)
0313      382 FORMAT(T17,I3,T24,I3,T29,F10.4,T41,F10.4,T53,F10.4,T65,F10.4,T77,
      IF10.4)
0314      WRITE(6,386)
0315      386 FORMAT('1'////T15,'COMBINED STRESS - COMPRESSIVE - EQUATION 21 USE
      10'////T15,'ASTERISKS INDICATE WHERE THE COMPRESSIVE STRESS RATIO WAS
      2 GREATER THAN 0.15 AND EQUATIONS 19 AND 20 WERE USED'//)
0316      WRITE(6,381)
0317      DO 400 I=1,NSUP
0318      DO 390 J=1,NCOM
0319      IF(CMPS(I,J,4).GT.0.15)GO TO 385
0320      WRITE(6,382)I,J,CMPS(I,J,4),BENDW(I,J,4),BENDS(I,J,4),TOTC(I,J);
      1CSL
0321      GO TO 390
0322      385 WRITE(6,382)I,J,TOTC(I,J),TOTC(I,J),TOTC(I,J),TOTC(I,J),CSL
0323      390 CONTINUE
0324      400 CONTINUE
0325      IF(MCNT3.EQ.0)GO TO 410
0326      WRITE(6,403)MCNT3
0327      403 FORMAT('///T15,'THE COMBINED STRESS TERMS EXCEEDED 1.0',I5,' TIMES
      1. THE SUPPORTS ARE: '//)
0328      WRITE(6,342)(NCI3(I),I=1,MCNT3)
0329      410 IF(MCNT1.EQ.0)GO TO 500
0330      WRITE(6,401)
0331      401 FORMAT('1'////T15,'COMBINED STRESS - COMPRESSIVE - EQUATION 19'//)
0332      WRITE(6,381)
0333      DO 420 I=1,MCNT1
0334      J=NCAT(I,1)
0335      K=NCAT(I,2)
0336      WRITE(6,382)J,K,CMPS(J,K,4),T219(J,K),T319(J,K),T19C(J,K),CSL
0337      420 CONTINUE
0338      WRITE(6,421)
0339      421 FORMAT('1'////T15,'COMBINED STRESS - COMPRESSIVE - EQUATION 20'//)
0340      WRITE(6,391)
0341      DO 450 I=1,MCNT1
0342      J=NCAT(I,1)
0343      K=NCAT(I,2)
0344      WRITE(6,382)J,K,T120(J,K),BENDW(J,K,4),BENDS(J,K,4),T20C(J,K),CSL
0345      450 CONTINUE
0346      500 WRITE(6,501)
0347      501 FORMAT('1'////T15,'COMBINED STRESS - TENSION - EQUATION 20 USED'//)
0348      WRITE(6,381)
0349      DO 550 I=1,NSUP
0350      DO 540 J=1,NCOM
0351      540 WRITE(6,382)I,J,T120(I,J),BENDW(I,J,4),BENDS(I,J,4),TOTT(I,J),CSL
0352      550 CONTINUE
0353      IF(MCNT4.EQ.0)GO TO 20000
0354      WRITE(6,403)MCNT4
0355      WRITE(6,342)(NCT4(I),I=1,MCNT4)

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0001 SUBROUTINE ACD(P1,SV,WV,T1,SM,WM,CPI,CSV,CWV,CT1,CSM,CWM,K,I)
0002 DIMENSION P1(100,101),SV(100,101),WV(100,101),T1(100,101),SM(100,101),
      1 WM(100,101),CPI(100,101),CSV(100,101),CWV(100,101),
      2 CT1(100,101),CSM(100,101),CWM(100,101)
0003 DO 100 L=1,100
0004   CPI(L,I)= CPI(L,I)+ P1(L,K)
0005   CSV(L,I)= CSV(L,I)+ SV(L,K)
0006   CWV(L,I)= CWV(L,I)+ WV(L,K)
0007   CT1(L,I)= CT1(L,I)+ T1(L,K)
0008   CSM(L,I)= CSM(L,I)+ SM(L,K)
0009   CWM(L,I)= CWM(L,I)+ WM(L,K)
0010   100 CONTINUE
0011   RETURN
0012   END
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0356 20000 STOP
0357 END

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