LOFT TECHNICAL REPORT LTR 125-9

RE&C INTERNAL REPORT RE-A-78-173

OCTOBER 30, 1978

LOFT CIS ANALYSIS 4"-WH-237-E
INSIDE CONTAINMENT PENETRATION S-17B

M. E. Nitzel

EG&G Idaho, Inc.

IDAHO NATIONAL ENGINEERING LABORATORY

DEPARTMENT OF ENERGY

IDAHO OPERATIONS OFFICE UNDER CONTRACT EY-76-C-07-1570

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

LOFT TECHNICAL REPORT LTR 125-9

Report No. RE-A-78-173

Date: OCTOBER 30, 1978 *Sh*

NOTICE

MA ONLY

PORTIONS OF THIS REPORT ARE ILLEGIBLE. It has been reproduced from the best available copy to permit the broadest possible availability.

INTERNAL TECHNICAL REPORT

Title: LOFT CIS ANALYSIS - 4"-WH-237-E
INSIDE CONTAINMENT PENETRATION S-17B

Organization: Applied Mechanics Branch

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

Author: M. E. Nitzel/ *M. E. Nitzel*

Checked By: J. W. Muffett/ *J. W. Muffett*

Approved By: C. A. Moore/ *C. A. Moore*

cc: J. G. Arendts
S. M. Gardner (3)
M. M. Laughlin (5)
C. A. Moore
J. W. Muffett
M. E. Nitzel

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

THIS DOCUMENT HAS NOT RECEIVED PATENT
CLEARANCE AND IS NOT TO BE TRANSMITTED
TO THE PUBLIC DOMAIN

LOFT TECHNICAL REPORT
LOFT PROGRAM

FORM EG&G-229
(Rev 12-76)

TITLE LOFT CIS ANALYSIS - 4"-WH-237-E INSIDE CONTAINMENT PENETRATION S-17B		REPORT NO. LTR 125-9 RE-A-78-173
AUTHOR M. E. Nitzel		GWA NO. 52162-700-540
PERFORMING ORGANIZATION Applied Mechanics <i>7-28-78</i>		DATE October 30, 1978
LOFT APPROVAL <i>Mike Maringas</i> <i>7-11-78</i> <i>4-WH-78</i> <i>O.B. M... 10/30/78</i>		
PSE	for Seismic PSB Mgr. review	P&OSB Mgr.
		PSE RSB Mgr.

ABSTRACT

This report describes the stress analysis performed on the 4"-WH-237-E piping system inside containment penetration S-17B. Deadweight, thermal expansion, and seismic loads were considered. Results of this analysis show that the subject piping system will meet ASME Code, Section III, Class 2 requirements.

CONTENTS

ABSTRACT- - - - -	ii
I. SCOPE - - - - -	1
II. INTRODUCTION- - - - -	2
III. PIPING SYSTEM DESCRIPTION - - - - -	3
1. STRUCTURAL DESCRIPTION - - - - -	3
2. MATERIAL AND GEOMETRIC DATA- - - - -	3
IV. DESIGN AND SERVICE CONDITIONS - - - - -	6
1. DESIGN CONDITIONS- - - - -	6
2. LEVEL A SERVICE CONDITIONS - - - - -	6
3. LEVEL B SERVICE CONDITIONS - - - - -	6
4. LEVEL C SERVICE CONDITIONS - - - - -	7
5. LEVEL D SERVICE CONDITIONS - - - - -	7
6. TEST CONDITIONS- - - - -	7
V. PIPING SYSTEM STRUCTURAL ANALYSIS - - - - -	8
1. WEIGHT ANALYSIS- - - - -	8
2. THERMAL EXPANSION ANALYSIS - - - - -	8
3. SEISMIC ANALYSES - - - - -	8
VI. ASME BOILER AND PRESSURE VESSEL CODE, SECTION III, STRESS ANALYSIS - - - - -	12
1. MINIMUM THICKNESS CHECK- - - - -	12
2. DESIGN, LEVEL A, AND LEVEL B SERVICE CONDITIONS STRESS ANALYSIS- - - - -	13
3. LEVEL C SERVICE CONDITIONS STRESS ANALYSIS - - -	13
4. LEVEL D SERVICE CONDITIONS STRESS ANALYSIS - - -	14
VII. COMPONENT SUPPORT ANALYSIS- - - - -	15
VIII. SPECIAL CONSIDERATIONS- - - - -	17
IX. CONCLUSIONS - - - - -	18
X. REFERENCES- - - - -	19
APPENDIX A -- BASIC DATA, INPUT PARAMETERS- - - - -	A-i
APPENDIX B -- COMPUTER PROGRAM DESCRIPTION- - - - -	B-i
APPENDIX C -- WEIGHT ANALYSIS RESULTS - - - - -	C-i

APPENDIX D -- THERMAL EXPANSION ANALYSIS RESULTS-	D-i
APPENDIX E -- SEISMIC ANALYSES RESULTS-	E-i
APPENDIX F -- DESIGN, LEVEL A, AND LEVEL B SERVICE CONDITIONS STRESS ANALYSIS RESULTS-	F-i
APPENDIX G -- LEVEL C SERVICE CONDITIONS STRESS ANALYSIS RESULTS-	G-i
APPENDIX H -- LEVEL D SERVICE CONDITIONS STRESS ANALYSIS RESULTS-	H-i
APPENDIX I -- COMPONENT SUPPORT ANALYSIS RESULTS-	I-i

TABLES

I. Piping System Valve Design Weights and Centers of Gravity -	11
II. Minimum Thickness Parameters-	13
III. Loads on Piping Supports-	16

FIGURES

1. Piping System Computer Model Plot-	4
2. SSE-Seismic Response Spectra Envelope-	9

I. SCOPE

This document constitutes the stress report required by Subarticle NCA-3350 of the ASME Boiler and Pressure Vessel Code, Section III, "Nuclear Power Plant Components", 1977 through Winter 1977 Addenda*. The piping system analyzed, to be installed as part of the "Loss-of-Fluid-Test" (LOFT) Reactor, was the 4"-WH-237-E and associated piping inside containment penetration S-17B.

II. INTRODUCTION

The piping system was analyzed according to the procedures specified in Subsection NC-3600 of the Code and found acceptable. The governing conditions, engineering assumptions, and analytical techniques used in completing the analysis are described in the following pages. All loading conditions and design data used in performing the analysis were obtained from the LOFT Line Designation Tables^[2]. A Design Specification is to be issued in the future.

III. PIPING SYSTEM DESCRIPTION

The high level radioactive waste (WH) system transports wastes that are anticipated to contain radioactive nuclides or chemicals that exceed the limits for waste disposal to surface ponds. These wastes are transported to storage tanks located in a below grade concrete building.

The purposes of this analysis were to (1) determine the loads imposed on the containment penetration and (2) assure containment isolation integrity. Thus, this analysis included sufficient portions of the connecting pipe lines 4"-PR-6-E, 3"-PR-96-E, 2"-WH-12-E, and 2"-WH-230-E to account for their effects on the 4"-WH-237-E line.

1. STRUCTURAL DESCRIPTION

Figure 1 is an isometric plot of the Class 2 piping system analyzed in this report. The data points and elements are identified on the plot and a listing of the geometric data used in performing the system's structural analysis appears in Appendix A.

2. MATERIAL AND GEOMETRIC DATA

The piping has the following design parameters:

O.D. (inches)	2.375	3.500	4.500
Thickness (inches)	0.154	0.216	0.237
Weight (lbs/inch)	5.102	10.780	16.29
Material	A312, TP304L SST		
E _{cold} (10 ⁶ psi)	28.160	28.160	28.160

LOFT CIS ANALYSIS - 4, -WH-237-E, INSIDE S
NUPIE MATHEMATICAL MODEL

ROTATION ABOUT Y-AXIS = 45.4DEG.
X-Z PLANE TILT = 45.4DEG.

See Reference 4

FIGURE 1
PIPING SYSTEM COMPUTER MODEL PLOT

S (200°F) (psi)	15700	15700	15700
S_Y (psi)	25000	25000	25000
α (10^{-6} in./in.°F)	9.340	9.340	9.340

The expansion coefficient and thermal conductivities of SA-312, TP 304L, stainless steel are defined in Tables I-4.0 and I-5.0 of the Code.

IV. DESIGN AND SERVICE CONDITIONS

Listed in the following sections are the various design and service conditions used in analyzing the piping. This information was obtained from Reference 2.

1. DESIGN CONDITIONS

Class 2 - All Piping

Design Pressure - 150 PSI

Design Temperature - 100°F

2. LEVEL A SERVICE CONDITIONS

Level A service conditions, dealing mainly with the stress range due to thermal expansion, are based on the operating temperature(s) given below:

Class 2 - All Piping

Operating Pressure - 50 PSI

Operating Temperature - 100°F

3. LEVEL B SERVICE CONDITIONS

The only Level B service condition resulting in significant dynamic loads for the piping system is the Operating Basis Earthquake (OBE).

4. LEVEL C SERVICE CONDITIONS

The only significant Level C service conditions which affects the piping system is the Safe Shutdown Earthquake (SSE).

5. LEVEL D SERVICE CONDITIONS

The SSE plus Loss-of-Coolant Accident (LOCA) response envelopes all other Level D service responses for LOFT and will be used as the basis for Level D service conditions analysis.

6. TEST CONDITIONS

Cold Hydrostatic Test - Design Pressure x 1.25

Cold Leakage Test - Design Pressure Only

Hot Leakage Test - Design Pressure and Level A Service Temperature(s)

V. PIPING SYSTEM STRUCTURAL ANALYSIS

The piping system was analyzed for the various structural loads described in Section IV using the computer code NUPIPE-II, developed by Nuclear Services Corporation. This computer program is described in Appendix B. All limiting assumptions made in performing the analysis are listed in the following subsections.

1. WEIGHT ANALYSIS

An analysis for normal weight loading was performed for the system; the piping uniform weights used are listed in Section III.2 of this report. The weights and C.G.'s of the valves and operators are given in Table 1. The results of the weight analysis are contained in Appendix C of this report.

2. THERMAL EXPANSION ANALYSIS

The piping system addressed in this report was analyzed for the steady-state temperature conditions as outlined in Section IV.2. The results of this analysis are contained in Appendix D.

3. SEISMIC ANALYSIS

The piping system was analyzed for the effects of the Operating Basis Earthquake (OBE) and the Safe Shutdown Earthquake (SSE). For this analysis, OBE is to be considered one-half the magnitude of the SSE. The SSE response spectra is shown in Figure 2. This response spectra, multiplied by conservative directional intensity factors, was applied in

FIGURE 2
SSE - SEISMIC RESPONSE SPECTRA ENVELOPE

1% DAMPING

46 1323

K&E
10 X 10 TO 1/2 INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

all three directions simultaneously. Any seismic differential anchor movement effects present on the piping were taken into account. The results of the seismic analyses are contained in Appendix E.

TABLE I.
Piping System Valve Design Weights
And Centers of Gravity

<u>Valve</u>	<u>Flooded Weight</u>	<u>(Distance from C.G. axis of Pipe)</u>
CV-P11-59	100 lb	24 in.
CV-P11-64-1	100 lb	30 in.
CV-P122-12	100 lb	30 in.
V-379-CE	80 lb	0 in.
V-2188	70 lb	8 in.
V-2547-CE	40 lb	0 in.
CV-P11-17	40 lb	12 in.
V-171-CE	35 lb	0 in.

VI. ASME BOILER AND PRESSURE VESSEL CODE, SECTION III, STRESS ANALYSIS

A stress analysis of the Class 2 piping addressed in this report, per rules of Subsection NC-3600 of the Code, was performed using the results obtained from the analyses described in Section V of this report.

1. MINIMUM THICKNESS CHECK

The Code requires verification that the piping minimum wall thickness is satisfactory. The thickness was checked against Equation (1) of NC-3641.1:

$$t_M = \frac{P D_o}{2 (S + P_y)} + A$$

where t_M = Minimum required wall thickness

P = Internal design pressure

D_o = Outside diameter

S = Allowable stress

$y = .4$ or $\frac{d}{d+D_o}$ if $D_o/t_M < 6$ (per Code)

A = Corrosion allowance (.08).

Results of this calculation are contained in Table II.

TABLE II.

MINIMUM THICKNESS PARAMETERS

<u>Pressure (psi)</u>	<u>O. D. (inches)</u>	<u>S (psi)</u>	<u>t_M (inches)</u>	<u>t_{actual} (inches)</u>
150	2.375	15700	0.091	0.154
150	3.500	15700	0.099	0.216
150	4.500	15700	0.101	0.237

Since the actual thicknesses are all greater than the t_M calculated, the system meets the requirements of NC-3641.1.

2. DESIGN, LEVEL A, AND LEVEL B SERVICE CONDITIONS STRESS ANALYSIS

The loading conditions, defined as Design, Level A, and Level B in Section IV.1, 2, and 3, were used in performing a stress analysis of the piping system per the rules given in Subsection NC-3650 of the Code. The computer program NUPIPE-II was used for this analysis. The results of Equations (8), (9), (10), and (11) are detailed in Appendix F. Test conditions are encompassed by this stress analysis.

3. LEVEL C SERVICE CONDITIONS STRESS ANALYSIS

The only loading which was postulated as a Level C service condition is the SSE. NC-3611.2 (c) requires that Equation (9) of NC-3652.2 be satisfied with an allowable of $1.8 S_h$. These results, as calculated using NUPIPE-II, are contained in Appendix G.

4. LEVEL D SERVICE CONDITIONS STRESS ANALYSIS

There was no Level D service condition specified for this pipe system.

VII. COMPONENT SUPPORT ANALYSIS

Any component supports designed and built by EG&G Idaho, Inc. have been analyzed in accordance with the AISC Manual of Steel Construction^[3]. The analysis of these component supports would be contained in Appendix I. All component supports which have been supplied by a commercial manufacturer carry loads which are less than the manufacturer's stated load capacity. A summary of sustained loads on all piping supports is contained in Table III.

TABLE IIILOADS ON PIPING SUPPORTS

<u>Support Type</u>	<u>Support No.</u>	<u>Deadweight</u>	<u>Thermal</u>	<u>OBE</u>	<u>SSE</u>	<u>Rated Load</u>
U-BOLT	S1-X	-62.	12.	240.	480.	2260
	S1-Y	576.	-49.	379.	757.	2260
ROD*	S2-Y	59.	-22.	28.	57.	240
ROD*	S3-Y	186.	-11.	52.	104.	440
ROD*	S4-Y	62.	6.	40.	81.	240
ROD*	S5-Y	122.	-21.	30.	61.	240
ROD*	S6-Y	33.	8.	21.	42.	240
ROD*	S7-Y	253.	22.	159.	317.	705

NOTE:

1. All loads are in pounds.
2. S1-X indicates that this is the load in the global X direction on support S1.
3. * indicates that equivalent restraint should be provided for both up and down (+Y and -Y) movement.

VIII. SPECIAL CONSIDERATIONS

There were no special considerations made for this analysis.

IX. CONCLUSIONS

The piping system addressed in this report was analyzed for the loads and operating conditions given in Reference 2 using the techniques described herein. All stresses have been found to be within limits established by Section III of the ASME Boiler and Pressure Vessel Code. The results of this analysis warrant the following recommendations:

1. The Project Engineer should verify that the U-Bolt designated as support S1 in Figure 1 is a standard weight U-Bolt (Grinnell Figure 137 or equivalent) fabricated from a rod not less than one half inch in diameter.
2. A minimum diameter of 5/8 inch is required for the rod in support S7.
3. A minimum diameter of 1/2 inch is required for the rod in support S8.
4. Equivalent restraint in both the up and down (+Y and -Y) directions should be assured for supports S2-S7.
5. The Applied Mechanics Branch should be contacted for review of any changes in the current support configuration.

X. REFERENCES

1. American Society of Mechanical Engineers, ASME Boiler & Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components", Subsection NC, 1977 Edition, Winter 1977 Addenda.
2. Aerojet Nuclear Company, "Line Designation Tables", Specification P-1, Rev. 2, March 27, 1974.
3. American Institute of Steel Construction, Manual of Steel Construction, Seventh Edition, pp 5-6 to 5-24, 1973.
4. Computer Plot Based on Sketches Made at LOFT By Applied Mechanics Branch Personnel During March, 1978.

APPENDIX A
BASIC DATA, INPUT PARAMETERS

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 1

PROGRAM CONTROL CARD

CARDTYPE	NCHECK	DAMP	CODE	GLOB	DYN	THEATA	INTOUT	STORE
CONTROL	0	0	2.	0.	0.	0.0000	0.	0.

CARDTYPE	NPR	NPIPS	UNITS	EIGSAV
CONTROL	10	0	ENGLISH	0

FLEXIBILITY ANALYSIS CONTROL CARDS

CARDTYPE	NCASE	MODE	TLOAD	CMODE	CFREQ	SPEC	SAVE	CYCLE	TITLE
FLEXAN	1	1	3.	0.	0.	0.00	1.	0.	DEADWEIGHT
FLEXAN	2	1	2.	0.	0.	0.00	1.	0.	THERMAL EXPANSION PLUS ANCHOR MOVEMENTS
FLEXAN	3	1	11.	30.	50.	1.00	1.	0.	SSE RESPONSE SPECTRUM - 1% DAMPING

CASE COMBINATION CONTROL CARDS

CARDTYPE	NCASE	CASES-COMB	AMLLT	BMULT	CCODE	SAVE	CYCLE	TITLE
MODFLEX	4	3 AND 1	.5	0.0	0.0	1.0	0.0	OBE RESPONSE SPECTRUM - ONE-HALF SSE

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 2

SEISMIC RESPONSE SPECTRA - SET 1

X-EARTHQUAKE		Y-EARTHQUAKE		Z-EARTHQUAKE	
PERIOD (SEC)	ACCELERATION (G)	PERIOD (SEC)	ACCELERATION (G)	PERIOD (SEC)	ACCELERATION (G)
0.000	.342	0.000	.228	0.000	.342
.010	.342	.010	.228	.010	.342
.250	1.460	.250	.973	.250	1.460
.800	.637	.800	.425	.800	.637
1.400	.342	1.400	.228	1.400	.342
2.200	.217	2.200	.145	2.200	.217
3.000	.186	3.000	.124	3.000	.186
10.000	.186	10.000	.124	10.000	.186

AZ

LTR 125 9 7

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 3

CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
XSECTN	0	1	.450E+01	.237E+00	.163E+02	.282E+02	.150E+03	0.
XSECTN	0	2	.350E+01	.216E+00	.108E+02	.262E+02	.150E+03	0.
XSECTN	0	3	.236E+01	.154E+00	.598E+01	.262E+02	.150E+03	0.
XSECTN	0	4	.481E+01	.780E+00	.944E+02	.282E+02	.150E+03	0.
XSECTN	0	5	.344E+01	.190E+00	.107E+02	.262E+02	.150E+03	0.
OPVAL	1	1	.277E+02	.560E-02	0.	0.	.900E+02	0.
CHECK MAGNITUDE OF ENTRIES ON ABOVE OPVAL CARD ****								
ANCHOR	0	5	0.	0.	0.	0.	0.	0.
FGRUN	5	10	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	10	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	10	15	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	15	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	15	20	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	20	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	20	25	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	25	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	25	30	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	30	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	30	35	0.	0.	-.540E+00	.100E+01	.100E+01	0.
MASSPT	0	35	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	35	40	0.	0.	-.290E+00	.400E+01	.100E+01	0.
VALVE	40	45	0.	0.	-.580E+00	.100E+01	.100E+01	0.
RUN	45	50	0.	-.100E+01	0.	.100E+01	.100E+01	0.
RUN	50	55	0.	-.100E+01	0.	.100E+01	.100E+01	0.
CWEIGHT	0	55	0.	.100E+03	0.	0.	0.	0.
MASSPT	0	55	.100E+01	.100E+01	.100E+01	0.	0.	0.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 4

*** INPUT DATA ***

CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
VALVE	45	60	0.	0.	-.580E+00	.100E+01	.100E+01	0.
FGRUN	60	65	0.	0.	-.290E+00	.400E+01	.100E+01	0.
MASSPT	0	65	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	65	70	0.	0.	-.167E+00	.100E+01	.100E+01	0.
RUN	70	75	0.	0.	-.330E+00	.100E+01	.100E+01	0.
MASSPT	0	75	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	75	80	0.	0.	-.750E+00	.100E+01	.100E+01	0.
MASSPT	0	80	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	80	85	0.	0.	-.750E+00	.100E+01	.100E+01	0.
MASSPT	0	85	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	85	90	0.	0.	-.290E+00	.400E+01	.100E+01	0.
FGRUN	90	95	0.	0.	-.290E+00	.400E+01	.100E+01	0.
MASSPT	0	95	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	95	100	0.	0.	-.580E+00	.100E+01	.100E+01	0.
MASSPT	0	100	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	100	105	0.	0.	-.150E+01	.100E+01	.100E+01	0.
MASSPT	0	105	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	105	110	0.	0.	-.580E+00	.100E+01	.100E+01	0.
MASSPT	0	110	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	110	115	0.	0.	-.290E+00	.400E+01	.100E+01	0.
VALVE	115	120	0.	0.	-.667E+00	.100E+01	.100E+01	0.
RUN	120	125	-.125E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	125	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	125	130	-.125E+01	0.	0.	.100E+01	.100E+01	0.
CWEIGHT	0	130	0.	.100E+03	0.	0.	0.	0.

LVR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 5

*** INPUT DATA ***

CAROTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
RESTRAINT	0	130	0.	.200E+05	0.	0.	0.	0.
MASSPT	0	130	.100E+01	.100E+01	.100E+01	0.	0.	0.
VALVE	120	135	0.	0.	-.667E+00	.100E+01	.100E+01	0.
FGRUN	135	140	0.	0.	-.290E+00	.400E+01	.100E+01	0.
MASSPT	0	140	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	140	145	0.	0.	-.710E+00	.100E+01	.100E+01	0.
MASSPT	0	145	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	145	146	0.	0.	-.333E+00	.100E+01	.100E+01	0.
MASSPT	0	146	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	146	147	0.	.333E+00	0.	.100E+01	.100E+01	0.
RUN	147	150	0.	.875E+00	0.	.100E+01	.100E+01	0.
MASSPT	0	150	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	150	155	0.	.290E+00	0.	.400E+01	.100E+01	0.
VALVE	155	160	0.	.710E+00	0.	.100E+01	.100E+01	0.
RUN	160	165	.125E+01	0.	0.	.100E+01	.100E+01	0.
RUN	165	170	.125E+01	0.	0.	.100E+01	.100E+01	0.
CWEIGHT	0	170	0.	.100E+03	0.	0.	0.	0.
MASSPT	0	170	.100E+01	.100E+01	.100E+01	0.	0.	0.
VALVE	160	175	0.	.710E+00	0.	.100E+01	.100E+01	0.
FGRUN	175	180	0.	.792E+00	0.	.400E+01	.100E+01	0.
MASSPT	0	180	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	180	185	.600E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	185	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	185	190	0.	0.	.100E+01	.100E+01	.100E+01	0.
RESTRAINT	0	190	.200E+05	.200E+05	0.	0.	0.	0.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 6

CARDTYPE	*** INPUT DATA ***							
	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
MASSPT	0	190	.100E+C1	.100E+01	.100E+01	0.	0.	0.
FGRUN	146	148	0.	-.333E+00	0.	.100E+01	.100E+01	0.
RUN	148	195	0.	-.117E+01	0.	.100E+01	.100E+01	0.
MASSPT	0	195	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	195	196	0.	-.117E+01	0.	.100E+01	.100E+01	0.
FGRUN	196	200	0.	-.333E+00	0.	.100E+01	.100E+01	0.
MASSPT	0	200	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	200	201	0.	-.333E+00	0.	.100E+01	.100E+01	0.
RUN	201	205	0.	-.833E+00	0.	.100E+01	.100E+01	0.
MASSPT	0	205	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	205	210	0.	-.125E+01	0.	.100E+01	.100E+01	0.
MASSPT	0	210	.100E+C1	.100E+01	.100E+01	0.	0.	0.
ELBOW	210	215	.600E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	215	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	215	220	.154E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	220	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	220	225	.100E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	225	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	225	230	.290E+00	0.	0.	.100E+01	.100E+01	0.
FGRUN	230	235	.290E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	235	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	235	240	.121E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	240	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	240	245	.121E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	245	.100E+01	.100E+01	.100E+01	0.	0.	0.

LVR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 7

CARDTYPE	11	12	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
RUN	245	250	.171E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	250	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	250	255	.600E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	255	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	255	260	0.	0.	.792E+00	.400E+01	.100E+01	0.
VALVE	260	265	0.	0.	.500E+00	.100E+01	.100E+01	0.
MASSPT	0	265	.100E+01	.100E+01	.100E+01	0.	0.	0.
CWEIGHT	0	265	0.	.800E+02	0.	0.	0.	0.
VALVE	265	270	0.	0.	.500E+00	.100E+01	.100E+01	0.
FGRUN	270	275	0.	0.	.792E+00	.400E+01	.100E+01	0.
MASSPT	0	275	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	275	280	.600E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	280	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	280	285	0.	-.200E+01	0.	.100E+01	.100E+01	0.
MASSPT	0	285	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	285	290	0.	-.150E+01	0.	.100E+01	.100E+01	0.
MASSPT	0	290	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	290	295	0.	-.125E+01	0.	.100E+01	.100E+01	0.
MASSPT	0	295	.100E+01	.100E+01	.100E+01	0.	0.	0.
REDUCER	295	300	0.	-.353E+00	0.	.500E+01	.100E+01	0.
MASSPT	0	300	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	300	305	0.	-.250E+00	0.	.300E+01	.100E+01	0.
ANCHOR	0	305	0.	0.	0.	0.	0.	0.
FGRUN	200	202	-.333E+00	0.	0.	.200E+01	.100E+01	0.
TEE	200	202	0.	0.	0.	0.	0.	0.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-H-237-E, INSIDE, S17B, NORM & UPSET

PAGE 8

*** INPUT DATA ***

CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
FGRUN	202	310	-.117E+01	0.	0.	.200E+01	.100E+01	0.
MASSPT	0	310	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	310	315	-.150E+01	0.	0.	.200E+01	.100E+01	0.
MASSPT	0	315	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	315	320	-.167E+01	0.	0.	.200E+01	.100E+01	0.
MASSPT	0	320	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	320	325	.450E+01	0.	0.	.200E+01	.100E+01	0.
MASSPT	0	325	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	325	330	0.	.183E+01	0.	.200E+01	.100E+01	0.
MASSPT	0	330	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	330	335	0.	.133E+01	0.	.200E+01	.100E+01	0.
MASSPT	0	335	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	335	340	0.	.163E+01	0.	.200E+01	.100E+01	0.
MASSPT	0	340	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	340	345	.450E+01	0.	0.	.200E+01	.100E+01	0.
MASSPT	0	345	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	345	350	0.	0.	.142E+01	.200E+01	.100E+01	0.
MASSPT	0	350	.100E+01	.100E+01	.100E+01	0.	0.	0.
RESTRAINT	0	350	0.	.200E+05	0.	0.	0.	0.
RUN	350	355	0.	0.	.133E+01	.200E+01	.100E+01	0.
MASSPT	0	355	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	355	360	0.	0.	.133E+01	.200E+01	.100E+01	0.
VALVE	360	365	0.	0.	.500E+00	.200E+01	.100E+01	0.
RUN	365	370	.667E+00	0.	0.	.200E+01	.100E+01	0.
MASSPT	0	370	.100E+01	.100E+01	.100E+01	0.	0.	0.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NGRM & UPSET

PAGE 9

			*** INPUT DATA ***					
CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
CWEIGHT	0	370	0.	.700E+02	0.	0.	0.	0.
VALVE	365	375	0.	0.	.500E+00	.200E+01	.100E+01	0.
FGRUN	375	380	0.	0.	.117E+01	.200E+01	.100E+01	0.
RESTRAINT	0	380	0.	.200E+05	0.	0.	0.	0.
MASSPT	0	380	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	380	385	0.	0.	.125E+01	.200E+01	.100E+01	0.
MASSPT	0	385	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	385	390	0.	0.	.125E+01	.200E+01	.100E+01	0.
MASSPT	0	390	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	390	395	.450E+01	0.	0.	.200E+01	.100E+01	0.
RUN	395	400	-.500E+00	0.	0.	.200E+01	.100E+01	0.
ANCHOR	0	400	0.	0.	0.	0.	0.	0.
BRANCH	70	405	0.	.198E+00	0.	.300E+01	.100E+01	.119E+01
FGRUN	405	406	0.	.333E+00	0.	.300E+01	.100E+01	0.
MASSPT	0	406	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	406	410	0.	.833E+00	0.	.300E+01	.100E+01	0.
MASSPT	0	410	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	410	415	0.	.917E+00	0.	.300E+01	.100E+01	0.
MASSPT	0	415	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	415	420	.300E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	420	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	420	425	-.750E+00	0.	0.	.300E+01	.100E+01	0.
VALVE	425	430	-.583E+00	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	430	.100E+01	.100E+01	.100E+01	0.	0.	0.
CWEIGHT	0	430	0.	.400E+02	0.	0.	0.	0.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 10

*** INPUT DATA ***

CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
VALVE	430	435	-.583E+00	0.	0.	.300E+01	.100E+01	0.
RUN	435	440	-.583E+00	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	440	.100E+01	.100E+01	.100E+01	0.	0.	0.
RESTRAINT	0	440	0.	.200E+05	0.	0.	0.	0.
RUN	440	445	-.108E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	445	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	445	450	-.108E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	450	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	450	455	-.108E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	455	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	455	460	-.108E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	460	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	460	465	-.108E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	465	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	465	470	-.108E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	470	.100E+01	.100E+01	.100E+01	0.	0.	0.
RESTRAINT	0	470	0.	.200E+05	0.	0.	0.	0.
FGRUN	470	475	-.108E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	475	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBDW	475	480	.300E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	480	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	480	485	0.	-.150E+01	0.	.300E+01	.100E+01	0.
MASSPT	0	485	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBDW	485	490	.300E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	490	.100E+01	.100E+01	.100E+01	0.	0.	0.

LFR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-LH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 11

CARDTYPE	I1	I2	*** INPUT DATA ***					
			DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
FGRUN	490	495	C.	0.	-.146E+01	.300E+01	.100E+01	0.
MASSPT	0	495	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	495	500	0.	0.	-.108E+01	.300E+01	.100E+01	0.
MASSPT	0	500	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	500	505	0.	0.	-.208E+00	.300E+01	.100E+01	0.
MASSPT	0	505	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	505	510	0.	.208E+00	0.	.300E+01	.100E+01	0.
MASSPT	0	510	.100E+01	.100E+01	.100E+01	0.	0.	0.
TEE	505	510	0.	0.	0.	0.	0.	0.
RUN	510	515	0.	.667E+00	0.	.300E+01	.100E+01	0.
MASSPT	0	515	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	515	520	0.	.875E+00	0.	.300E+01	.100E+01	0.
MASSPT	0	520	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	520	525	.300E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	525	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	525	530	.117E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	530	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	530	535	.117E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	535	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	535	540	.300E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	540	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	540	550	0.	0.	.167E+00	.300E+01	.100E+01	0.
VALVE	550	555	0.	0.	.417E+00	.300E+01	.100E+01	0.
RUN	555	560	.100E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	560	.100E+01	.100E+01	.100E+01	0.	0.	0.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 12

			*** INPUT DATA ***					
CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
CWEIGHT	0	560	0.	.400E+02	0.	0.	0.	0.
VALVE	555	565	0.	0.	.417E+00	.300E+01	.100E+01	0.
FGRUN	565	570	0.	0.	.833E+00	.300E+01	.100E+01	0.
MASSPT	0	570	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	570	575	.300E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	575	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	575	580	0.	.917E+00	0.	.300E+01	.100E+01	0.
ANCHOR	0	580	0.	0.	0.	0.	0.	0.
FGRUN	505	585	0.	0.	-.208E+00	.300E+01	.100E+01	0.
MASSPT	0	585	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	585	590	0.	0.	-.100E+01	.300E+01	.100E+01	0.
MASSPT	0	590	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	590	595	0.	0.	-.129E+01	.300E+01	.100E+01	0.
MASSPT	0	595	.100E+01	.100E+01	.100E+01	0.	0.	0.
RESTRAINT	0	595	0.	.200E+05	0.	0.	0.	0.
RUN	595	600	0.	0.	-.125E+01	.300E+01	.100E+01	0.
MASSPT	0	600	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	600	605	0.	0.	-.146E+01	.300E+01	.100E+01	0.
MASSPT	0	605	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	605	610	0.	0.	-.125E+01	.300E+01	.100E+01	0.
MASSPT	0	610	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	610	615	0.	0.	-.163E+01	.300E+01	.100E+01	0.
MASSPT	0	615	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	615	620	.300E+01	0.	0.	.300E+01	.100E+01	0.
MASSPT	0	620	.100E+01	.100E+01	.100E+01	0.	0.	0.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LGFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 13

*** INPUT DATA ***

CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
FGRUN	620	625	0.	-.188E+01	0.	.300E+01	.100E+01	0.
MASSPT	0	625	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	625	626	0.	-.170E+01	0.	.300E+01	.100E+01	0.
MASSPT	0	626	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	626	630	0.	-.170E+01	0.	.300E+01	.100E+01	0.
MASSPT	0	630	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	630	635	0.	-.170E+01	0.	.300E+01	.100E+01	0.
MASSPT	0	635	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	635	640	0.	-.170E+01	0.	.300E+01	.100E+01	0.
VALVE	640	645	0.	-.583E+00	0.	.300E+01	.100E+01	0.
MASSPT	0	645	.100E+01	.100E+01	.100E+01	0.	0.	0.
CWEIGHT	0	645	0.	.350E+02	0.	0.	0.	0.
VALVE	645	650	0.	-.583E+00	0.	.300E+01	.100E+01	0.
FGRUN	650	655	0.	-.200E+01	0.	.300E+01	.100E+01	0.
ANCHOR	0	655	0.	0.	0.	0.	0.	0.
STRESS7	0	0	0.	0.	0.	0.	0.	0.
9CASES		1	0	4	0	0	0	0
10CASES		2	0	0	0	0	0	0
CKNODES		0	0	0	0	0	0	0
ALLDONE		0	0	0	0	0	0	0

LTR 125 9

APPENDIX B
COMPUTER PROGRAM DESCRIPTION

The NUPIPE-II computer program performs linear elastic analysis of three-dimensional piping systems subject to thermal, deadweight, seismic, and other static and dynamic loads. The NUPIPE-II program is also designed to perform stress and fatigue analyses in accordance with the ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components, 1974 Edition through the Summer 1975 Addenda; and the ANSI B31.1 Code, 1967 and Summer 1973 versions. Piping systems of more than one classification can be analysed.

NUPIPE-II utilizes the finite element method of analysis with special features incorporated to accommodate specific requirements of piping system analysis. In accordance with the finite element method, the continuous piping is mathematically idealized as an assembly of elastic structural members connecting discrete nodal points. Nodal points are placed in such a manner as to isolate particular types of piping elements, such as straight runs of pipe, elbows, valves, etc., for which force-deformation characteristics can be categorized. Nodal points are also placed at all discontinuities, such as piping supports, concentrated weights, branch lines, and changes in cross-section. System loads such as weights, equivalent thermal forces, and earthquake inertia forces are applied at the nodal points. For the deadweight and dynamic time-history and response spectra analyses, distributed weight properties of the piping as well as concentrated weights, such as valves, pumps, or snubbers, can be considered. A lumped mass model of the piping system is used for all dynamic analyses. Both translational and rotational degrees-of-freedom, may be considered.

For further information concerning NUPIPE-II capabilities or analytical procedures, contact Applied Mechanics Branch.

LTR 125 9

APPENDIX C
WEIGHT ANALYSIS RESULTS

06/06/78

NUPIPE-FIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
LOFT CIS ANALYSIS - 4"-KH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 34

SUPPORT REACTIONS FOR LOAD CASE NO. 1
DEADWEIGHT

NODE	TYPE	REACTION (LBS OR IN-LBS)	DIRECTION
5		10.	X CCCC
5		237.	Y CCCC
5		16.	Z CCCC
5		10229.	X CCCC
5		1512.	Z CCCC
5		253.	Y CCCC
5		362.	X CCCC
5		376.	Y CCCC
5		60.	X CCCC
5		393.	Y CCCC
5		11.	Z CCCC
5		2079.	X CCCC
5		1561.	Y CCCC
5		239.	Z CCCC
5		186.	Y CCCC
5		62.	Y CCCC
5		1.	X CCCC
5		15.	Y CCCC
5		104.	X CCCC
5		192.	Y CCCC
5		794.	Z CCCC
5		122.	Y CCCC
5		33.	Y CCCC
5		110.	X CCCC
5		66.	Y CCCC
5		1.	Z CCCC
5		647.	Y CCCC
5		276.	Y CCCC
5		236.	Z CCCC
5		59.	Y CCCC
5		1.	X CCCC
5		116.	Y CCCC
5		10.	Z CCCC
5		32.	X CCCC
5		16.	Y CCCC
5		88.	Z CCCC

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1

PAGE 36

LOFT CIS ANALYSIS - 4"-KH-237-E, INSIDE, S17B, NORM & UPSET

INTERNAL FORCES AND DEFLECTIONS FOR LOAD CASE NO. 1

DEADWEIGHT

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	5	10.	237.	18.	8829.	-1094.	1512.	-.000	-.000	-.000	-.0000	.0000	-.0000
	10	-10.	-221.	-18.	-8853.	970.	-1512.	-.000	-.003	-.000	-.0004	.0001	-.0001
RUN	10	10.	221.	18.	6033.	-970.	1512.	-.000	-.003	-.000	-.0004	.0001	-.0001
	15	-10.	-204.	-18.	-3533.	846.	-1512.	-.001	-.010	-.000	-.0007	.0001	-.0002
RUN	15	10.	204.	18.	3533.	-846.	1512.	-.001	-.010	-.000	-.0007	.0001	-.0002
	20	-10.	-186.	-18.	-1178.	722.	-1512.	-.003	-.020	-.000	-.0009	.0002	-.0003
RUN	20	10.	186.	18.	1178.	-722.	1512.	-.003	-.020	-.000	-.0009	.0002	-.0003
	25	-10.	-172.	-18.	-931.	599.	-1512.	-.005	-.031	-.000	-.0009	.0002	-.0005
RUN	25	10.	172.	18.	-931.	-599.	1512.	-.005	-.031	-.000	-.0009	.0002	-.0005
	30	-10.	-156.	-18.	-2945.	475.	-1512.	-.008	-.041	-.000	-.0008	.0002	-.0006
PRUN	30	10.	156.	18.	-2945.	-475.	1512.	-.008	-.041	-.000	-.0008	.0002	-.0006
	35	-10.	-147.	-18.	-3924.	408.	-1512.	-.009	-.045	-.000	-.0006	.0002	-.0006
FGRUN	35	10.	147.	18.	-3924.	-408.	1512.	-.009	-.045	-.000	-.0006	.0002	-.0006
	40	-10.	-119.	-18.	-4337.	372.	-1512.	-.010	-.047	-.000	-.0006	.0002	-.0007
VALVE	40	10.	119.	18.	-4337.	-372.	1512.	-.010	-.047	-.000	-.0006	.0002	-.0007
	45	-10.	-110.	-18.	-5185.	301.	-1512.	-.012	-.052	-.000	-.0006	.0003	-.0007
RUN	45	0.	133.	0.	-0.	0.	0.	-.012	-.052	-.000	-.0006	.0003	-.0007
	50	-0.	-116.	-0.	-0.	-0.	-0.	-.020	-.052	.007	-.0006	.0003	-.0007
RUN	50	0.	116.	0.	0.	0.	0.	-.020	-.052	.007	-.0006	.0003	-.0007
	55	-0.	-100.	0.	0.	0.	0.	-.026	-.052	.013	-.0006	.0003	-.0007
VALVE	45	10.	-23.	18.	-5155.	-301.	1512.	-.012	-.052	-.000	-.0006	.0003	-.0007
	60	-10.	32.	-18.	-4994.	229.	-1512.	-.014	-.055	-.000	-.0005	.0003	-.0007
FGRUN	60	10.	-22.	18.	-4994.	-229.	1512.	-.014	-.055	-.000	-.0005	.0003	-.0007
	65	-10.	60.	-18.	-4634.	193.	-1512.	-.015	-.057	-.000	-.0005	.0003	-.0007
RUN	65	10.	-60.	18.	-4634.	-193.	1512.	-.015	-.057	-.000	-.0005	.0003	-.0007
	70	-10.	62.	-18.	-4712.	172.	-1512.	-.015	-.058	-.000	-.0004	.0003	-.0007
RUN	70	1.	-42.	17.	-4712.	-225.	1257.	-.015	-.058	-.000	-.0004	.0003	-.0007
	75	-1.	48.	-17.	-4540.	219.	-1257.	-.016	-.059	-.000	-.0003	.0003	-.0008

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S175, NORM & UPSET

PAGE 37

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	75	1.	-48.	17.	-4540.	-219.	1257.	-.015	-.059	-.000	-.0003	.0003	-.0008
	80	-1.	60.	-17.	4055.	207.	-1257.	-.019	-.061	-.000	-.0001	.0003	-.0006
FGRUN	80	1.	-60.	17.	-4055.	-207.	1257.	-.019	-.061	-.000	-.0001	.0003	-.0008
	85	-1.	72.	-17.	3460.	194.	-1257.	-.021	-.062	-.000	.0000	.0003	-.0009
FGRUN	85	1.	-72.	17.	-3460.	-194.	1257.	-.021	-.062	-.000	.0000	.0003	-.0009
	90	-1.	100.	-17.	3161.	189.	-1257.	-.022	-.062	-.000	.0000	.0003	-.0009
FGRUN	90	1.	-100.	17.	-3161.	-189.	1257.	-.022	-.062	-.000	.0000	.0003	-.0009
	95	-1.	127.	-17.	2767.	185.	-1257.	-.023	-.062	-.000	.0001	.0003	-.0009
FGRUN	95	1.	-127.	17.	-2767.	-185.	1257.	-.023	-.062	-.000	.0001	.0003	-.0009
	100	-1.	136.	-17.	1851.	175.	-1257.	-.025	-.061	-.000	.0001	.0003	-.0010
RUN	100	1.	-136.	17.	-1851.	-175.	1257.	-.025	-.061	-.000	.0001	.0003	-.0010
	105	-1.	161.	-17.	825.	150.	-1257.	-.030	-.058	-.000	.0002	.0003	-.0011
RUN	105	1.	-161.	17.	-825.	-150.	1257.	-.030	-.058	-.000	.0002	.0003	-.0011
	110	-1.	170.	-17.	1977.	140.	-1257.	-.032	-.057	-.000	.0001	.0003	-.0012
FGRUN	110	1.	-170.	17.	-1977.	-140.	1257.	-.032	-.057	-.000	.0001	.0003	-.0012
	115	-1.	198.	-17.	2617.	135.	-1257.	-.034	-.056	-.000	.0001	.0003	-.0012
VALVE	115	1.	-198.	17.	-2617.	-135.	1257.	-.034	-.056	-.000	.0001	.0003	-.0012
	120	-1.	209.	-17.	4243.	124.	-1257.	-.036	-.055	-.000	.0001	.0003	-.0012
RUN	120	0.	-112.	0.	-0.	0.	3973.	-.036	-.055	-.000	.0001	.0003	-.0012
	125	-0.	132.	-0.	0.	0.	-2139.	-.036	-.035	.005	.0001	.0003	-.0014
RUN	125	0.	-132.	0.	-0.	-0.	2139.	-.036	-.035	.005	.0001	.0003	-.0014
	130	-0.	153.	-0.	0.	-0.	-0.	-.036	-.013	.009	.0001	.0003	-.0015
VALVE	120	1.	-96.	17.	4243.	-124.	-2717.	-.036	-.055	-.000	.0001	.0003	-.0012
	135	-1.	107.	-17.	-5055.	113.	2717.	-.039	-.055	-.000	.0000	.0003	-.0012
FGRUN	135	1.	-107.	17.	5055.	-113.	-2717.	-.039	-.055	-.000	.0000	.0003	-.0012
	140	-1.	135.	-17.	-5479.	108.	2717.	-.040	-.055	-.000	-.0000	.0003	-.0011
FGRUN	140	1.	-135.	17.	5479.	-108.	-2717.	-.040	-.055	-.000	-.0000	.0003	-.0011
	145	-1.	146.	-17.	-6676.	96.	2717.	-.042	-.056	-.000	-.0003	.0003	-.0010
FGRUN	145	1.	-146.	17.	6676.	-96.	-2717.	-.042	-.056	-.000	-.0003	.0003	-.0010
	146	-1.	152.	-17.	-7272.	91.	2717.	-.044	-.057	-.000	-.0004	.0003	-.0009
FGRUN	146	62.	-317.	0.	6800.	749.	834.	-.044	-.057	-.000	-.0004	.0003	-.0009
	147	-62.	322.	-0.	-6800.	-749.	-1083.	-.040	-.057	-.002	-.0005	.0003	-.0009

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 38

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	147	62.	-322.	0.	6800.	749.	1083.	-.040	-.057	-.002	-.0005	.0003	-.0009
	150	-62.	336.	-0.	-6800.	-749.	-1738.	-.030	-.057	-.010	-.0009	.0002	-.0010
FGRUN	150	62.	-336.	0.	6800.	749.	1738.	-.030	-.057	-.010	-.0009	.0002	-.0010
	155	-62.	364.	-0.	-6800.	-749.	-1955.	-.026	-.057	-.013	-.0009	.0002	-.0010
VALVE	155	62.	-364.	0.	6800.	749.	1955.	-.026	-.057	-.013	-.0009	.0002	-.0010
	160	-62.	375.	-0.	-6800.	-749.	-2487.	-.017	-.057	-.021	-.0010	.0002	-.0011
RUN	160	0.	141.	0.	0.	0.	3611.	-.017	-.057	-.021	-.0010	.0002	-.0011
	165	-0.	-120.	0.	0.	0.	-1653.	-.017	-.075	-.025	-.0010	.0002	-.0013
RUN	165	0.	120.	0.	0.	0.	1653.	-.017	-.075	-.025	-.0010	.0002	-.0013
	170	-0.	-100.	-0.	-0.	-0.	0.	-.017	-.094	-.028	-.0010	.0002	-.0013
VALVE	160	62.	-516.	0.	6800.	749.	-1124.	-.017	-.057	-.021	-.0010	.0002	-.0011
	175	-62.	527.	-0.	-6800.	-749.	593.	-.008	-.057	-.030	-.0011	.0002	-.0010
FGRUN	175	62.	-527.	0.	6800.	749.	-593.	-.008	-.057	-.030	-.0011	.0002	-.0010
	180	-62.	555.	-0.	-6800.	-749.	374.	-.005	-.057	-.034	-.0012	.0002	-.0010
ELBOW	180	62.	-555.	0.	6800.	749.	-374.	-.005	-.057	-.034	-.0012	.0002	-.0010
	185	-62.	568.	-0.	-3432.	-374.	0.	.002	-.044	-.045	-.0025	.0001	-.0010
FGRUN	185	62.	-568.	0.	3432.	374.	0.	.002	-.044	-.045	-.0025	.0001	-.0010
	190	-62.	576.	-0.	-0.	-0.	0.	.003	-.029	-.045	-.0026	.0001	-.0010
FGRUN	146	-61.	155.	17.	471.	-839.	-3550.	-.044	-.057	-.000	-.0004	.0003	-.0009
	143	61.	-159.	-17.	-533.	839.	3307.	-.047	-.057	.002	-.0004	.0003	-.0009
RUN	148	-61.	159.	17.	535.	-839.	-3307.	-.047	-.057	.002	-.0004	.0003	-.0009
	195	61.	-140.	-17.	-770.	839.	2453.	-.058	-.057	.008	-.0005	.0004	-.0007
RUN	195	-61.	140.	17.	770.	-839.	-2453.	-.058	-.057	.008	-.0005	.0004	-.0007
	196	61.	-121.	-17.	-1003.	839.	1599.	-.066	-.057	.015	-.0005	.0005	-.0005
FGRUN	196	-61.	121.	17.	1003.	-839.	-1599.	-.066	-.057	.015	-.0005	.0005	-.0005
	200	61.	-116.	-17.	-1070.	839.	1355.	-.066	-.057	.017	-.0005	.0005	-.0005
FGRUN	200	-60.	104.	11.	949.	-1234.	-2036.	-.068	-.057	.017	-.0005	.0005	-.0005
	201	60.	-98.	-11.	-992.	1234.	1798.	-.070	-.057	.019	-.0006	.0005	-.0005
RUN	201	-60.	98.	11.	992.	-1234.	-1798.	-.070	-.057	.019	-.0006	.0005	-.0005
	205	60.	-85.	-11.	-1101.	1234.	1203.	-.074	-.057	.025	-.0006	.0006	-.0004
FGRUN	205	-60.	85.	11.	1101.	-1234.	-1203.	-.074	-.057	.025	-.0006	.0006	-.0004
	210	60.	-73.	-11.	-1199.	1234.	667.	-.077	-.057	.031	-.0007	.0007	-.0003

LIR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 39

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
ELBOW	210	-60.	73.	11.	1199.	-1234.	-667.	-.077	-.057	.031	-.0007	.0007	-.0003
	215	60.	-60.	-11.	-1265.	1168.	707.	-.079	-.059	.031	-.0008	.0008	-.0002
FGRUN	215	-60.	60.	11.	1265.	-1168.	-707.	-.079	-.059	.031	-.0008	.0008	-.0002
	220	60.	-43.	-11.	-1265.	1032.	1348.	-.079	-.061	.020	-.0009	.0009	-.0001
FGRUN	220	-60.	43.	11.	1265.	-1032.	-1348.	-.079	-.061	.020	-.0009	.0009	-.0001
	225	60.	-27.	-11.	-1265.	901.	1764.	-.079	-.062	.010	-.0010	.0009	-.0000
FGRUN	225	-60.	27.	11.	1265.	-901.	-1764.	-.079	-.062	.010	-.0010	.0009	-.0000
	230	60.	-22.	-11.	-1265.	863.	1848.	-.079	-.062	.006	-.0010	.0009	-.0000
FGRUN	230	-60.	22.	11.	1265.	-863.	-1848.	-.079	-.062	.006	-.0010	.0009	-.0000
	235	60.	-17.	-11.	-1265.	825.	1916.	-.079	-.062	.003	-.0010	.0010	-.0000
RUN	235	-60.	17.	11.	1265.	-825.	-1916.	-.079	-.062	.003	-.0010	.0010	-.0000
	240	60.	3.	-11.	-1265.	667.	2021.	-.079	-.061	-.011	-.0012	.0010	.0002
RUN	240	-60.	-3.	11.	1265.	-667.	-2021.	-.079	-.061	-.011	-.0012	.0010	.0002
	245	60.	22.	-11.	-1265.	509.	1841.	-.079	-.053	-.026	-.0013	.0011	.0003
RUN	245	-60.	-22.	11.	1265.	-509.	-1841.	-.079	-.053	-.026	-.0013	.0011	.0003
	250	60.	42.	-11.	-1265.	351.	1376.	-.079	-.053	-.042	-.0014	.0011	.0004
ELBOW	250	-60.	-42.	11.	1265.	-351.	-1376.	-.079	-.053	-.042	-.0014	.0011	.0004
	255	60.	55.	-11.	-975.	-72.	1086.	-.072	-.043	-.048	-.0016	.0011	.0007
FGRUN	255	-60.	-55.	11.	975.	72.	-1086.	-.072	-.043	-.048	-.0016	.0011	.0007
	260	60.	62.	-11.	-735.	-280.	1086.	-.068	-.034	-.048	-.0016	.0011	.0007
VALVE	260	-60.	-62.	11.	735.	280.	-1086.	-.068	-.034	-.048	-.0016	.0011	.0007
	265	60.	90.	-11.	-217.	-637.	1086.	-.061	-.025	-.048	-.0016	.0011	.0007
VALVE	265	-60.	-170.	11.	217.	637.	-1086.	-.061	-.025	-.048	-.0016	.0011	.0007
	270	60.	179.	-11.	831.	-995.	1086.	-.055	-.015	-.048	-.0016	.0011	.0007
FGRUN	270	-60.	-179.	11.	-831.	995.	-1086.	-.055	-.015	-.048	-.0016	.0011	.0007
	275	60.	206.	-11.	1505.	-1203.	1086.	-.051	-.009	-.048	-.0016	.0011	.0007
ELBOW	275	-60.	-206.	11.	-1505.	1203.	-1086.	-.051	-.009	-.048	-.0016	.0011	.0007
	280	60.	219.	-11.	2714.	-1561.	728.	-.040	-.000	-.041	-.0011	.0010	.0008
FGRUN	280	-60.	-219.	11.	-2714.	1561.	-728.	-.040	-.000	-.041	-.0011	.0010	.0008
	285	60.	243.	-11.	2518.	-1561.	-343.	-.026	-.000	-.023	-.0008	.0008	.0008
RUN	285	-60.	-243.	11.	-2518.	1561.	343.	-.026	-.000	-.023	-.0008	.0008	.0008
	290	60.	268.	-11.	2322.	-1561.	-1415.	-.012	-.000	-.010	-.0006	.0006	.0007

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 40

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)			R
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ	
RUN	290	-60.	-268.	11.	-2322.	1561.	1415.	-.012	-.003	-.010	-.0006	.0005	.0007	
	295	60.	268.	-11.	2158.	-1561.	-2308.	-.003	-.000	-.002	-.0005	.0004	.0006	
REDUCE	295	-60.	-236.	11.	-2158.	1561.	2308.	-.003	-.000	-.002	-.0005	.0004	.0006	
	300	60.	232.	-11.	2112.	-1561.	-2560.	-.001	-.000	-.000	-.0003	.0003	.0004	
RUN	300	-60.	-292.	11.	-2112.	1561.	2560.	-.001	-.000	-.000	-.0003	.0003	.0004	
	305	60.	293.	-11.	2079.	-1561.	-2739.	-.000	-.000	-.000	-.0000	.0000	.0000	
FGRUN	200	-1.	12.	6.	121.	395.	681.	-.068	-.057	.017	-.0005	.0005	-.0005	
	202	1.	-9.	-6.	-121.	-372.	-723.	-.068	-.055	.019	-.0006	.0005	-.0005	
FGRUN	202	-1.	9.	6.	121.	372.	723.	-.068	-.055	.019	-.0006	.0005	-.0005	
	310	1.	-4.	-6.	-121.	-292.	-756.	-.068	-.047	.025	-.0006	.0004	-.0006	
RUN	310	-1.	-4.	6.	121.	292.	756.	-.068	-.047	.025	-.0006	.0004	-.0006	
	315	1.	20.	-6.	-121.	-189.	-540.	-.068	-.034	.033	-.0006	.0004	-.0006	
RUN	315	-1.	-20.	6.	121.	189.	540.	-.068	-.034	.033	-.0006	.0004	-.0006	
	320	1.	34.	-6.	-121.	-101.	-120.	-.068	-.021	.039	-.0006	.0004	-.0006	
ELBOW	320	-1.	-34.	6.	121.	101.	120.	-.068	-.021	.039	-.0006	.0004	-.0006	
	325	1.	40.	-6.	-95.	-75.	54.	-.064	-.017	.037	-.0007	.0003	-.0009	
FGRUN	325	-1.	-40.	6.	95.	75.	-54.	-.064	-.017	.037	-.0007	.0003	-.0009	
	330	1.	56.	-6.	-5.	-75.	79.	-.049	-.017	.025	-.0007	.0003	-.0008	
RUN	330	-1.	-56.	6.	5.	75.	-79.	-.049	-.017	.025	-.0007	.0003	-.0008	
	335	1.	70.	-6.	-96.	-75.	102.	-.036	-.017	.014	-.0007	.0003	-.0008	
FGRUN	335	-1.	-70.	6.	96.	75.	-102.	-.036	-.017	.014	-.0007	.0003	-.0008	
	340	1.	66.	-6.	-196.	-75.	127.	-.022	-.017	.003	-.0006	.0003	-.0008	
ELBOW	340	-1.	-66.	6.	196.	75.	-127.	-.022	-.017	.003	-.0006	.0003	-.0008	
	345	1.	93.	-6.	-624.	-61.	134.	-.017	-.015	-.000	-.0005	.0002	-.0008	
FGRUN	345	-1.	-93.	6.	624.	61.	-134.	-.017	-.015	-.000	-.0005	.0002	-.0008	
	350	1.	124.	-6.	-1351.	-99.	134.	-.014	-.009	-.000	-.0003	.0002	-.0007	
RUN	350	-1.	-124.	6.	1351.	99.	-134.	-.014	-.009	-.000	-.0003	.0002	-.0007	
	355	1.	82.	-6.	-1851.	-99.	134.	-.011	-.005	-.000	-.0001	.0002	-.0007	
FGRUN	355	-1.	-82.	6.	1851.	99.	-134.	-.011	-.005	-.000	-.0001	.0002	-.0007	
	360	1.	58.	-6.	-314.	-146.	134.	-.008	-.005	-.000	-.0001	.0002	-.0007	
VALVE	360	-1.	-58.	6.	314.	146.	-134.	-.008	-.005	-.000	-.0001	.0002	-.0007	
	365	1.	48.	-6.	-617.	-154.	134.	-.007	-.005	-.000	-.0001	.0002	-.0007	

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 41

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	365	0.	77.	-0.	0.	-0.	589.	-.007	-.005	-.000	-.0001	.0002	-.0007
	370	0.	-70.	0.	-0.	0.	-0.	-.007	-.011	-.002	-.0001	.0002	-.0007
VALVE	365	-1.	-29.	6.	617.	154.	-723.	-.007	-.005	-.000	-.0001	.0002	-.0007
	375	1.	35.	-6.	-425.	-163.	723.	-.005	-.005	-.000	-.0001	.0002	-.0006
FGRUN	375	-1.	-35.	6.	425.	163.	-723.	-.005	-.005	-.000	-.0001	.0002	-.0006
	380	1.	47.	-6.	148.	-183.	723.	-.003	-.003	-.000	-.0001	.0001	-.0005
RUN	380	-1.	15.	6.	-146.	183.	-723.	-.003	-.003	-.000	-.0001	.0001	-.0005
	365	1.	-2.	-6.	22.	-205.	723.	-.001	-.002	-.000	-.0001	.0001	-.0003
FGRUN	385	-1.	2.	6.	-22.	205.	-723.	-.001	-.002	-.000	-.0001	.0001	-.0003
	390	1.	8.	-6.	54.	-220.	723.	-.000	-.001	-.000	-.0001	.0001	-.0002
ELBOW	390	-1.	-6.	6.	-54.	220.	-723.	-.000	-.001	-.000	-.0001	.0001	-.0002
	395	1.	14.	-6.	104.	-201.	772.	-.000	-.000	-.000	-.0000	.0000	-.0000
RUN	395	-1.	-14.	6.	-104.	201.	-772.	-.000	-.000	-.000	-.0000	.0000	-.0000
	400	1.	15.	-6.	104.	-192.	794.	-.000	-.000	-.000	-.0000	.0000	-.0000
BRANCH	70	9.	-20.	1.	6.	53.	255.	-.015	-.058	-.000	-.0004	.0003	-.0007
	405	-9.	21.	-1.	-3.	-53.	-277.	-.013	-.053	-.001	-.0004	.0002	-.0008
FGRUN	405	9.	-21.	1.	3.	53.	277.	-.013	-.053	-.001	-.0004	.0002	-.0008
	406	-9.	23.	-1.	2.	-53.	-312.	-.010	-.058	-.003	-.0004	.0002	-.0008
RUN	406	9.	-23.	1.	-2.	53.	312.	-.010	-.058	-.003	-.0004	.0002	-.0008
	410	-9.	28.	-1.	15.	-53.	-401.	-.001	-.058	-.007	-.0004	.0002	-.0010
FGRUN	410	9.	-28.	1.	-15.	53.	401.	-.001	-.058	-.007	-.0004	.0002	-.0010
	415	-9.	32.	-1.	25.	-53.	-473.	.008	-.058	-.010	-.0004	.0002	-.0012
ELBOW	415	9.	-32.	1.	-25.	53.	473.	.008	-.058	-.010	-.0004	.0002	-.0012
	420	-9.	34.	-1.	29.	-49.	-400.	.012	-.053	-.011	-.0004	.0001	-.0017
FGRUN	420	9.	-34.	1.	-29.	49.	400.	.012	-.053	-.011	-.0004	.0001	-.0017
	425	-9.	37.	-1.	29.	-41.	-165.	.012	-.043	-.010	-.0004	.0001	-.0018
VALVE	425	9.	-37.	1.	-29.	41.	165.	.012	-.043	-.010	-.0004	.0001	-.0018
	430	-9.	41.	-1.	29.	-32.	69.	.012	-.030	-.010	-.0004	.0001	-.0018
VALVE	430	9.	-81.	1.	-29.	32.	-69.	.012	-.030	-.010	-.0004	.0001	-.0018
	435	-9.	84.	-1.	29.	-23.	666.	.012	-.017	-.009	-.0004	.0001	-.0016
RUN	435	9.	-84.	1.	-29.	23.	-666.	.012	-.017	-.009	-.0004	.0001	-.0016
	440	-9.	86.	-1.	29.	-15.	1268.	.012	-.006	-.008	-.0004	.0001	-.0014

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1

PAGE 42

LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	440	-9.	-34.	-1.	-29.	15.	-1266.	.012	-.006	-.008	-.0004	.0001	-.0014
	445	-9.	-28.	-1.	29.	2.	869.	.012	.007	-.007	-.0003	.0001	-.0007
RUN	445	-9.	-28.	-1.	-29.	-2.	-869.	.012	.007	-.007	-.0003	.0001	-.0007
	450	-9.	-21.	-1.	29.	18.	554.	.012	.012	-.005	-.0003	.0001	-.0002
RUN	450	-9.	-21.	-1.	-29.	-18.	-554.	.012	.012	-.005	-.0003	.0001	-.0002
	455	-9.	-15.	-1.	29.	35.	322.	.012	.012	-.004	-.0003	.0001	-.0001
RUN	455	-9.	-15.	-1.	-29.	-35.	-322.	.012	.012	-.004	-.0003	.0001	-.0001
	460	-9.	-8.	-1.	29.	51.	174.	.012	.009	-.002	-.0003	.0002	.0003
RUN	460	-9.	-8.	-1.	-29.	-51.	-174.	.012	.009	-.002	-.0003	.0002	.0003
	465	-9.	-2.	-1.	29.	68.	110.	.012	.004	-.001	-.0002	.0002	.0004
RUN	465	-9.	-2.	-1.	-29.	-68.	-110.	.012	.004	-.001	-.0002	.0002	.0004
	470	-9.	5.	-1.	29.	84.	129.	.012	-.002	.004	-.0002	.0003	.0005
FGRUN	470	-9.	5.	-1.	-29.	-84.	-129.	.012	-.002	.004	-.0002	.0003	.0005
	475	-9.	-23.	-1.	29.	97.	-125.	.012	-.007	.006	-.0002	.0003	.0005
ELBOW	475	-9.	-23.	-1.	-29.	-97.	125.	.012	-.007	.006	-.0002	.0003	.0005
	480	-9.	-21.	-1.	25.	101.	-164.	.013	-.008	.006	-.0002	.0004	.0003
FGRUN	480	-9.	-21.	-1.	-25.	-101.	164.	.013	-.008	.006	-.0002	.0004	.0003
	485	-9.	-15.	-1.	10.	101.	-57.	.016	-.008	.010	-.0002	.0005	.0002
ELBOW	485	-9.	-15.	-1.	-10.	-101.	57.	.016	-.008	.010	-.0002	.0005	.0002
	490	-9.	-12.	-1.	46.	74.	-30.	.016	-.009	.011	-.0002	.0005	.0002
FGRUN	490	-9.	-12.	-1.	-46.	-74.	30.	.016	-.009	.011	-.0002	.0005	.0002
	495	-9.	-5.	-1.	174.	-55.	-30.	.008	-.011	.011	-.0001	.0005	.0002
FGRUN	495	-9.	-5.	-1.	-174.	55.	30.	.008	-.011	.011	-.0001	.0005	.0002
	500	-9.	1.	-1.	198.	-171.	-30.	.001	-.011	.011	-.0001	.0005	.0001
FGRUN	500	-9.	1.	-1.	-198.	171.	30.	.001	-.011	.011	-.0001	.0005	.0001
	505	-9.	-1.	-1.	194.	-193.	-30.	.005	-.011	.011	-.0001	.0004	.0001
FGRUN	505	-9.	-1.	-1.	-194.	193.	30.	.005	-.011	.011	-.0001	.0004	.0001
	510	-10.	-18.	-1.	293.	-106.	-70.	-.000	-.011	.011	-.0001	.0004	.0001
RUN	510	-10.	-18.	-1.	-293.	106.	70.	-.000	-.011	.011	-.0001	.0004	.0001
	515	-10.	-14.	-1.	296.	-106.	-147.	-.001	-.011	.011	-.0001	.0004	.0001
FGRUN	515	-10.	-14.	-1.	-296.	106.	147.	-.001	-.011	.011	-.0001	.0004	.0001
	520	-10.	-10.	-1.	287.	-106.	-219.	-.001	-.011	.010	-.0002	.0003	.0000

LFR 125 9

06/06/73

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S176, NORM & UPSET

PAGE 43

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
ELBOW	520	10.	10.	1.	279.	106.	219.	-.001	-.011	.010	-.0002	.0003	.0000
	525	-10.	-8.	-1.	-276.	-109.	-220.	-.001	-.011	.008	-.0004	.0003	-.0002
FGRUN	525	10.	8.	1.	276.	109.	220.	-.001	-.011	.008	-.0004	.0003	-.0002
	530	-10.	-3.	-1.	-275.	-121.	-151.	-.001	-.015	.005	-.0006	.0002	-.0004
FGRUN	530	10.	3.	1.	276.	121.	161.	-.001	-.015	.005	-.0006	.0002	-.0004
	535	-10.	3.	-1.	-276.	-133.	-162.	-.001	-.019	.003	-.0008	.0001	-.0005
ELBOW	535	10.	-3.	1.	276.	133.	162.	-.001	-.019	.003	-.0008	.0001	-.0005
	540	-10.	5.	-1.	-264.	-107.	-174.	-.001	-.018	.003	-.0010	.0000	-.0005
FGRUN	540	10.	-5.	1.	264.	107.	174.	-.001	-.018	.003	-.0010	.0000	-.0005
	550	-10.	6.	-1.	-269.	-117.	-174.	-.001	-.019	.003	-.0010	.0000	-.0005
VALVE	550	10.	-6.	1.	269.	117.	174.	-.001	-.019	.003	-.0010	.0000	-.0005
	555	-10.	8.	-1.	-234.	-68.	-174.	-.001	-.014	.003	-.0010	-.0000	-.0005
RUN	555	0.	46.	0.	0.	0.	516.	-.001	-.014	.003	-.0010	-.0000	-.0005
	560	0.	40.	-0.	0.	0.	-0.	-.001	-.022	.003	-.0010	-.0000	-.0007
VALVE	555	10.	-54.	1.	234.	68.	-342.	-.001	-.014	.003	-.0010	-.0000	-.0005
	565	-10.	57.	-1.	43.	-20.	342.	-.001	-.009	.003	-.0010	-.0000	-.0005
FGRUN	565	10.	-57.	1.	-43.	20.	-342.	-.001	-.009	.003	-.0010	-.0000	-.0005
	570	-10.	60.	-1.	451.	47.	342.	-.001	-.002	.003	-.0009	-.0000	-.0003
ELBOW	570	10.	-60.	1.	-451.	-47.	-342.	-.001	-.002	.003	-.0009	-.0000	-.0003
	575	-10.	62.	-1.	638.	76.	313.	-.000	-.000	.001	-.0003	-.0000	-.0001
FGRUN	575	10.	-62.	1.	-638.	-76.	-313.	-.000	-.000	.001	-.0003	-.0000	-.0001
	580	-10.	66.	-1.	647.	76.	236.	-.000	-.000	.000	-.0000	-.0000	-.0000
FGRUN	505	-1.	-22.	0.	-492.	87.	-16.	.000	-.011	.011	.0001	.0004	.0001
	585	1.	23.	-0.	435.	-85.	16.	-.001	-.010	.011	.0001	.0004	.0001
RUN	585	-1.	-23.	0.	-435.	85.	-16.	-.001	-.010	.011	.0001	.0004	.0001
	590	1.	29.	-0.	121.	-77.	16.	-.006	-.008	.011	.0003	.0004	.0001
RUN	590	-1.	-29.	0.	-121.	77.	-16.	-.011	-.003	.011	.0002	.0003	.0002
	595	1.	37.	-0.	-392.	-65.	16.	-.015	-.002	.011	-.0000	.0003	.0002
RUN	595	-1.	23.	0.	392.	65.	-16.	-.011	-.003	.011	.0002	.0003	.0002
	600	1.	-15.	-0.	-111.	-54.	16.	-.015	-.002	.011	-.0000	.0003	.0002
RUN	600	-1.	15.	0.	111.	54.	-16.	-.019	-.002	.011	-.0000	.0003	.0002
	605	1.	-6.	-0.	76.	-42.	16.	-.019	-.002	.011	-.0000	.0002	.0002

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 44

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	605	-1.	6.	0.	-76.	42.	-16.	-.019	-.002	.011	-.0000	.0002	.0002
	610	1.	1.	-0.	114.	-31.	16.	-.022	-.002	.011	.0001	.0002	.0002
FGRUN	610	-1.	-1.	0.	-114.	31.	-16.	-.022	-.002	.011	.0001	.0002	.0002
	615	1.	9.	-0.	27.	-18.	16.	-.025	-.001	.011	.0001	.0002	.0002
ELBOW	615	-1.	-9.	0.	-27.	18.	-16.	-.025	-.001	.011	.0001	.0002	.0002
	620	1.	12.	-0.	-5.	-16.	13.	-.025	-.000	.010	.0001	.0001	.0002
FGRUN	620	-1.	-12.	0.	5.	16.	-13.	-.025	-.000	.010	.0001	.0001	.0002
	625	1.	21.	-0.	-9.	-16.	-1.	-.020	-.000	.008	.0001	.0001	.0003
RUN	625	-1.	-21.	0.	9.	16.	1.	-.020	-.000	.008	.0001	.0001	.0003
	626	1.	32.	-0.	-13.	-16.	-16.	-.015	-.000	.006	.0001	.0001	.0002
P RUN	626	-1.	-32.	0.	13.	16.	16.	-.015	-.000	.006	.0001	.0001	.0002
	630	1.	42.	-0.	-17.	-16.	-31.	-.010	-.000	.004	.0001	.0001	.0002
P RUN	630	-1.	-42.	0.	17.	16.	31.	-.010	-.000	.004	.0001	.0001	.0002
	635	1.	52.	-0.	-21.	-16.	-46.	-.006	-.000	.002	.0001	.0001	.0002
FGRUN	635	-1.	-52.	0.	21.	16.	46.	-.006	-.000	.002	.0001	.0001	.0002
	640	1.	62.	-0.	-25.	-16.	-61.	-.003	-.000	.001	.0000	.0000	.0001
VALVE	640	-1.	-62.	0.	25.	16.	61.	-.003	-.000	.001	.0000	.0000	.0001
	645	1.	66.	-0.	-26.	-16.	-66.	-.002	-.000	.001	.0000	.0000	.0001
VALVE	645	-1.	-101.	0.	26.	16.	66.	-.002	-.000	.001	.0000	.0000	.0001
	650	1.	104.	-0.	-27.	-16.	-71.	-.001	-.000	.000	.0000	.0000	.0001
FGRUN	650	-1.	-104.	0.	27.	16.	71.	-.001	-.000	.000	.0000	.0000	.0001
	655	1.	116.	-0.	-32.	-16.	-88.	-.000	-.000	.000	.0000	.0000	.0000

LTR 125 9

APPENDIX D
THERMAL EXPANSION ANALYSIS RESULTS

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 45

SUPPORT REACTIONS FOR LOAD CASE NO. 2
 THERMAL EXPANSION PLUS ANCHOR MOVEMENTS

NODE	TYPE	REACTION (LBS OR IN-LBS)	DIRECTION
5	FORCE	-9.	X COORD
5	FORCE	7.	Y COORD
5	FORCE	-22.	Z COORD
5	MOMENT	502.	X COORD
5	MOMENT	70.	Y COORD
5	MOMENT	534.	Z COORD
130	FORCE	22.	X COORD
190	FORCE	12.	Y COORD
190	FORCE	-45.	Z COORD
305	FORCE	-25.	X COORD
305	FORCE	49.	Y COORD
305	FORCE	3.	Z COORD
305	MOMENT	137.	X COORD
305	MOMENT	624.	Y COORD
305	MOMENT	111.	Z COORD
350	FORCE	-11.	Y COORD
380	FORCE	5.	Y COORD
400	FORCE	5.	X COORD
400	FORCE	-1.	Y COORD
400	FORCE	10.	Z COORD
400	MOMENT	-122.	X COORD
400	MOMENT	-655.	Y COORD
400	MOMENT	155.	Z COORD
440	FORCE	-21.	Y COORD
470	FORCE	8.	Y COORD
580	FORCE	17.	X COORD
580	FORCE	4.	Y COORD
580	FORCE	-3.	Z COORD
580	MOMENT	55.	X COORD
580	MOMENT	-206.	Y COORD
580	MOMENT	212.	Z COORD
655	FORCE	-22.	X COORD
655	FORCE	-10.	Y COORD
655	FORCE	14.	Z COORD
655	MOMENT	7.	X COORD
655	MOMENT	436.	Y COORD
655	MOMENT	155.	Z COORD

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1

PAGE 46

LOFT CIS ANALYSIS - 4"-KH-237-E, INSIDE, S17B, NORM & UPSET

INTERNAL FORCES AND DEFLECTIONS FOR LOAD CASE NO. 2

THERMAL EXPANSION PLUS ANCHOR MOVEMENTS

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	5	-9.	7.	-22.	502.	70.	534.	.000	-.000	-.000	-.0000	-.0000	-.0000
	10	9.	-7.	22.	-419.	43.	-534.	.000	-.000	-.006	-.0000	-.0000	-.0000
RUN	10	-9.	7.	-22.	419.	-43.	534.	.000	-.000	-.006	-.0000	-.0000	-.0000
	15	9.	-7.	22.	-335.	156.	-534.	.000	-.001	-.011	-.0000	-.0000	-.0001
RUN	15	-9.	7.	-22.	335.	-156.	534.	.000	-.001	-.011	-.0000	-.0000	-.0001
	20	9.	-7.	22.	-252.	269.	-534.	-.000	-.001	-.017	-.0001	-.0000	-.0001
RUN	20	-9.	7.	-22.	252.	-269.	534.	-.000	-.001	-.017	-.0001	-.0000	-.0001
	25	9.	-7.	22.	-169.	382.	-534.	-.000	-.002	-.022	-.0001	-.0000	-.0002
RUN	25	-9.	7.	-22.	169.	-382.	534.	-.000	-.002	-.022	-.0001	-.0000	-.0002
	30	9.	-7.	22.	-85.	495.	-534.	-.001	-.003	-.028	-.0001	-.0001	-.0002
2 RUN	30	-9.	7.	-22.	85.	-495.	534.	-.001	-.003	-.028	-.0001	-.0001	-.0002
	35	9.	-7.	22.	-40.	556.	-534.	-.001	-.004	-.031	-.0001	-.0001	-.0002
FGRUN	35	-9.	7.	-22.	40.	-556.	534.	-.001	-.004	-.031	-.0001	-.0001	-.0002
	40	9.	-7.	22.	-16.	589.	-534.	-.002	-.004	-.033	-.0001	-.0001	-.0002
VALVE	40	-9.	7.	-22.	16.	-589.	534.	-.002	-.004	-.033	-.0001	-.0001	-.0002
	45	9.	-7.	22.	32.	655.	-534.	-.002	-.005	-.036	-.0001	-.0001	-.0002
RUN	45	0.	0.	-0.	0.	0.	0.	-.002	-.005	-.036	-.0001	-.0001	-.0002
	50	-0.	-0.	0.	-0.	-0.	-0.	-.005	-.010	-.035	-.0001	-.0001	-.0002
RUN	50	0.	0.	-0.	0.	0.	0.	-.005	-.010	-.035	-.0001	-.0001	-.0002
	55	-0.	-0.	0.	-0.	0.	0.	-.008	-.016	-.034	-.0001	-.0001	-.0002
VALVE	45	-9.	7.	-22.	-32.	-655.	534.	-.002	-.005	-.036	-.0001	-.0001	-.0002
	60	9.	-7.	22.	81.	720.	-534.	-.003	-.005	-.039	-.0001	-.0001	-.0002
FGRUN	60	-9.	7.	-22.	-81.	-720.	534.	-.003	-.005	-.039	-.0001	-.0001	-.0002
	65	9.	-7.	22.	105.	753.	-534.	-.003	-.006	-.041	-.0001	-.0001	-.0003
RUN	65	-9.	7.	-22.	-105.	-753.	534.	-.003	-.006	-.041	-.0001	-.0001	-.0003
	70	9.	-7.	22.	119.	772.	-534.	-.004	-.006	-.042	-.0001	-.0001	-.0003
RUN	70	8.	-10.	-19.	-43.	-630.	387.	-.004	-.006	-.042	-.0001	-.0001	-.0003
	75	-8.	10.	19.	3.	599.	-387.	-.004	-.006	-.044	-.0001	-.0001	-.0003

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 47

MEMBER	END	FX	FORCES (LBS) FY	FZ	MX	MOMENTS (IN-LBS) MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
RUN	75	8.	-10.	-19.	-3.	-599.	387.	-.004	-.006	-.044	-.0001	.0001	-.0003
	80	-8.	10.	19.	-88.	529.	-387.	-.005	-.007	-.048	-.0001	.0001	-.0003
FGRUN	80	8.	-10.	-19.	88.	-529.	387.	-.005	-.007	-.048	-.0001	.0001	-.0003
	85	-8.	10.	19.	-179.	456.	-387.	-.007	-.008	-.052	-.0001	.0002	-.0003
FGRUN	85	8.	-10.	-19.	179.	-456.	387.	-.007	-.008	-.052	-.0001	.0002	-.0003
	90	-8.	10.	19.	-214.	431.	-387.	-.007	-.008	-.054	-.0001	.0002	-.0003
FGRUN	90	8.	-10.	-19.	214.	-431.	387.	-.007	-.008	-.054	-.0001	.0002	-.0003
	95	-8.	10.	19.	-249.	404.	-387.	-.008	-.008	-.055	-.0001	.0002	-.0003
FGRUN	95	8.	-10.	-19.	249.	-404.	387.	-.008	-.008	-.055	-.0001	.0002	-.0003
	100	-8.	10.	19.	-320.	349.	-387.	-.009	-.009	-.058	-.0001	.0002	-.0003
RUN	100	8.	-10.	-19.	320.	-349.	387.	-.009	-.009	-.058	-.0001	.0002	-.0003
	105	-8.	10.	19.	-502.	209.	-387.	-.013	-.011	-.067	-.0001	.0002	-.0004
RUN	105	8.	-10.	-19.	502.	-209.	387.	-.013	-.011	-.067	-.0001	.0002	-.0004
	110	-8.	10.	19.	-572.	154.	-387.	-.014	-.012	-.070	-.0002	.0002	-.0004
FGRUN	110	8.	-10.	-19.	572.	-154.	387.	-.014	-.012	-.070	-.0002	.0002	-.0004
	115	-8.	10.	19.	-607.	127.	-387.	-.015	-.013	-.072	-.0002	.0002	-.0004
VALVE	115	8.	-10.	-19.	607.	-127.	387.	-.015	-.013	-.072	-.0002	.0002	-.0004
	120	-8.	10.	19.	-688.	64.	-387.	-.017	-.014	-.075	-.0002	.0002	-.0004
RUN	120	0.	-22.	0.	0.	0.	647.	-.017	-.014	-.075	-.0002	.0002	-.0004
	125	-0.	22.	0.	0.	-0.	-324.	-.024	-.008	-.072	-.0002	.0002	-.0004
RUN	125	0.	-22.	0.	0.	0.	324.	-.024	-.008	-.072	-.0002	.0002	-.0004
	130	0.	22.	0.	0.	0.	-0.	-.031	-.001	-.069	-.0002	.0002	-.0005
VALVE	120	8.	11.	-19.	638.	-64.	-260.	-.017	-.014	-.075	-.0002	.0002	-.0004
	135	-8.	-11.	19.	-596.	2.	260.	-.016	-.016	-.079	-.0002	.0002	-.0004
FGRUN	135	8.	11.	-19.	596.	-2.	-260.	-.016	-.016	-.079	-.0002	.0002	-.0004
	140	-8.	-11.	19.	-556.	-25.	260.	-.019	-.016	-.081	-.0002	.0002	-.0004
FGRUN	140	8.	11.	-19.	556.	25.	-260.	-.019	-.016	-.081	-.0002	.0002	-.0004
	145	-8.	-11.	19.	-459.	-92.	260.	-.021	-.018	-.085	-.0002	.0002	-.0004
FGRUN	145	8.	11.	-19.	459.	92.	-260.	-.021	-.018	-.085	-.0002	.0002	-.0004
	146	-8.	-11.	19.	-413.	-123.	260.	-.022	-.019	-.087	-.0002	.0002	-.0004
FGRUN	146	8.	11.	-19.	413.	123.	-260.	-.022	-.019	-.087	-.0002	.0002	-.0004
	147	-12.	49.	0.	-591.	-146.	541.	-.022	-.019	-.087	-.0002	.0002	-.0004
		12.	-49.	-0.	591.	146.	-492.	-.020	-.017	-.087	-.0002	.0002	-.0004

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 48

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	147	-12.	49.	0.	-591.	-146.	492.	-.020	-.017	-.087	-.0002	.0002	-.0004
	150	-12.	-49.	-0.	591.	146.	-365.	-.018	-.012	-.089	-.0002	.0002	-.0004
FGRUN	150	-12.	49.	0.	-591.	-146.	365.	-.016	-.012	-.089	-.0002	.0002	-.0004
	155	-12.	-49.	-0.	591.	146.	-323.	-.015	-.010	-.090	-.0002	.0002	-.0004
VALVE	155	-12.	49.	0.	-591.	-146.	323.	-.015	-.010	-.090	-.0002	.0002	-.0004
	160	-12.	-49.	-0.	591.	146.	-219.	-.011	-.006	-.091	-.0002	.0002	-.0004
RUN	160	0.	0.	0.	0.	0.	0.	-.011	-.006	-.091	-.0002	.0002	-.0004
	165	-0.	-0.	-0.	0.	0.	-0.	-.004	-.013	-.095	-.0002	.0002	-.0004
RUN	165	0.	0.	0.	0.	0.	0.	-.004	-.013	-.095	-.0002	.0002	-.0004
	170	-0.	0.	-0.	-0.	-0.	0.	-.003	-.019	-.098	-.0002	.0002	-.0004
VALVE	160	-12.	49.	0.	-591.	-146.	219.	-.011	-.006	-.091	-.0002	.0002	-.0004
	175	-12.	-49.	-0.	591.	146.	-115.	-.008	-.003	-.093	-.0002	.0002	-.0004
FGRUN	175	-12.	49.	0.	-591.	-146.	115.	-.008	-.003	-.093	-.0002	.0002	-.0004
	180	-12.	-49.	-0.	591.	146.	-73.	-.006	-.001	-.093	-.0001	.0002	-.0004
ELBOW	180	-12.	49.	0.	-591.	-146.	73.	-.006	-.001	-.093	-.0001	.0002	-.0004
	185	-12.	-49.	-0.	296.	73.	-0.	-.002	-.002	-.091	-.0000	.0003	-.0004
FGRUN	185	-12.	49.	0.	-296.	-73.	-0.	-.002	-.002	-.091	-.0000	.0003	-.0004
	190	-12.	-49.	-0.	-0.	0.	0.	-.001	-.002	-.088	-.0000	.0003	-.0004
FGRUN	146	20.	-38.	-19.	1004.	269.	-801.	-.022	-.019	-.087	-.0002	.0002	-.0004
	148	-20.	38.	19.	-929.	-269.	881.	-.023	-.021	-.086	-.0002	.0002	-.0004
RUN	146	20.	-38.	-19.	929.	269.	-881.	-.023	-.021	-.086	-.0002	.0002	-.0004
	195	-20.	38.	19.	-667.	-269.	1160.	-.028	-.027	-.082	-.0003	.0002	-.0003
RUN	195	20.	-38.	-19.	667.	269.	-1160.	-.028	-.027	-.082	-.0003	.0002	-.0003
	196	-20.	38.	19.	-405.	-269.	1440.	-.032	-.034	-.078	-.0003	.0002	-.0002
FGRUN	196	20.	-38.	-19.	405.	269.	-1440.	-.032	-.034	-.078	-.0003	.0002	-.0002
	200	-20.	38.	19.	-330.	-269.	1520.	-.032	-.036	-.076	-.0003	.0002	-.0002
FGRUN	200	26.	-43.	-8.	757.	916.	-1426.	-.032	-.036	-.076	-.0003	.0002	-.0002
	201	-26.	43.	8.	-723.	-916.	1531.	-.033	-.037	-.075	-.0003	.0001	-.0001
RUN	201	26.	-43.	-8.	723.	916.	-1531.	-.033	-.037	-.075	-.0003	.0001	-.0001
	205	-26.	43.	8.	-639.	-916.	1793.	-.034	-.042	-.071	-.0004	.0001	-.0001
FGRUN	205	26.	-43.	-8.	639.	916.	-1793.	-.034	-.042	-.071	-.0004	.0001	-.0001
	210	-26.	43.	8.	-563.	-916.	2029.	-.034	-.046	-.068	-.0004	.0000	-.0000

LIR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 49

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	OX	OY	OZ	RX	RY	RZ
ELBOW	210	-26.	-43.	-8.	563.	916.	-2029.	-.034	-.046	-.066	-.0004	.0000	.0000
	215	-26.	43.	8.	-512.	-866.	1927.	-.030	-.047	-.065	-.0005	-.0001	.0005
FGRUN	215	-26.	-43.	-8.	512.	866.	-1927.	-.030	-.047	-.065	-.0005	-.0001	.0005
	220	-26.	43.	8.	-512.	-761.	1387.	-.024	-.040	-.062	-.0006	-.0002	.0006
FGRUN	220	-26.	-43.	-8.	512.	761.	-1387.	-.024	-.040	-.062	-.0006	-.0002	.0006
	225	-26.	43.	8.	-512.	-659.	868.	-.019	-.032	-.060	-.0005	-.0002	.0007
FGRUN	225	-26.	-43.	-8.	512.	659.	-868.	-.019	-.032	-.060	-.0005	-.0002	.0007
	230	-26.	43.	8.	-512.	-630.	718.	-.017	-.030	-.059	-.0006	-.0003	.0007
FGRUN	230	-26.	-43.	-8.	512.	630.	-718.	-.017	-.030	-.059	-.0006	-.0003	.0007
	235	-26.	43.	8.	-512.	-601.	567.	-.016	-.027	-.058	-.0006	-.0003	.0007
RUN	235	-26.	-43.	-8.	512.	601.	-567.	-.016	-.027	-.058	-.0006	-.0003	.0007
	240	-26.	43.	8.	-512.	-479.	-60.	-.009	-.017	-.054	-.0007	-.0003	.0007
RUN	240	-26.	-43.	-8.	512.	479.	60.	-.009	-.017	-.054	-.0007	-.0003	.0007
	245	-26.	43.	8.	-512.	-356.	-687.	-.002	-.006	-.049	-.0007	-.0003	.0007
RUN	245	-26.	-43.	-8.	512.	356.	687.	-.002	-.006	-.049	-.0007	-.0003	.0007
	250	-26.	43.	8.	-512.	-234.	-1313.	.005	.004	-.044	-.0008	-.0004	.0006
ELBOW	250	-26.	-43.	-8.	512.	234.	1313.	.005	.004	-.044	-.0008	-.0004	.0006
	255	-26.	43.	8.	-253.	-26.	-1573.	.005	.011	-.039	-.0008	-.0004	.0004
FGRUN	255	-26.	-43.	-8.	253.	26.	1573.	.005	.011	-.039	-.0008	-.0004	.0004
	260	-26.	43.	8.	-101.	65.	-1573.	.004	.014	-.038	-.0008	-.0004	.0004
VALVE	260	-26.	-43.	-8.	101.	-65.	1573.	.004	.014	-.038	-.0008	-.0004	.0004
	265	-26.	43.	8.	158.	223.	-1573.	.002	.019	-.035	-.0008	-.0004	.0004
VALVE	265	-26.	-43.	-8.	158.	-223.	1573.	.002	.019	-.035	-.0008	-.0004	.0004
	270	-26.	43.	8.	-418.	380.	-1573.	-.001	.023	-.032	-.0008	-.0004	.0004
FGRUN	270	-26.	-43.	-8.	418.	-380.	1573.	-.001	.023	-.032	-.0008	-.0004	.0004
	275	-26.	43.	8.	-569.	472.	-1573.	-.002	.026	-.031	-.0008	-.0004	.0004
ELBOW	275	-26.	-43.	-8.	569.	472.	1573.	-.002	.026	-.031	-.0008	-.0004	.0004
	280	-26.	43.	8.	-879.	629.	-1416.	-.003	.027	-.024	-.0006	-.0004	.0002
FGRUN	280	-26.	-43.	-8.	879.	-629.	1416.	-.003	.027	-.024	-.0006	-.0004	.0002
	285	-26.	43.	8.	-1031.	629.	-944.	-.001	.019	-.014	-.0005	-.0003	.0001
RUN	285	-26.	-43.	-8.	1031.	-629.	944.	-.001	.019	-.014	-.0005	-.0003	.0001
	290	-26.	43.	8.	-1183.	629.	-472.	.000	.010	-.007	-.0004	-.0002	.0000

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM. & UPSET

PAGE 50

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	290	26.	-43.	-8.	-1183.	-629.	472.	.000	.010	-.007	-.0004	-.0002	-.0000
	295	-26.	43.	8.	1309.	629.	-79.	.000	.003	-.001	-.0003	-.0002	-.0000
REDUCE	295	26.	-43.	-8.	-1309.	-629.	79.	.000	.003	-.001	-.0003	-.0002	-.0000
	300	-26.	43.	8.	1345.	629.	32.	.000	.001	-.000	-.0002	-.0001	-.0000
RUN	300	26.	-43.	-8.	-1345.	-629.	-32.	.000	.001	-.000	-.0002	-.0001	-.0000
	305	-26.	43.	8.	1370.	629.	111.	.000	-.000	-.000	-.0000	-.0000	-.0000
FGRUN	200	-6.	5.	-10.	-426.	-647.	-94.	-.032	-.036	-.076	-.0003	.0002	-.0002
	202	6.	-5.	10.	426.	606.	72.	-.034	-.035	-.076	-.0003	.0002	-.0002
FGRUN	202	-6.	5.	-10.	-426.	-606.	-72.	-.034	-.035	-.076	-.0003	.0002	-.0002
	310	6.	-5.	10.	426.	462.	-4.	-.041	-.033	-.072	-.0002	.0003	-.0002
RUN	310	-6.	5.	-10.	-426.	-462.	4.	-.041	-.033	-.072	-.0002	.0003	-.0002
	315	6.	-5.	10.	426.	277.	-102.	-.049	-.033	-.067	-.0001	.0003	-.0002
RUN	315	-6.	5.	-10.	-426.	-277.	102.	-.049	-.030	-.067	-.0001	.0003	-.0002
	320	6.	-5.	10.	426.	117.	-187.	-.056	-.027	-.061	-.0000	.0004	-.0002
ELBOW	320	-6.	5.	-10.	-426.	-117.	187.	-.056	-.027	-.061	.0000	.0004	-.0002
	325	6.	-5.	10.	330.	71.	-183.	-.057	-.024	-.059	.0001	.0004	-.0003
FGRUN	325	-6.	5.	-10.	-380.	-71.	183.	-.057	-.024	-.059	.0001	.0004	-.0003
	330	6.	-5.	10.	200.	71.	-74.	-.052	-.015	-.056	.0002	.0005	-.0003
RUN	330	-6.	5.	-10.	-200.	-71.	74.	-.052	-.015	-.056	.0002	.0005	-.0003
	335	6.	-5.	10.	36.	71.	25.	-.047	-.008	-.054	.0002	.0005	-.0003
FGRUN	335	-6.	5.	-10.	-36.	-71.	-25.	-.047	-.008	-.054	.0002	.0005	-.0003
	340	6.	-5.	10.	-144.	71.	135.	-.042	.000	-.050	.0002	.0005	-.0003
ELBOW	340	-6.	5.	-10.	144.	-71.	-135.	-.042	.000	-.050	.0002	.0005	-.0003
	345	6.	-5.	10.	-215.	43.	163.	-.039	.002	-.047	.0001	.0005	-.0003
FGRUN	345	-6.	5.	-10.	215.	-43.	-163.	-.039	.002	-.047	.0001	.0005	-.0003
	350	6.	-5.	10.	-283.	-35.	163.	-.032	.001	-.042	.0001	.0005	-.0002
RUN	350	-6.	5.	-10.	283.	35.	-163.	-.032	.001	-.042	.0001	.0005	-.0002
	355	6.	-5.	10.	-201.	-135.	163.	-.024	-.000	-.034	.0000	.0005	-.0002
FGRUN	355	-6.	5.	-10.	201.	135.	-163.	-.024	-.000	-.034	.0000	.0005	-.0002
	360	6.	-5.	10.	-119.	-234.	163.	-.017	-.000	-.027	-.0000	.0004	-.0001
VALVE	360	-6.	5.	-10.	119.	234.	-163.	-.017	-.000	-.027	-.0000	.0004	-.0001
	365	6.	-5.	10.	-68.	-272.	163.	-.014	-.000	-.024	-.0000	.0004	-.0001

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 51

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	365	0.	-0.	-0.	0.	0.	-0.	-.014	-.000	-.024	-.0000	.0004	-.0001
	370	-0.	0.	0.	-0.	0.	-0.	-.011	-.002	-.027	-.0000	.0004	-.0001
VALVE	365	-6.	-5.	-10.	88.	272.	-163.	-.014	-.000	-.024	-.0000	.0004	-.0001
	375	6.	5.	10.	-57.	-309.	163.	-.012	-.000	-.021	-.0000	.0004	-.0001
FGRUN	375	-6.	-5.	-10.	57.	309.	-163.	-.012	-.000	-.021	-.0000	.0004	-.0001
	380	6.	5.	10.	-57.	-309.	163.	-.006	-.000	-.014	-.0000	.0004	-.0001
RUN	380	-6.	1.	-10.	-15.	396.	-163.	-.006	-.000	-.014	-.0000	.0004	-.0001
	385	6.	-1.	10.	15.	-490.	163.	-.001	-.000	-.007	-.0000	.0003	-.0001
FGRUN	385	-6.	1.	-10.	4.	490.	-163.	-.001	-.000	-.007	-.0000	.0003	-.0001
	390	6.	-1.	10.	-17.	-555.	163.	.002	-.000	-.003	-.0000	.0002	-.0000
ELBOW	390	-6.	1.	-10.	17.	555.	-163.	.002	-.000	-.003	-.0000	.0002	-.0000
	395	6.	-1.	10.	-22.	-630.	157.	.001	-.000	-.000	-.0000	.0000	-.0000
D7 RUN	395	-6.	1.	-10.	22.	630.	-157.	.001	-.000	-.000	-.0000	.0000	-.0000
	400	6.	-1.	10.	-22.	-645.	155.	-.000	-.000	-.000	-.0000	.0000	-.0000
BRANCH	405	-17.	17.	-4.	-76.	-142.	147.	-.004	-.006	-.042	-.0001	.0001	-.0003
	406	17.	-17.	4.	68.	142.	-106.	-.003	-.005	-.042	-.0001	.0001	-.0003
FGRUN	405	-17.	17.	-4.	-68.	-142.	106.	-.003	-.005	-.042	-.0001	.0001	-.0003
	406	17.	-17.	4.	53.	142.	-37.	-.002	-.003	-.042	-.0001	.0002	-.0003
RUN	406	-17.	17.	-4.	-53.	-142.	37.	-.002	-.003	-.042	-.0001	.0002	-.0003
	410	17.	-17.	4.	18.	142.	135.	.001	.002	-.043	-.0000	.0003	-.0003
FGRUN	410	-17.	17.	-4.	-18.	-142.	-135.	.001	.002	-.043	-.0000	.0003	-.0003
	415	17.	-17.	4.	10.	142.	273.	.003	.006	-.043	-.0000	.0003	-.0002
ELBOW	415	-17.	17.	-4.	-10.	-142.	-273.	.003	.006	-.043	-.0000	.0003	-.0002
	420	17.	-17.	4.	20.	131.	274.	.002	.007	-.042	-.0000	.0004	-.0001
FGRUN	420	-17.	17.	-4.	-20.	-131.	-274.	.002	.007	-.042	-.0000	.0004	-.0001
	425	17.	-17.	4.	20.	110.	171.	-.001	.006	-.039	-.0000	.0005	.0002
VALVE	425	-17.	17.	-4.	-20.	-110.	-171.	-.001	.006	-.039	-.0000	.0005	.0002
	430	17.	-17.	4.	20.	85.	52.	-.004	.004	-.036	-.0000	.0005	.0002
VALVE	430	-17.	17.	-4.	-20.	-85.	-52.	-.004	.004	-.036	-.0000	.0005	.0002
	435	17.	-17.	4.	20.	61.	-67.	-.008	.003	-.032	-.0000	.0005	.0002
RUN	435	-17.	17.	-4.	-20.	-61.	-67.	-.008	.003	-.032	-.0000	.0005	.0002
	440	17.	-17.	4.	20.	36.	-186.	-.011	.001	-.029	-.0000	.0005	.0002

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 52

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	440	-17.	-4.	-4.	20.	-36.	186.	-.011	.001	-.029	-.0000	.0005	.0002
	445	17.	4.	4.	-20.	-9.	-132.	-.017	-.001	-.022	-.0001	.0005	.0001
RUN	445	-17.	-4.	-4.	20.	9.	132.	-.017	-.001	-.022	-.0001	.0005	.0001
	450	17.	4.	4.	-20.	-55.	-77.	-.023	-.001	-.015	-.0001	.0005	-.0000
RUN	450	-17.	-4.	-4.	20.	55.	77.	-.023	-.001	-.015	-.0001	.0005	-.0000
	455	17.	4.	4.	-20.	-100.	-23.	-.029	-.001	-.009	-.0001	.0005	-.0000
RUN	455	-17.	-4.	-4.	20.	100.	23.	-.029	-.001	-.009	-.0001	.0005	-.0000
	460	17.	4.	4.	-20.	-146.	32.	-.035	-.000	-.003	-.0001	.0004	-.0000
RUN	460	-17.	-4.	-4.	20.	146.	-32.	-.035	-.000	-.003	-.0001	.0004	-.0000
	465	17.	4.	4.	-20.	-191.	86.	-.041	.000	.001	-.0001	.0003	-.0000
RUN	465	-17.	-4.	-4.	20.	191.	-86.	-.041	.000	.001	-.0001	.0003	-.0000
	470	17.	4.	4.	-20.	-237.	141.	-.047	-.000	.003	-.0002	.0001	.0001
FGRUN	470	-17.	4.	-4.	20.	237.	-141.	-.047	-.000	.003	-.0002	.0001	.0001
	475	17.	-4.	4.	-20.	-272.	104.	-.052	-.002	.003	-.0002	-.0000	.0002
ELBOW	475	-17.	4.	-4.	20.	272.	-104.	-.052	-.002	.003	-.0002	-.0000	.0002
	480	17.	-4.	4.	-20.	-282.	42.	-.053	-.004	.003	-.0001	-.0002	.0002
FGRUN	480	-17.	4.	-4.	10.	282.	-42.	-.053	-.004	.003	-.0001	-.0002	.0002
	485	17.	-4.	4.	32.	-282.	-165.	-.050	-.009	.005	-.0001	-.0005	.0002
ELBOW	485	-17.	4.	-4.	-32.	282.	165.	-.050	-.009	.005	-.0001	-.0005	.0002
	490	17.	-4.	4.	54.	-231.	-217.	-.048	-.011	.004	-.0001	-.0006	.0001
FGRUN	490	-17.	4.	-4.	-54.	231.	217.	-.048	-.011	.004	-.0001	-.0006	.0001
	495	17.	-4.	4.	107.	19.	-217.	-.038	-.011	-.003	-.0000	-.0007	-.0001
FGRUN	495	-17.	4.	-4.	-107.	-19.	217.	-.038	-.011	-.003	-.0000	-.0007	-.0001
	500	17.	-4.	4.	154.	242.	-217.	-.030	-.011	-.009	.0001	-.0006	-.0003
FGRUN	500	-17.	4.	-4.	-154.	-242.	217.	-.030	-.011	-.009	.0001	-.0006	-.0003
	505	17.	-4.	4.	163.	256.	-217.	-.028	-.010	-.010	.0001	-.0006	-.0003
FGRUN	505	-17.	4.	-3.	92.	-239.	237.	-.028	-.010	-.010	.0001	-.0006	-.0003
	510	17.	-4.	3.	-92.	239.	-193.	-.028	-.009	-.010	.0001	-.0005	-.0004
RUN	510	-17.	-4.	-3.	85.	-239.	193.	-.028	-.009	-.010	.0001	-.0005	-.0004
	515	17.	4.	3.	-85.	239.	-55.	-.024	-.005	-.009	.0001	-.0004	-.0004
FGRUN	515	-17.	-4.	-3.	61.	-239.	55.	-.024	-.005	-.009	.0001	-.0004	-.0004
	520	17.	4.	3.	-61.	239.	76.	-.021	-.002	-.009	.0001	-.0003	-.0004

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 53

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
ELBOW	520	-17.	-4.	3.	-38.	-239.	-76.	-.021	-.002	-.009	.0001	-.0003	-.0004
	525	17.	4.	-3.	-29.	230.	117.	-.019	-.001	-.008	-.0000	-.0001	-.0003
FGRUN	525	-17.	-4.	3.	29.	-230.	-117.	-.019	-.001	-.008	-.0000	-.0001	-.0003
	530	17.	4.	-3.	-29.	197.	76.	-.014	-.004	-.008	-.0000	.0000	-.0002
FGRUN	530	-17.	-4.	3.	29.	-197.	-76.	-.014	-.004	-.008	-.0000	.0000	-.0002
	535	17.	4.	-3.	-29.	165.	35.	-.009	-.007	-.009	-.0001	.0002	-.0002
ELBOW	535	-17.	-4.	3.	29.	-165.	-35.	-.009	-.007	-.009	-.0001	.0002	-.0002
	540	17.	4.	-3.	-13.	104.	24.	-.006	-.007	-.009	-.0001	.0003	-.0002
FGRUN	540	-17.	-4.	3.	18.	-104.	-24.	-.006	-.007	-.009	-.0001	.0003	-.0002
	550	17.	4.	-3.	-22.	121.	24.	-.007	-.007	-.009	-.0001	.0003	-.0002
VALVE	550	-17.	-4.	3.	22.	-121.	-24.	-.007	-.007	-.009	-.0001	.0003	-.0002
	555	17.	4.	-3.	-23.	34.	24.	-.005	-.006	-.007	-.0001	.0003	-.0002
RUN	555	0.	0.	0.	0.	0.	0.	-.005	-.006	-.007	-.0001	.0003	-.0002
	560	-0.	0.	0.	-0.	0.	-0.	.001	-.008	-.011	-.0001	.0003	-.0002
VALVE	555	-17.	-4.	3.	3.	-34.	-24.	-.005	-.006	-.007	-.0001	.0003	-.0002
	565	17.	4.	-3.	15.	-53.	24.	-.003	-.005	-.004	-.0001	.0003	-.0002
FGRUN	565	-17.	-4.	3.	-15.	53.	-24.	-.003	-.006	-.004	-.0001	.0003	-.0002
	570	17.	4.	-3.	41.	-174.	24.	-.001	-.005	-.001	-.0001	.0003	-.0001
ELBOW	570	-17.	-4.	3.	-41.	174.	-24.	-.001	-.005	-.001	-.0001	.0003	-.0001
	575	17.	4.	-3.	61.	-226.	76.	-.000	-.004	-.000	-.0000	.0001	-.0001
FGRUN	575	-17.	-4.	3.	-61.	226.	-76.	-.000	-.004	.000	-.0000	.0001	-.0001
	580	17.	4.	-3.	85.	-226.	215.	-.000	-.000	.000	-.0000	.0000	-.0000
FGRUN	505	0.	7.	-7.	-255.	-46.	-20.	-.028	-.010	-.010	.0001	-.0006	-.0003
	525	-0.	-7.	7.	273.	46.	20.	-.027	-.013	-.011	.0002	-.0005	-.0003
RUN	585	0.	7.	-7.	-273.	-46.	-20.	-.027	-.010	-.011	.0002	-.0005	-.0003
	590	-0.	-7.	7.	361.	45.	20.	-.021	-.007	-.017	.0004	-.0005	-.0003
RUN	590	0.	7.	-7.	-361.	-45.	-20.	-.021	-.007	-.017	.0004	-.0005	-.0003
	595	-0.	-7.	7.	475.	43.	20.	-.013	.001	-.024	.0007	-.0005	-.0003
RUN	595	0.	-14.	-7.	-475.	-43.	-20.	-.013	.001	-.024	.0007	-.0005	-.0003
	600	-0.	14.	7.	259.	41.	20.	-.006	.014	-.031	.0010	-.0004	-.0003
RUN	600	0.	-14.	-7.	-259.	-41.	-20.	-.006	.014	-.031	.0010	-.0004	-.0003
	605	-0.	14.	7.	8.	40.	20.	-.002	.033	-.039	.0011	-.0004	-.0002

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1 PAGE 54
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

MEMBER	END	FX	FORCES (LBS)			MX	MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
			FY	FZ			MY	MZ	DX	DY	DZ	RX	RY	RZ	
RUN	605	0.	-14.	-7.	-8.	-40.	-20.	.002	.033	-.039	.0011	-.0004	-.0002		
	610	-0.	14.	7.	-208.	38.	20.	.007	.049	-.046	.0010	-.0004	-.0002		
FGRUN	610	0.	-14.	-7.	208.	-38.	-20.	.007	.049	-.046	.0010	-.0004	-.0002		
	615	-0.	14.	7.	-445.	36.	20.	.013	.065	-.054	.0008	-.0003	-.0002		
ELBOW	615	0.	-14.	-7.	445.	-36.	-20.	.013	.065	-.054	.0008	-.0003	-.0002		
	620	-0.	14.	7.	-468.	36.	20.	.014	.065	-.057	.0002	-.0003	-.0002		
FGRUN	620	0.	-14.	-7.	468.	-36.	-20.	.014	.065	-.057	.0002	-.0003	-.0002		
	625	-0.	14.	7.	-342.	36.	22.	.010	.055	-.057	-.0002	-.0003	-.0002		
RUN	625	0.	-14.	-7.	342.	-36.	-22.	.010	.055	-.057	-.0002	-.0003	-.0002		
	626	-0.	14.	7.	-209.	36.	24.	.007	.046	-.050	-.0005	-.0002	-.0001		
RUN	626	0.	-14.	-7.	209.	-36.	-24.	.007	.046	-.050	-.0005	-.0002	-.0001		
	630	-0.	14.	7.	-76.	36.	27.	.005	.037	-.038	-.0006	-.0002	-.0001		
RUN	630	0.	-14.	-7.	76.	-36.	-27.	.005	.037	-.038	-.0006	-.0002	-.0001		
	635	-0.	14.	7.	56.	36.	29.	.003	.027	-.025	-.0006	-.0001	-.0001		
FGRUN	635	0.	-14.	-7.	-56.	-36.	-29.	.003	.027	-.025	-.0006	-.0001	-.0001		
	640	-0.	14.	7.	189.	36.	31.	.001	.018	-.013	-.0005	-.0001	-.0001		
VALVE	640	0.	-14.	-7.	-189.	-36.	-31.	.001	.018	-.013	-.0005	-.0001	-.0001		
	645	-0.	14.	7.	234.	36.	32.	.001	.014	-.009	-.0005	-.0001	-.0000		
VALVE	645	0.	-14.	-7.	-234.	-36.	-32.	.001	.014	-.009	-.0005	-.0001	-.0000		
	650	-0.	14.	7.	280.	36.	32.	.001	.011	-.006	-.0005	-.0001	-.0000		
FGRUN	650	0.	-14.	-7.	-280.	-36.	-32.	.001	.011	-.006	-.0005	-.0001	-.0000		
	655	-0.	14.	7.	436.	36.	35.	.000	-.000	-.000	-.0000	-.0000	-.0000		

LTR 125 9

APPENDIX E
SEISMIC ANALYSES RESULTS

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 476

SUPPORT REACTIONS FOR LOAD CASE NO. 3

SSE RESPONSE SPECTRUM - 1% DAMPING
 COMBINED RESULT FOR MODE 1 THRU 30 BY RMS SUMMATION

SPECTRA SET = 1

MODE	TYPE	REACTIONS (LBS OR IN-LBS)	DIRECTION
5	FORCE	195.	X COORD
5	FORCE	116.	Y COORD
5	FORCE	219.	Z COORD
5	MOMENT	4944.	X COORD
5	MOMENT	11780.	Y COORD
5	MOMENT	4119.	Z COORD
130	FORCE	317.	X COORD
190	FORCE	450.	Y COORD
190	FORCE	757.	Z COORD
305	FORCE	565.	X COORD
305	FORCE	114.	Y COORD
305	FORCE	231.	Z COORD
305	MOMENT	11245.	X COORD
305	MOMENT	7769.	Y COORD
305	MOMENT	22750.	Z COORD
330	FORCE	104.	Y COORD
380	FORCE	81.	Y COORD
400	FORCE	137.	X COORD
400	FORCE	7.	Y COORD
400	FORCE	94.	Z COORD
400	MOMENT	427.	X COORD
400	MOMENT	6727.	Y COORD
400	MOMENT	1000.	Z COORD
440	FORCE	61.	Y COORD
470	FORCE	42.	Y COORD
580	FORCE	138.	X COORD
580	FORCE	58.	Y COORD
580	FORCE	157.	Z COORD
580	MOMENT	2060.	X COORD
530	MOMENT	4130.	Y COORD
530	MOMENT	1459.	Z COORD
595	FORCE	57.	Y COORD
655	FORCE	86.	X COORD
655	FORCE	12.	Y COORD
655	FORCE	56.	Z COORD
655	MOMENT	2466.	X COORD
655	MOMENT	984.	Y COORD
655	MOMENT	5493.	Z COORD

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1

PAGE 477

LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

INTERNAL FORCES AND DEFLECTIONS FOR LOAD CASE NO. 3

SSE RESPONSE SPECTRUM - 1% DAMPING

COMBINED RESULT FOR MODE 1 THRU 30 BY RMS SUMMATION

SPECTRA SET = 1

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	5	195.	118.	219.	4944.	11780.	4119.	.000	.000	.000	.0000	.0000	.0000
	10	195.	118.	219.	3580.	9583.	4119.	.004	.002	.000	.0003	.0006	.0003
RUN	10	195.	117.	219.	3580.	9583.	4119.	.004	.002	.000	.0003	.0006	.0003
	15	195.	117.	219.	2288.	7481.	4119.	.015	.006	.000	.0004	.0011	.0006
RUN	15	193.	115.	219.	2288.	7481.	4119.	.015	.006	.000	.0004	.0011	.0006
	20	193.	115.	219.	1191.	5579.	4119.	.031	.012	.000	.0005	.0015	.0009
RUN	20	191.	112.	219.	1191.	5579.	4119.	.031	.012	.000	.0005	.0015	.0009
	25	191.	112.	219.	1166.	4139.	4119.	.051	.013	.000	.0005	.0018	.0013
RUN	25	186.	108.	219.	1166.	4139.	4119.	.051	.013	.000	.0005	.0018	.0013
	30	186.	108.	219.	2202.	3677.	4119.	.073	.024	.000	.0005	.0019	.0016
RUN	30	182.	103.	219.	2202.	3677.	4119.	.073	.024	.000	.0005	.0019	.0016
	35	182.	103.	219.	2819.	3953.	4119.	.085	.027	.000	.0005	.0020	.0017
FGRUN	35	160.	84.	218.	2819.	3953.	4119.	.085	.027	.000	.0005	.0020	.0017
	40	160.	84.	218.	3090.	4192.	4119.	.092	.029	.000	.0005	.0020	.0018
VALVE	40	160.	84.	218.	3090.	4192.	4119.	.092	.029	.000	.0005	.0020	.0018
	45	160.	84.	218.	3642.	4629.	4119.	.106	.032	.000	.0004	.0020	.0018
RUN	45	102.	60.	38.	917.	0.	2445.	.106	.032	.000	.0004	.0020	.0018
	50	102.	60.	38.	459.	0.	1223.	.125	.032	.005	.0005	.0020	.0019
RUN	50	102.	60.	38.	459.	0.	1223.	.125	.032	.005	.0005	.0020	.0019
	55	102.	60.	38.	0.	0.	0.	.147	.032	.011	.0005	.0020	.0020
VALVE	45	105.	49.	209.	3835.	4829.	2890.	.106	.032	.000	.0004	.0020	.0018
	60	105.	49.	209.	4065.	5241.	2890.	.119	.035	.000	.0004	.0020	.0019
FGRUN	60	105.	49.	209.	4065.	5241.	2890.	.119	.035	.000	.0004	.0020	.0019
	65	105.	49.	209.	4187.	5473.	2890.	.126	.036	.000	.0004	.0020	.0019
RUN	65	92.	49.	209.	4187.	5473.	2890.	.126	.036	.000	.0004	.0020	.0019
	70	92.	49.	209.	4229.	5589.	2390.	.130	.037	.000	.0004	.0020	.0019
RUN	70	61.	74.	191.	4384.	5711.	3294.	.130	.037	.000	.0004	.0020	.0019
	75	61.	74.	191.	4520.	5896.	3294.	.157	.038	.000	.0004	.0020	.0020
RUN	75	59.	74.	191.	4520.	5896.	3294.	.137	.038	.000	.0004	.0020	.0020
	80	59.	74.	191.	4843.	5660.	3294.	.154	.040	.000	.0004	.0020	.0021

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-227-E, INSIDE, S17B, NORM & UPSET

PAGE 478

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	80	57.	75.	191.	4843.	5660.	3294.	.154	.040	.000	.0004	.0020	.0021
	85	57.	75.	191.	5189.	5626.	3294.	.171	.041	.000	.0005	.0020	.0023
FGRUN	95	55.	80.	190.	5189.	5626.	3294.	.171	.041	.000	.0005	.0020	.0023
	90	55.	80.	190.	5303.	5577.	3294.	.177	.041	.000	.0006	.0020	.0023
FGRUN	90	55.	80.	190.	5303.	5577.	3294.	.177	.041	.000	.0006	.0020	.0023
	95	55.	80.	190.	5427.	5532.	3294.	.184	.041	.000	.0006	.0020	.0023
FGRUN	95	60.	87.	190.	5427.	5532.	3294.	.184	.041	.000	.0006	.0020	.0023
	100	60.	87.	190.	5651.	5373.	3294.	.196	.042	.000	.0007	.0021	.0024
RUN	100	65.	91.	190.	5651.	5373.	3294.	.196	.042	.000	.0007	.0021	.0024
	105	65.	91.	190.	6409.	5002.	3294.	.230	.046	.000	.0012	.0023	.0028
RUN	105	72.	95.	190.	6409.	5002.	3294.	.230	.046	.000	.0012	.0023	.0028
	110	72.	95.	190.	6780.	4908.	3294.	.244	.050	.000	.0014	.0024	.0029
FGRUN	110	99.	107.	189.	6780.	4908.	3294.	.244	.050	.000	.0014	.0024	.0029
	115	99.	107.	189.	6987.	4875.	3294.	.250	.053	.000	.0015	.0024	.0029
VALVE	115	99.	107.	189.	6987.	4875.	3294.	.250	.053	.000	.0015	.0024	.0029
	120	99.	107.	189.	7531.	4896.	3294.	.267	.061	.000	.0016	.0024	.0030
RUN	120	122.	310.	68.	0.	1919.	9296.	.267	.061	.000	.0016	.0024	.0030
	125	122.	310.	68.	0.	898.	4644.	.267	.022	.037	.0015	.0025	.0025
RUN	125	94.	310.	60.	0.	898.	4644.	.267	.022	.037	.0016	.0025	.0025
	130	94.	310.	60.	0.	0.	0.	.267	.016	.075	.0016	.0025	.0023
VALVE	120	210.	366.	198.	7531.	3800.	12333.	.267	.061	.000	.0016	.0024	.0030
	135	210.	366.	198.	9929.	4393.	12333.	.284	.071	.000	.0017	.0025	.0032
FGRUN	135	210.	366.	198.	9929.	4393.	12333.	.284	.071	.000	.0017	.0025	.0032
	140	210.	366.	198.	11051.	4017.	12333.	.291	.076	.000	.0017	.0025	.0033
FGRUN	140	243.	375.	197.	11051.	4017.	12333.	.291	.076	.000	.0017	.0025	.0033
	145	243.	375.	197.	13990.	6350.	12333.	.311	.090	.000	.0022	.0027	.0039
FGRUN	145	250.	377.	197.	13990.	6350.	12333.	.311	.090	.000	.0022	.0027	.0039
	146	250.	377.	197.	15414.	7191.	12333.	.320	.099	.000	.0025	.0028	.0042
FGRUN	146	338.	605.	168.	12555.	8312.	20951.	.320	.099	.000	.0025	.0028	.0042
	147	338.	605.	168.	12014.	8312.	19611.	.303	.099	.011	.0027	.0030	.0046
RUN	147	338.	605.	168.	12014.	8312.	19611.	.303	.099	.011	.0027	.0030	.0046
	150	338.	605.	168.	10659.	8312.	16103.	.249	.099	.042	.0033	.0035	.0055

LTR 125 9

06/06/78

NUPIPE-TIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17E, NORM & UPSET

PAGE 479

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	150	387.	626.	155.	10659.	8312.	16103.	.249	.099	.042	.0033	.0035	.0055
	155	387.	626.	155.	10269.	8312.	14770.	.230	.099	.054	.0033	.0036	.0056
VALVE	155	387.	626.	155.	10269.	8312.	14770.	.230	.099	.054	.0033	.0036	.0056
	160	387.	626.	155.	9384.	8312.	11516.	.132	.099	.083	.0035	.0038	.0058
RUN	160	82.	126.	123.	0.	3705.	3792.	.182	.099	.083	.0035	.0038	.0058
	165	82.	126.	123.	0.	1852.	1896.	.182	.185	.138	.0035	.0039	.0060
RUN	165	82.	126.	123.	0.	1852.	1896.	.182	.185	.138	.0035	.0039	.0060
	170	82.	126.	123.	0.	0.	0.	.182	.275	.196	.0035	.0040	.0060
VALVE	150	462.	740.	40.	9384.	5740.	8420.	.182	.099	.083	.0035	.0038	.0058
	175	462.	740.	40.	9185.	5740.	4483.	.132	.099	.113	.0036	.0038	.0059
FGRUN	175	462.	740.	40.	9185.	5740.	4483.	.132	.099	.113	.0036	.0038	.0059
	180	462.	740.	40.	9135.	5740.	2864.	.112	.099	.126	.0036	.0039	.0059
ELBOW	130	477.	754.	12.	9105.	5740.	2864.	.112	.099	.126	.0036	.0039	.0059
	185	477.	754.	12.	4540.	2876.	0.	.050	.070	.152	.0053	.0045	.0064
FGRUN	185	479.	757.	3.	4540.	2876.	0.	.050	.070	.152	.0053	.0045	.0064
	190	479.	757.	3.	0.	0.	0.	.024	.038	.152	.0054	.0046	.0064
FGRUN	146	104.	234.	128.	4717.	2614.	8904.	.320	.099	.000	.0025	.0028	.0042
	145	104.	234.	128.	4273.	2614.	9188.	.337	.099	.010	.0026	.0028	.0040
RUN	143	104.	234.	128.	4273.	2614.	9188.	.337	.099	.010	.0026	.0028	.0040
	195	104.	234.	128.	2959.	2614.	10252.	.337	.099	.048	.0029	.0027	.0024
RUN	195	74.	224.	123.	2959.	2614.	10252.	.337	.099	.048	.0029	.0027	.0024
	196	74.	224.	123.	2385.	2614.	10843.	.431	.099	.087	.0029	.0026	.0027
FGRUN	195	74.	224.	123.	2385.	2614.	10843.	.431	.099	.087	.0029	.0026	.0027
	200	74.	224.	123.	2435.	2614.	11023.	.442	.099	.099	.0029	.0026	.0025
FGRUN	200	115.	142.	111.	1282.	2663.	6752.	.442	.099	.099	.0029	.0026	.0025
	201	115.	142.	111.	1390.	2663.	6304.	.451	.099	.110	.0029	.0026	.0025
RUN	201	115.	142.	111.	1390.	2663.	6304.	.451	.099	.110	.0029	.0026	.0025
	205	115.	142.	111.	2081.	2663.	5349.	.473	.099	.139	.0029	.0027	.0021
FGRUN	205	133.	137.	102.	2081.	2663.	5349.	.473	.099	.139	.0029	.0027	.0021
	210	133.	137.	102.	2876.	2663.	4383.	.490	.099	.165	.0028	.0028	.0019
ELBOW	210	148.	133.	95.	2876.	2663.	4383.	.490	.099	.165	.0028	.0028	.0019
	215	148.	133.	95.	3401.	2489.	4317.	.500	.106	.166	.0025	.0031	.0012

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM E UPSET

PAGE 480

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	215	168.	129.	88.	3401.	2489.	4317.	.500	.106	.156	.0025	.0031	.0012
	220	168.	129.	88.	3401.	2441.	5675.	.500	.116	.137	.0024	.0033	.0010
FGRUN	225	191.	123.	81.	3401.	2441.	5675.	.500	.116	.137	.0024	.0033	.0010
	225	191.	123.	81.	3401.	2737.	7007.	.500	.122	.114	.0023	.0034	.0008
FGRUN	225	209.	118.	77.	3401.	2737.	7007.	.500	.122	.114	.0023	.0034	.0008
	230	209.	118.	77.	3401.	2871.	7388.	.499	.123	.109	.0023	.0035	.0008
FGRUN	230	209.	118.	77.	3401.	2671.	7388.	.499	.123	.109	.0023	.0035	.0008
	235	209.	118.	77.	3401.	3015.	7771.	.499	.124	.105	.0023	.0035	.0008
RUN	235	230.	113.	73.	3401.	3015.	7771.	.499	.124	.105	.0023	.0035	.0008
	240	230.	113.	73.	3401.	3709.	9318.	.499	.123	.104	.0022	.0037	.0010
RUN	240	258.	106.	69.	3401.	3709.	9318.	.499	.123	.104	.0022	.0037	.0010
	245	258.	106.	69.	3401.	4499.	10779.	.499	.114	.126	.0022	.0039	.0015
ELBOW	245	287.	101.	66.	3401.	4499.	10779.	.499	.114	.126	.0022	.0039	.0015
	250	287.	101.	66.	3401.	5334.	12168.	.499	.099	.166	.0022	.0041	.0023
ELBOW	250	311.	98.	67.	3401.	5334.	12168.	.499	.099	.166	.0022	.0041	.0023
	255	311.	98.	67.	3253.	3992.	12723.	.472	.073	.187	.0028	.0051	.0040
FGRUN	255	356.	99.	80.	3253.	3992.	12723.	.472	.073	.187	.0028	.0051	.0040
	260	356.	99.	80.	3186.	2960.	12723.	.455	.063	.187	.0028	.0051	.0041
VALVE	260	356.	99.	80.	3186.	2960.	12723.	.455	.063	.187	.0028	.0051	.0041
	265	356.	99.	80.	3159.	1919.	12723.	.426	.046	.187	.0029	.0051	.0042
VALVE	265	486.	111.	164.	3159.	1919.	12723.	.426	.046	.187	.0029	.0051	.0042
	270	486.	111.	164.	3169.	3314.	12723.	.397	.028	.187	.0029	.0051	.0044
FGRUN	270	486.	111.	164.	3169.	3314.	12723.	.397	.028	.187	.0029	.0051	.0044
	275	486.	111.	164.	3240.	4806.	12723.	.380	.018	.187	.0029	.0050	.0045
ELBOW	275	522.	113.	194.	3240.	4806.	12723.	.380	.018	.187	.0029	.0050	.0045
	280	522.	113.	194.	2523.	7769.	9599.	.321	.000	.168	.0033	.0047	.0058
FGRUN	280	541.	113.	210.	2523.	7769.	9599.	.321	.000	.168	.0033	.0047	.0058
	285	541.	113.	210.	2620.	7769.	837.	.212	.000	.108	.0033	.0038	.0062
RUN	285	557.	113.	224.	2620.	7769.	837.	.212	.000	.108	.0033	.0038	.0062
	290	557.	113.	224.	6232.	7769.	10222.	.102	.000	.051	.0029	.0030	.0057
RUN	290	564.	113.	231.	6232.	7769.	10222.	.102	.000	.051	.0029	.0030	.0057
	295	564.	113.	231.	9596.	7769.	18666.	.023	.000	.012	.0023	.0022	.0047

LIR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 481

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
REDUCE	295	565.	114.	231.	9596.	7769.	18666.	.023	.000	.012	.0023	.0022	.0047
	300	565.	114.	231.	10560.	7769.	21057.	.006	.000	.003	.0017	.0016	.0035
RUN	300	565.	114.	231.	10560.	7769.	21057.	.006	.000	.003	.0017	.0016	.0035
	305	565.	114.	231.	11245.	7769.	22750.	.000	.000	.000	.0000	.0000	.0000
FGRUN	200	122.	90.	72.	1413.	2641.	4886.	.442	.099	.099	.0029	.0026	.0025
	202	122.	90.	72.	1413.	2381.	4575.	.442	.090	.107	.0030	.0025	.0023
FGRUN	202	122.	90.	72.	1413.	2381.	4575.	.442	.090	.107	.0030	.0025	.0023
	310	122.	90.	72.	1413.	1532.	3520.	.442	.064	.137	.0032	.0022	.0016
RUN	310	97.	88.	74.	1413.	1532.	3520.	.442	.064	.137	.0032	.0022	.0016
	315	97.	88.	74.	1413.	886.	2581.	.442	.041	.174	.0035	.0021	.0011
RUN	315	83.	88.	79.	1413.	886.	2581.	.442	.041	.174	.0035	.0021	.0011
	320	83.	88.	79.	1413.	1546.	2415.	.442	.029	.206	.0038	.0022	.0010
ELBOW	320	75.	66.	84.	1413.	1546.	2415.	.442	.029	.206	.0038	.0022	.0010
	325	75.	88.	84.	1063.	1262.	2189.	.439	.027	.199	.0039	.0024	.0015
FGRUN	325	68.	89.	92.	1063.	1862.	2189.	.439	.027	.199	.0039	.0024	.0015
	330	68.	89.	92.	773.	1862.	1041.	.434	.027	.129	.0040	.0029	.0017
RUN	330	58.	91.	99.	773.	1862.	1041.	.434	.027	.129	.0040	.0029	.0017
	335	58.	91.	99.	2257.	1862.	251.	.433	.027	.067	.0037	.0033	.0018
FGRUN	335	49.	93.	103.	2257.	1862.	251.	.433	.027	.067	.0037	.0033	.0018
	340	49.	92.	103.	4040.	1862.	783.	.433	.027	.008	.0031	.0038	.0018
ELBOW	340	44.	95.	104.	4040.	1862.	783.	.433	.027	.008	.0031	.0038	.0018
	345	44.	95.	104.	4271.	1782.	962.	.415	.018	.005	.0015	.0042	.0016
FGRUN	345	45.	97.	104.	4271.	1782.	962.	.415	.018	.005	.0015	.0042	.0016
	350	45.	97.	104.	3808.	1502.	962.	.362	.005	.005	.0009	.0044	.0014
RUN	350	52.	72.	103.	3808.	1502.	962.	.362	.005	.005	.0009	.0044	.0014
	355	52.	72.	103.	2701.	1167.	962.	.290	.008	.005	.0003	.0046	.0012
FGRUN	355	66.	71.	103.	2701.	1167.	962.	.290	.008	.005	.0003	.0046	.0012
	360	66.	71.	103.	1626.	1212.	962.	.216	.009	.005	.0001	.0046	.0009
VALVE	360	66.	71.	103.	1626.	1212.	962.	.216	.009	.005	.0001	.0046	.0009
	365	66.	71.	103.	1254.	1446.	962.	.188	.008	.005	.0002	.0046	.0009
RUN	365	73.	38.	15.	0.	117.	300.	.158	.002	.005	.0002	.0046	.0009
	370	73.	36.	15.	0.	0.	0.	.158	.011	.042	.0002	.0046	.0009

LTR 125 9

05/06/78

NUPIPE-II - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17E, NORM & UPSET

PAGE 462

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
VALVE	365	125.	76.	95.	1254.	1457.	1028.	.138	.003	.005	.0002	.0045	.0009
	375	125.	76.	95.	791.	1862.	1028.	.160	.007	.005	.0002	.0046	.0009
FGRUN	375	125.	76.	95.	791.	1862.	1028.	.160	.007	.005	.0002	.0046	.0009
	380	125.	76.	95.	378.	3312.	1028.	.099	.004	.005	.0002	.0042	.0006
RUN	380	134.	7.	94.	378.	3312.	1028.	.099	.004	.005	.0002	.0042	.0006
	385	134.	7.	94.	387.	5190.	1028.	.041	.002	.005	.0001	.0034	.0004
FGRUN	385	136.	7.	94.	387.	5190.	1028.	.041	.002	.005	.0001	.0034	.0004
	390	136.	7.	94.	412.	6571.	1028.	.008	.001	.005	.0001	.0027	.0002
ELBOW	390	137.	7.	94.	412.	6571.	1028.	.008	.001	.005	.0001	.0027	.0002
	395	137.	7.	94.	427.	6836.	1007.	.000	.000	.000	.0000	.0001	.0000
RUN	395	137.	7.	94.	427.	6836.	1007.	.000	.000	.000	.0000	.0001	.0000
	400	137.	7.	94.	427.	6727.	1000.	.000	.000	.000	.0000	.0000	.0000
BRANCH	70	97.	40.	54.	1486.	994.	1937.	.130	.037	.000	.0004	.0020	.0019
	405	97.	40.	54.	1358.	994.	1723.	.126	.037	.001	.0004	.0019	.0019
FGRUN	405	97.	40.	54.	1358.	994.	1723.	.126	.037	.001	.0004	.0019	.0019
	405	97.	40.	54.	1142.	994.	1273.	.121	.037	.003	.0006	.0019	.0020
RUN	405	96.	41.	54.	1142.	994.	1373.	.121	.037	.003	.0006	.0019	.0020
	410	96.	41.	54.	609.	994.	704.	.111	.037	.010	.0010	.0019	.0020
FGRUN	410	94.	41.	53.	609.	994.	704.	.111	.037	.010	.0010	.0019	.0020
	415	94.	41.	53.	209.	994.	882.	.108	.037	.019	.0011	.0022	.0019
ELBOW	415	92.	42.	52.	209.	994.	882.	.108	.037	.019	.0011	.0022	.0019
	420	92.	42.	52.	125.	885.	966.	.108	.033	.027	.0014	.0026	.0013
FGRUN	420	90.	43.	51.	125.	885.	966.	.108	.033	.027	.0014	.0026	.0013
	425	90.	43.	51.	125.	721.	747.	.108	.026	.040	.0014	.0027	.0012
VALVE	425	90.	43.	51.	125.	721.	747.	.108	.026	.040	.0014	.0027	.0012
	430	90.	43.	51.	125.	667.	543.	.108	.017	.059	.0014	.0028	.0012
VALVE	430	69.	51.	23.	125.	667.	543.	.108	.017	.059	.0014	.0028	.0012
	435	69.	51.	23.	125.	664.	481.	.106	.009	.077	.0014	.0028	.0011
RUN	435	69.	51.	23.	125.	664.	481.	.108	.009	.077	.0014	.0028	.0011
	440	69.	51.	23.	125.	702.	647.	.108	.003	.096	.0014	.0028	.0010
RUN	440	68.	15.	18.	125.	702.	647.	.108	.003	.096	.0014	.0028	.0010
	445	68.	15.	18.	125.	797.	538.	.108	.009	.131	.0015	.0027	.0006

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 483

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	445	66.	14.	13.	125.	797.	538.	.108	.009	.131	.0015	.0027	.0006
	450	66.	14.	13.	125.	855.	473.	.108	.015	.164	.0015	.0027	.0003
RUN	450	65.	13.	9.	125.	855.	473.	.108	.015	.164	.0015	.0027	.0003
	455	65.	13.	9.	125.	862.	444.	.108	.017	.195	.0016	.0027	.0001
RUN	455	65.	12.	10.	125.	862.	444.	.108	.017	.195	.0016	.0027	.0001
	460	65.	12.	10.	125.	806.	449.	.108	.015	.225	.0016	.0029	.0003
RUN	460	64.	12.	17.	125.	506.	449.	.108	.015	.225	.0016	.0029	.0003
	465	64.	12.	17.	125.	717.	426.	.108	.009	.255	.0017	.0031	.0006
RUN	465	64.	13.	24.	125.	717.	426.	.108	.009	.255	.0017	.0031	.0006
	470	64.	13.	24.	125.	671.	544.	.108	.002	.288	.0017	.0034	.0009
FGRUN	470	65.	37.	31.	125.	671.	544.	.108	.002	.288	.0017	.0034	.0009
	475	65.	37.	31.	125.	737.	478.	.108	.011	.317	.0018	.0037	.0011
ELBOW	475	65.	37.	36.	125.	737.	478.	.108	.011	.317	.0018	.0037	.0011
	480	65.	37.	36.	109.	793.	333.	.109	.015	.322	.0017	.0042	.0015
FGRUN	480	65.	36.	41.	109.	793.	333.	.109	.015	.322	.0017	.0042	.0015
	485	65.	36.	41.	542.	793.	520.	.114	.015	.306	.0015	.0048	.0015
ELBOW	485	66.	35.	46.	542.	793.	520.	.114	.015	.306	.0015	.0048	.0015
	490	66.	35.	46.	729.	862.	711.	.109	.016	.302	.0009	.0054	.0013
FGRUN	490	66.	34.	52.	729.	882.	711.	.109	.015	.302	.0009	.0054	.0013
	495	66.	34.	52.	1086.	1602.	711.	.104	.019	.302	.0004	.0062	.0014
FGRUN	495	66.	33.	60.	1086.	1602.	711.	.104	.019	.302	.0004	.0062	.0014
	500	66.	33.	60.	1455.	2402.	711.	.150	.015	.302	.0008	.0073	.0018
FGRUN	500	69.	33.	64.	1458.	2402.	711.	.150	.015	.302	.0008	.0073	.0018
	505	69.	33.	64.	1531.	2565.	711.	.176	.015	.302	.0010	.0076	.0018
FGRUN	505	124.	45.	146.	2613.	2300.	1311.	.176	.015	.302	.0010	.0076	.0018
	510	124.	45.	146.	2257.	2300.	1512.	.173	.015	.300	.0013	.0077	.0020
RUN	510	125.	44.	149.	2257.	2300.	1512.	.173	.015	.300	.0013	.0077	.0020
	515	125.	44.	149.	1087.	2300.	620.	.159	.015	.288	.0020	.0081	.0023
FGRUN	515	126.	44.	154.	1087.	2300.	620.	.159	.015	.288	.0020	.0081	.0023
	520	126.	44.	154.	334.	2300.	654.	.145	.015	.274	.0022	.0087	.0023
ELBOW	520	126.	44.	157.	334.	2300.	654.	.145	.015	.274	.0022	.0087	.0023
	525	126.	44.	157.	664.	1853.	842.	.143	.010	.241	.0025	.0094	.0018

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, SITE, NORM & UPSET.

PAGE 484

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	525	127.	44.	161.	664.	1853.	842.	.140	.010	.241	.0025	.0094	.0018
	530	127.	44.	161.	664.	710.	391.	.140	.014	.135	.0022	.0097	.0018
FGRUN	530	128.	44.	164.	664.	710.	391.	.140	.014	.135	.0022	.0097	.0018
	535	128.	44.	164.	664.	1972.	254.	.140	.030	.031	.0019	.0091	.0016
ELBOW	535	128.	44.	165.	654.	1972.	254.	.140	.030	.031	.0019	.0091	.0016
	540	128.	44.	165.	654.	2486.	350.	.117	.030	.006	.0017	.0070	.0016
FGRUN	540	130.	44.	165.	564.	2486.	350.	.117	.030	.006	.0017	.0070	.0016
	550	130.	44.	165.	596.	2463.	350.	.123	.031	.006	.0017	.0069	.0016
VALVE	550	130.	44.	165.	596.	2463.	350.	.123	.031	.006	.0017	.0069	.0016
	555	130.	44.	165.	455.	2641.	350.	.123	.023	.006	.0017	.0067	.0016
FGRUN	555	23.	32.	21.	0.	254.	381.	.039	.023	.006	.0017	.0067	.0016
	560	23.	32.	21.	0.	0.	0.	.089	.043	.076	.0017	.0067	.0017
VALVE	555	136.	58.	157.	455.	2754.	482.	.069	.023	.006	.0017	.0067	.0016
	565	138.	58.	157.	419.	3128.	482.	.057	.015	.006	.0017	.0064	.0016
FGRUN	565	138.	58.	157.	419.	3128.	482.	.057	.015	.006	.0017	.0064	.0016
	570	138.	58.	157.	654.	3804.	482.	.016	.004	.006	.0015	.0052	.0015
ELBOW	570	138.	58.	157.	654.	3804.	482.	.016	.004	.006	.0015	.0052	.0015
	575	138.	58.	157.	1006.	4130.	516.	.002	.000	.003	.0006	.0023	.0004
FGRUN	575	138.	58.	157.	1006.	4130.	516.	.002	.000	.003	.0006	.0023	.0004
	580	138.	58.	157.	2060.	4130.	1459.	.000	.000	.000	.0000	.0000	.0000
FGRUN	585	60.	49.	84.	1355.	3436.	1202.	.175	.015	.302	.0010	.0076	.0018
	585	60.	49.	84.	1233.	3299.	1202.	.193	.014	.302	.0009	.0073	.0017
RUN	585	60.	50.	79.	1233.	3299.	1202.	.193	.014	.302	.0009	.0073	.0017
	590	60.	50.	79.	646.	2667.	1202.	.284	.008	.302	.0005	.0069	.0015
RUN	590	57.	51.	70.	646.	2667.	1202.	.284	.008	.302	.0005	.0069	.0015
	595	57.	51.	70.	247.	1893.	1202.	.420	.003	.302	.0005	.0100	.0020
RUN	595	54.	13.	60.	247.	1893.	1202.	.420	.003	.302	.0005	.0100	.0020
	600	54.	13.	60.	226.	1234.	1202.	.566	.007	.302	.0004	.0107	.0030
RUN	600	46.	13.	51.	226.	1234.	1202.	.566	.007	.302	.0004	.0107	.0030
	605	48.	13.	51.	355.	753.	1202.	.744	.011	.302	.0001	.0103	.0043
RUN	605	40.	12.	41.	355.	753.	1202.	.744	.011	.302	.0001	.0108	.0043
	610	40.	12.	41.	497.	760.	1202.	.897	.010	.303	.0002	.0105	.0055

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 485

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	610	31.	12.	33.	497.	760.	1202.	.897	.010	.303	.0002	.0105	.0055
	615	31.	12.	33.	660.	960.	1202.	1.058	.003	.303	.0007	.0098	.0069
ELBOW	615	25.	12.	29.	660.	960.	1202.	1.058	.003	.303	.0007	.0098	.0069
	620	25.	12.	29.	675.	984.	1199.	1.063	.000	.300	.0015	.0029	.0079
FGRUN	620	24.	12.	25.	675.	984.	1199.	1.063	.000	.300	.0015	.0029	.0079
	625	24.	12.	25.	676.	984.	1036.	.899	.000	.272	.0021	.0075	.0090
RUN	625	32.	12.	19.	676.	984.	1036.	.899	.000	.272	.0021	.0075	.0090
	626	32.	12.	19.	722.	984.	736.	.708	.000	.231	.0025	.0061	.0098
RUN	626	42.	12.	17.	722.	984.	736.	.708	.000	.231	.0025	.0061	.0098
	630	42.	12.	17.	673.	984.	816.	.509	.000	.180	.0029	.0047	.0097
-RUN	630	52.	12.	23.	673.	984.	816.	.509	.000	.180	.0029	.0047	.0097
	635	52.	12.	23.	592.	984.	1579.	.320	.000	.122	.0029	.0033	.0087
FGRUN	635	62.	12.	32.	592.	984.	1579.	.320	.000	.122	.0029	.0033	.0087
	640	62.	12.	32.	802.	984.	2680.	.162	.000	.066	.0025	.0020	.0066
VALVE	640	62.	12.	32.	802.	984.	2680.	.162	.000	.066	.0025	.0020	.0066
	645	62.	12.	32.	968.	984.	3087.	.117	.000	.048	.0024	.0018	.0062
VALVE	645	86.	12.	59.	968.	984.	3087.	.117	.000	.048	.0024	.0018	.0062
	650	86.	12.	59.	1229.	984.	3597.	.075	.000	.031	.0023	.0016	.0058
FGRUN	650	86.	12.	59.	1229.	984.	3597.	.075	.000	.031	.0023	.0016	.0058
	655	86.	12.	59.	2466.	984.	5493.	.000	.000	.000	.0000	.0000	.0000

LFR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1

PAGE 490

LDFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM E UPSET

SUPPORT REACTIONS FOR LOAD COMBINATION CASE NO. 4

DBE RESPONSE SPECTRUM - ONE-HALF SSE

NODE	TYPE	REACTIONS (LBS OR IN-LBS)	DIRECTION
5	FORCE	98.	X COORD
5	FORCE	59.	Y COORD
5	FORCE	109.	Z COORD
5	MOMENT	2472.	X COORD
5	MOMENT	5890.	Y COORD
5	MOMENT	2060.	Z COORD
130	FORCE	159.	Y COORD
190	FORCE	240.	X COORD
190	FORCE	379.	Y COORD
305	FORCE	282.	X COORD
305	FORCE	557.	Y COORD
305	FORCE	116.	Z COORD
305	MOMENT	5622.	X COORD
305	MOMENT	3884.	Y COORD
305	MOMENT	11375.	Z COORD
350	FORCE	52.	Y COORD
350	FORCE	40.	Y COORD
400	FORCE	68.	X COORD
400	FORCE	4.	Y COORD
400	FORCE	47.	Z COORD
400	MOMENT	213.	X COORD
400	MOMENT	3363.	Y COORD
400	MOMENT	500.	Z COORD
440	FORCE	30.	Y COORD
470	FORCE	21.	Y COORD
580	FORCE	69.	X COORD
580	FORCE	29.	Y COORD
580	FORCE	79.	Z COORD
580	MOMENT	1030.	X COORD
580	MOMENT	2065.	Y COORD
580	MOMENT	729.	Z COORD
595	FORCE	28.	Y COORD
655	FORCE	43.	X COORD
655	FORCE	6.	Y COORD
655	FORCE	30.	Z COORD
655	MOMENT	1233.	X COORD
655	MOMENT	492.	Y COORD
655	MOMENT	2747.	Z COORD

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1

PAGE 491

LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

INTERNAL FORCES AND DEFLECTIONS FOR LOAD CASE NO. 4

OBE RESPONSE SPECTRUM - ONE-HALF SSE

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	5	98.	59.	109.	2472.	5890.	2060.	.000	.000	.000	.0000	.0000	.0000
	10	98.	59.	109.	1790.	4792.	2060.	.002	.001	.000	.0001	.0003	.0002
RUN	10	97.	56.	109.	1790.	4792.	2060.	.002	.001	.000	.0001	.0003	.0002
	15	97.	56.	109.	1144.	3741.	2060.	.007	.003	.000	.0002	.0006	.0003
RUN	15	97.	56.	109.	1144.	3741.	2060.	.007	.003	.000	.0002	.0006	.0003
	20	97.	56.	109.	595.	2790.	2060.	.015	.006	.000	.0003	.0003	.0005
RUN	20	95.	56.	109.	595.	2790.	2060.	.015	.006	.000	.0003	.0008	.0005
	25	95.	56.	109.	583.	2070.	2060.	.025	.009	.000	.0003	.0009	.0006
RUN	25	93.	54.	109.	533.	2070.	2060.	.025	.009	.000	.0003	.0009	.0006
	30	93.	54.	109.	1101.	1839.	2060.	.036	.012	.000	.0003	.0010	.0008
RUN	30	91.	52.	109.	1101.	1839.	2060.	.036	.012	.000	.0003	.0010	.0008
	35	91.	52.	109.	1410.	1977.	2060.	.043	.014	.000	.0002	.0010	.0009
FGRUN	35	80.	42.	109.	1410.	1977.	2060.	.043	.014	.000	.0002	.0010	.0009
	40	80.	42.	109.	1545.	2096.	2060.	.046	.015	.000	.0002	.0010	.0009
VALVE	40	80.	42.	109.	1545.	2096.	2060.	.046	.015	.000	.0002	.0010	.0009
	45	80.	42.	109.	1821.	2415.	2060.	.053	.016	.000	.0002	.0010	.0009
RUN	45	51.	30.	19.	459.	0.	1223.	.053	.016	.000	.0002	.0010	.0009
	50	51.	30.	19.	229.	0.	611.	.063	.016	.000	.0002	.0010	.0010
RUN	50	51.	30.	19.	229.	0.	611.	.063	.016	.000	.0002	.0010	.0010
	55	51.	30.	19.	0.	0.	0.	.073	.016	.000	.0002	.0010	.0010
VALVE	45	52.	25.	104.	1918.	2415.	1445.	.053	.016	.000	.0002	.0010	.0009
	60	52.	25.	104.	2033.	2620.	1445.	.060	.017	.000	.0002	.0010	.0009
FGRUN	60	52.	25.	104.	2033.	2620.	1445.	.060	.017	.000	.0002	.0010	.0009
	65	52.	25.	104.	2093.	2736.	1445.	.063	.018	.000	.0002	.0010	.0009
RUN	65	46.	25.	104.	2093.	2736.	1445.	.063	.018	.000	.0002	.0010	.0009
	70	46.	25.	104.	2115.	2794.	1445.	.065	.018	.000	.0002	.0010	.0010
RUN	70	31.	37.	95.	2192.	2856.	1647.	.065	.018	.000	.0002	.0010	.0010
	75	31.	37.	95.	2260.	2848.	1647.	.069	.019	.000	.0002	.0010	.0010
RUN	75	30.	37.	95.	2260.	2848.	1647.	.069	.019	.000	.0002	.0010	.0010
	80	30.	37.	95.	2422.	2830.	1647.	.077	.020	.000	.0002	.0010	.0011

LTR 125 9

06/06/78

NUPIPE-III - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 492

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	80	26.	35.	95.	2422.	2830.	1647.	.077	.023	.000	.0002	.0010	.0011
	85	29.	38.	95.	2595.	2813.	1647.	.085	.020	.000	.0003	.0010	.0011
FGRUN	85	27.	40.	95.	2595.	2813.	1647.	.085	.020	.000	.0003	.0010	.0011
	90	27.	40.	95.	2651.	2788.	1647.	.089	.020	.000	.0003	.0010	.0011
FGRUN	90	27.	40.	95.	2651.	2788.	1647.	.089	.020	.000	.0003	.0010	.0011
	95	27.	40.	95.	2713.	2766.	1647.	.092	.021	.000	.0003	.0010	.0012
FGRUN	95	30.	43.	95.	2713.	2766.	1647.	.092	.021	.000	.0003	.0010	.0012
	100	30.	43.	95.	2826.	2687.	1647.	.098	.021	.000	.0004	.0010	.0012
RUN	100	33.	45.	95.	2826.	2687.	1647.	.098	.021	.000	.0004	.0010	.0012
	105	33.	45.	95.	3205.	2501.	1647.	.115	.023	.000	.0006	.0011	.0014
RUN	105	36.	48.	95.	3205.	2501.	1647.	.115	.023	.000	.0006	.0011	.0014
	110	36.	48.	95.	3390.	2454.	1647.	.122	.025	.000	.0007	.0012	.0014
FGRUN	110	50.	54.	95.	3390.	2454.	1647.	.122	.025	.000	.0007	.0012	.0014
	115	50.	54.	95.	3494.	2438.	1647.	.125	.026	.000	.0007	.0012	.0015
VALVE	115	50.	54.	95.	3494.	2438.	1647.	.125	.026	.000	.0007	.0012	.0015
	120	50.	54.	95.	3765.	2448.	1647.	.133	.031	.000	.0008	.0012	.0015
RUN	120	61.	155.	34.	0.	960.	4648.	.133	.031	.000	.0008	.0012	.0015
	125	61.	155.	34.	0.	449.	2322.	.133	.011	.013	.0008	.0012	.0012
RUN	125	47.	155.	30.	0.	449.	2322.	.133	.011	.016	.0008	.0012	.0012
	130	47.	155.	30.	0.	0.	0.	.133	.008	.037	.0008	.0013	.0012
VALVE	120	105.	183.	99.	3765.	1900.	6166.	.133	.031	.000	.0008	.0012	.0015
	135	105.	183.	99.	4964.	2167.	6166.	.142	.035	.000	.0008	.0012	.0016
FGRUN	135	105.	183.	99.	4964.	2197.	6166.	.142	.035	.000	.0008	.0012	.0016
	140	105.	183.	99.	5526.	2409.	6166.	.146	.038	.000	.0009	.0012	.0016
FGRUN	140	121.	187.	99.	5526.	2409.	6166.	.146	.038	.000	.0009	.0012	.0016
	145	121.	187.	99.	6995.	3175.	6166.	.155	.045	.000	.0011	.0014	.0020
FGRUN	145	125.	189.	99.	6995.	3175.	6166.	.155	.045	.000	.0011	.0014	.0020
	146	125.	189.	99.	7707.	3596.	6166.	.160	.049	.000	.0013	.0014	.0021
FGRUN	146	169.	303.	84.	6278.	4156.	10475.	.160	.049	.000	.0013	.0014	.0021
	147	169.	303.	84.	6007.	4156.	9806.	.151	.049	.005	.0014	.0015	.0023
RUN	147	169.	303.	84.	6007.	4156.	9806.	.151	.049	.005	.0014	.0015	.0023
	150	169.	303.	84.	5330.	4156.	8052.	.125	.049	.021	.0016	.0018	.0028

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 493

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	150	194.	313.	78.	5330.	4156.	6052.	.125	.049	.021	.0016	.0018	.0028
	155	194.	313.	78.	5135.	4156.	7385.	.115	.049	.027	.0017	.0018	.0028
VALVE	155	194.	313.	78.	5135.	4156.	7385.	.115	.049	.027	.0017	.0018	.0028
	160	194.	313.	78.	4692.	4156.	5758.	.091	.049	.042	.0017	.0019	.0029
RUN	160	41.	63.	62.	0.	1852.	1896.	.091	.049	.042	.0017	.0019	.0029
	165	41.	63.	62.	0.	926.	948.	.091	.093	.069	.0017	.0020	.0030
RUN	165	41.	63.	62.	0.	926.	948.	.091	.093	.069	.0017	.0020	.0030
	170	41.	63.	62.	0.	0.	0.	.091	.137	.098	.0017	.0020	.0030
VALVE	160	231.	370.	20.	4692.	2870.	4210.	.091	.049	.042	.0017	.0019	.0029
	175	231.	370.	20.	4592.	2870.	2241.	.066	.049	.057	.0016	.0019	.0029
FGRUN	175	231.	370.	20.	4592.	2870.	2241.	.066	.049	.057	.0018	.0019	.0029
	180	231.	370.	20.	4553.	2870.	1432.	.056	.049	.063	.0016	.0019	.0030
ELBOW	180	239.	377.	6.	4553.	2870.	1432.	.056	.049	.063	.0018	.0019	.0030
	185	239.	377.	6.	2270.	1438.	0.	.025	.035	.076	.0027	.0023	.0032
FGRUN	185	240.	378.	2.	2270.	1438.	0.	.025	.035	.076	.0027	.0023	.0032
	190	240.	378.	2.	0.	0.	0.	.012	.019	.076	.0027	.0023	.0032
FGRUN	146	52.	117.	64.	2358.	1307.	4452.	.160	.049	.000	.0013	.0014	.0021
	148	52.	117.	64.	2139.	1307.	4594.	.168	.049	.005	.0013	.0014	.0023
RUN	148	52.	117.	64.	2139.	1307.	4594.	.168	.049	.005	.0013	.0014	.0020
	195	52.	117.	64.	1479.	1307.	5126.	.194	.049	.024	.0014	.0013	.0017
RUN	195	37.	112.	61.	1479.	1307.	5126.	.194	.049	.024	.0014	.0013	.0017
	196	37.	112.	61.	1193.	1307.	5421.	.216	.050	.044	.0014	.0013	.0013
FGRUN	196	37.	112.	61.	1193.	1307.	5421.	.216	.050	.044	.0014	.0013	.0013
	200	37.	112.	61.	1217.	1307.	5511.	.221	.050	.049	.0015	.0013	.0012
FGRUN	200	58.	71.	56.	641.	1331.	3351.	.221	.050	.049	.0015	.0013	.0012
	201	58.	71.	56.	695.	1331.	3152.	.226	.050	.055	.0015	.0013	.0012
RUN	201	58.	71.	56.	695.	1331.	3152.	.226	.050	.055	.0015	.0013	.0012
	205	58.	71.	56.	1041.	1331.	2674.	.236	.050	.070	.0014	.0014	.0010
FGRUN	205	66.	68.	51.	1041.	1331.	2674.	.236	.050	.070	.0014	.0014	.0010
	210	66.	68.	51.	1438.	1331.	2191.	.245	.050	.082	.0014	.0014	.0009
ELBOW	210	74.	67.	48.	1438.	1331.	2191.	.245	.050	.082	.0014	.0014	.0009
	215	74.	67.	48.	1701.	1244.	2158.	.250	.053	.083	.0013	.0016	.0008

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM E UPSET

PAGE 494

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	215	84.	64.	44.	1701.	1244.	2153.	.250	.053	.083	.0013	.0016	.0006
	220	84.	64.	44.	1701.	1220.	2837.	.250	.053	.068	.0012	.0016	.0005
FGRUN	220	95.	62.	41.	1701.	1220.	2837.	.250	.058	.068	.0012	.0016	.0005
	225	95.	62.	41.	1701.	1369.	3504.	.250	.061	.057	.0011	.0017	.0004
FGRUN	225	104.	59.	39.	1701.	1369.	3504.	.250	.061	.057	.0011	.0017	.0004
	230	104.	59.	39.	1701.	1436.	3694.	.250	.062	.055	.0011	.0017	.0004
FGRUN	230	104.	59.	38.	1701.	1436.	3694.	.250	.062	.055	.0011	.0017	.0004
	235	104.	59.	38.	1701.	1508.	3685.	.250	.062	.053	.0011	.0017	.0004
RUN	235	115.	56.	36.	1701.	1508.	3885.	.250	.062	.053	.0011	.0017	.0004
	240	115.	56.	36.	1701.	1854.	4038.	.250	.061	.052	.0011	.0018	.0003
RUN	240	129.	53.	34.	1701.	1854.	4658.	.250	.061	.052	.0011	.0018	.0003
	245	129.	53.	34.	1701.	2249.	5389.	.250	.057	.063	.0011	.0019	.0003
E15 RUN	245	144.	50.	33.	1701.	2249.	5389.	.250	.057	.063	.0011	.0019	.0003
	250	144.	50.	33.	1701.	2667.	6084.	.250	.049	.063	.0011	.0021	.0011
ELBOW	250	156.	49.	34.	1701.	2667.	6084.	.250	.049	.063	.0011	.0021	.0011
	255	156.	49.	34.	1627.	1996.	6362.	.236	.036	.094	.0014	.0025	.0020
FGRUN	255	178.	50.	40.	1627.	1996.	6362.	.236	.036	.094	.0014	.0025	.0020
	260	178.	50.	40.	1593.	1480.	6362.	.228	.031	.094	.0014	.0025	.0020
VALVE	260	178.	50.	40.	1593.	1480.	6362.	.228	.031	.094	.0014	.0025	.0020
	265	178.	50.	40.	1580.	960.	6362.	.213	.023	.094	.0014	.0025	.0021
VALVE	265	243.	56.	82.	1580.	960.	6362.	.213	.023	.094	.0014	.0025	.0021
	270	243.	56.	82.	1585.	1657.	6362.	.198	.014	.094	.0014	.0025	.0022
FGRUN	270	243.	56.	82.	1585.	1657.	6362.	.198	.014	.094	.0014	.0025	.0022
	275	243.	56.	82.	1620.	2403.	6362.	.190	.009	.094	.0014	.0025	.0022
ELBOW	275	261.	57.	97.	1620.	2403.	6362.	.190	.009	.094	.0014	.0025	.0022
	280	261.	57.	97.	1262.	3884.	4799.	.161	.000	.084	.0017	.0024	.0029
FGRUN	280	270.	57.	105.	1262.	3884.	4799.	.161	.000	.084	.0017	.0024	.0029
	285	270.	57.	105.	1310.	3884.	418.	.106	.000	.054	.0016	.0019	.0031
RUN	285	278.	57.	112.	1310.	3884.	418.	.106	.000	.054	.0016	.0019	.0031
	290	278.	57.	112.	3116.	3884.	5111.	.051	.000	.026	.0015	.0015	.0029
RUN	290	282.	57.	115.	3116.	3884.	5111.	.051	.000	.026	.0015	.0015	.0029
	295	282.	57.	115.	4798.	3884.	9333.	.012	.000	.006	.0012	.0011	.0023

LIR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 495

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
REDUCE	295	282.	57.	116.	4798.	3884.	9333.	.012	.003	.006	.0012	.0011	.0323
	300	282.	57.	116.	5280.	3884.	10528.	.003	.000	.001	.0009	.0008	.0018
RUN	300	282.	57.	116.	5280.	3884.	10528.	.003	.000	.001	.0009	.0008	.0018
	305	282.	57.	116.	5622.	3884.	11375.	.000	.000	.000	.0000	.0000	.0000
FGRUN	200	61.	45.	36.	706.	1321.	2443.	.221	.050	.049	.0015	.0013	.0012
	202	61.	45.	36.	706.	1190.	2288.	.221	.045	.054	.0015	.0013	.0011
FGRUN	202	61.	45.	36.	706.	1190.	2288.	.221	.045	.054	.0015	.0013	.0011
	310	61.	45.	36.	706.	766.	1760.	.221	.032	.069	.0016	.0011	.0008
RUN	310	49.	44.	37.	706.	766.	1760.	.221	.032	.069	.0016	.0011	.0008
	315	49.	44.	37.	706.	443.	1290.	.221	.021	.087	.0018	.0011	.0006
RUN	315	42.	44.	39.	706.	443.	1290.	.221	.021	.087	.0018	.0011	.0006
	320	42.	44.	39.	706.	773.	1208.	.221	.014	.103	.0019	.0011	.0005
ELBOW	320	38.	44.	42.	706.	773.	1208.	.221	.014	.103	.0019	.0011	.0005
	325	38.	44.	42.	532.	931.	1095.	.220	.013	.099	.0020	.0012	.0007
FGRUN	325	34.	44.	46.	532.	931.	1095.	.220	.013	.099	.0020	.0012	.0007
	330	34.	44.	46.	386.	931.	521.	.217	.013	.064	.0020	.0014	.0009
RUN	330	29.	45.	50.	386.	931.	521.	.217	.013	.064	.0020	.0014	.0009
	335	29.	45.	50.	1128.	931.	126.	.216	.013	.034	.0018	.0017	.0009
FGRUN	335	24.	46.	52.	1128.	931.	126.	.216	.013	.034	.0018	.0017	.0009
	340	24.	46.	52.	2020.	931.	392.	.216	.013	.004	.0015	.0019	.0009
ELBOW	340	22.	47.	52.	2020.	931.	392.	.216	.013	.004	.0015	.0019	.0009
	345	22.	47.	52.	2135.	891.	481.	.208	.009	.002	.0007	.0021	.0008
FGRUN	345	23.	48.	52.	2135.	891.	481.	.208	.009	.002	.0007	.0021	.0008
	350	23.	48.	52.	1904.	751.	481.	.181	.003	.002	.0005	.0022	.0007
RUN	350	26.	36.	52.	1904.	751.	481.	.181	.003	.002	.0005	.0022	.0007
	355	26.	36.	52.	1350.	583.	481.	.145	.004	.002	.0002	.0023	.0006
FGRUN	355	33.	36.	52.	1350.	583.	481.	.145	.004	.002	.0002	.0023	.0006
	360	33.	36.	52.	813.	606.	481.	.108	.004	.002	.0001	.0023	.0005
VALVE	360	33.	36.	52.	813.	606.	481.	.108	.004	.002	.0001	.0023	.0005
	365	33.	36.	52.	627.	723.	481.	.094	.004	.002	.0001	.0023	.0005
RUN	365	36.	19.	7.	0.	59.	150.	.094	.004	.002	.0001	.0023	.0005
	370	36.	19.	7.	0.	0.	0.	.094	.005	.021	.0001	.0023	.0005

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM E UPSET

PAGE 496

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
VALVE	365	62.	39.	47.	627.	728.	514.	.094	.004	.002	.0001	.0023	.0004
	375	62.	39.	47.	395.	931.	514.	.030	.003	.002	.0001	.0023	.0004
FGRUN	375	62.	39.	47.	395.	931.	514.	.080	.003	.002	.0001	.0023	.0004
	380	62.	39.	47.	189.	1658.	514.	.049	.002	.002	.0001	.0021	.0003
RUN	380	67.	4.	47.	189.	1656.	514.	.049	.002	.002	.0001	.0021	.0003
	385	67.	4.	47.	193.	2595.	514.	.020	.001	.002	.0001	.0017	.0002
FGRUN	385	68.	4.	47.	193.	2595.	514.	.020	.001	.002	.0001	.0017	.0002
	390	68.	4.	47.	206.	3286.	514.	.004	.000	.002	.0000	.0014	.0001
ELBOW	390	68.	4.	47.	206.	3286.	514.	.004	.000	.002	.0000	.0014	.0001
	395	68.	4.	47.	213.	3418.	503.	.000	.000	.000	.0000	.0001	.0000
RUN	395	68.	4.	47.	213.	3418.	503.	.000	.000	.000	.0000	.0001	.0000
	400	68.	4.	47.	213.	3363.	500.	.000	.000	.000	.0000	.0000	.0000
BRANCH	70	48.	20.	27.	743.	497.	968.	.065	.018	.000	.0002	.0010	.0010
	405	48.	20.	27.	679.	497.	861.	.063	.018	.001	.0002	.0010	.0010
FGRUN	405	48.	20.	27.	679.	497.	861.	.063	.018	.001	.0002	.0010	.0010
	406	48.	20.	27.	571.	497.	886.	.060	.013	.001	.0003	.0009	.0010
RUN	406	48.	20.	27.	571.	497.	886.	.060	.018	.001	.0003	.0009	.0010
	410	48.	20.	27.	304.	497.	352.	.056	.018	.005	.0005	.0010	.0010
FGRUN	410	47.	21.	27.	304.	497.	352.	.056	.018	.005	.0005	.0010	.0010
	415	47.	21.	27.	105.	497.	441.	.054	.013	.009	.0006	.0011	.0009
ELBOW	415	46.	21.	26.	105.	497.	441.	.054	.018	.009	.0006	.0011	.0009
	420	46.	21.	26.	62.	442.	483.	.054	.017	.013	.0007	.0013	.0006
FGRUN	420	45.	21.	25.	62.	442.	483.	.054	.017	.013	.0007	.0013	.0006
	425	45.	21.	25.	62.	360.	373.	.054	.013	.020	.0007	.0014	.0006
VALVE	425	45.	21.	25.	62.	360.	373.	.054	.013	.020	.0007	.0014	.0006
	430	45.	21.	25.	62.	334.	272.	.054	.009	.029	.0007	.0014	.0006
VALVE	430	35.	25.	11.	62.	334.	272.	.054	.009	.029	.0007	.0014	.0006
	435	35.	25.	11.	62.	332.	241.	.054	.005	.039	.0007	.0014	.0006
RUN	435	35.	25.	11.	62.	332.	241.	.054	.005	.039	.0007	.0014	.0006
	440	35.	25.	11.	62.	351.	324.	.054	.002	.048	.0007	.0014	.0005
RUN	440	34.	7.	9.	62.	351.	324.	.054	.002	.048	.0007	.0014	.0005
	445	34.	7.	9.	62.	399.	269.	.054	.005	.066	.0007	.0014	.0003

LTR 125 9

06/06/76

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 497

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ,RY
RUN	445	33.	7.	6.	62.	399.	269.	.054	.005	.066	.0007	.0014	.0003
	450	33.	7.	6.	62.	428.	236.	.054	.007	.082	.0008	.0013	.0002
RUN	450	33.	6.	4.	62.	428.	236.	.054	.007	.082	.0008	.0013	.0002
	455	33.	6.	4.	62.	431.	222.	.054	.008	.098	.0008	.0014	.0001
RUN	455	32.	6.	5.	62.	431.	222.	.054	.008	.098	.0008	.0014	.0001
	460	32.	6.	5.	62.	403.	225.	.054	.007	.112	.0008	.0014	.0002
RUN	460	32.	6.	8.	62.	403.	225.	.054	.007	.112	.0008	.0014	.0002
	465	32.	6.	8.	62.	359.	243.	.054	.004	.128	.0008	.0015	.0003
RUN	465	32.	6.	12.	62.	359.	243.	.054	.004	.128	.0008	.0015	.0003
	470	32.	6.	12.	62.	336.	272.	.054	.001	.144	.0009	.0017	.0004
FGRUN	470	32.	19.	16.	62.	336.	272.	.054	.001	.144	.0009	.0017	.0004
	475	32.	19.	15.	62.	369.	239.	.054	.005	.158	.0009	.0019	.0006
ELBOW	475	32.	18.	18.	62.	369.	239.	.054	.006	.158	.0009	.0019	.0006
	480	32.	18.	18.	55.	397.	167.	.054	.007	.161	.0008	.0021	.0007
FGRUN	480	33.	18.	21.	55.	397.	167.	.054	.007	.161	.0008	.0021	.0007
	485	33.	18.	21.	271.	397.	260.	.057	.007	.153	.0008	.0024	.0007
ELBOW	485	33.	18.	23.	271.	397.	260.	.057	.007	.153	.0008	.0024	.0007
	490	33.	18.	23.	365.	441.	355.	.054	.003	.151	.0005	.0027	.0006
FGRUN	490	33.	17.	26.	365.	441.	355.	.054	.006	.151	.0005	.0027	.0006
	495	33.	17.	26.	543.	801.	355.	.052	.010	.151	.0002	.0031	.0007
FGRUN	495	34.	17.	30.	543.	801.	355.	.052	.010	.151	.0002	.0031	.0007
	500	34.	17.	30.	729.	1201.	355.	.080	.009	.151	.0004	.0037	.0009
FGRUN	500	34.	16.	32.	729.	1201.	355.	.080	.009	.151	.0004	.0037	.0009
	505	34.	16.	32.	765.	1282.	355.	.088	.007	.151	.0005	.0038	.0009
FGRUN	505	62.	22.	73.	1309.	1150.	906.	.088	.007	.151	.0005	.0038	.0009
	510	62.	22.	73.	1128.	1150.	756.	.086	.007	.150	.0007	.0038	.0010
RUN	510	63.	22.	75.	1128.	1150.	756.	.086	.007	.150	.0007	.0038	.0010
	515	63.	22.	75.	544.	1150.	310.	.080	.007	.144	.0010	.0041	.0012
FGRUN	515	63.	22.	77.	544.	1150.	310.	.080	.007	.144	.0010	.0041	.0012
	520	63.	22.	77.	167.	1150.	327.	.073	.007	.137	.0011	.0043	.0012
ELBOW	520	63.	22.	79.	167.	1150.	327.	.073	.007	.137	.0011	.0043	.0012
	525	63.	22.	79.	332.	926.	421.	.070	.005	.120	.0013	.0047	.0009

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S176, NORM & UPSET

PAGE 493

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	525	63.	22.	81.	332.	526.	421.	.070	.005	.120	.0013	.0047	.0009
	530	63.	22.	81.	332.	355.	195.	.070	.007	.067	.0011	.0048	.0008
FGRUN	530	64.	22.	82.	332.	355.	195.	.070	.007	.067	.0011	.0048	.0008
	535	64.	22.	82.	332.	986.	127.	.070	.015	.015	.0009	.0046	.0008
ELBOW	535	64.	22.	82.	332.	986.	127.	.070	.015	.015	.0009	.0046	.0008
	540	64.	22.	82.	282.	1243.	175.	.058	.015	.003	.0009	.0035	.0008
FGRUN	540	65.	22.	82.	282.	1243.	175.	.058	.015	.003	.0009	.0035	.0008
	550	65.	22.	82.	298.	1232.	175.	.062	.016	.003	.0008	.0034	.0008
VALVE	550	65.	22.	82.	298.	1232.	175.	.062	.016	.003	.0008	.0034	.0008
	555	65.	22.	82.	227.	1320.	175.	.045	.011	.003	.0008	.0033	.0008
RUN	555	11.	16.	11.	0.	127.	191.	.045	.011	.003	.0008	.0033	.0008
	560	11.	16.	11.	0.	0.	0.	.045	.021	.028	.0008	.0033	.0008
VALVE	555	69.	29.	79.	227.	1377.	241.	.045	.011	.003	.0008	.0033	.0008
	565	69.	29.	79.	209.	1564.	241.	.028	.007	.003	.0008	.0032	.0008
FGRUN	565	69.	29.	79.	209.	1564.	241.	.028	.007	.003	.0008	.0032	.0008
	570	69.	29.	79.	327.	1902.	241.	.008	.002	.003	.0007	.0026	.0008
ELBOW	570	69.	29.	79.	327.	1902.	241.	.008	.002	.003	.0007	.0026	.0008
	575	69.	29.	79.	503.	2065.	258.	.001	.000	.002	.0003	.0011	.0002
FGRUN	575	69.	29.	79.	503.	2065.	258.	.001	.000	.002	.0003	.0011	.0002
	580	69.	29.	79.	1030.	2065.	729.	.000	.000	.000	.0000	.0000	.0000
FGRUN	585	30.	25.	42.	678.	1718.	601.	.088	.007	.151	.0005	.0038	.0009
	585	30.	25.	42.	616.	1650.	601.	.097	.007	.151	.0004	.0039	.0009
RUN	585	30.	25.	39.	616.	1650.	601.	.097	.007	.151	.0004	.0039	.0009
	590	30.	25.	39.	323.	1333.	601.	.142	.004	.151	.0003	.0044	.0007
RUN	590	29.	25.	35.	323.	1333.	601.	.142	.004	.151	.0003	.0044	.0007
	595	29.	25.	35.	123.	946.	601.	.210	.001	.151	.0002	.0050	.0010
RUN	595	27.	7.	30.	123.	946.	601.	.210	.001	.151	.0002	.0050	.0010
	600	27.	7.	30.	113.	617.	601.	.263	.003	.151	.0002	.0053	.0015
RUN	600	24.	6.	25.	113.	617.	601.	.283	.003	.151	.0002	.0053	.0015
	605	24.	6.	25.	173.	377.	601.	.372	.006	.151	.0001	.0054	.0022
RUN	605	20.	6.	21.	173.	377.	601.	.372	.006	.151	.0001	.0054	.0022
	610	20.	6.	21.	248.	380.	601.	.448	.005	.151	.0001	.0053	.0028

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 499

MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
FGRUN	610	15.	6.	17.	248.	380.	601.	.448	.005	.151	.0001	.0053	.0028
	615	15.	6.	17.	330.	480.	601.	.529	.001	.151	.0004	.0049	.0034
ELBOW	615	12.	6.	14.	330.	480.	601.	.529	.001	.151	.0004	.0049	.0034
	620	12.	6.	14.	338.	492.	599.	.531	.000	.150	.0007	.0044	.0040
FGRUN	620	12.	6.	12.	333.	492.	599.	.531	.000	.150	.0007	.0044	.0040
	625	12.	6.	12.	338.	492.	518.	.450	.000	.136	.0010	.0038	.0045
RUN	625	16.	6.	9.	338.	492.	518.	.450	.000	.136	.0010	.0038	.0045
	626	16.	6.	9.	361.	492.	368.	.354	.000	.116	.0013	.0031	.0049
RUN	626	21.	6.	9.	361.	492.	368.	.354	.000	.116	.0013	.0031	.0049
	630	21.	6.	9.	335.	492.	408.	.255	.000	.090	.0014	.0024	.0049
RUN	630	26.	6.	11.	336.	492.	408.	.255	.000	.090	.0014	.0024	.0049
	635	26.	6.	11.	296.	492.	789.	.160	.000	.061	.0015	.0017	.0044
FGRUN	635	31.	6.	16.	296.	492.	789.	.160	.000	.061	.0015	.0017	.0044
	640	31.	6.	16.	401.	492.	1340.	.081	.000	.033	.0013	.0010	.0033
VALVE	640	31.	6.	16.	401.	492.	1340.	.081	.000	.033	.0013	.0010	.0033
	645	31.	6.	16.	484.	492.	1543.	.058	.000	.024	.0012	.0009	.0031
VALVE	645	43.	6.	30.	484.	492.	1543.	.058	.000	.024	.0012	.0009	.0031
	650	43.	6.	30.	614.	492.	1798.	.037	.000	.016	.0012	.0008	.0029
FGRUN	650	43.	6.	30.	614.	492.	1798.	.037	.000	.016	.0012	.0008	.0029
	655	43.	6.	30.	1233.	492.	2747.	.000	.000	.000	.0000	.0000	.0000

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NCRH & UPSET

PAGE 502

ASME SECTION III CLASS 2 OR ANSI 831.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
FGRUN	5	1.000	3380.	5364.	218.	3597.
	10	1.000	2587.	4217.	201.	2788.
RUN	10	1.000	2587.	4217.	201.	2788.
	15	1.000	1875.	3182.	192.	2067.
RUN	15	1.000	1875.	3182.	192.	2067.
	20	1.000	1318.	2358.	192.	1509.
RUN	20	1.000	1318.	2358.	192.	1509.
	25	1.000	1274.	2154.	200.	1474.
RUN	25	1.000	1274.	2154.	200.	1474.
	30	1.000	1701.	2579.	217.	1918.
RUN	30	1.000	1701.	2579.	217.	1918.
	35	1.000	1961.	2902.	226.	2189.
FGRUN	35	1.000	656.	976.	78.	734.
	40	1.000	699.	1033.	80.	779.
RUN	45	1.000	712.	1098.	0.	712.
	50	1.000	712.	905.	0.	712.
RUN	50	1.000	712.	905.	0.	712.
	55	1.000	712.	712.	0.	712.
FGRUN	60	1.000	756.	1120.	90.	847.
	65	1.000	741.	1116.	93.	834.
RUN	65	1.000	2211.	3315.	275.	2485.
	70	2.847	3838.	6231.	796.	4634.
RUN	70	2.847	3792.	6297.	624.	4421.
	75	1.000	2105.	3286.	211.	2317.
RUN	75	1.000	2106.	3286.	211.	2317.
	80	1.000	1968.	3172.	195.	2154.
FGRUN	80	1.000	1968.	3172.	195.	2154.
	85	1.000	1802.	3033.	189.	1987.

LTR 125 9

APPENDIX F
DESIGN, LEVEL A, AND LEVEL B SERVICE
CONDITIONS STRESS ANALYSIS RESULTS

06/06/78

NUPIFE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 503

ASME SECTION III CLASS 2 OR ANSI B31.1.3 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIFY FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
FGRUN	35	1.000	602.	1021.	63.	665.
	50	1.000	574.	994.	62.	636.
FGRUN	90	1.000	574.	994.	62.	636.
	95	1.000	537.	960.	62.	599.
FGRUN	95	1.000	1612.	2857.	181.	1793.
	100	1.000	1375.	2627.	181.	1556.
RUN	100	1.000	1375.	2627.	181.	1556.
	105	1.000	1159.	2455.	197.	1356.
RUN	105	1.000	1159.	2455.	197.	1356.
	110	1.000	1406.	2735.	209.	1615.
FGRUN	110	1.000	467.	919.	71.	538.
	115	1.000	523.	982.	73.	597.
RUN	120	1.000	1887.	3290.	191.	2078.
	125	1.000	1344.	2044.	96.	1440.
RUN	125	1.000	1344.	2044.	96.	1440.
	130	1.000	712.	712.	0.	712.
FGRUN	135	1.000	808.	1634.	65.	874.
	140	1.000	846.	1713.	62.	908.
FGRUN	140	1.000	2520.	5069.	182.	2702.
	145	1.000	2843.	5755.	158.	3001.
FGRUN	145	1.000	2843.	5755.	158.	3001.
	146	1.000	3007.	6112.	149.	3156.
FGRUN	146	1.000	2749.	6563.	241.	2990.
	147	1.000	2760.	6374.	231.	2991.
RUN	147	1.000	2760.	6374.	231.	2991.
	150	1.000	2799.	5906.	210.	3009.
FGRUN	150	1.000	941.	1997.	71.	1012.
	155	1.000	946.	1942.	69.	1016.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 504

ASME SECTION III CLASS 2 OR ANSI 831.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
RUN	160	1.000	1779.	2563.	0.	1779.
	165	1.000	1201.	1592.	0.	1201.
RUN	165	1.000	1201.	1592.	0.	1201.
	170	1.000	712.	712.	0.	712.
FGRUN	175	1.000	921.	1511.	62.	984.
	180	1.000	920.	1480.	62.	982.
ELBOW	180	1.953	3679.	6091.	354.	4033.
	185	1.953	2207.	3370.	176.	2383.
FGRUN	185	1.000	1732.	2527.	90.	1822.
	190	1.000	712.	712.	0.	712.
FGRUN	146	1.000	1799.	3338.	388.	2187.
	148	1.000	1733.	3280.	387.	2120.
RUN	148	1.000	1733.	3280.	387.	2120.
	195	1.000	1511.	3135.	404.	1915.
RUN	195	1.000	1511.	3135.	404.	1915.
	196	1.000	1323.	3008.	449.	1772.
FGRUN	196	1.000	1323.	3008.	449.	1772.
	200	1.450	1329.	3191.	677.	2006.
FGRUN	200	1.450	1536.	2713.	796.	2332.
	201	1.000	1420.	2452.	569.	1989.
RUN	201	1.000	1420.	2452.	569.	1989.
	205	1.000	1317.	2252.	624.	1941.
FGRUN	205	1.000	1317.	2252.	624.	1941.
	210	1.000	1258.	2127.	679.	1936.
ELBOW	210	1.953	1511.	2784.	1326.	2337.
	215	1.953	1518.	2824.	1255.	2773.
FGRUN	215	1.000	1262.	2154.	642.	1905.
	220	1.000	1338.	2380.	492.	1829.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1

PAGE 505

LOGT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S176, NORM & UPSET

ASME SECTION III CLASS 2 OR ANSI B31.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIFY FACTOR	SUSTAINED STRESS EQ. 6 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
FGRUN	220	1.000	1338.	2380.	492.	1329.
	225	1.000	1407.	2627.	356.	1763.
FGRUN	225	1.000	1407.	2627.	356.	1763.
	230	1.000	1422.	2696.	320.	1742.
FGRUN	230	1.000	1422.	2696.	320.	1742.
	235	1.000	1433.	2764.	287.	1721.
RUN	235	1.000	1433.	2764.	287.	1721.
	240	1.000	1444.	3009.	208.	1652.
RUN	240	1.000	1444.	3009.	208.	1652.
	245	1.000	1389.	3187.	274.	1664.
RUN	245	1.000	1389.	3187.	274.	1664.
	250	1.000	1274.	3301.	422.	1697.
ELBOW	250	1.953	1535.	4505.	825.	2360.
	255	1.953	1345.	4317.	920.	2264.
FGRUN	255	1.000	378.	1069.	160.	538.
	260	1.000	366.	1042.	159.	525.
FGRUN	270	1.000	401.	1081.	168.	569.
	275	1.000	454.	1156.	175.	628.
ELBOW	275	1.953	1670.	4697.	1003.	2673.
	280	1.953	2104.	4833.	1028.	3132.
FGRUN	280	1.000	1662.	3525.	527.	2189.
	285	1.000	1594.	2812.	453.	2047.
RUN	285	1.000	1594.	2812.	453.	2047.
	290	1.000	1639.	3748.	420.	2059.
RUN	290	1.000	1639.	3748.	420.	2059.
	295	1.000	1754.	5062.	430.	2134.
REDUCE	295	2.000	4033.	14682.	1845.	5878.
	300	2.000	4169.	15972.	1884.	6053.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1

PAGE 506

LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

ASME SECTION III CLASS 2 OR ANSI B31.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIFY FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
RUN	300	1.000	6725.	27512.	2489.	9214.
	305	1.000	6908.	29149.	2533.	9441.
FGRUN	200	1.450	1039.	2592.	564.	1603.
	202	1.000	1057.	2518.	407.	1464.
FGRUN	202	1.000	1057.	2518.	407.	1464.
	310	1.000	1056.	2174.	344.	1399.
RUN	310	1.000	1056.	2174.	344.	1399.
	315	1.000	927.	1767.	283.	1211.
RUN	315	1.000	927.	1767.	283.	1211.
	320	1.000	716.	1590.	262.	978.
ELBOW	320	1.777	752.	1917.	466.	1218.
	325	1.777	704.	1621.	416.	1120.
FGRUN	325	1.000	680.	1515.	234.	914.
	330	1.000	667.	1287.	123.	790.
RUN	330	1.000	667.	1287.	123.	790.
	335	1.000	694.	1497.	46.	740.
FGRUN	335	1.000	694.	1497.	46.	740.
	340	1.000	742.	1976.	119.	856.
ELBOW	340	1.777	786.	2432.	204.	990.
	345	1.777	1076.	2798.	265.	1342.
FGRUN	345	1.000	969.	2251.	149.	1109.
	350	1.000	1624.	2773.	180.	1803.
RUN	350	1.000	1624.	2773.	180.	1803.
	355	1.000	979.	1824.	159.	1138.
FGRUN	355	1.000	979.	1824.	159.	1138.
	360	1.000	810.	1424.	169.	979.
RUN	360	1.000	810.	1424.	169.	979.
	365	1.000	930.	1013.	0.	930.
	370	1.000	608.	608.	0.	608.

LTR 125 9

06/06/78

NLPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, NORM & UPSET

PAGE 507

ASME SECTION III CLASS 2 OF ANSI B31.1-B STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIFY FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
FGRUN	375	1.000	1075.	1695.	193.	1268.
	380	1.000	1023.	1977.	234.	1258.
RUN	380	1.000	1023.	1977.	234.	1258.
	385	1.000	1018.	2468.	282.	1301.
FGRUN	385	1.000	1018.	2468.	282.	1301.
	390	1.000	1022.	2843.	316.	1336.
ELBOW	390	1.777	1160.	3587.	562.	1722.
	395	1.777	1194.	3716.	631.	1825.
RUN	395	1.000	1047.	2939.	355.	1402.
	400	1.000	1056.	2920.	363.	1421.
BRANCH	70	2.847	1185.	4250.	675.	1860.
	405	1.000	1050.	3069.	317.	1368.
FGRUN	405	1.000	1050.	3069.	317.	1368.
	406	1.000	1109.	2822.	261.	1370.
RUN	406	1.000	1109.	2822.	261.	1370.
	410	1.000	1257.	2399.	330.	1567.
FGRUN	410	1.000	1257.	2399.	330.	1567.
	415	1.000	1377.	2504.	516.	1893.
ELBOW	415	1.732	1616.	3081.	894.	2510.
	420	1.732	1458.	2891.	864.	2342.
FGRUN	420	1.000	1255.	2358.	510.	1765.
	425	1.000	899.	1775.	343.	1243.
RUN	435	1.000	1697.	2392.	156.	1852.
	440	1.000	2705.	3512.	320.	3025.
RUN	440	1.000	2705.	3512.	320.	3025.
	445	1.000	2036.	2649.	224.	2260.
RUN	445	1.000	2036.	2649.	224.	2260.
	450	1.000	1508.	2334.	163.	1671.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 508

ASME SECTION III CLASS 2 OR ANSI B31.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
RUN	450	1.000	1508.	2334.	163.	1671.
	455	1.000	1124.	1943.	176.	1299.
RUN	455	1.000	1124.	1943.	176.	1299.
	460	1.000	887.	1667.	252.	1139.
RUN	460	1.000	887.	1667.	252.	1139.
	465	1.000	800.	1534.	353.	1154.
RUN	465	1.000	800.	1534.	353.	1154.
	470	1.000	842.	1573.	463.	1305.
FGRUN	470	1.000	842.	1573.	463.	1305.
	475	1.000	848.	1592.	489.	1337.
ELBOW	475	1.732	928.	1895.	848.	1776.
	480	1.732	1001.	1945.	830.	1930.
FGRUN	480	1.000	903.	1620.	479.	1382.
	485	1.000	773.	1669.	551.	1324.
ELBOW	485	1.732	831.	2021.	955.	1786.
	490	1.732	780.	2247.	933.	1712.
FGRUN	490	1.000	733.	1863.	538.	1272.
	495	1.000	888.	2615.	406.	1294.
FGRUN	495	1.000	888.	2615.	406.	1294.
	500	1.000	1020.	3449.	603.	1523.
FGRUN	500	1.000	1020.	3449.	603.	1523.
	505	1.251	1039.	3612.	826.	1865.
FGRUN	505	1.251	1114.	4406.	732.	1846.
	510	1.000	1117.	4100.	535.	1652.
RUN	510	1.000	1117.	4100.	535.	1652.
	515	1.000	1147.	3341.	424.	1571.
FGRUN	515	1.000	1147.	3341.	424.	1571.
	520	1.000	1147.	3341.	424.	1571.
	520	1.000	1199.	3222.	425.	1624.

CTR 125 9

06/06/78

NLPIPE-III - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 509

ASME SECTION III CLASS 2 OR ANSI B31.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIFY FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
ELBOW	520	1.732	1384.	4013.	737.	2121.
	525	1.732	1383.	3713.	754.	2137.
FGRUN	525	1.000	1197.	2991.	435.	1633.
	530	1.000	1150.	2029.	358.	1503.
FGRUN	530	1.000	1150.	2029.	358.	1503.
	535	1.000	1159.	2915.	286.	1445.
ELBOW	535	1.732	1332.	3615.	496.	1828.
	540	1.732	1305.	4106.	314.	1616.
FGRUN	540	1.000	1137.	3294.	181.	1318.
	550	1.000	1150.	3294.	210.	1360.
RUN	555	1.000	1443.	1827.	0.	1443.
	560	1.000	578.	578.	0.	578.
FGRUN	565	1.000	1157.	3832.	100.	1257.
	570	1.000	1530.	4790.	302.	1832.
ELBOW	570	1.732	1815.	6051.	523.	2339.
	575	1.732	2135.	6798.	715.	2850.
FGRUN	575	1.000	1777.	5365.	413.	2189.
	580	1.000	1739.	5796.	542.	2281.
FGRUN	585	1.251	1416.	4671.	545.	1961.
	585	1.000	1323.	4441.	466.	1788.
RUN	585	1.000	1323.	4441.	466.	1788.
	590	1.000	819.	3330.	611.	1430.
RUN	590	1.000	819.	3330.	611.	1430.
	595	1.000	1246.	3136.	800.	2045.
RUN	595	1.000	1246.	3136.	800.	2045.
	600	1.000	787.	2243.	441.	1228.
RUN	600	1.000	787.	2243.	441.	1228.
	605	1.000	725.	1951.	75.	801.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S17B, NORM & UPSET

PAGE 510

ASME SECTION III CLASS 2 OR ANSI B31.1.6 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF. FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
RUN	605	1.000	725.	1951.	75.	801.
	610	1.000	778.	2041.	356.	1134.
FGRUN	610	1.000	778.	2041.	356.	1134.
	615	1.000	639.	2042.	749.	1388.
ELBOW	615	1.732	657.	2480.	1297.	1955.
	620	1.732	626.	2467.	1366.	1991.
FGRUN	620	1.000	615.	2032.	788.	1403.
	625	1.000	609.	1934.	577.	1187.
RUN	625	1.000	609.	1934.	577.	1187.
	626	1.000	622.	1817.	356.	980.
RUN	626	1.000	622.	1817.	356.	980.
	630	1.000	643.	1854.	148.	792.
RUN	630	1.000	643.	1854.	148.	792.
	635	1.000	667.	2303.	122.	789.
FGRUN	635	1.000	667.	2303.	122.	789.
	640	1.000	691.	3177.	326.	1016.
FGRUN	650	1.000	709.	3999.	476.	1184.
	655	1.000	736.	5651.	735.	1474.

LTR 125 9

APPENDIX G
LEVEL C SERVICE CONDITIONS
STRESS ANALYSIS RESULTS

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, EMERGENCY

PAGE 502

ASME SECTION III CLASS 2 OR ANSI 331.2.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSITY FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
FGRUN	5	1.000	3380.	7343.	0.	3380.
	10	1.000	2387.	5847.	0.	2387.
RUN	10	1.000	2387.	5847.	0.	2387.
	15	1.000	1875.	4489.	0.	1875.
RUN	15	1.000	1875.	4489.	0.	1875.
	20	1.000	1318.	3398.	0.	1318.
RUN	20	1.000	1318.	3398.	0.	1318.
	25	1.000	1274.	3034.	0.	1274.
RUN	25	1.000	1274.	3034.	0.	1274.
	30	1.000	1701.	3453.	0.	1701.
RUN	30	1.000	1701.	3453.	0.	1701.
	35	1.000	1961.	3843.	0.	1961.
FGRUN	35	1.000	656.	1296.	0.	656.
	40	1.000	699.	1367.	0.	699.
RUN	45	1.000	712.	1484.	0.	712.
	50	1.000	712.	1093.	0.	712.
RUN	50	1.000	712.	1093.	0.	712.
	55	1.000	712.	1098.	0.	712.
FGRUN	60	1.000	756.	1483.	0.	756.
	65	1.000	741.	1492.	0.	741.
RUN	65	1.000	2211.	4419.	0.	2211.
	70	2.847	3538.	9824.	0.	3538.
RUN	70	2.847	3796.	8796.	0.	3796.
	75	1.000	2106.	4466.	0.	2106.
RUN	75	1.000	2106.	4466.	0.	2106.
	80	1.000	1968.	4376.	0.	1968.
FGRUN	80	1.000	1968.	4376.	0.	1968.
	85	1.000	1802.	4265.	0.	1802.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-4H-237-B, INSIDE, S178, EMERGENCY

PAGE 503

ASME SECTION III CLASS 2 OR ANSI 931.1.9 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
FGRUN	85	1.000	602.	1439.	0.	602.
	90	1.000	574.	1415.	0.	574.
FGRUN	90	1.000	574.	1415.	0.	574.
	95	1.000	537.	1384.	0.	537.
FGRUN	95	1.000	1612.	4101.	0.	1612.
	100	1.000	1375.	3878.	0.	1375.
RUN	100	1.000	1375.	3878.	0.	1375.
	105	1.000	1159.	3752.	0.	1159.
RUN	105	1.000	1159.	3752.	0.	1159.
	110	1.000	1406.	4065.	0.	1406.
FGRUN	110	1.000	467.	1371.	0.	467.
	115	1.000	523.	1441.	0.	523.
RUN	120	1.000	1887.	4693.	0.	1887.
	125	1.000	1344.	2743.	0.	1344.
RUN	125	1.000	1344.	2743.	0.	1344.
	130	1.000	712.	712.	0.	712.
FGRUN	135	1.000	808.	2450.	0.	808.
	140	1.000	846.	2579.	0.	846.
FGRUN	140	1.000	2520.	7513.	0.	2520.
	145	1.000	2843.	8567.	0.	2843.
FGRUN	145	1.000	2843.	8667.	0.	2843.
	146	1.000	3007.	9218.	0.	3007.
FGRUN	146	1.000	2749.	13376.	0.	2749.
	147	1.000	2760.	9989.	0.	2760.
RUN	147	1.000	2760.	9989.	0.	2760.
	150	1.000	2799.	9014.	0.	2799.
FGRUN	150	1.000	941.	3054.	0.	941.
	155	1.000	946.	2938.	0.	946.

52

LFR 125 9

36/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LDFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, EMERGENCY

PAGE 504

ASME SECTION III CLASS 2 OR ANSI B31.1.3 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIFY FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
RUN	163	1.000	1779.	3347.	0.	1779.
	165	1.000	1201.	1934.	0.	1201.
RUN	165	1.000	1201.	1934.	0.	1201.
	170	1.000	712.	712.	0.	712.
FGRUN	175	1.000	921.	2100.	0.	921.
	180	1.000	920.	2039.	0.	920.
ELBDW	180	1.953	3679.	3502.	0.	3679.
	185	1.953	2207.	4534.	0.	2207.
FGRUN	185	1.000	1732.	3321.	0.	1732.
	190	1.000	712.	712.	0.	712.
FGRUN	146	1.000	1799.	4377.	0.	1799.
	148	1.000	1733.	4327.	0.	1733.
RUN	148	1.000	1733.	4327.	0.	1733.
	195	1.000	1511.	4759.	0.	1511.
RUN	195	1.000	1511.	4759.	0.	1511.
	196	1.000	1323.	4594.	0.	1323.
FGRUN	196	1.000	1323.	4594.	0.	1323.
	200	1.450	1329.	5054.	0.	1329.
FGRUN	200	1.450	1536.	3891.	0.	1536.
	201	1.000	1420.	3483.	0.	1420.
RUN	201	1.000	1420.	3483.	0.	1420.
	205	1.000	1317.	3187.	0.	1317.
FGRUN	205	1.000	1317.	3187.	0.	1317.
	210	1.000	1258.	2996.	0.	1258.
ELBDW	210	1.953	1511.	4057.	0.	1511.
	215	1.953	1518.	4131.	0.	1518.
FGRUN	215	1.000	1262.	3046.	0.	1262.
	220	1.000	1318.	3423.	0.	1318.

LTR 125 9

06/06/75

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, EMERGENCY

PAGE 505

ASME SECTION III-CLASS 2 OR ANSI B31.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
FGRUN	220	1.000	1336.	3423.	0.	1336.
	225	1.000	1407.	3847.	0.	1407.
FGRUN	225	1.000	1407.	3847.	0.	1407.
	230	1.000	1422.	3971.	0.	1422.
FGRUN	230	1.000	1422.	3971.	0.	1422.
	235	1.000	1433.	4095.	0.	1433.
RUN	235	1.000	1433.	4095.	0.	1433.
	240	1.000	1444.	4574.	0.	1444.
RUN	240	1.000	1444.	4574.	0.	1444.
	245	1.000	1339.	4985.	0.	1339.
RUN	245	1.000	1274.	5323.	0.	1274.
	250	1.000	1339.	4985.	0.	1339.
ELBOW	250	1.953	1345.	7283.	0.	1345.
	255	1.953	1345.	7283.	0.	1345.
FGRUN	255	1.000	378.	1758.	0.	378.
	260	1.000	366.	1717.	0.	366.
FGRUN	270	1.000	401.	1760.	0.	401.
	275	1.000	454.	1859.	0.	454.
ELBOW	275	1.953	1670.	7724.	0.	1670.
	280	1.953	2104.	7562.	0.	2104.
FGRUN	280	1.000	1562.	5358.	0.	1562.
	285	1.000	1594.	4030.	0.	1594.
RUN	285	1.000	1594.	4030.	0.	1594.
	290	1.000	1639.	5858.	0.	1639.
RUN	290	1.000	1754.	5373.	0.	1754.
	295	1.000	1639.	5858.	0.	1639.
REDUCE	295	2.000	4033.	25331.	0.	4033.
	300	2.000	4169.	27775.	0.	4169.

LTR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, EMERGENCY

PAGE 506

ASME SECTION III CLASS 2 OR ANSI B31.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
RUN	300	1.000	6725.	43299.	0.	6725.
	305	1.000	5908.	31391.	0.	5908.
FGRUN	200	1.450	1039.	4144.	0.	1039.
	202	1.000	1057.	3980.	0.	1057.
FGRUN	202	1.000	1057.	3980.	0.	1057.
	310	1.000	1056.	3292.	0.	1056.
RUN	310	1.000	1056.	3292.	0.	1056.
	315	1.000	927.	2607.	0.	927.
RUN	315	1.000	927.	2607.	0.	927.
	320	1.000	716.	2453.	0.	716.
ELBOW	320	1.777	752.	3081.	0.	752.
	325	1.777	704.	2937.	0.	704.
FGRUN	325	1.000	660.	2355.	0.	660.
	330	1.000	657.	1907.	0.	657.
RUN	330	1.000	667.	1937.	0.	667.
	335	1.000	694.	2350.	0.	694.
FGRUN	335	1.000	694.	2300.	0.	694.
	340	1.000	742.	3211.	0.	742.
ELBOW	340	1.777	786.	4078.	0.	786.
	345	1.777	1076.	4320.	0.	1076.
FGRUN	345	1.000	959.	3543.	0.	959.
	350	1.000	1624.	3522.	0.	1624.
RUN	350	1.000	1624.	3522.	0.	1624.
	355	1.000	979.	2570.	0.	979.
FGRUN	355	1.000	979.	2570.	0.	979.
	360	1.000	810.	2037.	0.	810.
RUN	360	1.000	930.	1106.	0.	930.
	370	1.000	608.	608.	0.	608.

LIR 125 9

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S173, EMERGENCY

PAGE 507

ASME SECTION III CLASS 2 OR ANSI 331.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
FGRUN	375	1.000	1075.	2315.	0.	1075.
	380	1.000	1023.	2930.	0.	1023.
RUN	380	1.000	1023.	2930.	0.	1023.
	385	1.000	1018.	3918.	0.	1018.
FGRUN	385	1.000	1018.	3918.	0.	1018.
	390	1.000	1022.	4664.	0.	1022.
ELBOW	390	1.777	1160.	5015.	0.	1160.
	395	1.777	1194.	5235.	0.	1194.
RUN	395	1.000	1047.	4631.	0.	1047.
	400	1.000	1058.	4752.	0.	1058.
BRANCH	70	2.847	1185.	7315.	0.	1185.
	405	1.000	1050.	5037.	0.	1050.
FGRUN	405	1.000	1050.	5037.	0.	1050.
	406	1.000	1109.	4535.	0.	1109.
RUN	406	1.000	1109.	4535.	0.	1109.
	410	1.000	1257.	3540.	0.	1257.
FGRUN	410	1.000	1257.	3540.	0.	1257.
	415	1.000	1377.	3532.	0.	1377.
ELBOW	415	1.732	1616.	4545.	0.	1616.
	420	1.732	1458.	4324.	0.	1458.
FGRUN	420	1.000	1255.	3451.	0.	1255.
	425	1.000	899.	2652.	0.	899.
RUN	425	1.000	1697.	3087.	0.	1697.
	435	1.000	2705.	4319.	0.	2705.
RUN	435	1.000	2705.	4319.	0.	2705.
	440	1.000	2036.	3662.	0.	2036.
RUN	440	1.000	2036.	3662.	0.	2036.
	445	1.000	2036.	3562.	0.	2036.
RUN	445	1.000	1503.	3153.	0.	1503.

LTR 125 9

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
LJFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, EMERGENCY

LTR 125 9

67

MEMBER	NODE	STRESS INTENSIFY FACTOR	SUSTAINED STRESS EQ. 9 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
RUN	450	1.000	1508.	3163.	0.	1508.
	455	1.000	1124.	2762.	0.	1124.
RUN	455	1.000	1124.	2762.	0.	1124.
	450	1.000	887.	2448.	0.	887.
RUN	460	1.000	887.	2448.	0.	887.
	465	1.000	800.	2257.	0.	800.
RUN	455	1.000	800.	2257.	0.	800.
	470	1.000	842.	2304.	0.	842.
FGRUN	470	1.000	842.	2304.	0.	842.
	475	1.000	848.	2335.	0.	848.
ELBOW	475	1.732	928.	2351.	0.	928.
	480	1.732	1001.	2890.	0.	1001.
FGRUN	480	1.000	903.	2357.	0.	903.
	485	1.000	773.	2504.	0.	773.
ELBOW	485	1.732	831.	3211.	0.	831.
	490	1.732	780.	3715.	0.	780.
FGRUN	490	1.000	733.	2992.	0.	733.
	495	1.000	838.	4343.	0.	838.
FGRUN	495	1.000	852.	4343.	0.	852.
	500	1.000	1020.	5878.	0.	1020.
FGRUN	500	1.000	1020.	5878.	0.	1020.
	505	1.251	1039.	6186.	0.	1039.
FGRUN	505	1.251	1114.	7697.	0.	1114.
	510	1.000	1117.	7083.	0.	1117.
RJN	510	1.000	1117.	7083.	0.	1117.
	515	1.000	1147.	5935.	0.	1147.
FGRUN	515	1.000	1147.	5935.	0.	1147.
	520	1.000	1199.	5245.	0.	1199.

06/06/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4"-WH-237-E, INSIDE, S178, EMERGENCY

PAGE 509

ASME SECTION III CLASS 2 OR ANSI B31.1.8 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSIF FACTOR	SUSTAINED STRESS EQ. 8 (PSI)	OCCASIONAL STRESS EQ. 9 (PSI)	EXPANSION STRESS EQ. 10 (PSI)	SUSTAINED PLUS EXPANSION STRESS EQ. 11 (PSI)
ELBOW	520	1.732	1384.	5642.	0.	1384.
	523	1.732	1383.	5344.	0.	1383.
FGRUN	525	1.000	1197.	4735.	0.	1197.
	530	1.000	1150.	2937.	0.	1150.
FGRUN	530	1.000	1150.	2907.	0.	1150.
	535	1.000	1159.	4672.	0.	1159.
ELBOW	535	1.732	1332.	5898.	0.	1332.
	540	1.732	1305.	6903.	0.	1305.
FGRUN	540	1.000	1137.	5450.	0.	1137.
	550	1.000	1150.	5438.	0.	1150.
RUN	555	1.000	1443.	2211.	0.	1443.
	560	1.000	578.	578.	0.	578.
FGRUN	565	1.000	1157.	6533.	0.	1157.
	570	1.000	1530.	8050.	0.	1530.
ELBOW	570	1.732	1815.	12285.	0.	1815.
	575	1.732	2135.	11450.	0.	2135.
FGRUN	575	1.000	1777.	3953.	0.	1777.
	580	1.000	1739.	9852.	0.	1739.
FGRUN	585	1.251	1416.	7925.	0.	1416.
	585	1.000	1323.	7563.	0.	1323.
RUN	585	1.000	1323.	7563.	0.	1323.
	590	1.000	819.	5340.	0.	819.
RUN	590	1.000	819.	5340.	0.	819.
	595	1.000	1246.	5026.	0.	1246.
	600	1.000	787.	3699.	0.	787.
RUN	600	1.000	787.	3699.	0.	787.
	605	1.000	725.	3175.	0.	725.

LTR 125 9

06/06/78

NUPIPE-11M - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 4" WH-237-B, INSIDE, S178, EMERGENCY

PAGE 510

ASME SECTION III CLASS 2 OR ANSI B31.1.3 STRESS SUMMARY

MEMBER	NODE	STRESS INTENSITY FACTOR	SUSTAINED STRESS (PSI)	OCCASIONAL STRESS (PSI)	EXPANSION STRESS (PSI)	SUSTAINED PLUS EXPANSION STRESS (PSI)
RUN	605	1.000	725.	3176.	0.	725.
	610	1.000	778.	3303.	0.	778.
FGRUN	610	1.000	778.	3303.	0.	778.
	615	1.000	839.	3448.	0.	839.
ELBOW	615	1.732	857.	4302.	0.	857.
	620	1.732	828.	4309.	0.	828.
FGRUN	620	1.000	815.	3450.	0.	815.
	625	1.000	809.	3259.	0.	809.
RUN	625	1.000	809.	3259.	0.	809.
	628	1.000	822.	3012.	0.	822.
RUN	628	1.000	822.	3012.	0.	822.
	630	1.000	843.	3085.	0.	843.
RUN	630	1.000	843.	3085.	0.	843.
	635	1.000	867.	3939.	0.	867.
FGRUN	635	1.000	867.	3939.	0.	867.
	640	1.000	891.	3832.	0.	891.
FGRUN	640	1.000	891.	3832.	0.	891.
	650	1.000	709.	7289.	0.	709.
	655	1.000	738.	10964.	0.	738.

LTR 125 9

APPENDIX H
LEVEL D SERVICE CONDITIONS
STRESS ANALYSIS RESULTS

There are no Level D service conditions applicable to this system.

APPENDIX I
COMPONENT SUPPORT ANALYSIS RESULTS

All supports on this system were standard vendor items and do not require analysis.