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LOFT CIS ANALYSIS 1"-SSS-3-E
INSIDE CONTAINMENT PENETRATION S-11C

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DEPARTMENT OF ENERGY

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

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RESEARCH, ENGINEERING AND CONSTRUCTION REPORT ENGINEERING ANALYSIS DIVISION

APPLIED MECHANICS BRANCH

LOFT CIS ANALYSIS

1"-SSS-3-E INSIDE CONTAINMENT PENETRATION S-11C

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LOFT TECHNICAL REPORT
LOFT PROGRAM

FORM EG&G-229
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PSE for PSB Mgr. Seismic P&SB Mgr. PSE RSB Mgr. review		

ABSTRACT

This report describes the stress analysis performed on the 1"-SSS-3-E piping system inside containment penetration S-11C. Deadweight, thermal expansion, and seismic loads were considered. Results of this analysis show that the subject pipe system will meet ASME Boiler and Pressure Vessel Code, Section III, Class 2 Requirements provided that additional supports (S3 and S6) are installed as recommended.

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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 1"-SSS-3-E inside containment penetration S-11C.

*Hereafter referred to as the Code^[1].

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 cognizant engineer.

III. PIPING SYSTEM DESCRIPTION

The sampling system provides a means for collecting and analyzing samples from the LOFT facility. The sampling system vents to an exhaust system which is designed to accommodate radioactive effluents.

The purposes of this analysis were to (1) determine the loads imposed on the containment penetration and (2) assure containment isolation integrity. Thus, not all of the main piping system or branch piping may have been analyzed due to its negligible effect on the two primary purposes of this analysis.

1. STRUCTURAL DESCRIPTION

Figure 1 is a computer 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)	1.315
Thickness (inches)	0.133
Weight (lbs/inch)	2.053 (includes fluid weight)
Material	A312, TP 304L SST
E_{cold} (10^6 psi)	28.16
S (212°F) (psi)	15700
S_y (psi)	25000
α (10^{-6} in./in.°F)	9.34

LOFT CIS ANALYSIS - L-SSS-3-E. INSIDE.
NUPIPE MATHEMATICAL MODEL

==LEGEND==

- / - NODE LOCATION
- - MASSPOINT LOCATION
- ←--- - SPRING HANGER
- - SNUBBER
- ←| - RIGID SUPPORT
- ≡ - ANCHOR
- * - ELASTO JOINT
- ≡ - FLEXIBLE ANCHOR
- - VALVE

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

See Reference 3

Figure 1
PIPING SYSTEM COMPUTER MODEL PLOT

The expansion coefficients and thermal conductivities of SA-312, TP 314L 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 the cognizant engineer.

1. DESIGN CONDITIONS

Class 2 - All Piping

Design Pressure: 150 psi

Design Temperature: 212°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: 15 psi

Operating Temperature: 180°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 condition 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 I. 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 ANALYSES

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 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.

FIGURE 2
SSE - SEISMIC RESPONSE SPECTRA ENVELOPE
1% DAMPING

TABLE IPIPING SYSTEM VALVE DESIGN WEIGHTS
AND CENTERS OF GRAVITY

<u>Valve</u>	<u>Flooded Weight</u>	(Distance from <u>C.G. axis of Pipe</u>)
CV-P-124-49	50 lb.	21 inches

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	1.315	15700	0.086	0.133

Since the actual thickness is 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^[2]. 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.

Support S3, a 3/8" U-bolt should be installed approximately two feet upstream from the valve, CV-P-124-49.

Support S6 should be a rigid beam type support attached approximately six feet upstream from the existing rod hanger designated as S5 in Figure 1. It should be noted that support S6 replaces an existing U-bolt type support. Support S6 was modeled and analyzed using the properties of 1" schedule 40 pipe. Other cross sections could be used provided that directional stiffnesses are at least equal to those used in the model; however, the 1" schedule 40 pipe is recommended.

Supports S3 and S6 were added to provide necessary seismic restraint.

TABLE III

LOADS 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>
Rod	S1-Y	41.	0.	2.	3.	250.
Rod	S2-Y	9.	-4.	3.	5.	250.
U-bolt*	S3-Y	3.	2.	0.	1.	485.
	S3-Z	0.	-6.	9.	18.	
Rod	S4-Y	10.	0.	1.	2.	250.
Rod	S5-Y	14.	0.	1.	3.	250.
Rigid*	S6-X	0.	-2.	2.	4.	1000.
	S6-Y	5.	0.	0.	1.	1000.
	S6-Z	0.	3.	4.	8.	1000.

NOTE:

1. S6-X indicates that this is the load in pounds in the global X direction on support S6.
2. * Indicates support to be added.

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 stated loads and operating conditions given by the cognizant engineer using the techniques described herein. All stresses will be within limits established by Section III of the ASME Boiler and Pressure Vessel Code provided that recommendations made previously in this report are followed.

Design drawings of the recommended support modifications should be forwarded to the Applied Mechanics Branch for approval.

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. American Institute of Steel Construction, Manual of Steel Construction, Seventh Edition, pp 5-6 to 5-24, 1973.
3. Computer model plot based on sketches made at LOFT by Applied Mechanics Branch personnel during March, 1978.

APPENDIX A
BASIC DATA, INPUT PARAMETERS

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
LOFT CIS ANALYSIS - 1M-SSS-3-E, INSIDE, S11C, EMERGENCY

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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

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

CARDTYPE	NCASE	CASES-COMD	AMULT	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

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NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SLIC, EMERGENCY

PAGE 2

SEISMIC RESPONSE SPECTRA - SET 1

X-EARTHQUAKE
 PERIOD ACCELERATION
 (SEC) (G)

0.000	.342
.010	.342
.250	1.460
.800	.637
1.400	.342
2.200	.217
3.000	.186
10.000	.186

Y-EARTHQUAKE
 PERIOD ACCELERATION
 (SEC) (G)

0.000	.228
.010	.228
.250	.973
.800	.425
1.400	.228
2.200	.145
3.000	.124
10.000	.124

Z-EARTHQUAKE
 PERIOD ACCELERATION
 (SEC) (G)

0.000	.342
.010	.342
.250	1.460
.800	.637
1.400	.342
2.200	.217
3.000	.186
10.000	.186

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W PIPING SERVICES FOR THE SLIC LUNAR 1977-78

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NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, S11C, EMERGENCY

PAGE 3

*** INPUT DATA ***

CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
XSECTN	0	1	.132E+01	.133E+00	.205E+01	.282E+02	.150E+03	0.
OPVAL	1	1	.277E+02	.146E-01	0.	0.	.150E+02	0.
CHECK MAGNITUDE OF ENTRIES ON ABOVE OPVAL CARD ****								
ANCHOR	0	5	0.	0.	0.	0.	0.	0.
FGRUN	5	10	.417E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	10	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	10	15	.417E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	15	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	15	20	.417E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	20	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	20	25	.417E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	25	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	25	35	.417E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	35	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	35	40	.150E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	40	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	40	45	0.	.500E+00	0.	.100E+01	.100E+01	0.
MASSPT	0	45	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	45	50	.150E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	50	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	50	55	.583E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	55	.100E+01	.100E+01	.100E+01	0.	0.	0.
VALVE	55	60	.208E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	60	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	60	65	0.	0.	-.583E+00	.100E+01	.100E+01	0.
MASSPT	0	65	.100E+01	.100E+01	.100E+01	0.	0.	0.

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NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, S11C, EMERGENCY

PAGE 4

*** INPUT DATA ***

CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
RUN	65	70	0.	0.	-.117E+01	.100E+01	.100E+01	0.
CWEIGHT	0	70	0.	.400E-02	0.	0.	0.	0.
MASSPT	0	70	.100E+01	.100E-01	.100E+01	0.	0.	0.
RESTRAINT	0	70	0.	.200E+05	0.	0.	0.	0.
VALVE	60	75	.208E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	75	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	75	80	.250E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	80	.100E+01	.100E+01	.100E+01	0.	0.	0.
RESTRAINT	0	80	0.	.200E+05	0.	0.	0.	0.
RUN	80	85	.500E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	85	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	85	90	.100E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	90	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	90	95	.100E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	95	.100E+01	.100E+01	.100E+01	0.	0.	0.
RESTRAINT	0	95	0.	.200E+05	.200E+05	0.	0.	0.
RUN	95	100	.100E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	100	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	100	105	.100E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	105	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	105	110	.500E+00	0.	0.	.100E+01	.100E+01	0.
RESTRAINT	0	110	0.	.200E+05	0.	0.	0.	0.
MASSPT	0	110	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	110	115	.833E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	115	.100E+01	.100E+01	.100E+01	0.	0.	0.

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CARDTYPE	*** INPUT				DATA ***			
	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)
RUN	115	120	.833E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	120	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	120	125	.833E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	125	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	125	130	.833E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	130	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	130	135	.833E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	135	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	135	140	.500E+00	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	140	.100E+01	.100E+01	.100E+01	0.	0.	0.
ELBOW	140	145	.150E+01	0.	0.	.100E+01	.100E+01	0.
MASSPT	0	145	.100E+01	.100E+01	.100E+01	0.	0.	0.
FGRUN	145	150	0.	0.	-.500E+00	.100E+01	.100E+01	0.
MASSPT	0	150	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	150	155	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	155	.100E+01	.100E+01	.100E+01	0.	0.	0.
RESTRAINT	0	155	0.	.200E+05	0.	0.	0.	0.
RUN	155	160	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	160	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	160	165	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	165	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	165	170	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	170	.100E+01	.100E+01	.100E+01	0.	0.	0.
RUN	170	175	0.	0.	-.100E+01	.100E+01	.100E+01	0.
MASSPT	0	175	.100E+01	.100E+01	.100E+01	0.	0.	0.

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 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SLIC, EMERGENCY

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		*** INPUT DATA ***												
CARDTYPE	I1	I2	DELTA(1)	DELTA(2)	DELTA(3)	DELTA(4)	DELTA(5)	DELTA(6)	DELTA(7)	DELTA(8)	DELTA(9)	DELTA(10)	DELTA(11)	DELTA(12)
RUN	175	180	0.	0.	-.100E+01	.100E+01	.100E+01	0.	0.	0.	0.	0.	0.	0.
MASSPT	0	180	.100E+01	.100E+01	.100E+01	0.	0.	0.	0.	0.	0.	0.	0.	0.
RUN	180	185	0.	0.	-.100E+01	.100E+01	.100E+01	0.	0.	0.	0.	0.	0.	0.
MASSPT	0	185	.100E+01	.100E+01	.100E+01	0.	0.	0.	0.	0.	0.	0.	0.	0.
RESTRAINT	0	185	.425E+04	.115E+07	.425E+04	0.	0.	0.	0.	0.	0.	0.	0.	0.
STRESS7	0	0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
9CASES		1	0	3	0	0	0	0	0	0	0	0	0	0
10CASES		0	0	0	0	0	0	0	0	0	0	0	0	0
CKNODES		0	0	0	0	0	0	0	0	0	0	0	0	0
ALLOONE		0	0	0	0	0	0	0	0	0	0	0	0	0

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 analyzed.

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.

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 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SIIC, EMERGENCY

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SUPPORT REACTIONS FOR LOAD CASE NO. 1

DEADWEIGHT

NODE	TYPE	REACTION (LBS OR IN-LBS)	DIRECTION
5	FORCE	-0.	X COORD
5	FORCE	4.	Y COORD
5	FORCE	-0.	Z COORD
5	MOMENT	3.	X COORD
5	MOMENT	1.	Y COORD
5	MOMENT	38.	Z COORD
70	FORCE	41.	X COORD
80	FORCE	9.	Y COORD
95	FORCE	3.	Z COORD
95	FORCE	0.	X COORD
110	FORCE	10.	Y COORD
155	FORCE	14.	Z COORD
185	FORCE	0.	X COORD
185	FORCE	5.	Y COORD
185	FORCE	-0.	Z COORD

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LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SLIC, EMERGENCY

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	-0.	4.	-0.	3.	1.	38.	.000	-.000	.000	-.0000	-.0000	-.0000
	10	0.	-3.	0.	-3.	-1.	-19.	.000	-.000	.000	-.0000	-.0000	-.0001
RUN	10	-0.	3.	-0.	3.	1.	19.	.000	-.000	.000	-.0000	-.0000	-.0001
	15	0.	-3.	0.	-3.	-1.	-4.	.000	-.001	.000	-.0000	-.0000	-.0001
RUN	15	-0.	3.	-0.	3.	1.	4.	.000	-.001	.000	-.0000	-.0000	-.0001
	20	0.	-2.	0.	-3.	-0.	7.	.000	-.001	.000	-.0000	-.0000	-.0001
RUN	20	-0.	2.	-0.	3.	0.	-7.	.000	-.001	.000	-.0000	-.0000	-.0001
	25	0.	-1.	0.	-3.	-0.	13.	.000	-.001	.000	-.0000	-.0000	-.0001
FGRUN	25	-0.	1.	-0.	3.	0.	-13.	.000	-.001	.000	-.0000	-.0000	-.0001
	35	0.	-0.	0.	-3.	-0.	15.	.000	-.001	.000	-.0000	-.0000	-.0000
ELBOW	35	-0.	0.	-0.	3.	0.	-15.	.000	-.001	.000	-.0000	-.0000	-.0000
	40	0.	0.	0.	-3.	-0.	15.	.000	-.002	.000	-.0000	-.0000	.0000
FGRUN	40	-0.	-0.	-0.	3.	0.	-15.	.000	-.002	.000	-.0000	-.0000	.0000
	45	0.	1.	0.	-3.	-0.	15.	-.000	-.002	-.000	-.0000	-.0000	.0000
ELBOW	45	-0.	-1.	-0.	3.	0.	-15.	-.000	-.002	-.000	-.0000	-.0000	.0000
	50	0.	1.	0.	-3.	-0.	14.	-.000	-.001	-.000	-.0000	-.0000	.0001
FGRUN	50	-0.	-1.	-0.	3.	0.	-14.	-.000	-.001	-.000	-.0000	-.0000	.0001
	55	0.	2.	0.	-3.	-0.	5.	-.000	-.001	-.000	-.0001	-.0000	.0001
VALVE	55	-0.	-2.	-0.	3.	0.	-5.	-.000	-.001	-.000	-.0001	-.0000	.0001
	60	0.	2.	0.	-3.	-0.	-0.	-.000	-.001	-.000	-.0001	-.0000	.0001
RUN	60	0.	2.	0.	6.	0.	-0.	-.000	-.001	-.000	-.0001	-.0000	.0001
	65	-0.	-1.	-0.	4.	-0.	0.	-.000	-.001	-.000	-.0001	-.0000	.0001
RUN	65	-0.	1.	-0.	-4.	0.	-0.	-.000	-.001	-.000	-.0001	-.0000	.0001
	70	0.	1.	-0.	0.	-0.	0.	.000	-.002	-.000	-.0001	-.0000	.0001
VALVE	60	-0.	-5.	-0.	-3.	0.	0.	-.000	-.001	-.000	-.0001	-.0000	.0001
	75	0.	5.	0.	3.	-0.	-12.	-.000	-.001	-.000	-.0001	-.0000	.0001
FGRUN	75	-0.	-5.	-0.	-3.	0.	12.	-.000	-.001	-.000	-.0001	-.0000	.0001
	80	0.	5.	0.	3.	-0.	-28.	-.000	-.000	-.000	-.0001	-.0000	.0001

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 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SIIC, EMERGENCY

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MEMBER	END	FX	FORCES (LBS)			MX	MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
			FY	FZ			MY	MZ		DX	DY	DZ	RX	RY	RZ
RUN	80	-0.	3.	-0.	-3.	0.	28.	-.000	-.000	-.000	-.0001	-.0000	.0001		
	85	0.	-2.	0.	3.	-0.	-10.	-.000	-.000	-.000	-.0000	-.0000	.0000		
RUN	85	-0.	2.	-0.	-3.	0.	10.	-.000	-.000	-.000	-.0000	-.0000	.0000		
	90	0.	-0.	0.	3.	0.	7.	-.000	-.000	-.000	-.0000	-.0000	.0000		
RUN	90	-0.	0.	-0.	-3.	-0.	-7.	-.000	-.000	-.000	-.0000	-.0000	.0000		
	95	0.	2.	0.	3.	0.	0.	-.000	-.000	-.000	.0000	-.0000	.0000		
RUN	95	-0.	1.	0.	-3.	-0.	-0.	-.000	-.000	-.000	.0000	-.0000	.0000		
	100	0.	1.	-0.	3.	0.	-1.	-.000	-.000	-.000	.0000	-.0000	.0000		
RUN	100	-0.	-1.	0.	-3.	-0.	1.	-.000	.000	.000	.0000	-.0000	.0000		
	105	0.	3.	-0.	3.	0.	-27.	-.000	.000	.000	.0000	-.0000	-.0001		
RUN	105	-0.	-3.	0.	-3.	-0.	27.	-.000	-.000	.000	.0000	-.0000	-.0001		
	110	0.	4.	-0.	3.	0.	-49.	-.000	-.000	.000	.0001	-.0000	-.0001		
RUN	110	-0.	6.	0.	-3.	-0.	49.	-.000	-.000	.000	.0001	-.0000	-.0001		
	115	0.	-4.	-0.	3.	0.	-1.	-.000	-.003	.000	.0001	-.0000	-.0002		
RUN	115	-0.	4.	0.	-3.	-0.	1.	-.000	-.003	.000	.0001	.0000	-.0002		
	120	0.	-2.	-0.	3.	0.	30.	-.000	-.005	.000	.0001	.0000	-.0002		
RUN	120	-0.	2.	0.	-3.	-0.	-30.	-.000	-.005	.000	.0001	.0000	-.0002		
	125	0.	-1.	-0.	3.	0.	44.	-.000	-.006	.000	.0001	.0000	-.0000		
RUN	125	-0.	1.	0.	-3.	-0.	-44.	-.000	-.006	.000	.0001	.0000	-.0000		
	130	0.	1.	-0.	3.	-0.	41.	-.000	-.006	.000	.0001	.0000	.0001		
RUN	130	-0.	-1.	0.	-3.	0.	-41.	-.000	-.006	.000	.0001	.0000	.0001		
	135	0.	3.	-0.	3.	-0.	20.	-.000	-.004	.000	.0002	.0000	.0003		
FGRUN	135	-0.	-3.	0.	-3.	0.	-20.	-.000	-.004	.000	.0002	.0000	.0003		
	140	0.	4.	-0.	3.	-0.	6.	-.000	-.002	.000	.0002	.0000	.0003		
ELBOW	140	-0.	-4.	-0.	-3.	0.	-6.	-.000	-.002	.000	.0002	.0000	.0003		
	145	0.	4.	-0.	-2.	-0.	0.	-.000	-.002	.000	.0002	.0000	.0003		
FGRUN	145	-0.	-4.	0.	2.	0.	-0.	-.000	-.002	.000	.0002	.0000	.0003		
	150	0.	5.	-0.	-22.	-0.	0.	-.000	-.001	.000	.0001	.0000	.0003		
RUN	150	-0.	-5.	0.	22.	0.	-0.	-.000	-.001	.000	.0001	.0000	.0003		
	155	0.	7.	-0.	-92.	-0.	0.	-.000	-.001	.000	-.0001	-.0000	.0003		
RUN	155	-0.	-7.	0.	-92.	0.	-0.	-.000	-.001	.000	-.0001	-.0000	.0003		
	160	0.	-5.	-0.	-15.	-0.	0.	-.000	-.004	.000	-.0004	-.0000	.0003		

W PIPING BUSINESS PIPING STOCK FORMAT 1455 MC

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MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	160	-0.	5.	0.	15.	0.	-0.	-.000	-.004	.000	-.0004	-.0000	-.0003
	165	0.	-3.	-0.	37.	-0.	0.	-.000	-.009	.000	-.0004	-.0000	-.0003
RUN	165	-0.	3.	0.	-37.	0.	-0.	-.000	-.009	.000	-.0004	-.0000	-.0003
	170	0.	-1.	-0.	65.	-0.	0.	-.000	-.012	.000	-.0001	-.0000	-.0003
RUN	170	-0.	1.	0.	-65.	0.	-0.	-.000	-.012	.000	-.0001	-.0000	-.0003
	175	0.	1.	-0.	68.	-0.	0.	-.000	-.011	.000	-.0002	-.0000	-.0003
RUN	175	-0.	-1.	0.	-68.	0.	-0.	-.000	-.011	.000	.0002	-.0000	-.0003
	180	0.	3.	-0.	46.	-0.	0.	-.000	-.007	.000	.0005	-.0000	-.0003
RUN	180	-0.	-3.	0.	-46.	0.	-0.	-.000	-.007	.000	.0005	-.0000	-.0003
	185	0.	5.	-0.	0.	-0.	0.	-.000	-.000	.000	.0006	-.0000	-.0003

APPENDIX C
WEIGHT ANALYSIS RESULTS

APPENDIX D
THERMAL EXPANSION ANALYSIS RESULTS

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 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, S11C, EMERGENCY

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

NODE	TYPE	REACTION (LBS OR IN-LBS)	DIRECTION
5	FORCE	2.	X COORD
5	FORCE	2.	Y COORD
5	FORCE	2.	Z COORD
5	MOMENT	8.	X COORD
5	MOMENT	-56.	Y COORD
5	MOMENT	53.	Z COORD
70	FORCE	0.	Y COORD
80	FORCE	-4.	Y COORD
95	FORCE	2.	Y COORD
95	FORCE	-6.	Z COORD
110	FORCE	-0.	Y COORD
155	FORCE	0.	Y COORD
185	FORCE	-2.	X COORD
185	FORCE	0.	Y COORD
185	FORCE	3.	Z COORD

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LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, S11C, EMERGENCY

INTERNAL FORCES AND DEFLECTIONS FOR LOAD CASE NO. 2

THERMAL EXPANSION PLUS ANCHOR MOVEMENTS

MEMBER	END	FORCES (LBS)			MX	MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ		MY	MZ		DX	DY	DZ	RX	RY	RZ
FGRUN	5	-2.	-2.	-2.	8.	-56.	53.		-.000	-.000	-.000	-.0000	.0000	-.0000
	10	-2.	-2.	-2.	-8.	44.	-41.		.006	-.000	-.000	-.0000	.0001	-.0001
RUN	10	-2.	-2.	-2.	8.	-44.	41.		.006	-.000	-.000	-.0000	.0001	-.0001
	15	-2.	-2.	-2.	-8.	31.	-29.		.012	-.001	-.001	-.0000	.0002	-.0002
RUN	15	-2.	-2.	-2.	8.	-31.	29.		.012	-.001	-.001	-.0000	.0002	-.0002
	20	-2.	-2.	-2.	-8.	19.	-16.		.018	-.002	-.002	-.0001	.0002	-.0002
RUN	20	-2.	-2.	-2.	8.	-19.	16.		.018	-.002	-.002	-.0001	.0002	-.0002
	25	-2.	-2.	-2.	-8.	7.	-4.		.024	-.003	-.003	-.0001	.0003	-.0002
FGRUN	25	-2.	-2.	-2.	8.	-7.	4.		.024	-.003	-.003	-.0001	.0003	-.0002
	35	-2.	-2.	-2.	-8.	-2.	5.		.029	-.004	-.004	-.0001	.0003	-.0002
ELBOW	35	-2.	-2.	-2.	8.	-2.	-5.		.029	-.004	-.004	-.0001	.0003	-.0002
	40	-2.	-2.	-2.	-4.	-5.	6.		.031	-.002	-.005	-.0001	.0003	-.0002
FGRUN	40	-2.	-2.	-2.	4.	-5.	-8.		.031	-.002	-.005	-.0001	.0003	-.0002
	45	-2.	-2.	-2.	3.	-5.	0.		.031	-.001	-.005	-.0001	.0002	-.0002
ELBOW	45	-2.	-2.	-2.	-3.	5.	-0.		.031	.001	-.005	-.0001	.0002	-.0002
	50	-2.	-2.	-2.	7.	-9.	1.		.034	.003	-.006	-.0001	.0002	-.0002
FGRUN	50	-2.	-2.	-2.	-7.	9.	-1.		.034	.003	-.006	-.0001	.0002	-.0002
	55	-2.	-2.	-2.	7.	-23.	15.		.040	.002	-.007	-.0001	.0002	-.0002
VALVE	55	-2.	-2.	-2.	-7.	23.	-15.		.040	.002	-.007	-.0001	.0002	-.0002
	60	-2.	-2.	-2.	7.	-29.	21.		.043	.001	-.007	-.0001	.0002	-.0002
RUN	60	0.	0.	0.	-6.	-0.	-0.		.043	.001	-.007	-.0001	.0002	-.0002
	65	-0.	0.	-0.	4.	-0.	0.		.042	.001	-.016	-.0001	.0002	-.0002
RUN	65	-0.	0.	-0.	-4.	-0.	0.		.042	-.001	-.016	-.0001	.0002	-.0002
	70	0.	0.	0.	0.	0.	-0.		.039	-.000	-.033	-.0000	.0002	-.0002
VALVE	60	-2.	-3.	-2.	-1.	29.	-21.		.043	.001	-.007	-.0001	.0002	-.0002
	75	-2.	-3.	-2.	1.	-35.	28.		.046	.001	-.008	-.0001	.0002	-.0002
FGRUN	75	-2.	-3.	-2.	-1.	35.	-28.		.046	.001	-.008	-.0001	.0002	-.0002
	80	-2.	-3.	-2.	1.	-42.	36.		.050	.000	-.008	-.0001	.0001	-.0001

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 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SILC, EMERGENCY

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MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	80	2.	-1.	2.	-1.	42.	-36.	.050	.000	-.008	-.0001	.0001	-.0001
	85	-2.	1.	-2.	1.	-57.	27.	.057	-.000	-.009	-.0001	.0000	-.0001
RUN	85	2.	-1.	2.	-1.	57.	-27.	.057	-.000	-.009	-.0001	-.0000	-.0001
	90	-2.	1.	-2.	1.	-87.	10.	.072	-.001	-.007	-.0001	-.0003	.0000
RUN	90	2.	-1.	2.	-1.	87.	-10.	.072	-.001	-.007	-.0001	-.0003	.0000
	95	-2.	1.	-2.	1.	-116.	-8.	.086	-.000	.000	-.0001	-.0008	.0000
RUN	95	2.	0.	-3.	-1.	116.	8.	.086	-.000	.000	-.0001	-.0008	.0000
	100	-2.	-0.	3.	1.	-78.	-4.	.101	.000	.013	-.0000	-.0013	.0000
RUN	100	2.	0.	-3.	-1.	78.	4.	.101	.000	.013	-.0000	-.0013	.0000
	105	-2.	-0.	3.	1.	-39.	-1.	.116	.000	.031	-.0000	-.0016	-.0000
RUN	105	2.	0.	-3.	-1.	39.	1.	.116	.000	.031	-.0000	-.0016	-.0000
	110	-2.	-0.	3.	1.	-20.	1.	.123	.000	.041	-.0000	-.0017	-.0000
RUN	110	2.	0.	-3.	-1.	20.	-1.	.123	.000	.041	-.0000	-.0017	-.0000
	115	-2.	0.	3.	1.	12.	1.	.135	-.000	.058	-.0000	-.0017	-.0000
RUN	115	2.	0.	-3.	-1.	-12.	-1.	.135	-.000	.058	-.0000	-.0017	-.0000
	120	-2.	0.	3.	1.	44.	1.	.147	-.000	.074	-.0000	-.0016	.0000
RUN	120	2.	0.	-3.	-1.	-44.	-1.	.147	-.000	.074	-.0000	-.0016	.0000
	125	-2.	0.	3.	1.	77.	1.	.159	-.000	.089	-.0000	-.0013	.0000
RUN	125	2.	0.	-3.	-1.	-77.	-1.	.159	-.000	.089	-.0000	-.0013	.0000
	130	-2.	0.	3.	1.	109.	0.	.172	.000	.100	-.0000	-.0009	.0000
RUN	130	2.	0.	-3.	-1.	-109.	-0.	.172	.000	.100	-.0000	-.0009	.0000
	135	-2.	0.	3.	1.	141.	0.	.184	.000	.107	-.0000	-.0004	.0000
FGRUN	135	2.	0.	-3.	-1.	-141.	-0.	.184	.000	.107	-.0000	-.0004	.0000
	140	-2.	0.	3.	1.	155.	0.	.189	.000	.109	-.0000	-.0002	.0000
ELBOW	140	2.	0.	-3.	-1.	-155.	-0.	.189	.000	.109	-.0000	-.0002	.0000
	145	-2.	0.	3.	1.	157.	-0.	.191	.000	.107	-.0000	.0003	.0000
FGRUN	145	2.	0.	-3.	-1.	-157.	-0.	.191	.000	.107	-.0000	.0003	.0000
	150	-2.	0.	3.	1.	149.	0.	.189	.000	.101	-.0000	.0005	.0000
RUN	150	2.	0.	-3.	-1.	-149.	-0.	.189	-.000	.101	-.0000	.0005	.0000
	155	-2.	0.	3.	1.	128.	0.	.178	-.000	.087	-.0000	.0012	.0000
RUN	155	2.	0.	-3.	-1.	-128.	-0.	.178	-.000	.087	-.0000	.0012	.0000
	160	-2.	0.	3.	0.	107.	0.	.160	-.000	.072	-.0000	.0018	.0000

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NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SILC, EMERGENCY

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MEMBER	END	FORCES (LBS)			MX	MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ		MY	MZ		DX	DY	DZ	RX	RY	RZ
RUN	160	2.	-0.	-3.	-0.	-107.	-0.		.160	-.000	.072	-.0000	.0018	.0000
	165	-2.	0.	3.	0.	85.	0.		.136	-.000	.058	-.0000	.0023	.0000
RUN	165	2.	-0.	-3.	-0.	-85.	-0.		.136	-.000	.058	-.0000	.0023	.0000
	170	-2.	0.	3.	0.	64.	0.		.106	-.000	.043	.0000	.0026	.0000
RUN	170	2.	-0.	-3.	-0.	-64.	-0.		.106	-.000	.043	.0000	.0026	.0000
	175	-2.	0.	3.	0.	43.	0.		.073	-.000	.028	.0000	.0029	.0000
RUN	175	2.	-0.	-3.	-0.	-43.	-0.		.073	-.000	.028	.0000	.0029	.0000
	180	-2.	0.	3.	0.	21.	0.		.037	-.000	.014	.0000	.0030	.0000
RUN	180	2.	-0.	-3.	-0.	-21.	-0.		.037	-.000	.014	.0000	.0030	.0000
	185	-2.	0.	3.	0.	0.	0.		.000	-.000	-.001	.0000	.0031	.0000

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NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, S11C, EMERGENCY

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SUPPORT REACTIONS FOR LOAD CASE NO. 3

SSE RESPONSE SPECTRUM - 1% DAMPING
 COMBINED RESULT FOR MODE 1 THRU 8 BY RMS SUMMATION

SPECTRA SET = 1

MODE	TYPE	REACTIONS (LBS OR IN-LBS)	DIRECTION
5	FORCE	34.	X COORD
5	FORCE	7.	Y COORD
5	FORCE	20.	Z COORD
5	MOMENT	51.	X COORD
5	MOMENT	340.	Y COORD
5	MOMENT	65.	Z COORD
70	FORCE	3.	Y COORD
80	FORCE	5.	Y COORD
95	FORCE	1.	Y COORD
95	FORCE	18.	Z COORD
110	FORCE	2.	Y COORD
155	FORCE	3.	Y COORD
185	FORCE	4.	X COORD
185	FORCE	1.	Y COORD
185	FORCE	8.	Z COORD

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

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LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SILC, EMERGENCY

INTERNAL FORCES AND DEFLECTIONS FOR LOAD CASE NO. 3

SSE RESPONSE SPECTRUM - 1% DAMPING

COMBINED RESULT FOR MODE 1 THRU 8 BY RMS SUMMATION

SPECTRA SET = 1

MEMBER	END	FORCES (LBS)			MX	MOMENTS (IN-LBS)		M2	DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ		MY			DX	DY	DZ	RX	RY	RZ
FGRUN	5	34.	7.	20.	51.	340.		65.	.000	.000	.000	.0000	.0000	.0000
	10	34.	7.	20.	51.	241.		31.	.000	.000	.002	.0001	.0006	.0001
RUN	10	34.	7.	20.	51.	241.		31.	.000	.000	.002	.0001	.0006	.0001
	15	34.	7.	20.	51.	146.		5.	.000	.001	.006	.0003	.0010	.0001
RUN	15	34.	7.	20.	51.	146.		5.	.000	.001	.006	.0003	.0010	.0001
	20	34.	7.	20.	51.	75.		39.	.000	.001	.011	.0004	.0012	.0001
RUN	20	34.	7.	20.	51.	75.		39.	.000	.001	.011	.0004	.0012	.0001
	25	34.	7.	20.	51.	104.		73.	.000	.002	.017	.0005	.0012	.0000
FGRUN	25	34.	7.	20.	51.	104.		73.	.000	.002	.017	.0005	.0012	.0000
	35	34.	7.	20.	51.	162.		97.	.000	.001	.021	.0006	.0011	.0002
ELBOW	35	34.	7.	20.	51.	162.		97.	.000	.001	.021	.0006	.0011	.0002
	40	34.	7.	20.	21.	190.		56.	.001	.001	.023	.0006	.0010	.0004
FGRUN	40	34.	7.	20.	21.	190.		56.	.001	.001	.023	.0006	.0010	.0004
	45	34.	7.	20.	38.	190.		46.	.002	.001	.025	.0006	.0010	.0004
ELBOW	45	34.	7.	20.	38.	190.		46.	.002	.001	.025	.0006	.0010	.0004
	50	34.	7.	20.	67.	217.		86.	.002	.001	.027	.0004	.0011	.0002
FGRUN	50	34.	7.	19.	67.	217.		86.	.002	.001	.027	.0004	.0011	.0002
	55	34.	7.	19.	67.	319.		49.	.002	.000	.028	.0002	.0014	.0000
VALVE	55	34.	7.	19.	67.	319.		49.	.002	.000	.028	.0002	.0014	.0000
	60	34.	7.	19.	67.	366.		33.	.002	.000	.029	.0002	.0015	.0000
RUN	60	33.	3.	22.	65.	683.		0.	.002	.000	.029	.0002	.0015	.0000
	65	33.	3.	22.	43.	454.		0.	.019	.001	.029	.0000	.0031	.0000
RUN	65	32.	3.	21.	43.	454.		0.	.019	.001	.029	.0000	.0031	.0000
	70	32.	3.	21.	0.	0.		0.	.075	.000	.029	.0001	.0044	.0000
VALVE	60	5.	6.	15.	3.	476.		33.	.002	.000	.029	.0002	.0015	.0000
	75	5.	6.	15.	3.	438.		19.	.002	.000	.030	.0002	.0014	.0000
FGRUN	75	5.	6.	15.	3.	438.		19.	.002	.000	.030	.0002	.0014	.0000
	80	5.	6.	15.	3.	393.		6.	.002	.000	.031	.0002	.0010	.0000
RUN	80	5.	0.	16.	3.	393.		6.	.002	.000	.031	.0002	.0010	.0000
	85	5.	0.	16.	3.	301.		4.	.002	.000	.029	.0002	.0007	.0000

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LTR 121-6

06/26/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SILC, EMERGENCY

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MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	85	5.	0.	16.	3.	301.	4.	.002	.000	.029	.0002	.0007	.0000
	90	5.	0.	16.	3.	119.	2.	.002	.000	.018	.0002	.0013	.0000
RUN	90	5.	0.	16.	3.	119.	2.	.002	.000	.018	.0002	.0013	.0000
	95	5.	0.	16.	3.	112.	4.	.002	.000	.001	.0002	.0014	.0000
RUN	95	5.	1.	4.	3.	112.	5.	.002	.000	.001	.0002	.0014	.0000
	100	5.	1.	4.	3.	92.	5.	.002	.000	.014	.0002	.0011	.0000
RUN	100	5.	1.	4.	3.	92.	5.	.002	.000	.014	.0002	.0011	.0000
	105	5.	1.	4.	3.	94.	12.	.002	.000	.025	.0001	.0007	.0000
RUN	105	5.	1.	3.	3.	94.	12.	.002	.000	.025	.0001	.0007	.0000
	110	5.	1.	3.	3.	98.	16.	.002	.000	.028	.0001	.0005	.0001
RUN	110	5.	1.	2.	3.	98.	16.	.002	.000	.026	.0001	.0005	.0001
	115	5.	1.	2.	3.	102.	3.	.002	.001	.031	.0001	.0002	.0001
RUN	115	5.	1.	2.	3.	102.	3.	.002	.001	.031	.0001	.0002	.0001
	120	5.	1.	2.	3.	95.	8.	.002	.002	.029	.0001	.0004	.0001
RUN	120	5.	1.	3.	3.	95.	8.	.002	.002	.029	.0001	.0004	.0001
	125	5.	1.	3.	3.	78.	14.	.002	.003	.024	.0001	.0007	.0001
RUN	125	5.	0.	4.	3.	78.	14.	.002	.003	.024	.0001	.0007	.0001
	130	5.	0.	4.	3.	59.	14.	.002	.003	.017	.0001	.0009	.0000
RUN	130	5.	1.	4.	3.	59.	14.	.002	.003	.007	.0002	.0010	.0001
	135	5.	1.	4.	3.	59.	7.	.002	.003	.007	.0002	.0010	.0001
FGRUN	135	5.	1.	5.	3.	59.	7.	.002	.003	.007	.0002	.0010	.0001
	140	5.	1.	5.	3.	69.	2.	.002	.003	.003	.0002	.0010	.0001
ELBDH	140	5.	1.	5.	3.	69.	2.	.002	.003	.003	.0002	.0010	.0001
	145	5.	1.	5.	3.	68.	0.	.003	.002	.002	.0002	.0011	.0001
FGRUN	145	5.	1.	5.	3.	68.	0.	.003	.002	.002	.0002	.0011	.0001
	150	5.	1.	5.	7.	54.	0.	.008	.002	.002	.0002	.0011	.0001
RUN	150	5.	2.	5.	7.	54.	0.	.008	.002	.002	.0002	.0011	.0001
	155	5.	2.	5.	26.	54.	0.	.020	.000	.002	.0001	.0010	.0001
RUN	155	4.	1.	5.	26.	54.	0.	.020	.000	.002	.0001	.0010	.0001
	160	4.	1.	5.	12.	84.	0.	.029	.001	.002	.0001	.0007	.0001
RUN	160	2.	1.	6.	12.	84.	0.	.029	.001	.002	.0001	.0007	.0001
	165	2.	1.	6.	9.	106.	0.	.034	.002	.002	.0001	.0002	.0001

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NUPIPE-IIM STOCK FORMAT 1141-10

LTR 121-6

06/26/78

NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, S11C, EMERGENCY

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MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	165	1.	1.	6.	9.	106.	0.	.034	.002	.002	.0001	.0002	.0001
	170	1.	1.	6.	15.	107.	0.	.034	.003	.002	.0000	.0003	.0001
RUN	170	2.	0.	7.	15.	107.	0.	.034	.003	.002	.0000	.0003	.0001
	175	2.	0.	7.	16.	88.	0.	.027	.003	.002	.0001	.0008	.0001
RUN	175	3.	0.	7.	16.	88.	0.	.027	.003	.002	.0001	.0008	.0001
	180	3.	0.	7.	10.	49.	0.	.015	.002	.002	.0001	.0011	.0001
RUN	180	4.	1.	7.	10.	49.	0.	.015	.002	.002	.0001	.0011	.0001
	185	4.	1.	7.	0.	0.	0.	.001	.000	.002	.0001	.0012	.0001

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NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, S11C, EMERGENCY

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SUPPORT REACTIONS FOR LOAD COMBINATION CASE NO. 4
 OBE RESPONSE SPECTRUM - ONE-HALF SSE

NODE	TYPE	REACTIONS (LBS OR IN-LBS)	DIRECTION
5	FORCE	17.	X COORD
5	FORCE	3.	Y COORD
5	FORCE	10.	Z COORD
5	MOMENT	26.	X COORD
5	MOMENT	170.	Y COORD
5	MOMENT	32.	Z COORD
70	FORCE	2.	Y COORD
80	FORCE	3.	Y COORD
95	FORCE	0.	Y COORD
95	FORCE	9.	Z COORD
110	FORCE	1.	Y COORD
155	FORCE	1.	Y COORD
185	FORCE	2.	X COORD
185	FORCE	0.	Y COORD
185	FORCE	4.	Z COORD

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

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LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, S11C, EMERGENCY

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	17.	3.	10.	26.	170.	32.	.000	.000	.000	.0000	.0000	.0000
	10	17.	3.	10.	26.	121.	15.	.000	.000	.001	.0001	.0003	.0000
RUN	10	17.	3.	10.	26.	121.	15.	.000	.000	.001	.0001	.0003	.0000
	15	17.	3.	10.	26.	73.	2.	.000	.000	.003	.0001	.0005	.0001
RUN	15	17.	3.	10.	26.	73.	2.	.000	.000	.003	.0001	.0005	.0001
	20	17.	3.	10.	26.	38.	19.	.000	.001	.006	.0002	.0006	.0000
RUN	20	17.	3.	10.	26.	38.	19.	.000	.001	.006	.0002	.0006	.0000
	25	17.	3.	10.	26.	52.	36.	.000	.001	.009	.0003	.0006	.0000
FGRUN	25	17.	3.	10.	26.	52.	36.	.000	.001	.009	.0003	.0006	.0000
	35	17.	3.	10.	26.	81.	48.	.000	.001	.011	.0003	.0006	.0001
ELBOW	35	17.	3.	10.	26.	81.	48.	.000	.001	.011	.0003	.0006	.0001
	40	17.	3.	10.	11.	95.	28.	.000	.000	.012	.0003	.0005	.0002
FGRUN	40	17.	3.	10.	11.	95.	28.	.000	.000	.012	.0003	.0005	.0002
	45	17.	3.	10.	19.	95.	23.	.001	.000	.013	.0003	.0005	.0002
ELBOW	45	17.	3.	10.	19.	95.	23.	.001	.000	.013	.0003	.0005	.0002
	50	17.	3.	10.	34.	109.	43.	.001	.000	.013	.0002	.0005	.0001
FGRUN	50	17.	3.	10.	34.	109.	43.	.001	.000	.013	.0002	.0005	.0001
	55	17.	3.	10.	34.	160.	25.	.001	.000	.014	.0001	.0007	.0000
VALVE	55	17.	3.	9.	34.	160.	25.	.001	.000	.014	.0001	.0007	.0000
	60	17.	3.	9.	34.	183.	16.	.001	.000	.014	.0001	.0007	.0000
RUN	60	16.	2.	11.	32.	341.	0.	.001	.000	.014	.0001	.0007	.0000
	65	16.	2.	11.	22.	227.	0.	.009	.000	.014	.0000	.0016	.0000
RUN	65	16.	2.	11.	22.	227.	0.	.009	.000	.014	.0000	.0016	.0000
	70	16.	2.	11.	0.	0.	0.	.037	.000	.014	.0000	.0022	.0000
VALVE	60	3.	3.	8.	2.	238.	16.	.001	.000	.014	.0001	.0007	.0000
	75	3.	3.	8.	2.	219.	10.	.001	.000	.015	.0001	.0007	.0000
FGRUN	75	3.	3.	8.	2.	219.	10.	.001	.000	.015	.0001	.0007	.0000
	80	3.	3.	8.	2.	196.	3.	.001	.000	.015	.0001	.0005	.0000
RUN	80	3.	0.	8.	2.	196.	3.	.001	.000	.015	.0001	.0005	.0000
	85	3.	0.	8.	2.	151.	2.	.001	.000	.015	.0001	.0003	.0000

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LTR 121-6

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NUPIPE-IIM - NUCLEAR SERVICES CORPORATION PIPING ANALYSIS PROGRAM - VERSION 1.1
 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SIIC, EMERGENCY

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MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	DX	DY	DZ	RX	RY	RZ
RUN	85	3.	0.	8.	2.	151.	2.	.001	.000	.015	.0001	.0003	.0000
	90	3.	0.	8.	2.	59.	1.	.001	.000	.009	.0001	.0007	.0000
RUN	90	3.	0.	8.	2.	59.	1.	.001	.000	.009	.0001	.0007	.0000
	95	3.	0.	8.	2.	56.	2.	.001	.000	.000	.0001	.0007	.0000
RUN	95	3.	0.	2.	2.	56.	2.	.001	.000	.000	.0001	.0007	.0000
	100	3.	0.	2.	2.	46.	2.	.001	.000	.007	.0001	.0005	.0000
RUN	100	3.	0.	2.	2.	46.	2.	.001	.000	.007	.0001	.0005	.0000
	105	3.	0.	2.	2.	47.	6.	.001	.000	.012	.0001	.0004	.0000
RUN	105	3.	0.	2.	2.	47.	6.	.001	.000	.012	.0001	.0004	.0000
	110	3.	0.	2.	2.	49.	8.	.001	.000	.014	.0001	.0002	.0000
RUN	110	3.	1.	1.	2.	49.	8.	.001	.000	.014	.0001	.0002	.0000
	115	3.	1.	1.	2.	51.	2.	.001	.000	.015	.0001	.0001	.0000
RUN	115	3.	1.	1.	2.	51.	2.	.001	.000	.015	.0001	.0001	.0000
	120	3.	0.	1.	2.	47.	4.	.001	.001	.015	.0001	.0002	.0000
RUN	120	3.	0.	1.	2.	39.	7.	.001	.001	.012	.0001	.0003	.0000
	125	3.	0.	1.	2.	39.	7.	.001	.001	.012	.0001	.0003	.0000
RUN	125	3.	0.	2.	2.	29.	7.	.001	.001	.008	.0001	.0004	.0000
	130	2.	0.	2.	2.	29.	7.	.001	.001	.008	.0001	.0004	.0000
RUN	130	2.	0.	2.	2.	29.	3.	.001	.001	.004	.0001	.0005	.0000
	135	2.	1.	2.	2.	29.	3.	.001	.001	.004	.0001	.0005	.0000
FGRUN	135	2.	1.	2.	2.	35.	1.	.001	.001	.001	.0001	.0005	.0000
	140	2.	1.	2.	1.	34.	0.	.002	.001	.001	.0001	.0005	.0000
ELBOW	140	2.	1.	2.	1.	34.	0.	.002	.001	.001	.0001	.0005	.0000
	145	2.	1.	2.	1.	34.	0.	.002	.001	.001	.0001	.0005	.0000
FGRUN	145	2.	1.	2.	1.	34.	0.	.002	.001	.001	.0001	.0005	.0000
	150	2.	1.	2.	3.	27.	0.	.004	.001	.001	.0001	.0005	.0000
RUN	150	2.	1.	3.	3.	27.	0.	.004	.001	.001	.0001	.0005	.0000
	155	2.	1.	3.	13.	27.	0.	.010	.000	.001	.0001	.0005	.0000
RUN	155	2.	1.	3.	13.	27.	0.	.010	.000	.001	.0001	.0005	.0000
	160	2.	1.	3.	6.	42.	0.	.015	.001	.001	.0000	.0003	.0000
RUN	160	1.	1.	3.	0.	42.	0.	.015	.001	.001	.0000	.0003	.0000
	165	1.	1.	3.	4.	53.	0.	.017	.001	.001	.0000	.0001	.0000

W PIPING ANALYSIS PROGRAM STOCK FORMAT 11/95/85

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 LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SIIC, EMERGENCY

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MEMBER	END	FORCES (LBS)			MOMENTS (IN-LBS)			DEFLECTIONS (IN)			ROTATIONS (RAD)		
		FX	FY	FZ	MX	MY	MZ	UX	UY	UZ	RX	RY	RZ
RUN	165	0.	0.	3.	4.	53.	0.	.017	.001	.001	.0000	.0001	.0000
	170	0.	0.	3.	8.	54.	0.	.017	.001	.001	.0000	.0002	.0000
RUN	170	1.	0.	3.	8.	54.	0.	.017	.001	.001	.0000	.0002	.0000
	175	1.	0.	3.	8.	44.	0.	.013	.001	.001	.0000	.0004	.0000
RUN	175	2.	0.	3.	8.	44.	0.	.013	.001	.001	.0000	.0004	.0000
	180	2.	0.	3.	5.	25.	0.	.008	.001	.001	.0001	.0006	.0000
RUN	180	2.	0.	4.	5.	25.	0.	.008	.001	.001	.0001	.0006	.0000
	185	2.	0.	4.	0.	0.	0.	.000	.000	.001	.0001	.0006	.0000

APPENDIX E
SEISMIC ANALYSES RESULTS

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

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ASME SECTION III CLASS 2 OR ANSI B31.1-E 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	635.	1835.	533.	1168.
	10	1.000	504.	1354.	415.	918.
RUN	10	1.000	504.	1354.	415.	918.
	15	1.000	405.	936.	297.	702.
RUN	15	1.000	405.	936.	297.	702.
	20	1.000	420.	759.	181.	600.
RUN	20	1.000	420.	759.	181.	600.
	25	1.000	462.	930.	77.	538.
FGRUN	25	1.000	462.	930.	77.	538.
	35	1.000	475.	1145.	64.	538.
ELBOW	35	1.308	475.	1145.	84.	558.
	40	1.308	475.	1157.	80.	555.
FGRUN	40	1.000	475.	1157.	61.	536.
	45	1.000	475.	1156.	43.	519.
ELBOW	45	1.308	475.	1156.	57.	532.
	50	1.308	467.	1300.	103.	570.
FGRUN	50	1.000	467.	1300.	79.	545.
	55	1.000	412.	1543.	192.	603.
RUN	60	1.000	414.	2765.	40.	455.
	65	1.000	399.	1960.	27.	426.
RUN	65	1.000	399.	1960.	27.	426.
	70	1.000	371.	371.	0.	371.
FGRUN	75	1.000	458.	1960.	307.	764.
	80	1.000	563.	1909.	381.	944.
RUN	80	1.000	563.	1909.	381.	944.
	85	1.000	443.	1475.	434.	877.
RUN	85	1.000	443.	1475.	434.	877.
	90	1.000	427.	834.	598.	1025.

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LOFT CIS ANALYSIS - 1"-SSS-3-E, INSIDE, SLIC,

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

MEMBER	NUDE	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	90	1.000	427.	834.	598.	1025.
	95	1.000	395.	779.	798.	1193.
RUN	95	1.000	395.	779.	798.	1193.
	100	1.000	396.	713.	533.	929.
RUN	100	1.000	396.	713.	533.	929.
	105	1.000	559.	885.	268.	827.
RUN	105	1.000	559.	885.	268.	827.
	110	1.000	711.	1052.	136.	847.
RUN	110	1.000	711.	1052.	136.	847.
	115	1.000	396.	744.	85.	481.
RUN	115	1.000	396.	744.	85.	481.
	120	1.000	576.	902.	304.	881.
RUN	120	1.000	576.	902.	304.	881.
	125	1.000	672.	943.	524.	1196.
RUN	125	1.000	672.	943.	524.	1196.
	130	1.000	650.	857.	744.	1395.
RUN	130	1.000	650.	857.	744.	1395.
	135	1.000	513.	716.	964.	1477.
FGRUN	135	1.000	513.	716.	964.	1477.
	140	1.000	417.	654.	1063.	1480.
ELBOW	140	1.308	417.	654.	1391.	1808.
	145	1.308	386.	620.	1410.	1796.
FGRUN	145	1.000	386.	620.	1078.	1465.
	150	1.000	523.	711.	1023.	1546.
RUN	150	1.000	523.	711.	1023.	1546.
	155	1.000	1004.	1209.	877.	1881.
RUN	155	1.000	1004.	1209.	877.	1881.
	160	1.000	476.	768.	731.	1207.

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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	160	1.000	476.	768.	731.	1207.
	165	1.000	624.	987.	585.	1209.
RUN	165	1.000	624.	987.	585.	1209.
	170	1.000	814.	1185.	439.	1252.
RUN	170	1.000	814.	1185.	439.	1252.
	175	1.000	835.	1140.	292.	1127.
RUN	175	1.000	835.	1140.	292.	1127.
	180	1.000	687.	860.	146.	833.
RUN	180	1.000	687.	860.	146.	833.
	185	1.000	371.	371.	0.	371.

APPENDIX G
LEVEL C SERVICE CONDITIONS
STRESS ANALYSIS RESULTS

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

MEMBER	MODE	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	635.	3035.	0.	635.
	10	1.000	504.	2205.	0.	504.
RUN	10	1.000	504.	2205.	0.	504.
	15	1.000	405.	1467.	0.	405.
RUN	15	1.000	405.	1467.	0.	405.
	20	1.000	420.	1098.	0.	420.
RUN	20	1.000	420.	1098.	0.	420.
	25	1.000	462.	1398.	0.	462.
FGRUN	25	1.000	462.	1398.	0.	462.
	35	1.000	475.	1816.	0.	475.
ELBOW	35	1.308	475.	1816.	0.	475.
	40	1.308	475.	1838.	0.	475.
FGRUN	40	1.000	475.	1838.	0.	475.
	45	1.000	475.	1837.	0.	475.
ELBOW	45	1.308	475.	1837.	0.	475.
	50	1.308	467.	2133.	0.	467.
FGRUN	50	1.000	467.	2133.	0.	467.
	55	1.000	412.	2674.	0.	412.
RUN	60	1.000	414.	5115.	0.	414.
	65	1.000	399.	3522.	0.	399.
RUN	65	1.000	399.	3522.	0.	399.
	70	1.000	371.	371.	0.	371.
FGRUN	75	1.000	458.	3463.	0.	458.
	80	1.000	563.	3256.	0.	563.
RUN	80	1.000	563.	3256.	0.	563.
	85	1.000	443.	2507.	0.	443.
RUN	85	1.000	443.	2507.	0.	443.
	90	1.000	427.	1241.	0.	427.

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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	90	1.000	427.	1241.	0.	427.
	95	1.000	395.	1164.	0.	395.
RUN	95	1.000	395.	1164.	0.	395.
	100	1.000	396.	1029.	0.	396.
RUN	100	1.000	396.	1029.	0.	396.
	105	1.000	559.	1211.	0.	559.
RUN	105	1.000	559.	1211.	0.	559.
	110	1.000	711.	1394.	0.	711.
RUN	110	1.000	711.	1394.	0.	711.
	115	1.000	396.	1093.	0.	396.
RUN	115	1.000	396.	1093.	0.	396.
	120	1.000	576.	1228.	0.	576.
RUN	120	1.000	576.	1228.	0.	576.
	125	1.000	672.	1213.	0.	672.
RUN	125	1.000	672.	1213.	0.	672.
	130	1.000	650.	1063.	0.	650.
RUN	130	1.000	650.	1063.	0.	650.
	135	1.000	513.	918.	0.	513.
FGRUN	135	1.000	513.	918.	0.	513.
	140	1.000	417.	892.	0.	417.
ELBOW	140	1.308	417.	892.	0.	417.
	145	1.308	386.	855.	0.	386.
FGRUN	145	1.000	386.	855.	0.	386.
	150	1.000	523.	899.	0.	523.
RUN	150	1.000	523.	899.	0.	523.
	155	1.000	1004.	1414.	0.	1004.
RUN	155	1.000	1004.	1414.	0.	1004.
	160	1.000	476.	1059.	0.	476.

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

MEMBER	MODE	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	476.	1059.	0.	476.
	165	1.000	624.	1350.	0.	624.
RUN	165	1.000	624.	1350.	0.	624.
	170	1.000	814.	1557.	0.	814.
RUN	170	1.000	814.	1557.	0.	814.
	175	1.000	835.	1445.	0.	835.
RUN	175	1.000	835.	1445.	0.	835.
	180	1.000	687.	1032.	0.	687.
RUN	180	1.000	687.	1032.	0.	687.
	185	1.000	371.	371.	0.	371.

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

Piping support S6, which is required by this report,
will undergo complete analysis when the design is finalized.