REVISED TEST PROBLEMS
SONGS-1 LONG TERM SERVICE SEISMIC PROGRAM

Prepared for:

Southern California Edison

Prepared by:

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Impell Report No. 01-0310-1398
Revision 0

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1.0 INTRODUCTION

During the April 2-3, 1985 meeting between the Nuclear Regulatory Commission (NRC), Southern California Edison (SCE) and Impell, the NRC staff requested SCE to perform five sample test problems. The test problems were developed by the NRC's consultants to evaluate the proposed Long Term Service (LTS) methodologies for seismic analysis contained in Impell's computer codes. The objective was for the NRC to validate the proposed methodologies for use in SONGS-1 LTS seismic analysis by comparing these results with independent solutions calculated by the NRC's consultants.

The results of the five test problems were submitted to the NRC in "Methodology Test Problems SONGS-1 Long Term Service Seismic Program," Impell Report No. 01-0310-1389, April 15, 1985 [1]. These results were reviewed by the NRC's consultants. From the NRC's review, additional information was requested for Test Problem I and reanalyses of Test Problems II and IV were deemed necessary.

This report contains the revised results for Test Problems I and II along with a detailed description of each change made during the reanalysis, a summary of Impell's results, and the input and output computer listings. Test Problem IV contains a brief history of all the analyses made and a conclusion. No results are presented for Problem IV.

2.1 Soil-Structure Interaction by CLASSI

Test Problem I

This problem involved the generation of floor response spectra for the NRC-provided building model by performing a soil-structure interaction analysis. The input data for this analysis, including properties for the structure, the soil, the input time history, methodology, and results are given in Reference [1].

After reviewing the results, the NRC requested that additional spectra points be generated near the first interaction frequency of the structure to better define the peak spectral acceleration. The request was provided by Mr. Tom Cheng (NRC) on April 26, 1985. Impell decided to obtain a higher level of accuracy for the development of the CLASSI frequency transfer function by providing additional soil impedance values in the reanalysis.

The results reported in Reference [1] were based on the soil impedance curves calculated at eleven frequencies (see Figures I.2 through I.7 Reference [1]). Table I.1 contains the frequencies at which the SASSI impedance curves were originally developed.

In order to rerun CLASSI with more frequency points for the calculation of the transfer functions, additional values had to be interpolated on the original SASSI impedance curves. The number of frequency points was increased by eleven for a total of twenty-two points and the additional frequencies are shown in Table I.1.

After the CLASSI program was rerun, floor response spectra were generated from the new time histories for the same four locations in the structural model:

Elev.	0.0	(Basement Level)
Elev.	83.6	(Node 4)
Elev.	143.8	(Node 7)
Elev.	207.0	(Node 11)

In addition to generating spectral accelerations at the original 25 frequencies called for in the original problem, the floor spectra accelerations

were generated at additional frequencies between 1.5 Hz and 2.0 Hz to capture the peak response. The additional frequency* points are listed below:

1.55, 1.60, 1.65, 1.70, 1.75, 1.80, 1.85, 1.90, 1.95 Hz

Plots of the new response spectra are shown in Figures I.1 through I.4 and the peak spectral accelerations are tabulated below:

Node	Spectral Acceleration(G)	Frequency(Hz)
Base	2.1	4.5
4	4.45	1.85
7	7.19	1.85
11	10.02	1.85

* Frequency points between 1.5 and 2.0 Hz in steps of 0.05 Hz were requested by Mr. Tom Tsai of NCT Engineering.

TABLE I.1

Frequencies for SASSI Soil Impedance Curves Generation

ORIGINAL (Hz)	ADDITIONAL (Hz)
1.22	0.5
2.45	1.00
3.67	1.50
4.89	1.65
6.12	1.85
7.34	2.00
9.79	3.00
12.00	4.20
14.69	5.50
17.00	6.50
20.00	8.50

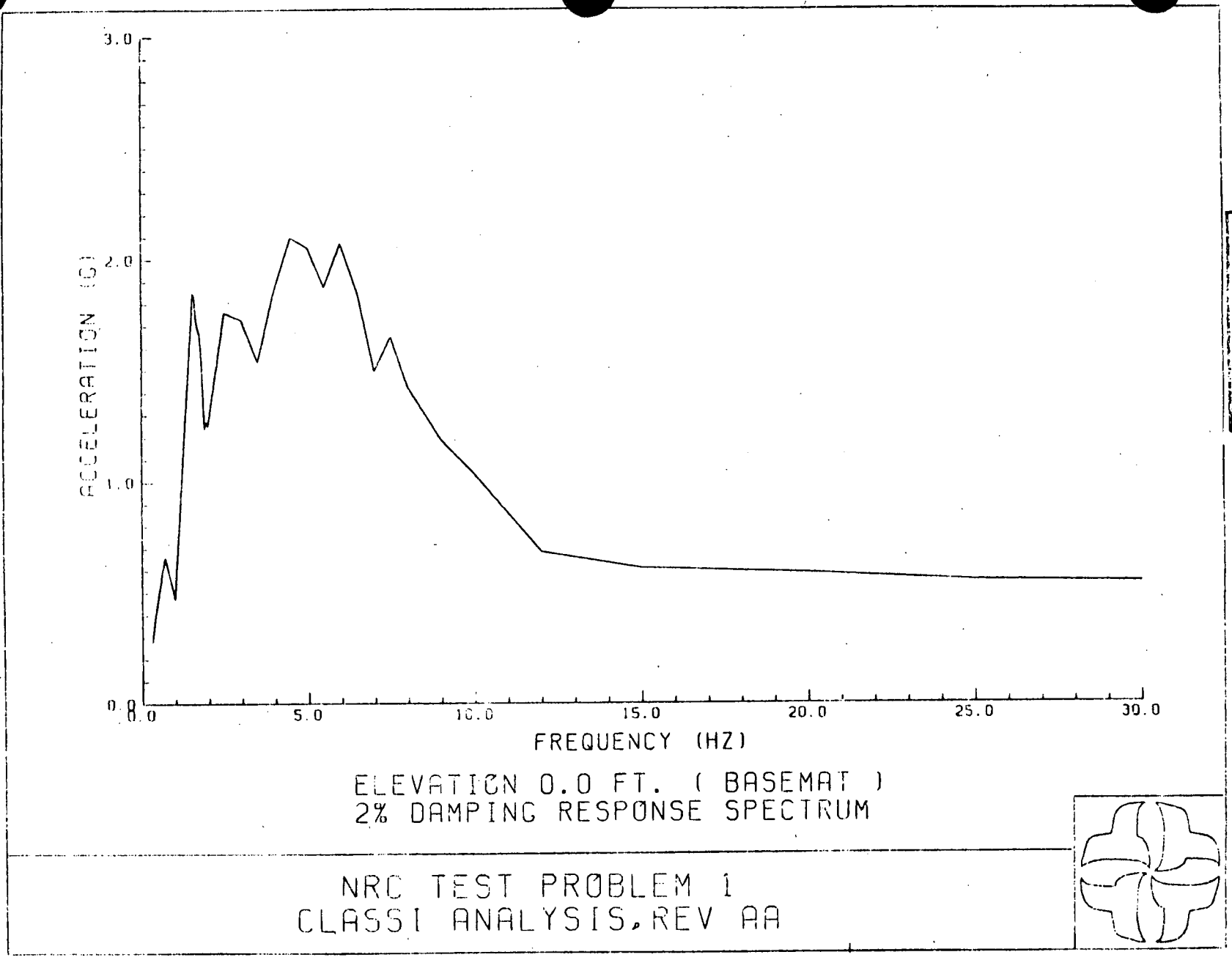

3.0
2.0
1.0
0.0
ACCELERATION (G)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
FREQUENCY (HZ)
ELEVATION 0.0 FT. (BASEMAT)
2% DAMPING RESPONSE SPECTRUM
NRC TEST PROBLEM 1
CLASSI ANALYSIS, REV AA

Figure I.1

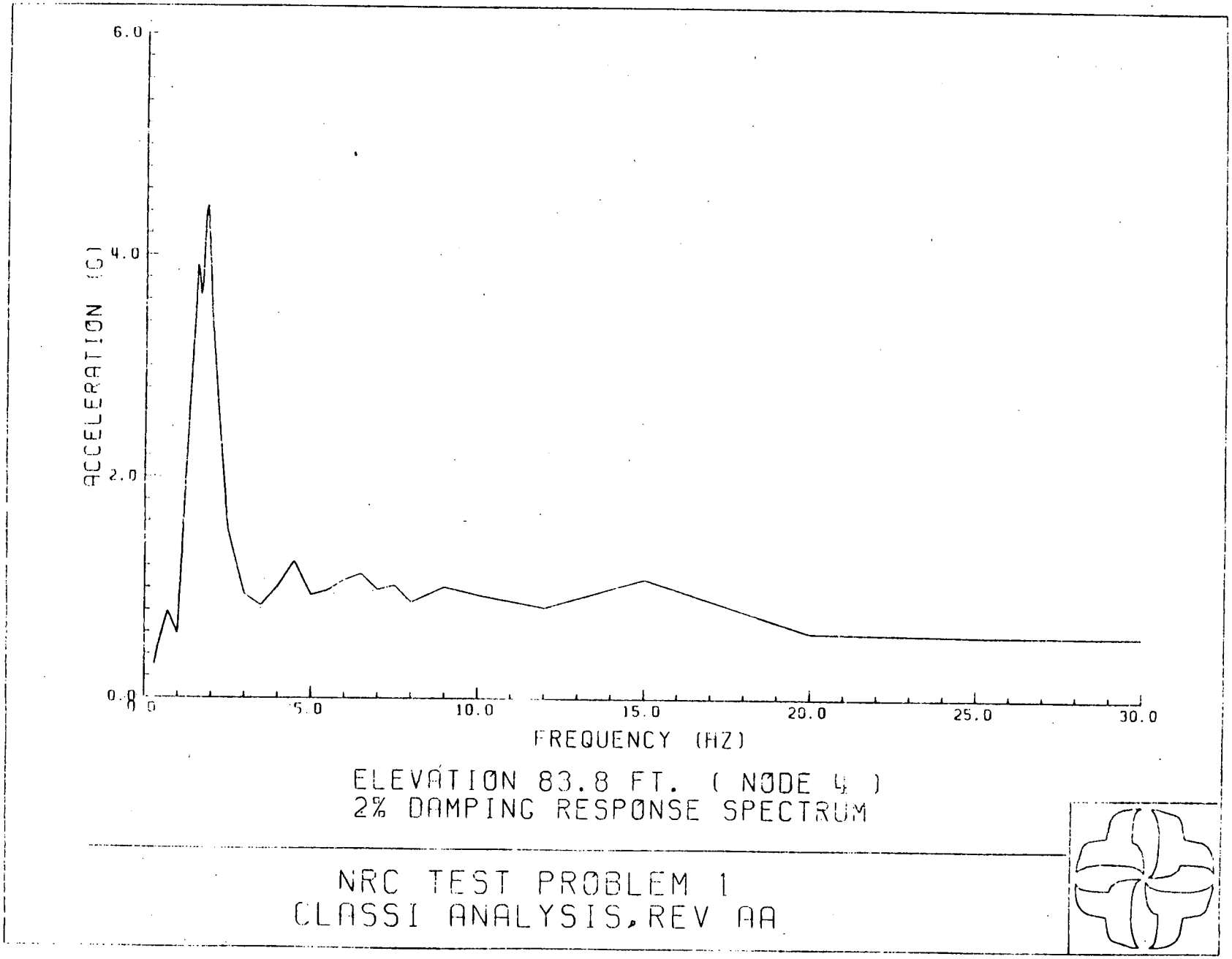

6.0
4.0
2.0
0.0
ACCELERATION (G)
0
5.0
10.0
15.0
20.0
25.0
30.0
FREQUENCY (HZ)
ELEVATION 83.8 FT. (NODE 4)
2% DAMPING RESPONSE SPECTRUM
NRC TEST PROBLEM 1
CLASSI ANALYSIS, REV AA

Figure I.2

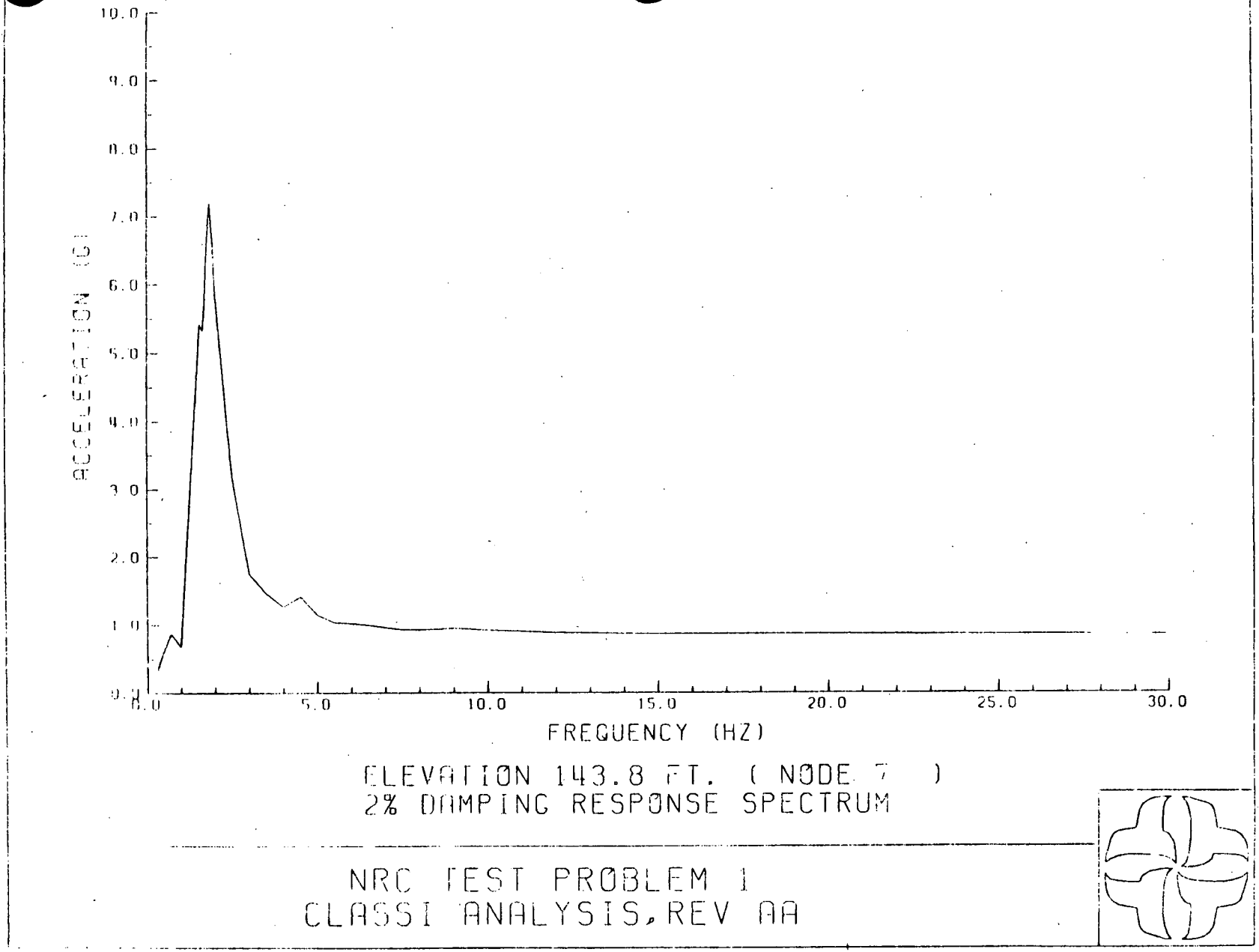

10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ACCELERATION (G)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
FREQUENCY (HZ)
ELEVATION 143.8 FT. (NODE 7)
2% DAMPING RESPONSE SPECTRUM
NRC TEST PROBLEM 1
CLASSI ANALYSIS, REV AA

Figure I.3

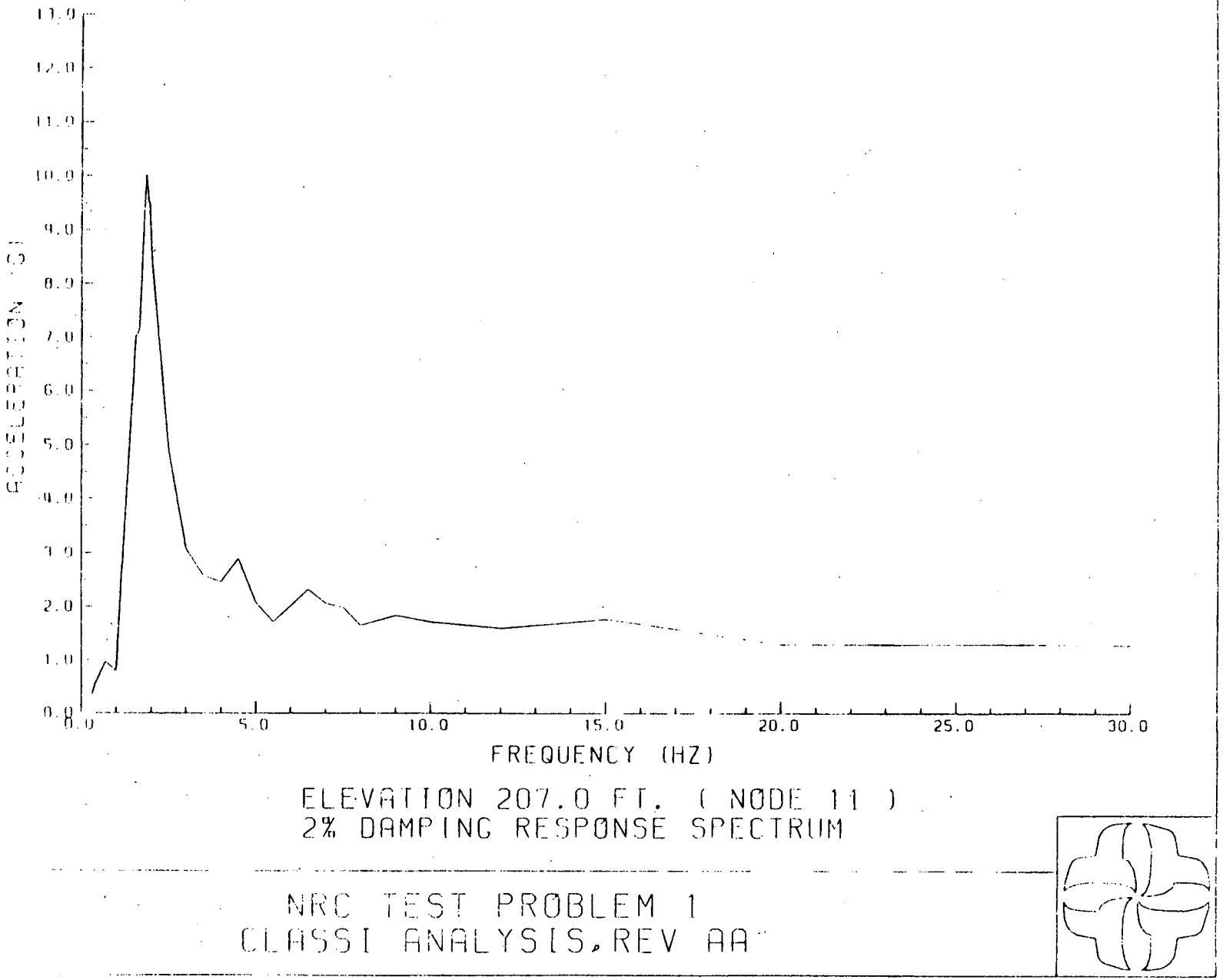
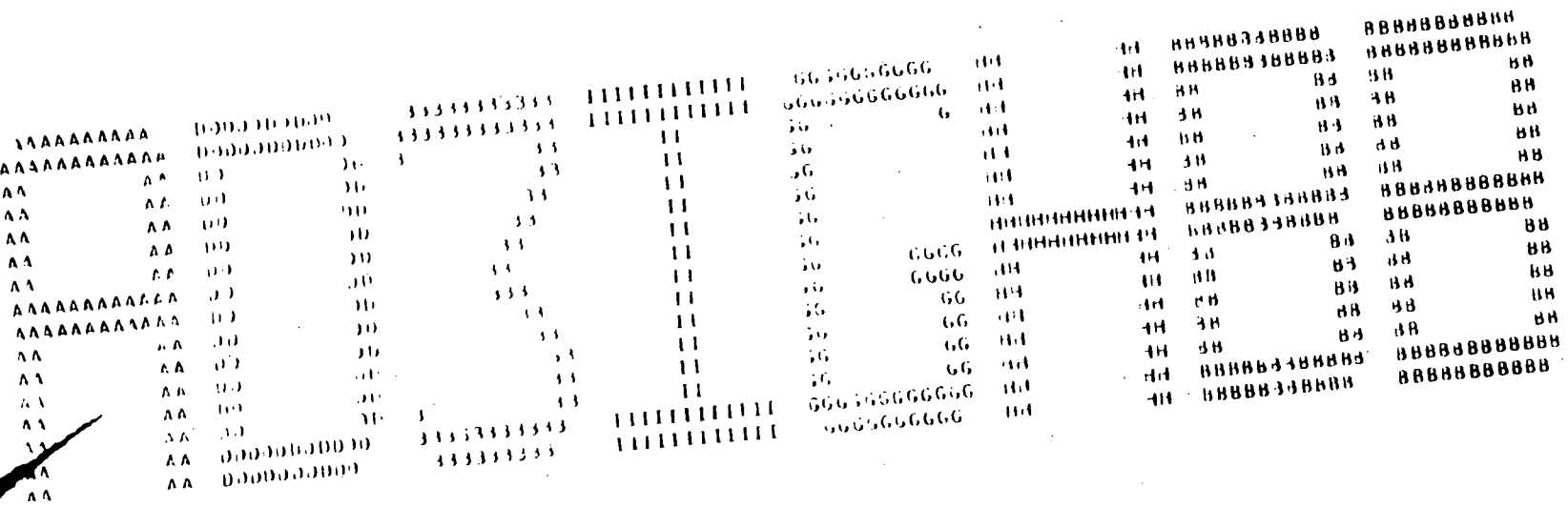

ACCELERATION (G)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
FREQUENCY (HZ)
ELEVATION 207.0 FT. (NODE 11)
2% DAMPING RESPONSE SPECTRUM
NRC TEST PROBLEM 1
CLASSI ANALYSIS, REV AA

Figure I.4



OPERATING SYSTEM = [illegible] 596/567-11. [illegible] PRINTED = 85/04/29. 20.15.43.
JOB ORIGIN = BATCH.
FAMILY = SYSTEM SERVICE CLASS = INSTALLATION CLASS 0.
[illegible] = [illegible] USER NAME = [illegible]
CREATING JSN = [illegible]

ADSIGHBB

DESIGN VERIFICATION	
CLIENT SCE	
JOB NO. 0310-068-1355	
CALC/PROB NO. MBC TEST -1-24	
BY: KH	DATE: 4/20/05
CHKD: SND	DATE: 4/20/05

CLASS I

SSIN

(22 frequencies)

SYSTEM BULLETIN

IMPELL WALNUT CREEK COMPUTER CENTER OPERATIONS HOURS (PACIFIC TIME)

MONDAY	AND	FRIDAY	0600	TO	2130
TUESDAY	TO	THURSDAY	0600	TO	2330
SATURDAY	AND	SUNDAY	0700	TO	1700

OPERATORS WILL NOT BE ON SITE AT ALL OTHER TIMES. EXTENDED OPERATOR COVERAGE MAY BE ARRANGED BY CONTACTING BOB EARL AT (415) 943-4663/4666

THE CYBER SYSTEM WILL BE UNAVAILABLE TO USERS AS FOLLOWS:

MONDAY	2000	TO	2100	SYSTEM BACKUP
TUESDAY	1930	TO	2300	MAINTENANCE + BACKUP
WEDNESDAY	2200	TO	2300	SYSTEM BACKUP
THURSDAY	2200	TO	2300	SYSTEM BACKUP
FRIDAY	2000	TO	2230	SYSTEM BACKUP + TESTING
SATURDAY	1600	TO	1700	SYSTEM BACKUP
SUNDAY	1400	TO	1700	SYSTEM BACKUP

HOLIDAY HOURS.

MONDAY, MAY 27, 1985. NO OPERATORS ON SITE. SYSTEM AVAILABLE TO USERS.

SPECIAL CYBER UPGRADE BLOCK TIME.

THE CYBER WILL BE UNAVAILABLE FOR PRODUCTION USE THURSDAYS FROM 2000 HRS. TO 2400 HRS. BEGINNING APRIL 11,1985 THROUGH MAY 30 1985. COMPUTER SERVICES WILL BE TESTING NOS VERSION 2.3 . ANY USERS WISHING TO TEST THEIR CODES DURRING THIS PERIOD WILL NEED TO CONTACT COMPUTER SERVICES AT (415)943-4666.

GENERAL INFORMATION.

DO NOT RELEASE MAGNETIC TAPES WHEN OPERATORS ARE NOT ON SITE.

USER ADVISORY. MAGNETIC TAPE BACKUPS.

MAGNETIC TAPES ARE SUSCEPTIBLE TO PHYSICAL DAMAGE. BACKUP TAPES ARE RECOMMENDED WHENEVER THE INFORMATION ON THE TAPE WOULD BE EXPENSIVE OR TIME CONSUMING TO RECREATE . PLEASE NOTE THAT IMPELL,CDC, AND UCC DO NOT GIVE REFUNDS FOR JOBS NECESSARY TO RECREATE A TAPE IF NO BACKUP EXISTS.

****

AS PER THE MEMO DISTRIBUTED TO DIVISIONS OVER A WEEK AGO, THE OLD OVERHEAD JOB NUMBERS BEGINNING WITH 0622 AND 0627 WILL NOT BE VALID AFTER 2/15/85. NEW NUMBERS BEGINNING WITH 062500# OR 062400 MUST BE REQUESTED. A CONSOLIDATED LIST OF OLD VERSUS SUGGESTED NEW NUMBERS WAS DISTRIBUTED TO EACH DIVISION TO EXPEDITE THE REVIEW. THESE CHANGES ARE BEING MADE TO SUIT ACCOUNTING DEPT. NUMBER CHANGES.

****

DIAL-IN PHONE NUMBERS

```
**************************
*   IMPELL CORP.         *
*   PROGRAM CLASSI       *
*   SUBPROGRAM SSIN      *
*                        *
*                        *
*   VERSION 0            *
**************************
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SSI OUTPUT

SOIL AND FOUNDATION DATA

REFERENCE SHEAR MODULUS : .342E+04
REFERENCE SHEAR VELOCITY : .100E+04
CHARACTERISTIC LENGTH : .650E+02

NUMBER OF FOUNDATIONS : 1
TOTAL NUMBER OF STRUCTURES : 1

FOUNDATION NUMBER 1
NUMBER OF SUPERSTRUCTURES ON TOP : 1
NUMBER OF DEGREES OF FREEDOM : 6
FOUNDATION DOF'S (ITDOF) : 1 2 3 4 5 6

IMPEDANCE TRANSFORMATION PARAMETERS
IFTIMP : 0
XF : 0.
YF : 0.
ZF : 0.
QF : 0.

MASS MATRIX OF FOUNDATION NUMBER 1, 6 D.O.F.

.621E+03	0.	0.	0.	0.	0.
0.	.621E+03	0.	0.	0.	0.
0.	0.	.621E+03	0.	0.	0.
0.	0.	0.	.140E+07	0.	0.
0.	0.	0.	0.	.140E+07	0.
0.	0.	0.	0.	0.	.279E+07

DATA FOR STRUCTURE NUMBER [illegible] FOUNDATION NUMB

NU[illegible]F STRUCTURAL MODES : 11
NUM[illegible] OF DOF (BASE EXCITATION) : 6
ACTIVE DOF OF BASE EXCITATION ARE : 1 2 3 4 5 6

COORDINATE TRANSFORM DATA
IFTRAN : 0
X : 0.
Y : 0.
Z : 0.
Q : 0.

STRUCTURAL PARAMETERS FOR STRUCTURE NUMBER 1 WERE CALCULATED BY SSI, IFCAL=1

NUMBER OF DOF FOR RESPONSE (NKEEP): 6
DOF FOR RESPONSE (KPCOM): 10 11 19 20 31 32

COORDINATES OF NODAL POINTS IFCNDR (0 => FREE; 1 => FIXED)

Y	Z						
0.00000	0.00000	0.00000	1	1	1	1	1	1
0.00000	0.00000	23.50000	0	1	0	1	0	1
0.00000	0.00000	43.80000	0	1	0	1	0	1
0.00000	0.00000	63.80000	0	1	0	1	0	1
0.00000	0.00000	83.80000	0	1	0	1	0	1
0.00000	0.00000	103.80000	0	1	0	1	0	1
0.00000	0.00000	123.80000	0	1	0	1	0	1
0.00000	0.00000	143.80000	0	1	0	1	0	1
0.00000	0.00000	165.30000	0	1	0	1	0	1
0.00000	0.00000	184.40000	0	1	0	1	0	1
0.00000	0.00000	198.50000	0	1	0	1	0	1
0.00000	0.00000	207.00000	0	1	0	1	0	1
1.00000	0.00000	0.00000	1	1	1	1	1	1

MODE	ENERGY								
1	5.264	33.100	.0500	-.300E+02	0.	-.317E+02	0.	.543E-05	0.
2	15.645	98.300	.0500	.113E-05	0.	.474E-07	0.	.555E+02	0.
3	16.234	102.000	.0500	.138E+02	0.	.865E-10	0.	.875E+02	0.
4	29.125	183.000	.0500	.692E+01	0.	-.146E-08	0.	-.494E+01	0.
5	41.698	262.000	.0500	-.457E+01	0.	.101E+02	0.	.123E-07	0.
6	44.086	277.000	.0500	.243E-08	0.	.822E-12	0.	-.147E+02	0.
7	53.635	337.000	.0500	-.280E+01	0.	-.502E-11	0.	-.856E+01	0.
8	61.911	389.000	.0500	.171E+01	0.	-.527E+01	0.	.750E-10	0.
9	69.073	434.000	.0500	.112E-10	0.	-.247E-10	0.	.124E+02	0.
10	69.551	437.000	.0500	.140E+01	0.	-.444E-12	0.	-.167E+01	0.
11	77.827	489.000	.0500	.840E+00	0.				

SAMEC BUILDING MASS MATRIX ABOUT THE FOUNDATION

.118E+04	0.	0.	0.	.122E+06 0.
0.	0.	0.	0.	0. 0.
0.	0.	.118E+04	0.	0. 0.
0.	0.	0.	0.	0. 0.
.122E+06	0.	0.	0.	.161E+08 0.
0.	0.	0.	0.	0. 0.

PARAMETERS FOR RESPONSE CALCULATION (CARD 5)

LET	:	1
NCOM	:	1
NCASE	:	1
NSTART	:	1
EXTRP	:	0
SSIB	:	18

PARAMETERS FOR REAL TIME ANALYSIS (CARD 6)

DT	=	.500E-02
SCALE	=	.498E+00
NPOINT	=	2001
NFFT	=	4096
FMIN	=	.500E+00
FMAX	=	.200E+02

INPUT TIME HISTORY NUMBER: 1

TIME	ACCEL
.005	-.118E+00
.025	-.847E-01
.045	-.112E-01
.065	.375E-01
.085	.778E-01
.105	.129E+00
.125	.972E-01
.145	.967E-02
.165	-.259E-01
.185	-.872E-02
.205	-.147E-02
.225	-.118E-03
.245	.182E-01
.265	-.116E-02
.285	-.907E-02
.305	.553E-02
.325	.312E-01
.345	.453E-01
.365	.528E-01
.385	.543E-01
.405	.245E-01
.425	-.553E-01
.445	-.797E-01
.465	-.127E-01
.485	.117E-01
.505	-.158E-01
.525	-.172E-01
.545	-.239E-01
.565	-.762E-01
.585	-.104E+00
.605	-.812E-01
.625	.386E-01
.645	.847E-01
.665	.126E-01
.685	.117E+00
.705	.142E-01
.725	-.603E-01
.745	-.245E-01
.765	-.768E-01
.785	-.106E+00
.805	-.578E-01
.825	.533E-01
.845	-.244E-02
.865	-.425E-01
.885	.146E-02
.905	-.573E-01
.925	-.156E+00
.945	-.131E+00
.965	-.275E-01
.985	.179E-02
1.005	.908E-02
1.025	.129E-01
1.045	.713E-02
1.065	-.207E-01
1.085	-.229E-01
1.105	.440E-01
1.125	.807E-01

TIME	ACCEL
.010	-.111E+00
.030	-.678E-01
.050	.172E-02
.070	.489E-01
.090	.902E-01
.110	.127E+00
.130	.758E-01
.150	-.618E-02
.170	-.252E-01
.190	-.678E-03
.210	-.673E-02
.230	.817E-02
.250	.141E-01
.270	-.454E-02
.290	-.802E-02
.310	.128E-01
.330	.356E-01
.350	.488E-01
.370	.528E-01
.390	.528E-01
.410	.678E-02
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.470	.169E-02
.490	.482E-02
.510	-.199E-01
.530	-.147E-01
.550	-.389E-01
.570	-.106E+00
.590	-.997E-01
.610	-.633E-01
.630	.763E-01
.650	.558E-01
.670	.391E-01
.690	.111E+00
.710	-.191E-01
.730	-.523E-01
.750	-.322E-01
.770	-.857E-01
.790	-.109E+00
.810	-.248E-01
.830	.648E-01
.850	-.283E-01
.870	-.288E-01
.890	-.256E-02
.910	-.827E-01
.930	-.166E+00
.950	-.101E+00
.970	-.157E-01
.990	.733E-02
1.010	.992E-02
1.030	.111E-01
1.050	.101E-02
1.070	-.280E-01
1.090	-.199E-01
1.110	.578E-01
1.130	.733E-01

TIME	ACCEL
.015	-.105E+00
.035	-.473E-01
.055	.131E-01
.075	.588E-01
.095	.104E+00
.115	.123E+00
.135	.538E-01
.155	-.168E-01
.175	-.233E-01
.195	.390E-02
.215	-.932E-02
.235	.157E-01
.255	.832E-02
.275	-.703E-02
.295	-.528E-02
.315	.200E-01
.335	.383E-01
.355	.528E-01
.375	.528E-01
.395	.485E-01
.415	-.138E-01
.435	-.827E-01
.455	-.495E-01
.475	.107E-01
.495	-.357E-02
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.535	-.133E-01
.555	-.598E-01
.575	-.108E+00
.595	-.962E-01
.615	-.368E-01
.635	.102E+00
.655	.233E-01
.675	.748E-01
.695	.857E-01
.715	-.436E-01
.735	-.384E-01
.755	-.461E-01
.775	-.937E-01
.795	-.104E+00
.815	.112E-01
.835	.496E-01
.855	-.411E-01
.875	-.137E-01
.895	-.140E-01
.915	-.110E+00
.935	-.156E+00
.955	-.718E-01
.975	-.802E-02
.995	.109E-01
1.015	.109E-01
1.035	.135E-01
1.055	-.543E-02
1.075	-.325E-01
1.095	.523E-02
1.115	.703E-01
1.135	.643E-01

TIME	ACCEL
.020	-.967E-01
.040	-.276E-01
.060	.252E-01
.080	.673E-01
.100	.117E+00
.120	.113E+00
.140	.305E-01
.160	-.229E-01
.180	-.173E-01
.200	.345E-02
.220	-.703E-02
.240	.192E-01
.260	.318E-02
.280	-.872E-02
.300	-.653E-03
.320	.263E-01
.340	.415E-01
.360	.533E-01
.380	.538E-01
.400	.394E-01
.420	-.353E-01
.440	-.852E-01
.460	-.306E-01
.480	.150E-01
.500	-.116E-01
.520	-.196E-01
.540	-.156E-01
.560	-.797E-01
.580	-.108E+00
.600	-.907E-01
.620	-.177E-02
.640	.107E+00
.660	.648E-02
.680	.102E+00
.700	.523E-01
.720	-.583E-01
.740	-.271E-01
.760	-.628E-01
.780	-.992E-01
.800	-.882E-01
.820	.417E-01
.840	.251E-01
.860	-.481E-01
.880	-.239E-02
.900	-.317E-01
.920	-.136E+00
.940	-.154E+00
.960	-.460E-01
.980	-.548E-02
1.000	.131E-01
1.020	.114E-01
1.040	.118E-01
1.060	-.129E-01
1.080	-.280E-01
1.100	.226E-01
1.120	.787E-01
1.140	.538E-01

1.205	.714E-02
1.225	-.102E-01
1.245	.149E-01
1.265	-.480E-02
1.285	-.211E-01
1.305	-.344E-01
1.325	-.423E-01
1.345	-.778E-01
1.365	-.108E+00
1.385	-.111E+00
1.405	-.802E-01
1.425	-.683E-01
1.445	-.603E-02
1.465	.101E+00
1.485	.130E+00
1.505	.812E-01
1.525	.628E-01
1.545	.558E-01
1.565	.175E-02
1.585	-.897E-02
1.605	-.391E-01
1.625	-.149E-01
1.645	-.613E-01
1.665	-.152E+00
1.685	-.334E-01
1.705	-.942E-01
1.725	-.982E-01
1.745	.321E-01
1.765	.166E-01
1.785	-.748E-02
1.805	.156E-01
1.825	.100E+00
1.845	.291E-01
1.865	.392E-01
1.885	.145E+00
1.905	.102E+00
1.925	-.568E-02
1.945	-.291E-01
1.965	.453E-02
1.985	-.320E-01
2.005	-.376E-01
2.025	-.872E-02
2.045	.168E-01
2.065	.792E-02
2.085	-.738E-02
2.105	.322E-01
2.125	.311E-01
2.145	-.330E-01
2.165	-.508E-01
2.185	-.673E-02
2.205	-.100E-01
2.225	.161E-02
2.245	.114E-01
2.265	.226E-02
2.285	-.297E-01
2.305	-.349E-01
2.325	-.270E-01
2.345	-.367E-02
2.365	-.230E-01
2.385	-.395E-01
2.405	-.782E-01
2.425	-.143E+00
2.445	-.137E+00

1.210	-.713
1.230	.613E-02
1.250	.126E-01
1.270	-.872E-02
1.290	-.253E-01
1.310	-.333E-01
1.330	-.618E-01
1.350	-.832E-01
1.370	-.116E+00
1.390	-.101E+00
1.410	-.782E-01
1.430	-.508E-01
1.450	.214E-01
1.470	.120E+00
1.490	.116E+00
1.510	.683E-01
1.530	.543E-01
1.550	.446E-01
1.570	-.932E-02
1.590	-.122E-01
1.610	-.463E-01
1.630	-.942E-02
1.650	-.111E+00
1.670	-.120E+00
1.690	-.335E-01
1.710	-.104E+00
1.730	-.603E-01
1.750	.396E-01
1.770	.105E-01
1.790	-.155E-01
1.810	.355E-01
1.830	.987E-01
1.850	.113E-01
1.870	.703E-01
1.890	.155E+00
1.910	.907E-01
1.930	-.292E-01
1.950	-.215E-01
1.970	.134E-02
1.990	-.382E-01
2.010	-.355E-01
2.030	.277E-02
2.050	.191E-01
2.070	.648E-03
2.090	-.428E-02
2.110	.325E-01
2.130	.119E-01
2.150	-.388E-01
2.170	-.508E-01
2.190	.102E-01
2.210	-.276E-02
2.230	-.145E-01
2.250	.583E-03
2.270	-.174E-02
2.290	-.359E-01
2.310	-.354E-01
2.330	-.147E-01
2.350	-.280E-02
2.370	-.288E-01
2.390	-.414E-01
2.410	-.872E-01
2.430	-.158E+00
2.450	-.157E+00

1.235	.847E-02
1.255	.892E-02
1.275	-.121E-01
1.295	-.281E-01
1.315	-.349E-01
1.335	-.628E-01
1.355	-.110E+00
1.375	-.118E+00
1.395	-.962E-01
1.415	-.733E-01
1.435	-.480E-01
1.455	.623E-01
1.475	.129E+00
1.495	.106E+00
1.515	.598E-01
1.535	.638E-01
1.555	.244E-01
1.575	-.162E-01
1.595	-.174E-01
1.615	-.445E-01
1.635	-.399E-02
1.655	-.126E+00
1.675	-.802E-01
1.695	-.435E-01
1.715	-.114E+00
1.735	-.239E-01
1.755	.320E-01
1.775	.528E-02
1.795	-.183E-01
1.815	.643E-01
1.835	.787E-01
1.855	.140E-01
1.875	.104E+00
1.895	.154E+00
1.915	.613E-01
1.935	-.341E-01
1.955	-.215E-02
1.975	-.733E-02
1.995	-.426E-01
2.015	-.282E-01
2.035	.708E-02
2.055	.236E-01
2.075	-.548E-02
2.095	.231E-02
2.115	.359E-01
2.135	-.417E-02
2.155	-.573E-01
2.175	-.448E-01
2.195	.229E-01
2.215	-.613E-02
2.235	.136E-01
2.255	.608E-02
2.275	-.115E-01
2.295	-.377E-01
2.315	-.312E-01
2.335	-.149E-01
2.355	-.253E-01
2.375	-.286E-01
2.395	-.543E-01
2.415	-.101E+00
2.435	-.170E+00
2.455	-.121E+00

1.240	.110E-02
1.260	-.165E-01
1.280	-.293E-01
1.300	-.383E-01
1.320	-.693E-01
1.340	-.104E+00
1.360	-.128E+00
1.380	-.942E-01
1.400	-.693E-01
1.420	-.315E-01
1.440	.802E-01
1.460	.148E+00
1.480	.942E-01
1.500	.583E-01
1.520	.638E-01
1.540	.142E-01
1.560	-.227E-02
1.580	-.271E-01
1.600	-.327E-01
1.620	-.221E-01
1.640	-.158E+00
1.660	-.472E-01
1.680	-.588E-01
1.700	-.114E+00
1.720	.992E-02
1.740	.245E-01
1.760	.188E-02
1.780	-.125E-01
1.800	.887E-01
1.820	.533E-01
1.840	.183E-01
1.860	.122E+00
1.880	.147E+00
1.900	.249E-01
1.920	-.334E-01
1.940	.220E-02
1.960	-.250E-01
1.980	-.447E-01
2.000	-.182E-01
2.020	.120E-01
2.040	.159E-01
2.060	-.528E-02
2.080	.987E-02
2.100	.371E-01
2.120	-.208E-01
2.140	-.513E-01
2.160	-.214E-01
2.180	.282E-01
2.200	-.768E-02
2.220	.199E-01
2.240	.265E-02
2.260	-.167E-01
2.280	-.381E-01
2.300	-.298E-01
2.320	-.151E-01
2.340	-.188E-01
2.360	-.548E-01
2.380	-.678E-01
2.400	-.121E+00
2.420	-.173E+00
2.440	-.113E+00
2.460	

2.525	-.728E-03
2.545	.104E+00
2.555	.397E-01
2.585	.501E-01
2.605	-.623E-01
2.625	-.778E-01
2.645	-.977E-01
2.665	-.151E+00
2.685	.444E-01
2.705	.139E+00
2.725	.153E+00
2.745	.204E+00
2.765	.523E-01
2.785	-.343E-01
2.805	-.523E-01
2.825	.225E-01
2.845	-.110E+00
2.865	-.142E+00
2.885	-.125E+00
2.905	-.173E+00
2.925	-.205E+00
2.945	-.902E-01
2.955	-.372E-01
2.985	-.231E-01
3.005	.295E-01
3.025	.749E-01
3.045	.842E-01
3.065	.379E-01
3.085	.266E-01
3.105	.157E+00
3.125	.233E+00
3.145	.332E+00
3.165	.384E+00
3.185	.325E+00
3.205	.643E-01
3.225	-.491E-01
3.245	-.271E-01
3.255	.152E-01
3.285	.907E-01
3.305	.145E+00
3.325	.186E+00
3.345	.141E+00
3.365	.967E-01
3.385	.857E-01
3.405	.122E+00
3.425	.116E+00
3.445	.148E+00
3.465	.183E+00
3.485	.134E+00
3.505	.683E-01
3.525	.792E-01
3.545	.115E+00
3.565	.732E-01
3.585	.140E+00
3.605	.133E+00
3.625	.207E+00
3.645	.190E+00
3.665	-.446E-01
3.685	-.953E-01
3.705	-.243E+00
3.725	-.338E+00
3.745	-.201E+00
3.765	-.912E-01

2.530	.526E-01
2.550	.117E+00
2.570	.862E-01
2.590	.441E-01
2.610	-.693E-01
2.630	-.538E-01
2.650	-.130E+00
2.670	-.115E+00
2.690	.693E-01
2.710	.113E+00
2.730	.298E+00
2.750	.145E+00
2.770	.121E-01
2.790	-.503E-01
2.810	-.285E-01
2.830	-.180E-01
2.850	-.140E+00
2.870	-.122E+00
2.890	-.124E+00
2.910	-.151E+00
2.930	-.151E+00
2.950	-.578E-01
2.970	-.344E-01
2.990	-.159E-01
3.010	.294E-01
3.030	.136E+00
3.050	.802E-01
3.070	.236E-01
3.090	.352E-01
3.110	.155E+00
3.130	.325E+00
3.150	.352E+00
3.170	.398E+00
3.190	.292E+00
3.210	.872E-01
3.230	-.523E-01
3.250	-.470E-01
3.270	.454E-01
3.290	.107E+00
3.310	.159E+00
3.330	.156E+00
3.350	.126E+00
3.370	.822E-01
3.390	.912E-01
3.410	.139E+00
3.430	.125E+00
3.450	.158E+00
4.470	.179E+00
3.490	.199E+00
3.510	.553E-01
3.530	.847E-01
3.550	.121E+00
3.570	.917E-01
3.590	.158E+00
3.610	.159E+00
3.630	.153E+00
3.650	.299E-01
3.670	-.417E-01
3.690	-.648E-01
3.710	-.254E+00
3.730	-.294E+00
3.750	-.206E+00
3.770	-.543E-01

2.555	.108E+00
2.575	.892E-01
2.595	.170E-01
2.615	-.688E-01
2.635	-.503E-01
2.655	-.154E+00
2.675	-.548E-01
2.695	.774E-01
2.715	.120E+00
2.735	.196E+00
2.755	.131E+00
2.775	-.145E-01
2.795	-.578E-01
2.815	-.481E-02
2.835	-.280E-01
2.855	-.150E+00
2.875	-.103E+00
2.895	-.137E+00
2.915	-.168E+00
2.935	-.160E+00
2.955	-.598E-01
2.975	-.206E-01
2.995	-.159E-01
3.015	.453E-01
3.035	.887E-01
3.055	.847E-01
3.075	.129E-01
3.095	.558E-01
3.115	.178E+00
3.135	.298E+00
3.155	.409E+00
3.175	.409E+00
3.195	.251E+00
3.215	.480E-01
3.235	-.296E-01
3.255	.151E-01
3.275	.638E-01
3.295	.136E+00
3.315	.177E+00
3.335	.157E+00
3.355	.121E+00
3.375	.688E-01
3.395	.997E-01
3.415	.108E+00
3.435	.122E+00
3.455	.165E+00
3.475	.173E+00
3.495	.787E-01
3.515	.588E-01
3.535	.952E-01
3.555	.827E-01
3.575	.101E+00
3.595	.168E+00
3.615	.172E+00
3.635	.187E+00
3.655	-.177E-01
3.675	-.327E-01
3.695	-.382E-01
3.715	-.282E+00
3.735	-.250E+00
3.755	-.758E-01
3.775	-.392E-01

2.560	.101E+00
2.580	.548E-01
2.600	-.723E-02
2.620	-.782E-01
2.640	-.588E-01
2.660	-.179E+00
2.680	.147E-02
2.700	.748E-01
2.720	.142E+00
2.740	.199E+00
2.760	.977E-01
2.780	-.236E-01
2.800	-.563E-01
2.820	.135E-01
2.840	-.643E-01
2.860	-.157E+00
2.880	-.158E+00
2.900	-.145E+00
2.920	-.188E+00
2.940	-.130E+00
2.960	-.429E-01
2.980	-.382E-01
3.000	-.145E-01
3.020	.643E-01
3.040	.832E-01
3.060	.583E-01
3.080	.381E-01
3.100	.768E-01
3.120	.211E+00
3.140	.305E+00
3.160	.386E+00
3.180	.319E+00
3.200	.222E+00
3.220	-.129E-01
3.240	-.178E-01
3.260	-.415E-02
3.280	.947E-01
3.300	.165E+00
3.320	.180E+00
3.340	.158E+00
3.360	.110E+00
3.380	.962E-01
3.400	.102E+00
3.420	.113E+00
3.440	.130E+00
3.460	.180E+00
3.480	.148E+00
3.500	.538E-01
3.520	.693E-01
3.540	.106E+00
3.560	.947E-01
3.580	.113E+00
3.600	.174E+00
3.620	.185E+00
3.640	.164E+00
3.660	-.441E-01
3.680	-.451E-01
3.700	-.137E+00
3.720	-.307E+00
3.740	-.216E+00
3.760	-.111E+00
3.780	-.548E-02

3.845	-.322E-01
[illegible].865	-.240E+00
[illegible].885	-.132E+00
[illegible].905	-.144E-01
3.925	.157E-03
3.945	.437E-01
3.965	.132E+00
3.985	.107E+00
4.005	.306E-01
4.025	-.155E-01
4.045	-.127E+00
4.055	-.100E+00
4.085	-.523E-01
4.105	.997E-01
4.125	.125E+00
4.145	.103E+00
4.165	-.982E-02
4.185	-.678E-01
4.205	-.867E-01
4.225	-.447E-01
4.245	.648E-01
4.265	.120E+00
4.285	.713E-01
4.305	-.837E-01
4.325	-.136E+00
4.345	-.982E-01
4.355	-.763E-01
4.385	-.289E-02
4.405	.115E+00
4.425	.118E+00
4.445	.151E+00
4.455	.198E+00
4.485	.106E+00
4.505	-.115E+00
4.525	-.136E+00
4.545	-.144E+00
4.565	-.156E+00
4.585	-.125E+00
4.605	.857E-02
4.625	.146E+00
4.645	.329E+00
4.655	.346E+00
4.685	.498E+00
4.705	.462E+00
4.725	.351E+00
4.745	.264E+00
4.765	.206E+00
4.785	.768E-02
4.805	-.105E+00
4.825	-.518E-01
4.845	-.278E+00
4.865	-.382E+00
4.885	-.248E+00
4.905	-.263E-01
4.925	-.737E-01
4.945	-.753E-01
4.955	-.129E+00
4.935	-.211E+00
5.005	-.277E+00
5.025	-.223E+00
5.045	-.137E+00
5.065	-.191E+00
5.085	-.982E-01
[illegible]	[illegible]

3.850	-.13[illegible]
3.870	-.249E+00
3.890	-.101E+00
3.910	-.430E-01
3.930	.827E-03
3.950	.902E-01
3.970	.125E+00
3.990	.101E+00
4.010	.284E-01
4.030	-.957E-01
4.050	-.154E+00
4.070	-.947E-01
4.090	-.349E-01
4.110	.807E-01
4.130	.134E+00
4.150	.103E+00
4.170	-.435E-01
4.190	-.653E-01
4.210	-.832E-01
4.230	.197E-01
4.250	.753E-01
4.270	.139E+00
4.290	.450E-01
4.310	-.553E-01
4.330	-.121E+00
4.350	-.105E+00
4.370	-.618E-01
4.390	.141E-01
4.410	.912E-01
4.430	.157E+00
4.450	.174E+00
4.470	.199E+00
4.490	.653E-01
4.510	-.857E-01
4.530	-.181E+00
4.550	-.155E+00
4.570	-.153E+00
4.590	-.116E+00
4.610	-.110E-01
4.630	.305E+00
4.650	.329E+00
4.670	.404E+00
4.690	.498E+00
4.710	.446E+00
4.730	.238E+00
4.750	.254E+00
4.770	.152E+00
4.790	-.543E-02
4.810	-.419E-01
4.830	-.191E+00
4.850	-.328E+00
4.870	-.386E+00
4.890	-.211E+00
4.910	-.115E+00
4.930	-.419E-01
4.950	-.415E-01
4.970	-.158E+00
4.990	-.225E+00
5.010	-.252E+00
5.030	-.178E+00
5.050	-.129E+00
5.070	-.882E-01
5.090	-.952E-01
[illegible]	[illegible]

[illegible]	[illegible]
[illegible].875	-.817E-01
[illegible].915	-.356E-01
[illegible].935	.104E-02
3.955	.917E-01
3.975	.118E+00
3.995	.892E-01
4.015	.137E-01
4.035	-.778E-01
4.055	-.322E-01
4.075	-.106E+00
4.095	.110E-01
4.115	.847E-01
4.135	.121E+00
4.155	-.653E-02
4.175	-.553E-01
4.195	-.877E-01
4.215	-.678E-01
4.235	.173E-01
4.255	.144E+00
4.275	.148E+00
4.295	.238E-01
4.315	-.753E-01
4.335	-.109E+00
4.355	-.773E-01
4.375	-.503E-01
4.395	.360E-01
4.415	.952E-01
4.435	.129E+00
4.455	.206E+00
4.475	.200E+00
4.495	.162E-01
4.515	-.952E-01
4.535	-.141E+00
4.555	-.148E+00
4.575	-.158E+00
4.595	-.962E-01
4.615	.219E-01
4.635	.289E+00
4.655	.383E+00
4.675	.454E+00
4.695	.498E+00
4.715	.406E+00
4.735	.284E+00
4.755	.187E+00
4.775	.118E+00
4.795	-.302E-01
4.815	-.223E-01
4.835	-.178E+00
4.855	-.412E+00
4.875	-.385E+00
4.895	-.173E+00
4.915	-.124E+00
4.935	-.912E-01
4.955	-.132E+00
4.975	-.166E+00
4.995	-.264E+00
5.015	-.242E+00
5.035	-.173E+00
5.055	-.967E-01
5.075	-.822E-01
5.095	-.857E-01
[illegible]	[illegible]

3.900	[illegible]
3.920	-.135E-01
3.940	.159E-01
3.960	.125E+00
3.980	.107E+00
4.000	.763E-01
4.020	-.434E-02
4.040	-.937E-01
4.060	-.108E+00
4.080	-.753E-02
4.100	.452E-01
4.120	.106E+00
4.140	.108E+00
4.160	.140E-01
4.180	-.107E+00
4.200	-.109E+00
4.220	-.533E-01
4.240	.390E-01
4.260	.115E+00
4.280	.812E-01
4.300	.184E-01
4.320	-.114E+00
4.340	-.987E-01
4.360	-.852E-01
4.380	-.122E-02
4.400	.481E-01
4.420	.111E+00
4.440	.129E+00
4.460	.201E+00
4.480	.107E+00
4.500	-.143E-01
4.520	-.123E+00
4.540	-.130E+00
4.560	-.159E+00
4.580	-.105E+00
4.600	-.852E-01
4.620	.857E-01
4.640	.305E+00
4.660	.335E+00
4.680	.488E+00
4.700	.487E+00
4.720	.368E+00
4.740	.284E+00
4.760	.219E+00
4.780	-.118E-01
4.800	-.362E-01
4.820	-.375E-01
4.840	-.215E+00
4.860	-.390E+00
4.880	-.241E+00
4.900	-.171E+00
4.920	-.937E-01
4.940	-.102E+00
4.960	-.106E+00
4.980	-.246E+00
5.000	-.291E+00
5.020	-.230E+00
5.040	-.155E+00
5.060	-.107E+00
5.080	-.997E-01
5.100	-.718E-01
[illegible]	[illegible]

5.155	-.133E+00
5.185	-.102E+00
5.215	-.129E+00
5.225	-.130E+00
5.245	-.877E-01
5.255	-.977E-01
5.235	-.133E+00
5.305	-.162E+00
5.325	-.156E+00
5.345	-.872E-01
5.355	-.151E-01
5.385	.593E-01
5.405	.708E-02
5.425	-.688E-01
5.445	-.508E-01
5.465	.728E-01
5.485	.593E-01
5.505	-.797E-01
5.525	-.872E-01
5.545	-.120E-01
5.565	-.137E+00
5.585	-.297E+00
5.605	-.338E+00
5.625	-.232E+00
5.645	-.269E+00
5.665	-.286E+00
5.685	-.203E+00
5.705	-.164E+00
5.725	-.195E+00
5.745	-.458E-01
5.765	-.133E-01
5.785	.648E-02
5.805	.229E+00
5.825	.350E+00
5.845	.178E+00
5.865	.137E+00
5.885	.215E+00
5.905	.202E+00
5.925	.153E+00
5.945	.192E+00
5.965	.176E+00
5.985	.121E+00
6.005	.144E+00
6.025	.240E+00
6.045	.245E+00
6.065	.753E-01
6.085	-.120E+00
6.105	-.153E+00
6.125	-.842E-01
6.145	-.158E+00
6.165	-.253E+00
6.185	-.300E+00
6.205	-.199E+00
6.225	-.917E-01
6.245	.203E-01
6.265	.224E-01
6.285	-.508E-01
6.305	-.137E+00
6.325	-.154E+00
6.345	-.684E-01
6.365	-.128E+00
6.385	-.179E+00
6.405	-.125E+00
[illegible]	[illegible]

5.170	-.13[illegible]
5.190	-.942E-01
5.210	-.120E+00
5.230	-.109E+00
5.250	-.887E-01
5.270	-.977E-01
5.290	-.142E+00
5.310	-.152E+00
5.330	-.852E-01
5.350	-.852E-01
5.370	.238E-01
5.390	.528E-01
5.410	.103E-01
5.430	-.643E-01
5.450	-.472E-01
5.470	.108E+00
5.490	.351E-01
5.510	-.416E-01
5.530	-.618E-01
5.550	-.155E-01
5.570	-.174E+00
5.590	-.308E+00
5.610	-.290E+00
5.630	-.216E+00
5.650	-.290E+00
5.670	-.257E+00
5.690	-.190E+00
5.710	-.182E+00
5.730	-.113E+00
5.750	-.250E-01
5.770	-.177E-01
5.790	.154E-01
5.810	.231E+00
5.830	.299E+00
5.850	.153E+00
5.870	.144E+00
5.890	.239E+00
5.910	.214E+00
5.930	.162E+00
5.950	.187E+00
5.970	.170E+00
5.990	.111E+00
6.010	.158E+00
6.030	.230E+00
6.050	.240E+00
6.070	.125E-01
6.090	-.129E+00
6.110	-.125E+00
6.130	-.128E+00
6.150	-.169E+00
6.170	-.290E+00
6.190	-.290E+00
6.210	-.207E+00
6.230	-.158E-01
5.250	.421E-01
6.270	.827E-02
6.290	-.852E-01
6.310	-.137E+00
6.330	-.753E-01
6.350	-.708E-01
6.370	-.130E+00
6.390	-.181E+00
5.410	-.117E+00
[illegible]	[illegible]

5.195	[illegible]
5.215	-.123E+00
5.235	-.101E+00
5.255	-.917E-01
5.275	-.982E-01
5.295	-.152E+00
5.315	-.150E+00
5.335	-.112E+00
5.355	.233E-01
5.375	.548E-01
5.395	.598E-01
5.415	-.171E-01
5.435	-.598E-01
5.455	.618E-01
5.475	.125E+00
5.495	.170E-01
5.515	-.479E-01
5.535	-.435E-01
5.555	-.106E+00
5.575	-.197E+00
5.595	-.343E+00
5.615	-.248E+00
5.635	-.240E+00
5.655	-.256E+00
5.675	-.251E+00
5.695	-.166E+00
5.715	-.199E+00
5.735	-.108E+00
5.755	.327E-01
5.775	-.259E-01
5.795	.548E-01
5.815	.271E+00
5.835	.271E+00
5.855	.129E+00
5.875	.160E+00
5.895	.255E+00
5.915	.198E+00
5.935	.176E+00
5.955	.192E+00
5.975	.159E+00
5.995	.106E+00
6.015	.184E+00
6.035	.248E+00
6.055	.997E-01
6.075	-.298E-01
6.095	-.163E+00
6.115	-.947E-01
6.135	-.133E+00
6.155	-.262E+00
6.175	-.296E+00
6.195	-.292E+00
6.215	-.173E+00
6.235	-.259E-01
6.255	.518E-01
6.275	-.753E-02
6.295	-.104E+00
6.315	-.143E+00
6.335	-.907E-01
6.355	-.952E-01
6.375	-.123E+00
6.395	-.201E+00
6.415	-.872E-01
[illegible]	[illegible]

5.220	-.129E+00
5.240	-.922E-01
5.260	-.957E-01
5.280	-.138E+00
5.300	-.156E+00
5.320	-.157E+00
5.340	-.104E+00
5.360	-.258E-01
5.380	.753E-01
5.400	.698E-01
5.420	-.503E-01
5.440	-.543E-01
5.460	.476E-01
5.480	.658E-01
5.500	.142E-01
5.520	-.733E-01
5.540	-.223E-01
5.560	-.106E+00
5.580	-.344E+00
5.600	-.357E+00
5.620	-.229E+00
5.640	-.254E+00
5.660	-.288E+00
5.680	-.192E+00
5.700	-.154E+00
5.720	-.204E+00
5.740	-.797E-01
5.760	.872E-03
5.780	.411E-01
5.800	.972E-01
5.820	.322E+00
5.840	.222E+00
5.860	.135E+00
5.880	.187E+00
5.900	.262E+00
5.920	.172E+00
5.940	.188E+00
5.950	.181E+00
5.980	.131E+00
6.000	.110E+00
6.020	.214E+00
6.040	.250E+00
6.060	.117E+00
6.080	-.159E+00
6.100	-.183E+00
6.120	-.802E-01
6.140	-.144E+00
6.160	-.241E+00
6.180	-.321E+00
6.200	-.296E+00
6.220	-.126E+00
6.240	-.962E-02
6.260	.386E-01
6.280	-.375E-01
6.300	-.114E+00
6.320	-.151E+00
6.340	-.812E-01
6.360	-.114E+00
6.380	-.208E+00
6.400	-.207E+00
6.420	-.643E-01

6.495	[illegible]
6.515	.252E+00
6.535	.187E+00
6.555	.201E+00
6.575	.578E-01
6.595	.917E-01
6.615	-.442E-02
6.635	-.492E-01
6.655	-.867E-01
6.675	-.822E-01
6.695	-.120E+00
6.715	-.708E-01
6.735	.206E-01
6.755	.302E-01
6.775	.135E+00
6.795	.112E+00
6.815	.942E-01
6.835	.215E+00
6.855	.316E+00
6.875	.230E+00
6.895	.205E+00
6.915	.340E+00
6.935	.478E+00
6.955	.395E+00
6.975	.337E+00
6.995	.345E+00
7.015	.224E+00
7.035	.138E-01
7.055	-.528E-01
7.075	-.109E+00
7.095	-.263E+00
7.115	-.304E+00
7.135	-.247E+00
7.155	-.158E+00
7.175	-.141E+00
7.195	-.728E-01
7.215	.787E-03
7.235	.548E-01
7.255	.395E-01
7.275	.518E-01
7.295	.127E+00
7.315	.158E+00
7.335	.201E+00
7.355	.221E+00
7.375	.142E+00
7.395	.207E-01
7.415	-.902E-01
7.435	-.205E+00
7.455	-.246E+00
7.475	-.887E-01
7.495	.307E-01
7.515	.152E+00
7.535	.147E+00
7.555	.105E+00
7.575	-.388E-01
7.595	-.125E+00
7.615	-.236E+00
7.635	-.313E+00
7.655	-.244E+00
7.675	-.147E+00
7.695	-.947E-01
7.715	.320E-02
7.735	.558E-01
7.755	.113E-01
[illegible]	[illegible]

.470	.28[illegible]
6.490	.237E+00
6.510	.206E+00
6.530	.728E-01
6.550	.434E-01
6.570	.713E-01
6.590	-.104E-01
6.610	-.703E-01
6.630	-.912E-01
6.650	-.957E-01
6.670	-.114E+00
6.690	-.618E-01
6.710	-.108E-01
6.730	.957E-01
6.750	.163E+00
6.770	.907E-01
6.790	.101E+00
6.810	.232E+00
6.830	.296E+00
6.850	.215E+00
6.870	.211E+00
6.890	.359E+00
6.910	.407E+00
6.930	.373E+00
6.950	.351E+00
6.970	.332E+00
6.990	.193E+00
7.010	.407E-01
7.030	-.106E+00
7.050	-.134E+00
7.070	-.296E+00
7.090	-.274E+00
7.110	-.207E+00
7.130	-.139E+00
7.150	-.145E+00
7.170	-.474E-01
7.190	-.339E-02
7.210	.201E-01
7.230	.255E-01
7.250	.698E-01
7.270	.136E+00
7.290	.158E+00
7.310	.213E+00
7.330	.178E+00
7.350	.122E+00
7.370	-.598E-02
7.390	-.104E+00
7.410	-.199E+00
7.430	-.133E+00
7.450	-.643E-01
7.470	.723E-01
7.490	.144E+00
7.510	.125E+00
7.530	-.233E-01
7.550	-.538E-01
7.570	-.178E+00
7.590	-.287E+00
7.610	-.292E+00
7.630	-.147E+00
7.650	-.148E+00
7.670	-.498E-01
7.690	-.286E-02
7.710	.309E-01
7.730	.598E-01
[illegible]	[illegible]

[illegible]	[illegible]
[illegible]15	.202E+00
[illegible]35	.125E+00
[illegible]55	.837E-01
6.575	.334E-01
6.595	-.416E-02
6.615	-.763E-01
6.635	-.718E-01
6.655	-.137E+00
6.675	-.101E+00
6.695	-.628E-01
6.715	-.305E-02
6.735	.763E-01
6.755	.145E+00
6.775	.802E-01
6.795	.119E+00
6.815	.265E+00
6.835	.282E+00
6.855	.196E+00
6.875	.221E+00
6.895	.398E+00
6.915	.385E+00
6.935	.352E+00
6.955	.340E+00
6.975	.322E+00
6.995	.147E+00
7.015	.231E-01
7.035	-.867E-01
7.055	-.278E+00
7.075	-.311E+00
7.095	-.263E+00
7.115	-.179E+00
7.135	-.145E+00
7.155	-.528E-01
7.175	-.385E-01
7.195	.178E-01
7.215	.758E-02
7.235	.429E-01
7.255	.862E-01
7.275	.143E+00
7.295	.176E+00
7.315	.222E+00
7.335	.178E+00
7.355	.249E-01
7.375	-.182E-01
7.395	-.146E+00
7.415	-.203E+00
7.435	-.163E+00
7.455	.593E-01
7.475	.972E-01
7.495	.166E+00
7.515	.992E-01
7.535	.207E-01
7.555	-.158E+00
7.575	-.224E+00
7.595	-.311E+00
7.615	-.253E+00
7.635	-.179E+00
7.655	-.543E-01
7.675	-.127E-01
7.695	.668E-02
7.715	.144E-01
7.735	.518E-01
[illegible]	[illegible]

6.520	.195E+00
6.540	.110E+00
6.560	.897E-01
6.580	.295E-01
6.600	-.318E-03
6.620	-.872E-01
6.640	-.698E-01
6.660	-.126E+00
6.680	-.887E-01
6.700	-.698E-01
6.720	.184E-01
6.740	.962E-01
6.760	.136E+00
6.780	.997E-01
6.800	.144E+00
6.820	.298E+00
6.840	.255E+00
6.860	.198E+00
6.880	.347E+00
6.900	.400E+00
6.920	.390E+00
6.940	.336E+00
6.960	.351E+00
6.980	.207E+00
7.000	.117E+00
7.020	-.193E-01
7.040	-.882E-01
7.060	-.248E+00
7.080	-.358E+00
7.100	-.253E+00
7.120	-.164E+00
7.140	-.143E+00
7.160	-.842E-01
7.180	.523E-01
7.200	.298E-01
7.220	.188E-01
7.240	.463E-01
7.260	.112E+00
7.280	.144E+00
7.300	.185E+00
7.320	.224E+00
7.340	.164E+00
7.360	.385E-01
7.380	-.128E+00
7.400	-.179E+00
7.420	-.222E+00
7.440	-.135E+00
7.460	.160E-01
7.480	.214E+00
7.500	.182E+00
7.520	.922E-01
7.540	.465E-03
7.560	-.109E+00
7.580	-.317E+00
7.600	-.330E+00
7.620	-.244E+00
7.640	-.170E+00
7.660	-.105E+00
7.680	.207E-01
7.700	.184E-01
7.720	.937E-02
7.740	.643E-01
[illegible]	[illegible]

7.835	-.106E+00
7.825	-.176E-01
7.845	-.231E-01
7.805	-.538E-01
7.885	.292E-01
7.905	.103E+00
7.925	.817E-01
7.945	-.185E-01
7.965	-.154E+00
7.985	-.305E+00
8.005	-.353E+00
8.025	-.310E+00
8.045	-.229E+00
8.065	-.223E+00
8.085	-.152E+00
8.105	-.558E-02
8.125	.159E-01
8.145	.143E-01
8.165	.312E-01
8.185	.538E-01
8.205	.922E-01
8.225	.104E+00
8.245	.188E-01
8.265	.122E-01
8.285	-.658E-01
8.305	-.162E+00
8.325	-.162E+00
8.345	-.932E-01
8.365	-.718E-01
8.385	.260E-01
8.405	.897E-01
8.425	.335E-01
8.445	.238E-01
8.465	.513E-01
8.485	.807E-01
8.505	.430E-01
8.525	.588E-01
8.545	.122E+00
8.565	.217E+00
8.585	.168E+00
8.605	.967E-01
8.625	.108E+00
8.645	-.146E-02
8.665	-.713E-01
8.685	-.115E+00
8.705	-.261E+00
8.725	-.334E+00
8.745	-.207E+00
8.765	-.179E+00
8.785	-.110E+00
8.805	.203E+00
8.825	.324E+00
8.845	.252E+00
8.865	.244E+00
8.885	.277E+00
8.905	.207E+00
8.925	.153E+00
8.945	.165E+00
8.965	.175E+00
8.985	.140E+00
9.005	.[illegible]
9.025	.[illegible]
9.045	-.427E-01

7.810	-.[illegible]
7.830	.381E-02
7.850	-.274E-01
7.870	-.453E-01
7.890	.458E-01
7.910	.718E-01
7.930	.152E-01
7.950	-.115E-01
7.970	-.213E+00
7.990	-.300E+00
8.010	-.349E+00
8.030	-.233E+00
8.050	-.222E+00
8.070	-.212E+00
8.090	-.149E+00
8.110	-.244E-01
8.130	.458E-01
8.150	.208E-01
8.170	.343E-01
8.190	.558E-01
8.210	.807E-01
8.230	.338E-01
8.250	.144E-01
8.270	-.420E-02
8.290	-.703E-01
8.310	-.130E+00
8.330	-.143E+00
8.350	-.977E-01
8.370	-.523E-01
8.390	.378E-01
8.410	.528E-01
8.430	.285E-01
8.450	.419E-01
8.470	.487E-01
8.490	.797E-01
8.510	.411E-01
8.530	.683E-01
8.550	.132E+00
8.570	.231E+00
8.590	.149E+00
8.610	.124E+00
8.630	.475E-01
8.650	-.354E-01
8.670	-.743E-01
8.690	-.117E+00
8.710	-.240E+00
8.730	-.273E+00
8.750	-.205E+00
8.770	-.159E+00
8.790	-.101E+00
8.810	.154E+00
8.830	.343E+00
8.850	.276E+00
8.870	.235E+00
8.890	.291E+00
8.910	.227E+00
8.930	.120E+00
8.950	.171E+00
8.970	.171E+00
8.990	.140E+00
9.010	.852E-01
9.030	-.466E-03
9.050	-.618E-01

7.835	-.134E-01
7.855	-.877E-01
7.875	-.198E-01
7.895	.439E-01
7.915	.738E-01
7.935	.658E-02
7.955	-.181E+00
7.975	-.247E+00
7.995	-.348E+00
8.015	-.326E+00
8.035	-.251E+00
8.055	-.183E+00
8.075	-.204E+00
8.095	-.114E+00
8.115	-.192E-01
8.135	.250E-01
8.155	.331E-01
8.175	.398E-01
8.195	.568E-01
8.215	.857E-01
8.235	.496E-01
8.255	.179E-04
8.275	-.241E-01
8.295	-.763E-01
8.315	-.134E+00
8.335	-.119E+00
8.355	-.807E-01
8.375	-.358E-01
8.395	.558E-01
8.415	.363E-01
8.435	.172E-01
8.455	.244E-01
8.475	.496E-01
8.495	.758E-01
8.515	.407E-01
8.535	.902E-01
8.555	.220E+00
8.575	.230E+00
8.595	.141E+00
8.615	.124E+00
8.635	.513E-01
8.655	-.907E-01
8.675	-.743E-01
8.695	-.138E+00
8.715	-.262E+00
8.735	-.267E+00
8.755	-.120E+00
8.775	-.171E+00
8.795	-.508E-01
8.815	.204E+00
8.835	.296E+00
8.855	.236E+00
8.875	.245E+00
8.895	.290E+00
8.915	.210E+00
8.935	.147E+00
8.955	.125E+00
8.975	.165E+00
8.995	.120E+00
9.015	.842E-01
9.035	.837E-02
9.055	-.912E-01

7.840	-.[illegible]
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7.880	-.114E-01
7.900	.312E-01
7.920	.842E-01
7.940	-.105E-01
7.960	-.127E+00
7.980	-.358E+00
8.000	-.386E+00
8.020	-.310E+00
8.040	-.251E+00
8.060	-.217E+00
8.080	-.140E+00
8.100	-.827E-01
8.120	.713E-03
8.140	.134E-01
8.160	.314E-01
8.180	.518E-01
8.200	.563E-01
8.220	.967E-01
8.240	.368E-01
8.260	.141E-01
8.280	-.668E-01
8.300	-.768E-01
8.320	-.154E+00
8.340	-.997E-01
8.360	-.842E-01
8.380	.385E-01
8.400	.593E-01
8.420	.346E-01
8.440	.142E-01
8.460	.472E-01
8.480	.882E-01
8.500	.673E-01
8.520	.461E-01
8.540	.108E+00
8.560	.206E+00
8.580	.188E+00
8.600	.146E+00
8.620	.113E+00
8.640	.394E-01
8.660	-.733E-01
8.680	-.147E+00
8.700	-.156E+00
8.720	-.304E+00
8.740	-.235E+00
8.760	-.171E+00
8.780	-.480E-01
8.800	-.523E-02
8.820	.278E+00
8.840	.264E+00
8.860	.252E+00
8.880	.240E+00
8.900	.287E+00
8.920	.176E+00
8.940	.162E+00
8.960	.162E+00
8.980	.136E+00
9.000	.987E-01
9.020	.857E-01
9.040	-.127E-01
9.060	-.847E-01

[illegible]	[illegible]
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[illegible]145	-.309E-01
[illegible]165	.236E-01
9.185	.778E-01
9.205	-.023E-01
9.225	-.114E+00
9.245	-.927E-01
9.265	-.714E-01
9.285	-.132E+00
9.305	-.109E+00
9.325	-.628E-01
9.345	.116E+00
9.365	.252E+00
9.385	.311E+00
9.405	.137E+00
9.425	.239E-01
9.445	.129E+00
9.465	.273E+00
9.485	.282E+00
9.505	.127E+00
9.525	.847E-01
9.545	-.498E-01
9.565	-.236E+00
9.585	-.231E+00
9.605	.233E-01
9.625	.141E+00
9.645	-.399E-01
9.665	-.177E+00
9.685	-.339E+00
9.705	-.382E+00
9.725	-.368E+00
9.745	-.310E+00
9.765	-.195E+00
9.785	-.362E-01
9.805	.146E+00
9.825	.133E+00
9.845	.671E-01
9.865	.643E-02
9.885	.248E-01
9.905	.473E-01
9.925	.301E-01
9.945	-.678E-01
9.965	-.122E+00
9.985	-.209E+00
10.005	-.199E+00

[illegible]	[illegible]
9.130	-.553E-01
9.150	-.528E-01
9.170	.513E-01
9.190	.673E-01
9.210	-.316E-01
9.230	-.135E+00
9.250	-.113E+00
9.270	-.798E-01
9.290	-.153E+00
9.310	-.119E+00
9.330	.498E-01
9.350	.156E+00
9.370	.296E+00
9.390	.294E+00
9.410	.158E+00
9.430	.693E-01
9.450	.144E+00
9.470	.317E+00
9.490	.247E+00
9.510	.136E+00
9.530	-.218E-01
9.550	-.723E-01
9.570	-.238E+00
9.590	-.175E+00
9.610	.618E-02
9.630	.633E-01
9.650	-.583E-01
9.670	-.222E+00
9.690	-.354E+00
9.710	-.379E+00
9.730	-.331E+00
9.750	-.296E+00
9.770	-.156E+00
9.790	-.952E-02
9.810	.111E+00
9.830	.146E+00
9.850	.508E-01
9.870	.148E-02
9.890	.353E-01
9.910	.548E-01
9.930	-.538E-01
9.950	-.758E-01
9.970	-.151E+00
9.990	-.223E+00

[illegible]155	.430E-01
[illegible]175	.357E-01
[illegible]195	.703E-01
9.215	-.603E-01
9.235	-.942E-01
9.255	-.420E-01
9.275	-.897E-01
9.295	-.154E+00
9.315	-.107E+00
9.335	.353E-01
9.355	.249E+00
9.375	.338E+00
9.395	.269E+00
9.415	.123E+00
9.435	.743E-01
9.455	.255E+00
9.475	.340E+00
9.495	.216E+00
9.515	.114E+00
9.535	.432E-02
9.555	-.252E+00
9.575	-.331E+00
9.595	-.138E+00
9.615	.513E-01
9.635	.406E-01
9.655	-.167E+00
9.675	-.256E+00
9.695	-.386E+00
9.715	-.369E+00
9.735	-.338E+00
9.755	-.193E+00
9.775	-.152E+00
9.795	.538E-01
9.815	.100E+00
9.835	.121E+00
9.855	.331E-01
9.875	.693E-02
9.895	.409E-01
9.915	.528E-01
9.935	-.388E-01
9.955	-.147E+00
9.975	-.179E+00
9.995	-.247E+00

[illegible]160	[illegible]
9.180	.952E-01
9.200	.787E-01
9.220	-.103E+00
9.240	-.807E-01
9.260	-.723E-01
9.280	-.802E-01
9.300	-.150E+00
9.320	-.837E-01
9.340	.653E-01
9.360	.233E+00
9.380	.290E+00
9.400	.256E+00
9.420	.643E-01
9.440	.103E+00
9.460	.242E+00
9.480	.309E+00
9.500	.193E+00
9.520	.952E-01
9.540	-.142E-01
9.560	-.205E+00
9.580	-.274E+00
9.600	-.123E+00
9.620	.112E+00
9.640	-.311E-02
9.660	-.149E+00
9.680	-.362E+00
9.700	-.449E+00
9.720	-.366E+00
9.740	-.327E+00
9.760	-.213E+00
9.780	.164E-01
9.800	.972E-01
9.820	.115E+00
9.840	.907E-01
9.860	.189E-01
9.880	.563E-02
9.900	.471E-01
9.920	.422E-01
9.940	-.490E-01
9.960	-.116E+00
9.980	-.202E+00
10.000	-.272E+00

REA[redacted]XTRAPOLATE IMPEDANCES

PROGRAM HAS READ IMPEDANCES FOR AO= .204E+00

PROGRAM HAS READ IMPEDANCES FOR AO= .408E+00

PROGRAM HAS READ IMPEDANCES FOR AO= .500E+00

PROGRAM HAS READ IMPEDANCES FOR AO= .613E+00

PROGRAM HAS READ IMPEDANCES FOR AO= .674E+00

PROGRAM HAS READ IMPEDANCES FOR AO= .756E+00

PROGRAM HAS READ IMPEDANCES FOR AO= .817E+00

PROGRAM HAS READ IMPEDANCES FOR AO= .100E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .123E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .150E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .172E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .200E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .225E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .250E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .265E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .300E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .347E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .400E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .490E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .600E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .694E+01

PROGRAM HAS READ IMPEDANCES FOR AO= .817E+01

FOUNDATION RESPONSE

DIRECTION OF RESPONSE :	1	MAXIMUM ACCELERATION :	.6308E+00
DIRECTION OF RESPONSE :	2	MAXIMUM ACCELERATION :	.1629E-25
DIRECTION OF RESPONSE :	3	MAXIMUM ACCELERATION :	.1015E-09
DIRECTION OF RESPONSE :	4	MAXIMUM ACCELERATION :	.1772E-26
DIRECTION OF RESPONSE :	5	MAXIMUM ACCELERATION :	.5308E-02
DIRECTION OF RESPONSE :	6	MAXIMUM ACCELERATION :	.1768E-16

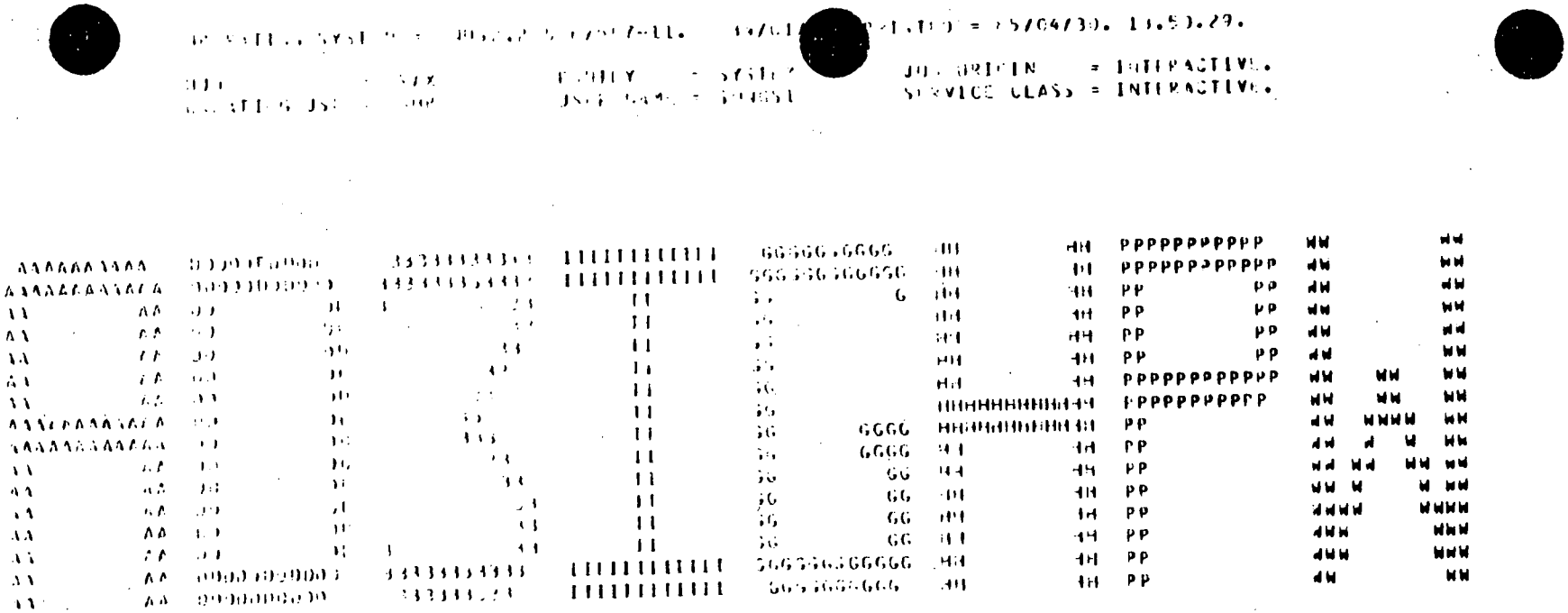
STRUCTURE RESPONSE

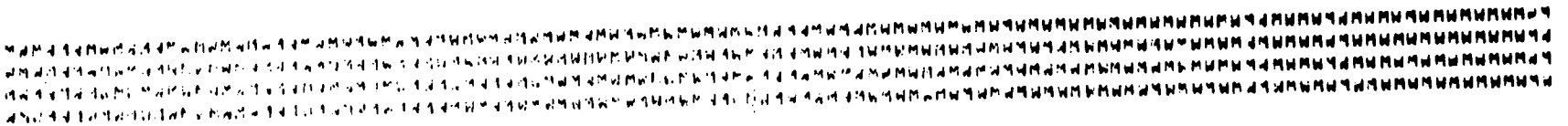
DOF.(KPCOM) :	10	MAXIMUM ACCELERATION :	.5706E+00
DOF.(KPCOM) :	11	MAXIMUM ACCELERATION :	.1265E-09
DOF.(KPCOM) :	19	MAXIMUM ACCELERATION :	.3477E+00
DOF.(KPCOM) :	20	MAXIMUM ACCELERATION :	.2053E-09
DOF.(KPCOM) :	31	MAXIMUM ACCELERATION :	.1277E+01
DOF.(KPCOM) :	32	MAXIMUM ACCELERATION :	.2444E-09

```
3HBA      RELL CYBER SYSTEM S/N 751.                    NOS2.2 ...

20.13.28.INSSIN,T7777,P2.
20.13.28.USER,SONGSI,.
20.13.28.CHARGE,PROJMC,031006813355.
20.13.29.$PROLOG,PROC1,..
20.13.30.$SETFS,PROC1/FS=AD.
20.13.30.PROC1.
20.13.30.//LOADER  587        .005 CP       .166 RT//LOADER  014472/040000-040000 CM   1 TM
20.13.31.IFE,OT.EQ.TXO,FLASHIT.
20.13.31.ENDIF,FLASHIT.
20.13.31.IFE,OT.EQ.BCO,BULLIT.
20.13.31.CHGFTN.
20.13.31.        END  CHGFTN
20.13.31.        15600 MAXIMUM EXECUTION FL.
20.13.31.        0.002 CP SECONDS EXECUTION TIME.
20.13.31.GET,SYSBULL/UN=EDSUPER,NA.
20.13.32.IFE,FILE(SYSBULL,AS),OUTIT.
20.13.32.COPY,SYSBULL.
20.13.32. EOI ENCOUNTERED.
20.13.32.ENDIF,OUTIT.
20.13.32.ENDIF,BULLIT.
20.13.33.RETURN,PROC1.
20.13.33.REVERT.
20.13.33.ROUTE,OUTPUT,DC=PR,UN=CSOVAX1,UJN=VAX,FC=CP,DEF.
20.13.34. ROUTE COMPLETE.
20.13.34.ATTACH,OCLAF.
20.13.34.REWIND,OCLAF.
20.13.34.COPYBF,OCLAF,TAPE10.
20.13.34. COPY COMPLETE.
20.13.35.REWIND,TAPE10.
20.13.35.ATTACH,T15.
20.13.35.ATTACH,T16.
20.13.35.ATTACH,T17.
20.13.36.COMMENT.  TAPE 15 IS STRUCTURE NODE DATA
20.13.36.COPYBF,T15,TAPE15.
20.13.36. COPY COMPLETE.
20.13.36.COMMENT.  TAPE 16 IS STRUCTURE MASS MATRIX
20.13.36.COPYBF,T16,TAPE16.
20.13.36. COPY COMPLETE.
20.13.36.COMMENT.  TAPE 17 IS FREQUENCIES, MODAL DAMPINGS, AND MODE SHAPES
20.13.36.COPYBF,T17,TAPE17.
20.13.36. COPY COMPLETE.
20.13.36.ATTACH,TAPE18.
20.13.37.REWIND,TAPE18.
20.13.37.REWIND,TAPE15,TAPE16,TAPE17,TAPE18.
20.13.37.ATTACH,SSIN/UN=SONGSI.
20.13.37.SSIN.
20.13.40.  CM LWA+1 =312312B, LOADER USED 330400B
20.13.40.//LOADER  587        .866 CP      2.769 RT//LOADER  333326/040000-334000 CM  73 TM
20.15.27.        STOP
20.15.27.        321400 MAXIMUM EXECUTION FL.
20.15.27.        53.880 CP SECONDS EXECUTION TIME.
20.15.27.REWIND,TAPE2.
20.15.27.PURGE,NRC1/NA.
20.15.27. NRC1 NOT FOUND.
20.15.27.DEFINE,NRC1/M=W.
20.15.28.COPYBF,TAPE2,NRC1.
20.15.30. EOI ENCOUNTERED.
20.15.30.EXIT.
20.15.30.UEAD,          0.302KUNS.
20.15.30.UEPF,          0.038KUNS.
```

20.15. [redacted]ALSP, 94.304UNTS.
20.15. [redacted]OUTE(*/DP=E)
20.15. [redacted]ND FILES PROCESSED.
20.15.30.$DAYFILE(OUTPUT,JT=DI)
20.16.33.UCLP, LB, HSOILP2, 1.505KLNS.





RESPEC

22 frequencies in class 2

DESIGN VERIFICATION	
CLIENT SCE	
JOB NO. 0310-008-1215	
CALC/PROB NO. MIC TEST-1-25	
BY: KH	DATE: 4/30/99
CHKD: SMD	DATE: 4/30/99

SYSTEM BULLETIN

IMPELL WALNUT CREEK COMPUTER CENTER OPERATIONS HOURS (PACIFIC TIME)

MONDAY	AND	FRIDAY	[illegible]	TO	2130
TUESDAY	TO	THURSDAY	[illegible]	TO	2330
SATURDAY	AND	SUNDAY	0700	TO	1700

OPERATORS WILL NOT BE ON SITE AT ALL OTHER TIMES. EXTENDED OPERATOR COVERAGE MAY BE ARRANGED BY CONTACTING [illegible] EARL AT (415) 743-[illegible]

THE CYBER SYSTEM WILL BE UNAVAILABLE TO USERS AS FOLLOWS:

MONDAY	2000	TO	2100	SYSTEM BACKUP
TUESDAY	1930	TO	2300	MAINTENANCE + BACKUP
WEDNESDAY	2200	TO	2300	SYSTEM BACKUP
THURSDAY	2200	TO	2300	SYSTEM BACKUP
FRIDAY	2000	TO	2230	SYSTEM BACKUP + TESTING
SATURDAY	1600	TO	1700	SYSTEM BACKUP
SUNDAY	1600	TO	1700	SYSTEM BACKUP

HOLIDAY HOURS.

MONDAY, MAY 27, 1985. NO OPERATORS ON SITE. SYSTEM AVAILABLE TO USERS.

SPECIAL CYBER UPGRADE BLOCK TIME.

THE CYBER WILL BE UNAVAILABLE FOR PRODUCTION USE THURSDAYS FROM 2000 HRS. TO 2400 HRS. BEGINNING APRIL 11,1985 THROUGH MAY 30 1985. COMPUTER SERVICES WILL BE TESTING NOS VERSION 2.3 . ANY USERS WISHING TO TEST THEIR CODES DURING THIS PERIOD WILL NEED TO CONTACT COMPUTER SERVICES AT (415)743-[illegible].

GENERAL INFORMATION.

DO NOT RELEASE MAGNETIC TAPES WHEN OPERATORS ARE NOT ON SITE.

USER ADVISORY. MAGNETIC TAPE BACKUPS.

MAGNETIC TAPES ARE SUSCEPTIBLE TO PHYSICAL DAMAGE. BACKUP TAPES ARE RECOMMENDED WHENEVER THE INFORMATION ON THE TAPE WOULD BE EXPENSIVE OR TIME CONSUMING TO RECREATE . PLEASE NOTE THAT IMPELL,CDC, AND [illegible] DO NOT GIVE REFUNDS FOR JOBS NECESSARY TO RECREATE A TAPE IF NO BACKUP EXISTS.

****

AS PER THE [illegible] DISTRIBUTED TO DIVISIONS OVER A WEEK AGO, THE [illegible] 0622 AND 0627 [illegible] GINNING [illegible] 7/15/85. [illegible] A CONSOLIDATED [illegible] DISTRIBUTED [illegible] CHANGES [illegible] TO [illegible] ACCOUNTING DEPT. [illegible] CHANGES.

****

[illegible]

```
CLR-SP,T/[illegible].
USER,[illegible].
CHARGE,[illegible].
ROUTE,OUTPUT,[illegible].
REWIND,INPUT.
COPYSBF,INPUT,OUTPUT.
REWIND,INPUT.
SKIPF,INPUT.
PURGE,CLR-ST/NA.
DEFINE,CLRST/[illegible].
ATTACH,TAPE[illegible].
GET,RESPEC/[illegible]-INPUT.
RESPEC.
REWIND,TAPE9.
COPYBF,TAPE9,CLRST.
```

[illegible]

ALL PROJECTS

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**********************
* IMPELL CORPORATION *
*   PROGRAM RESP G   *
*   VERSION 10/06/79 *
**********************
```

/ NRC TEST PROBLEM 1 / 22 ACCELEROGRAMS / 22 RESPONSE SPECTRA / 5-PT /

NUMBER OF ACCELERATION
TIME HISTORIES PROCESSED 0

INPUT TIME HISTORY INTEGRATION

TIME HISTORY NUMBER		1
NUMBER OF TIME POINTS	NTP	2001
INPUT CODE	INPT	1
TIME STEP	DEL	.0050
ACCELERATION SCALE FACTOR	SF12	1.0000

COMPUTATION AND OUTPUT CONTROL

INPUT HISTORY INTEGRATING CODE	INTV	2
SPECTRUM COMPUTATION CODE	ISPC	1
	IDUP	1
SPECTRUM OUTPUT CODE	IOUT	1
NUMBER OF FREQUENCY POINTS	NFP	50
NUMBER OF DAMPINGS	NDP	1
FREQUENCY SCALE TYPE CODE	IFSC	2
LOWEST FREQUENCY IN CPS	F1	.20000
HIGHEST FREQUENCY IN CPS	F2	30.0000
TIME STEP TO PERIOD RATIO	DTDP	.20000

FIELD LENGTH REQUIREMENTS
(IN OCTAL)

PROGRAM LENGTH	041637
BLANK COMMON REQUIRED	037647
FIELD LENGTH REQUIRED	056500

FORMAT OF INPUT TIME HISTORY IS

(E10.6)

* * * INPU[illegible]LERATION TIME HISTORY * * *

TIME	ACCEL	TIME	ACCEL	TIME	ACCEL	TIME	ACCEL	TIME	ACCEL
.005	-.250E-01	.010	-.354E-01	.015	-.513E-01	.020	-.621E-01	.025	-.698E-01
.030	-.730E-01	.035	-.741E-01	.040	-.710E-01	.045	-.649E-01	.050	-.564E-01
.055	-.450E-01	.060	-.333E-01	.065	-.192E-01	.070	-.370E-02	.075	.128E-01
.080	.299E-01	.085	.470E-01	.090	.316E-01	.095	.791E-01	.100	.931E-01
.105	.105E+00	.110	.115E+00	.115	.122E+00	.120	.126E+00	.125	.127E+00
.130	.123E+00	.135	.115E+00	.140	.104E+00	.145	.885E-01	.150	.709E-01
.155	.520E-01	.160	.331E-01	.165	.134E-01	.170	-.493E-04	.175	-.127E-01
.180	-.224E-01	.185	-.291E-01	.190	-.332E-01	.195	-.351E-01	.200	-.351E-01
.205	-.157E-01	.210	-.509E-01	.215	-.273E-01	.220	-.229E-01	.225	-.181E-01
.230	-.131E-01	.235	-.923E-02	.240	-.354E-02	.245	.557E-03	.250	.429E-02
.255	.752E-02	.260	.102E-01	.265	.121E-01	.270	.133E-01	.275	.135E-01
.280	.129E-01	.285	.118E-01	.290	.995E-02	.295	.829E-02	.300	.738E-02
.305	.711E-02	.310	.422E-02	.315	.122E-01	.320	.154E-01	.325	.213E-01
.330	.259E-01	.335	.316E-01	.340	.333E-01	.345	.406E-01	.350	.446E-01
.355	.484E-01	.360	.521E-01	.365	[illegible]	.370	.587E-01	.375	.612E-01
.380	.627E-01	.385	.641E-01	.390	.522E-01	.395	.599E-01	.400	.560E-01
.405	.504E-01	.410	.426E-01	.415	.325E-01	.420	.198E-01	.425	.461E-02
.430	-.125E-01	.435	-.304E-01	.440	-.473E-01	.445	-.616E-01	.450	-.715E-01
.455	-.761E-01	.460	-.759E-01	.465	-.791E-01	.470	-.597E-01	.475	-.489E-01
.480	-.384E-01	.485	-.296E-01	.490	-.232E-01	.495	-.189E-01	.500	-.160E-01
.505	-.135E-01	.510	-.103E-01	.515	-.753E-02	.520	-.426E-02	.525	-.186E-02
.530	-.134E-02	.535	-.345E-02	.540	-.139E-02	.545	-.157E-01	.550	-.244E-01
.555	-.335E-01	.560	-.422E-01	.565	-.532E-01	.570	-.578E-01	.575	-.659E-01
.580	-.752E-01	.585	-.853E-01	.590	-.974E-01	.595	-.108E+00	.600	-.116E+00
.605	-.119E+00	.610	-.113E+00	.615	-.105E-01	.620	-.791E-01	.625	-.538E-01
.630	-.269E-01	.635	-.150E-02	.640	.147E-01	.645	.334E-01	.650	.425E-01
.655	.476E-01	.660	.510E-01	.665	.559E-01	.670	.511E-01	.675	.693E-01
.680	.786E-01	.685	.867E-01	.690	.812E-01	.695	.903E-01	.700	.830E-01
.705	.709E-01	.710	.526E-01	.715	.335E-01	.720	.149E-01	.725	-.148E-02
.730	-.147E-01	.735	-.251E-01	.740	-.335E-01	.745	-.412E-01	.750	-.493E-01
.755	-.584E-01	.760	-.684E-01	.765	-.737E-01	.770	-.883E-01	.775	-.965E-01
.780	-.103E+00	.785	-.105E+00	.790	-.107E+00	.795	-.106E+00	.800	-.102E+00
.805	-.947E-01	.810	-.842E-01	.815	-.734E-01	.820	-.534E-01	.825	-.342E-01
.830	-.143E-01	.835	.422E-02	.840	.136E-01	.845	.300E-01	.850	.349E-01
.855	.345E-01	.860	.303E-01	.865	.234E-01	.870	.165E-01	.875	.109E-01
.880	.740E-02	.885	.573E-02	.890	.477E-02	.895	.290E-02	.900	-.156E-02
.905	-.965E-02	.910	-.224E-01	.915	-.313E-01	.920	-.579E-01	.925	-.779E-01
.930	-.968E-01	.935	-.113E+00	.940	-.125E+00	.945	-.133E+00	.950	-.135E+00
.955	-.132E+00	.960	-.125E+00	.965	-.113E+00	.970	-.983E-01	.975	-.810E-01
.980	-.664E-01	.985	-.436E-01	.990	-.259E-01	.995	-.102E-01	1.000	.260E-02
1.005	.123E-01	1.010	.189E-01	1.015	.231E-01	1.020	.254E-01	1.025	.266E-01
1.030	.273E-01	1.035	.276E-01	1.040	.275E-01	1.045	.256E-01	1.050	.243E-01
1.055	.262E-01	1.060	.141E-01	1.065	.539E-02	1.070	-.244E-02	1.075	-.114E-01
1.080	-.193E-01	1.085	-.251E-01	1.090	-.279E-01	1.095	-.271E-01	1.100	-.227E-01
1.105	-.150E-01	1.110	-.493E-02	1.115	.557E-02	1.120	.183E-01	1.125	.291E-01
1.130	.382E-01	1.135	.449E-01	1.140	.410E-01	1.145	.507E-01	1.150	.503E-01
1.155	.463E-01	1.160	.455E-01	1.165	.420E-01	1.170	.384E-01	1.175	.346E-01
1.180	.367E-01	1.185	.264E-01	1.190	.219E-01	1.195	.170E-01	1.200	.121E-01
1.205	.770E-02	1.210	.278E-02	1.215	-.333E-03	1.220	-.357E-02	1.225	-.544E-02
1.230	-.629E-02	1.235	-.634E-02	1.240	-.578E-02	1.245	-.480E-02	1.250	-.356E-02
1.255	-.219E-02	1.260	[illegible]	1.265	.237E-03	1.270	.103E-02	1.275	.118E-02
1.280	.564E-03	1.285	[illegible]	1.290	-.317E-02	1.295	-.508E-02	1.300	-.935E-02
1.305	-.127E-01	1.310	[illegible]	1.315	[illegible]	1.320	-.219E-01	1.325	-.249E-01
1.330	-.274E-01	1.335	[illegible]	1.340	[illegible]	1.345	-.443E-01	1.350	-.517E-01
1.355	[illegible]	1.360	[illegible]	1.365	[illegible]	1.370	-.842E-01	1.375	-.912E-01
1.380	[illegible]	1.385	-.101E+00	1.390	[illegible]	1.395	-.103E+00	1.400	-.102E+00
1.405	[illegible]	1.410	-.534E-01	1.415	-.370E-01	1.420	-.913E-01	1.425	-.747E-01
1.430	-.179E-01	1.435	-.502E-01	1.440	[illegible]	1.445	-.392E-01	1.450	-.242E-01
			[illegible]	1.465	.333E-01	1.470	.631E-01	1.475	.852E-01

1.575	-.753E-02
1.600	-.544E-01
1.625	-.539E-01
1.650	-.655E-01
1.675	-.103E+00
1.700	-.708E-01
1.725	-.761E-01
1.750	-.777E-02
1.775	.295E-01
1.800	.339E-01
1.825	.484E-01
1.850	.662E-01
1.875	.546E-01
1.900	.112E+00
1.925	.782E-01
1.950	-.599E-02
1.975	-.351E-01
2.000	-.375E-01
2.025	-.347E-01
2.050	.838E-02
2.075	.249E-01
2.100	.189E-01
2.125	.321E-01
2.150	-.454E-03
2.175	-.412E-01
2.200	-.269E-01
2.225	-.599E-02
2.250	.317E-02
2.275	-.246E-02
2.300	-.261E-01
2.325	-.438E-01
2.350	-.311E-01
2.375	-.285E-01
2.400	-.475E-01
2.425	-.974E-01
2.450	-.158E+00
2.475	-.126E+00
2.500	-.832E-01
2.525	-.250E-01
2.550	.602E-01
2.575	.119E+00
2.600	.573E-01
2.625	-.402E-01
2.650	-.114E+00
2.675	-.143E+00
2.700	-.100E-01
2.725	.129E+00
2.750	.227E+00
2.775	.129E+00
2.800	-.287E-02
2.825	-.540E-01
2.850	-.733E-01
2.875	-.131E+00
2.900	-.136E+00
2.925	-.156E+00
2.950	-.122E+00
2.975	-.496E-01
3.000	.252E-02
3.025	.406E-01
3.050	.799E-01
3.075	.422E-01
3.100	.183E-01
3.125	.113E+00

3.180	[illegible]	3.185	[illegible]	3.190	.371E+00	3.195	.391E+00	3.200	[illegible]
3.205	[illegible]	3.210	.244E+00	3.215	[illegible]	3.220	.149E+00	3.225	.103E+00
3.230	[illegible]	3.235	[illegible]	3.240	[illegible]	3.245	-.333E-01	3.250	-.496E-01
3.255	[illegible]	3.260	-.542E-01	3.265	[illegible]	3.270	-.409E-01	3.275	-.231E-01
3.280	[illegible]	3.285	.247E-01	3.290	.524E-01	3.295	.809E-01	3.300	.109E+00
3.305	.136E+00	3.310	.152E+00	3.315	.135E+00	3.320	.205E+00	3.325	.222E+00
3.330	.230E+00	3.335	.246E+00	3.340	.231E+00	3.345	.253E+00	3.350	.249E+00
3.355	.242E+00	3.360	.232E+00	3.365	.218E+00	3.370	.204E+00	3.375	.189E+00
3.380	.175E+00	3.385	.183E+00	3.390	.153E+00	3.395	.146E+00	3.400	.140E+00
3.405	.136E+00	3.410	.133E+00	3.415	.131E+00	3.420	.130E+00	3.425	.129E+00
3.430	.122E+00	3.435	.129E+00	3.440	.131E+00	3.445	.135E+00	3.450	.141E+00
3.455	.146E+00	3.460	.155E+00	3.465	.154E+00	3.470	.159E+00	3.475	.171E+00
3.480	.109E+00	3.485	.152E+00	3.490	.151E+00	3.495	.137E+00	3.500	.121E+00
3.505	.105E+00	3.510	.896E-01	3.515	.706E-01	3.520	.567E-01	3.525	.592E-01
3.530	.537E-01	3.535	.496E-01	3.540	.456E-01	3.545	.445E-01	3.550	.434E-01
3.555	.437E-01	3.560	.457E-01	3.565	.494E-01	3.570	.545E-01	3.575	.604E-01
3.580	.664E-01	3.585	.720E-01	3.590	.759E-01	3.595	.817E-01	3.600	.871E-01
3.605	.940E-01	3.610	.103E+00	3.615	.114E+00	3.620	.127E+00	3.625	.138E+00
3.630	.145E+00	3.635	.149E+00	3.640	.142E+00	3.645	.128E+00	3.650	.107E+00
3.655	.202E-01	3.660	.516E-01	3.665	.230E-01	3.670	-.984E-03	3.675	-.221E-01
3.680	-.403E-01	3.685	-.573E-01	3.690	[illegible]	3.695	-.973E-01	3.700	-.124E+00
3.705	-.154E+00	3.710	-.157E+00	3.715	-.221E+00	3.720	-.251E+00	3.725	-.275E+00
3.730	-.291E+00	3.735	-.229E+00	3.740	-.238E+00	3.745	-.289E+00	3.750	-.274E+00
3.755	-.254E+00	3.760	-.230E+00	3.765	-.202E+00	3.770	-.172E+00	3.775	-.140E+00
3.780	-.108E+00	3.785	-.765E-01	3.790	-.431E-01	3.795	-.235E-01	3.800	-.326E-02
3.805	.128E-01	3.810	.253E-01	3.815	.353E-01	3.820	.434E-01	3.825	.495E-01
3.830	.528E-01	3.835	.517E-01	3.840	.442E-01	3.845	.287E-01	3.850	.484E-02
3.855	-.265E-01	3.860	-.526E-01	3.865	-.100E+00	3.870	-.134E+00	3.875	-.162E+00
3.880	-.180E+00	3.885	-.183E+00	3.890	-.186E+00	3.895	-.177E+00	3.900	-.162E+00
3.905	-.146E+00	3.910	-.128E+00	3.915	-.110E+00	3.920	-.925E-01	3.925	-.742E-01
3.930	-.547E-01	3.935	-.337E-01	3.940	-.115E-01	3.945	.110E-01	3.950	.327E-01
3.955	.524E-01	3.960	.596E-01	3.965	.341E-01	3.970	.953E-01	3.975	.107E+00
3.980	.115E+00	3.985	.123E+00	3.990	.127E+00	3.995	.129E+00	4.000	.125E+00
4.005	.116E+00	4.010	.101E+00	4.015	.300E-01	4.020	.550E-01	4.025	.274E-01
4.030	-.743E-01	4.035	-.278E-01	4.040	-.527E-01	4.045	-.749E-01	4.050	-.943E-01
4.055	-.111E+00	4.060	-.125E+00	4.065	-.135E+00	4.070	-.142E+00	4.075	-.143E+00
4.080	-.140E+00	4.085	-.130E+00	4.090	-.114E+00	4.095	-.925E-01	4.100	-.670E-01
4.105	-.389E-01	4.110	-.955E-02	4.115	.135E-01	4.120	.472E-01	4.125	.726E-01
4.130	.948E-01	4.135	.113E+00	4.140	.126E+00	4.145	.134E+00	4.150	.135E+00
4.155	.127E+00	4.160	.117E+00	4.165	.130E+00	4.170	.787E-01	4.175	.546E-01
4.180	.296E-01	4.185	.504E-02	4.190	-.178E-01	4.195	-.382E-01	4.200	-.557E-01
4.205	-.696E-01	4.210	-.802E-01	4.215	-.630E-01	4.220	-.875E-01	4.225	-.834E-01
4.230	-.737E-01	4.235	-.585E-01	4.240	-.335E-01	4.245	-.150E-01	4.250	.107E-01
4.255	.370E-01	4.260	.621E-01	4.265	.348E-01	4.270	.104E+00	4.275	.119E+00
4.280	.128E+00	4.285	.152E+00	4.290	.130E+00	4.295	.121E+00	4.300	.106E+00
4.305	.640E-01	4.310	.589E-01	4.315	.310E-01	4.320	.544E-04	4.325	-.289E-01
4.330	-.549E-01	4.335	-.767E-01	4.340	-.936E-01	4.345	-.106E+00	4.350	-.114E+00
4.355	-.113E+00	4.360	-.119E+00	4.365	-.117E+00	4.370	-.112E+00	4.375	-.104E+00
4.380	-.929E-01	4.385	-.775E-01	4.390	-.534E-01	4.395	-.354E-01	4.400	-.126E-01
4.405	.116E-01	4.410	.349E-01	4.415	.562E-01	4.420	.752E-01	4.425	.919E-01
4.430	.107E+00	4.435	.121E+00	4.440	.135E+00	4.445	.149E+00	4.450	.163E+00
4.455	.177E+00	4.460	.139E+00	4.465	.137E+00	4.470	.201E+00	4.475	.199E+00
4.480	.190E+00	4.485	.174E+00	4.490	.152E+00	4.495	.124E+00	4.500	.918E-01
4.505	[illegible]	4.510	.164E-01	4.515	-.116E-01	4.520	-.549E-01	4.525	-.890E-01
4.530	-.129E+00	4.535	-.147E+00	4.540	-.159E+00	4.545	-.187E+00	4.550	-.199E+00
4.555	-.207E+00	4.560	-.210E+00	4.565	-.202E+00	4.570	-.204E+00	4.575	-.197E+00
4.580	[illegible]	4.585	[illegible]	4.590	[illegible]	4.595	-.150E+00	4.600	-.140E+00
4.605	[illegible]	4.610	-.711E-01	4.615	[illegible]	4.620	-.140E-01	4.625	.343E-01
4.630	[illegible]	4.635	[illegible]	4.640	[illegible]	4.645	.240E+00	4.650	.283E+00
4.655	[illegible]	4.660	[illegible]	4.665	.332E+00	4.670	.409E+00	4.675	.436E+00
4.680	[illegible]	4.685	[illegible]	4.690	[illegible]	4.695	.523E+00	4.700	.531E+00
4.705	[illegible]	4.710	[illegible]	4.715	[illegible]	4.720	.476E+00	4.725	.447E+00
4.730	[illegible]	4.735	[illegible]	4.740	[illegible]	4.745	.330E+00	4.750	.302E+00
		4.760	[illegible]	4.765	.210E+00	4.770	.176E+00	4.775	.141E+00

[illegible]	[illegible]	4.835	[illegible]	4.840	[illegible]	4.845	-.172E+00	4.850	-.201E+00
[illegible]	[illegible]	[illegible]	[illegible]	4.865	[illegible]	4.870	-.306E+00	4.875	-.318E+00
[illegible]	[illegible]	4.885	-.312E+00	4.890	[illegible]	4.895	-.259E+00	4.900	-.236E+00
4.905	-.231E+00	4.910	[illegible]	4.915	[illegible]	4.920	-.986E-01	4.925	-.705E-01
4.930	-.471E-01	4.935	[illegible]	4.940	[illegible]	4.945	-.750E-02	4.950	-.541E-02
4.955	[illegible]	4.960	-.177E-01	4.965	[illegible]	4.970	-.497E-01	4.975	-.716E-01
4.980	-.954E-01	4.985	-.123E+00	4.990	-.132E+00	4.995	-.181E+00	5.000	-.209E+00
5.005	-.235E+00	5.010	[illegible]	5.015	-.231E+00	5.020	-.295E+00	5.025	-.303E+00
5.030	-.305E+00	5.035	[illegible]	5.040	-.239E+00	5.045	-.274E+00	5.050	-.258E+00
5.055	-.241E+00	5.060	-.225E+00	5.065	-.211E+00	5.070	-.199E+00	5.075	-.188E+00
5.080	-.179E+00	5.085	-.170E+00	5.090	-.132E+00	5.095	-.154E+00	5.100	-.147E+00
5.105	-.140E+00	5.110	-.135E+00	5.115	-.131E+00	5.120	-.129E+00	5.125	-.127E+00
5.130	-.128E+00	5.135	-.129E+00	5.140	-.132E+00	5.145	-.137E+00	5.150	-.143E+00
5.155	-.150E+00	5.160	-.156E+00	5.165	-.165E+00	5.170	-.171E+00	5.175	-.175E+00
5.180	-.177E+00	5.185	-.176E+00	5.190	-.174E+00	5.195	-.170E+00	5.200	-.166E+00
5.205	-.163E+00	5.210	[illegible]	5.215	[illegible]	5.220	-.155E+00	5.225	-.152E+00
5.230	-.147E+00	5.235	-.140E+00	5.240	-.131E+00	5.245	-.122E+00	5.250	-.112E+00
5.255	-.103E+00	5.260	-.935E-01	5.265	-.790E-01	5.270	-.853E-01	5.275	-.841E-01
5.280	-.631E-01	5.285	-.630E-01	5.290	[illegible]	5.295	-.852E-01	5.300	-.877E-01
5.305	-.911E-01	5.310	-.951E-01	5.315	[illegible]	5.320	-.101E+00	5.325	-.102E+00
5.330	-.987E-01	5.335	-.913E-01	5.340	-.310E-01	5.345	-.657E-01	5.350	-.497E-01
5.355	-.308E-01	5.360	-.110E-01	5.365	[illegible]	5.370	.249E-01	5.375	.505E-01
5.380	.706E-01	5.385	.903E-01	5.390	.103E+00	5.395	.122E+00	5.400	.131E+00
5.405	.135E+00	5.410	.131E+00	5.415	.120E+00	5.420	.104E+00	5.425	.843E-01
5.430	.630E-01	5.435	.446E-01	5.440	[illegible]	5.445	.198E-01	5.450	.163E-01
5.455	.116E-01	5.460	.258E-01	5.465	.352E-01	5.470	.480E-01	5.475	.595E-01
5.480	.690E-01	5.485	.751E-01	5.490	.768E-01	5.495	.734E-01	5.500	.649E-01
5.505	.517E-01	5.510	.349E-01	5.515	.158E-01	5.520	-.338E-02	5.525	-.211E-01
5.530	-.357E-01	5.535	-.458E-01	5.540	-.533E-01	5.545	-.595E-01	5.550	-.644E-01
5.555	-.712E-01	5.560	-.821E-01	5.565	-.988E-01	5.570	-.122E+00	5.575	-.151E+00
5.580	-.165E+00	5.585	-.222E+00	5.590	-.258E+00	5.595	-.290E+00	5.600	-.317E+00
5.605	-.338E+00	5.610	-.350E+00	5.615	-.336E+00	5.620	-.355E+00	5.625	-.349E+00
5.630	-.341E+00	5.635	-.332E+00	5.640	-.323E+00	5.645	-.317E+00	5.650	-.312E+00
5.655	-.309E+00	5.660	-.307E+00	5.665	-.305E+00	5.670	-.301E+00	5.675	-.294E+00
5.680	-.285E+00	5.685	-.273E+00	5.690	-.250E+00	5.695	-.247E+00	5.700	-.235E+00
5.705	-.225E+00	5.710	-.218E+00	5.715	-.212E+00	5.720	-.207E+00	5.725	-.200E+00
5.730	-.191E+00	5.735	-.173E+00	5.740	-.151E+00	5.745	-.142E+00	5.750	-.121E+00
5.755	-.101E+00	5.760	-.924E-01	5.765	-.573E-01	5.770	-.554E-01	5.775	-.459E-01
5.780	-.370E-01	5.785	-.256E-01	5.790	-.127E-01	5.795	.613E-02	5.800	.307E-01
5.805	.605E-01	5.810	.942E-01	5.815	.130E+00	5.820	.154E+00	5.825	.196E+00
5.830	.222E+00	5.835	.241E+00	5.840	.231E+00	5.845	.253E+00	5.850	.249E+00
5.855	.238E+00	5.860	.224E+00	5.865	.203E+00	5.870	.194E+00	5.875	.183E+00
5.880	.177E+00	5.885	.175E+00	5.890	.178E+00	5.895	.185E+00	5.900	.193E+00
5.905	.201E+00	5.910	.208E+00	5.915	.212E+00	5.920	.215E+00	5.925	.215E+00
5.930	.214E+00	5.935	.213E+00	5.940	.212E+00	5.945	.213E+00	5.950	.214E+00
5.955	.217E+00	5.960	.219E+00	5.965	.221E+00	5.970	.221E+00	5.975	.220E+00
5.980	.213E+00	5.985	.214E+00	5.990	.210E+00	5.995	.207E+00	6.000	.204E+00
6.005	.264E+00	6.010	.206E+00	6.015	[illegible]	6.020	.222E+00	6.025	.235E+00
6.030	.251E+00	6.035	.265E+00	6.040	.234E+00	6.045	.246E+00	6.050	.302E+00
6.055	.299E+00	6.060	.246E+00	6.065	.252E+00	6.070	.228E+00	6.075	.187E+00
6.080	.140E+00	6.085	.919E-01	6.090	.432E-01	6.095	.293E-02	6.100	-.331E-01
6.105	-.620E-01	6.110	-.837E-01	6.115	-.790E-01	6.120	-.109E+00	6.125	-.116E+00
6.130	-.121E+00	6.135	-.125E+00	6.140	-.130E+00	6.145	-.137E+00	6.150	-.146E+00
6.155	-.190E+00	6.160	-.174E+00	6.165	-.172E+00	6.170	-.212E+00	6.175	-.234E+00
6.180	-.255E+00	6.185	-.274E+00	6.190	-.230E+00	6.195	-.301E+00	6.200	-.306E+00
6.205	-.304E+00	6.210	-.225E+00	6.215	-.279E+00	6.220	-.258E+00	6.225	-.232E+00
6.230	[illegible]	6.235	-.172E+00	6.240	[illegible]	6.245	-.110E+00	6.250	-.819E-01
6.255	[illegible]	6.260	[illegible]	6.265	[illegible]	6.270	-.176E-01	6.275	-.173E-01
6.280	[illegible]	6.285	[illegible]	6.290	[illegible]	6.295	-.791E-01	6.300	-.105E+00
6.305	-.133E+00	6.310	[illegible]	6.315	-.139E+00	6.320	-.204E+00	6.325	-.218E+00
6.330	-.227E+00	6.335	-.231E+00	6.340	-.232E+00	6.345	-.229E+00	6.350	-.225E+00
6.355	-.222E+00	6.360	-.221E+00	6.365	-.221E+00	6.370	-.224E+00	6.375	-.228E+00
6.380	[illegible]	6.385	-.290E+00	6.390	-.245E+00	6.395	-.248E+00	6.400	-.249E+00
[illegible]	[illegible]	6.410	-.237E+00	6.415	-.223E+00	6.420	-.202E+00	6.425	-.173E+00

6.480	[illegible]	6.485	[illegible]	6.490	[illegible]	6.495	.343E+00	6.500	.342E+00
6.505	.370E+00	6.510	.322E+00	6.515	.315[illegible]	6.520	.299E+00	6.525	.279E+00
6.530	.278E+00	6.535	.235E+00	6.540	.214[illegible]	6.545	.194E+00	6.550	.176E+00
6.555	.161E+00	6.560	.146E+00	6.565	.137E+00	6.570	.128E+00	6.575	.118E+00
6.580	.10[illegible]E+00	6.585	.979E-01	6.590	[illegible]	6.595	.745E-01	6.600	.628E-01
6.605	.517E-01	6.610	.417E-01	6.615	.329E-01	6.620	.253E-01	6.625	.188E-01
6.630	.129E-01	6.635	.737E-02	6.640	.134E-02	6.645	-.374E-02	6.650	-.924E-02
6.655	-.143E-01	6.660	-.125E-01	6.665	-.213E-01	6.670	-.224E-01	6.675	-.217E-01
6.680	-.192E-01	6.685	-.153E-01	6.690	-.102E-01	6.695	-.440E-02	6.700	.203E-02
6.705	.916E-02	6.710	.174E-01	6.715	.271E-01	6.720	.389E-01	6.725	.530E-01
6.730	[illegible]	6.735	[illegible]	6.740	.104E+00	6.745	.121E+00	6.750	.135E+00
6.755	.144E+00	6.760	.149E+00	6.765	.143E+00	6.770	.143E+00	6.775	.134E+00
6.780	.124E+00	6.785	.114E+00	6.790	.130E+00	6.795	.102E+00	6.800	.102E+00
6.805	.167E+00	6.810	.117E+00	6.815	.130E+00	6.820	.144E+00	6.825	.158E+00
6.830	.171E+00	6.835	.179E+00	6.840	.134E+00	6.845	.183E+00	6.850	.178E+00
6.855	.159E+00	6.860	.159E+00	6.865	.130E+00	6.870	.143E+00	6.875	.141E+00
6.880	.146E+00	6.885	.151E+00	6.890	.175E+00	6.895	.197E+00	6.900	.222E+00
6.905	.246E+00	6.910	.260E+00	6.915	.237E+00	6.920	.301E+00	6.925	.310E+00
6.930	.315E+00	6.935	.315E+00	6.940	.315E+00	6.945	.313E+00	6.950	.310E+00
6.955	.306E+00	6.960	.302E+00	6.965	[illegible]	6.970	.292E+00	6.975	.284E+00
6.980	.273E+00	6.985	[illegible]	6.990	.236E+00	6.995	.215E+00	7.000	.187E+00
7.005	.157E+00	7.010	.124E+00	7.015	.915E-01	7.020	.595E-01	7.025	.294E-01
7.030	.167E-02	7.035	-.232E-01	7.040	[illegible]	7.045	-.687E-01	7.050	-.909E-01
7.055	-.114E+00	7.060	-.138E+00	7.065	-.152E+00	7.070	-.185E+00	7.075	-.206E+00
7.080	-.223E+00	7.085	-.235E+00	7.090	-.240E+00	7.095	-.238E+00	7.100	-.230E+00
7.105	-.216E+00	7.110	-.197E+00	7.115	-.176E+00	7.120	-.154E+00	7.125	-.131E+00
7.130	-.168E+00	7.135	-.852E-01	7.140	-.640E-01	7.145	-.441E-01	7.150	-.257E-01
7.155	-.564E-02	7.160	.698E-02	7.165	.714E-01	7.170	.349E-01	7.175	.477E-01
7.180	.599E-01	7.185	.716E-01	7.190	.823E-01	7.195	.914E-01	7.200	.982E-01
7.205	.102E+00	7.210	.102E+00	7.215	.771E-01	7.220	.930E-01	7.225	.846E-01
7.230	.753E-01	7.235	.694E-01	7.240	.597E-01	7.245	.532E-01	7.250	.501E-01
7.255	.492E-01	7.260	.502E-01	7.265	.524E-01	7.270	.554E-01	7.275	.590E-01
7.280	.630E-01	7.285	.676E-01	7.290	.730E-01	7.295	.792E-01	7.300	.863E-01
7.305	.940E-01	7.310	.102E+00	7.315	.105E+00	7.320	.114E+00	7.325	.116E+00
7.330	.116E+00	7.335	.112E+00	7.340	.104E+00	7.345	.913E-01	7.350	.748E-01
7.355	.545E-01	7.360	[illegible]	7.365	.455E-02	7.370	-.239E-01	7.375	-.539E-01
7.380	-.647E-01	7.385	-.116E+00	7.390	-.147E+00	7.395	-.177E+00	7.400	-.206E+00
7.405	-.233E+00	7.410	-.266E+00	7.415	-.276E+00	7.420	-.290E+00	7.425	-.297E+00
7.430	-.297E+00	7.435	-.299E+00	7.440	-.274E+00	7.445	-.251E+00	7.450	-.221E+00
7.455	-.186E+00	7.460	-.146E+00	7.465	-.102E+00	7.470	-.566E-01	7.475	-.992E-02
7.480	.362E-01	7.485	[illegible]	7.490	.121E+00	7.495	.156E+00	7.500	.184E+00
7.505	.204E+00	7.510	.213E+00	7.515	.229E+00	7.520	.216E+00	7.525	.205E+00
7.530	.196E+00	7.535	.170E+00	7.540	.147E+00	7.545	.121E+00	7.550	.934E-01
7.555	.627E-01	7.560	[illegible]	7.565	[illegible]	7.570	-.448E-01	7.575	-.841E-01
7.580	-.123E+00	7.585	-.161E+00	7.590	-.194E+00	7.595	-.224E+00	7.600	-.247E+00
7.605	-.263E+00	7.610	-.273E+00	7.615	-.276E+00	7.620	-.272E+00	7.625	-.262E+00
7.630	-.247E+00	7.635	-.227E+00	7.640	-.294E+00	7.645	-.178E+00	7.650	-.150E+00
7.655	-.122E+00	7.660	-.935E-01	7.665	-.656E-01	7.670	-.388E-01	7.675	-.133E-01
7.680	.104E-01	7.685	.321E-01	7.690	.511E-01	7.695	.671E-01	7.700	.796E-01
7.705	.884E-01	7.710	.936E-01	7.715	.755E-01	7.720	.952E-01	7.725	.936E-01
7.730	.917E-01	7.735	.904E-01	7.740	.940E-01	7.745	.895E-01	7.750	.886E-01
7.755	.854E-01	7.760	.785E-01	7.765	[illegible]	7.770	.490E-01	7.775	.260E-01
7.780	-.126E-02	7.785	-.310E-01	7.790	-.610E-01	7.795	-.897E-01	7.800	-.112E+00
7.805	-.130E+00	7.810	-.142E+00	7.815	-.148E+00	7.820	-.149E+00	7.825	-.146E+00
7.830	-.140E+00	7.835	-.143E+00	7.840	[illegible]	7.845	-.121E+00	7.850	-.116E+00
7.855	-.113E+00	7.860	-.111E+00	7.865	-.109E+00	7.870	-.106E+00	7.875	-.102E+00
7.880	[illegible]	7.885	[illegible]	7.890	-.743E-01	7.895	-.598E-01	7.900	-.433E-01
7.905	[illegible]	7.910	[illegible]	7.915	[illegible]	7.920	.196E-01	7.925	.284E-01
7.930	[illegible]	7.935	.311E-01	7.940	[illegible]	7.945	.113E-01	7.950	-.696E-02
7.955	[illegible]	7.960	[illegible]	7.965	[illegible]	7.970	-.124E+00	7.975	-.161E+00
7.980	[illegible]	7.985	-.235E+00	7.990	-.270E+00	7.995	-.302E+00	8.000	-.330E+00
8.005	[illegible]	8.010	[illegible]	8.015	-.377E+00	8.020	-.378E+00	8.025	-.372E+00
8.030	-.356E+00	8.035	[illegible]	8.040	-.320E+00	8.045	-.297E+00	8.050	-.273E+00
				[illegible]	[illegible]	8.070	-.172E+00	8.075	-.176E+00
								[illegible]	[illegible]

8.145	.832E-01
8.150	.855E-01
8.155	.712E-01
8.160	.779E-01
8.165	.481E-01
8.170	-.142E-02
8.175	-.677E-01
8.180	-.140E+00
8.185	-.152E+00
8.190	-.101E+00
8.195	.807E-02
8.200	.690E-01
8.205	.605E-01
8.210	.431E-01
8.215	.550E-01
8.220	.476E-01
8.225	.683E-01
8.230	.157E+00
8.235	.194E+00
8.240	.153E+00
8.245	.654E-01
8.250	-.417E-01
8.255	-.120E+00
8.260	-.221E+00
8.265	-.251E+00
8.270	-.183E+00
8.275	-.724E-01
8.280	.147E+00
8.285	.317E+00
8.290	.308E+00
8.295	.250E+00
8.300	.184E+00
8.305	.988E-01
8.310	.853E-01
8.315	.976E-01
8.320	.846E-01
8.325	.288E-01
8.330	-.541E-01
8.335	-.130E+00
8.340	-.802E-01
8.345	-.330E-01
8.350	.522E-01
8.355	.120E+00
8.360	.400E-01
8.365	-.779E-01
8.370	-.114E+00
8.375	-.147E+00
8.380	-.156E+00
8.385	-.391E-01
8.390	.159E+00
8.395	.283E+00
8.400	.188E+00
8.405	.620E-01
8.410	.142E+00
8.415	.233E+00
8.420	.178E+00
8.425	.422E-01
8.430	-.152E+00
8.435	-.224E+00
8.440	-.238E-01
8.445	.110E+00
8.450	.349E-02
8.455	-.230E+00
8.460	-.374E+00

8.175	.813E-01
8.200	.722E-01
8.225	.760E-01
8.250	.383E-01
8.275	-.121E-01
8.300	-.843E-01
8.325	-.148E+00
8.350	-.147E+00
8.375	-.815E-01
8.400	.276E-01
8.425	.707E-01
8.450	.561E-01
8.475	.432E-01
8.500	.582E-01
8.525	.439E-01
8.550	.862E-01
8.575	.181E+00
8.600	.189E+00
8.625	.140E+00
8.650	.428E-01
8.675	-.586E-01
8.700	-.138E+00
8.725	-.238E+00
8.750	-.241E+00
8.775	-.167E+00
8.800	-.361E-01
8.825	.192E+00
8.850	.328E+00
8.875	.295E+00
8.900	.240E+00
8.925	.165E+00
8.950	.899E-01
8.975	.882E-01
9.000	.979E-01
9.025	.769E-01
9.050	.131E-01
9.075	-.689E-01
9.100	-.100E+00
9.125	-.725E-01
9.150	-.194E-01
9.175	.718E-01
9.200	.117E+00
9.225	.117E-01
9.250	-.898E-01
9.275	-.119E+00
9.300	-.154E+00
9.325	-.145E+00
9.350	.744E-03
9.375	.205E+00
9.400	.281E+00
9.425	.154E+00
9.450	.624E-01
9.475	.169E+00
9.500	.233E+00
9.525	.155E+00
9.550	.759E-02
9.575	-.187E+00
9.600	-.199E+00
9.625	.207E-01
9.650	.113E+00
9.675	-.427E-01
9.700	-.275E+00
9.725	-.386E+00

9.820	-.349E-01
9.825	.109E+00
9.850	.849E-01
9.875	-.277E-01
9.900	-.767E-01
9.925	-.779E-01
9.950	-.116E+00
9.975	-.181E+00
10.000	-.234E+00

SPECTRA FOR [illegible] STEEL
CALCULATED AT THE [illegible]

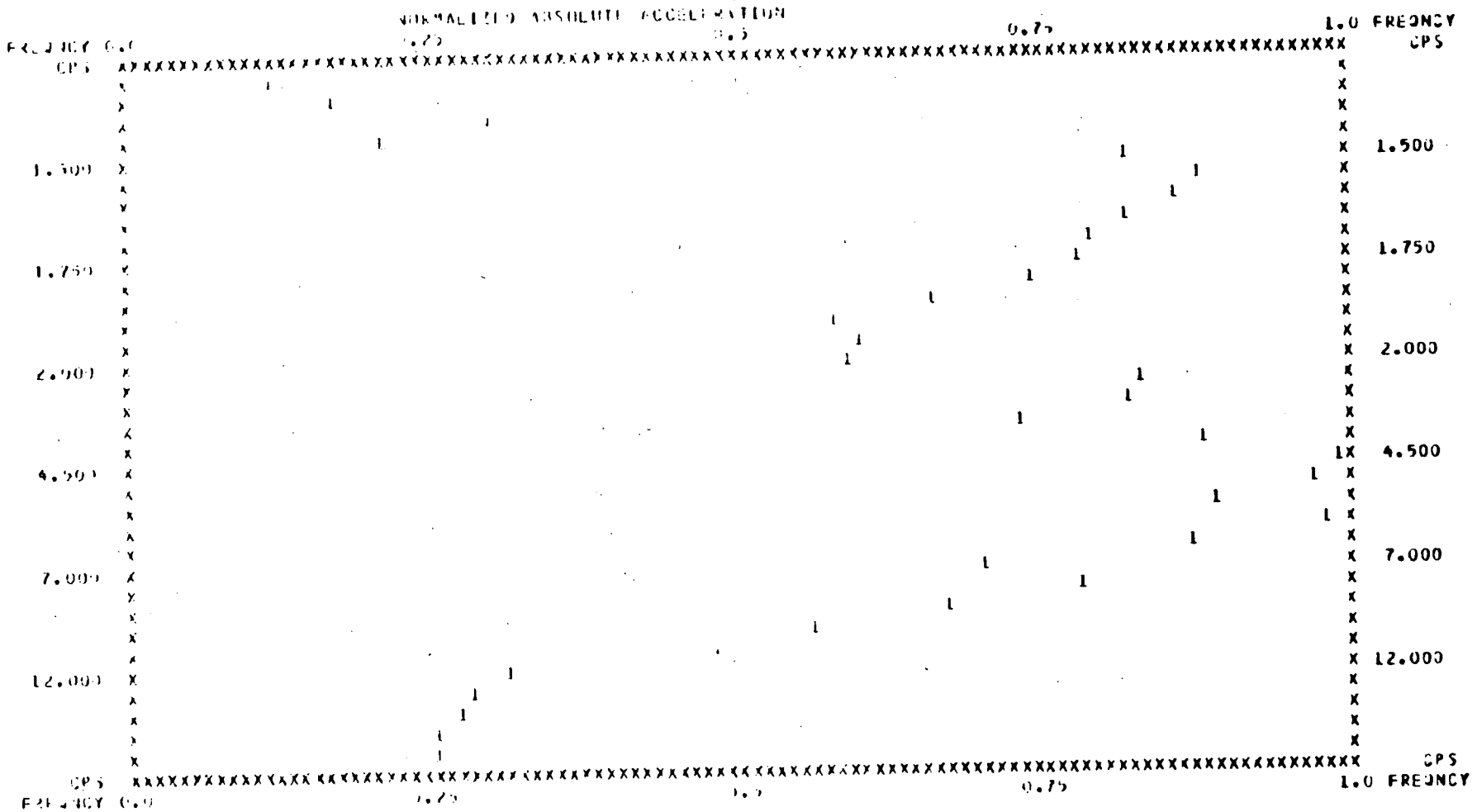
.3000	.4000	.7000	1.0000	1.3000	1.5000	1.6000	1.6500	1.7000	1.7500
1.8000	1.8500	1.9000	1.9500	2.0000	2.5000	3.0000	3.5000	4.0000	4.5000
5.0000	5.5000	6.0000	6.5000	7.0000	7.5000	8.0000	9.0000	10.0000	12.0000
15.0000	20.0000	25.0000	30.0000						

RESPONSE [illegible] FOR AT DAMPING = .02 [illegible] OUTPUT TO TAPE [illegible]

BASEMENT

FREQUENCY (CPS)	PERIOD (SEC)	ABSOLUTE ACCELERATION	PSEUDO VELOCITY	TIME AT MAXIMUM
.300	3.333	.2712E+00	.1433E+00	.9990E+01
.400	2.500	.3357E+00	.1474E+00	.1084E+02
.700	1.429	.5617E+00	.1504E+00	.6345E+01
1.000	1.000	.5705E+00	.7473E-01	.5225E+01
1.500	.667	.1720E+01	.1631E+00	.5315E+01
1.550	.645	.1351E+01	.1390E+00	.6765E+01
1.600	.625	.1321E+01	.1311E+00	.6725E+01
1.650	.606	.1723E+01	.1663E+00	.6695E+01
1.700	.588	.1533E+01	.1574E+00	.6675E+01
1.750	.571	.1553E+01	.1506E+00	.6655E+01
1.800	.556	.1365E+01	.1365E+00	.6630E+01
1.850	.541	.1332E+01	.1193E+00	.6510E+01
1.900	.526	.1239E+01	.1037E+00	.7090E+01
1.950	.513	.1274E+01	.1040E+00	.9550E+01
2.000	.500	.1246E+01	.9939E-01	.9320E+01
2.500	.400	.1751E+01	.1121E+00	.5490E+01
3.000	.333	.1723E+01	.9166E-01	.3955E+01
3.500	.286	.1537E+01	.6990E-01	.4440E+01
4.000	.250	.1858E+01	.7398E-01	.7730E+01
4.500	.222	.2097E+01	.7412E-01	.6550E+01
5.000	.200	.2059E+01	.6538E-01	.3070E+01
5.500	.182	.1374E+01	.5624E-01	.4035E+01
6.000	.167	.2071E+01	.5495E-01	.4590E+01
6.500	.154	.1345E+01	.4513E-01	.4470E+01
7.000	.143	.1443E+01	.3399E-01	.9765E+01
7.500	.133	.1549E+01	.3499E-01	.9750E+01
8.000	.125	.1425E+01	.2837E-01	.3740E+01
9.000	.111	.1157E+01	.2094E-01	.6515E+01
10.000	.100	.1034E+01	.1645E-01	.5490E+01
12.000	.083	.6332E+00	.9062E-02	.6215E+01
15.000	.067	.6034E+00	.7453E-02	.5720E+01
20.000	.050	.5864E+00	.4659E-02	.4710E+01
25.000	.040	.5502E+00	.3503E-02	.4700E+01
30.000	.033	.5422E+00	.2876E-02	.4700E+01

MAXIMUM ABSOLUTE SPECTRAL ACCELERATION .2097E+01
AT FREQUENCY (CPS) .4500E+01


NORMALIZED ABSOLUTE ACCELERATION
FREQNCY
CPS
0.25
0.5
0.75
1.0
1.500
1.750
2.000
4.500
7.000
12.000

INPUT TIME HISTORY CONTROL

TIME HISTORY NUMBER		2
NUMBER OF TIME POINTS	NTP	2001
INPUT CODE	INPT	1
TIME STEP	DEL	[illegible]
ACCELERATION SCALE FACTOR	SCFA	1.0000

COMPUTATION AND OUTPUT CONTROL

INPUT HISTORY INTEGRATION CODE	INTR	
SPECTRUM COMPUTATION CODES	ISPC	1
	ISUR	
SPECTRUM OUTPUT CODE	IPUT	1
NUMBER OF FREQUENCY POINTS	NFP	[illegible]4
NUMBER OF DAMPINGS	NDP	1
FREQUENCY SCALE TYPE CODE	IFSC	2
LOWEST FREQUENCY IN CPS	F1	.3000
HIGHEST FREQUENCY IN CPS	F2	30.0000
TIME STEP TO PERIOD RATIO	DTLP	.2000

FIELD LENGTH REQUIREMENTS
(IN OCTAL)

PROGRAM LENGTH	041437
BLANK COMMON REQUIRED	0[illegible]7647
FIELD LENGTH REQUIRED	050[illegible]6

FORMAT OF INPUT TIME HISTORY IS

(2[illegible]8(7),(I16.8))

* * * INPUT ACCELERATION TIME HISTORY * * * * * *

TIME	ACCEL	TIME	ACCEL	TIME	ACCEL	TIME	ACCEL	TIME	ACCEL
.005	.464E-02	.010	.157E-03	.015	-.397E-02	.020	-.213E-01	.025	-.350E-01
.030	-.475E-01	.035	-.552E-01	.040	-.594E-01	.045	-.562E-01	.050	-.474E-01
.055	-.349E-01	.060	-.209E-01	.065	-.777E-02	.070	.200E-02	.075	.818E-02
.080	.108E-01	.085	.112E-01	.090	.110E-01	.095	.121E-01	.100	.158E-01
.105	.220E-01	.110	.321E-01	.115	.430E-01	.120	.536E-01	.125	.621E-01
.130	.669E-01	.135	.670E-01	.140	.523E-01	.145	.535E-01	.150	.418E-01
.155	.289E-01	.160	.166E-01	.165	[illegible]	.170	-.359E-03	.175	-.347E-02
.180	-.269E-02	.185	.460E-03	.190	.543E-02	.195	.109E-01	.200	.156E-01
.205	.183E-01	.210	.203E-01	.215	.204E-01	.220	.198E-01	.225	.194E-01
.230	.201E-01	.235	.222E-01	.240	.258E-01	.245	.305E-01	.250	.357E-01
.255	.463E-01	.260	.437E-01	.265	.352E-01	.270	.448E-01	.275	.427E-01
.280	.394E-01	.285	.356E-01	.290	.310E-01	.295	.288E-01	.300	.266E-01
.305	.257E-01	.310	.258E-01	.315	.259E-01	.320	.298E-01	.325	.312E-01
.330	.337E-01	.335	.360E-01	.340	.379E-01	.345	.387E-01	.350	.393E-01
.355	.390E-01	.360	.343E-01	.365	.376E-01	.370	.373E-01	.375	.375E-01
.380	.384E-01	.385	.376E-01	.390	.403E-01	.395	.414E-01	.400	.410E-01
.405	.392E-01	.410	.359E-01	.415	.310E-01	.420	.249E-01	.425	.173E-01
.430	.879E-02	.435	-.724E-03	.440	-.109E-01	.445	-.214E-01	.450	-.313E-01
.455	-.394E-01	.460	-.447E-01	.465	-.450E-01	.470	-.428E-01	.475	-.354E-01
.480	-.250E-01	.485	-.136E-01	.490	-.359E-02	.495	.252E-02	.500	.361E-02
.505	-.632E-03	.510	-.905E-02	.515	-.179E-01	.520	-.290E-01	.525	-.355E-01
.530	-.374E-01	.535	-.349E-01	.540	-.273E-01	.545	-.233E-01	.550	-.195E-01
.555	-.201E-01	.560	-.250E-01	.565	-.359E-01	.570	-.507E-01	.575	-.649E-01
.580	-.772E-01	.585	-.460E-01	.590	-.308E-01	.595	-.923E-01	.600	-.922E-01
.605	-.916E-01	.610	-.910E-01	.615	-.322E-01	.620	-.916E-01	.625	-.881E-01
.630	-.662E-01	.635	-.673E-01	.640	-.506E-01	.645	-.323E-01	.650	-.159E-01
.655	-.475E-02	.660	-.704E-03	.665	-.436E-02	.670	-.141E-01	.675	-.256E-01
.680	-.348E-01	.685	-.379E-01	.690	-.330E-01	.695	-.207E-01	.700	-.397E-02
.705	.126E-01	.710	.240E-01	.715	.265E-01	.720	.185E-01	.725	.141E-02
.730	-.209E-01	.735	-.429E-01	.740	-.594E-01	.745	-.655E-01	.750	-.628E-01
.755	-.499E-01	.760	-.317E-01	.765	-.135E-01	.770	-.189E-03	.775	.464E-02
.780	-.473E-04	.785	-.127E-01	.790	-.298E-01	.795	-.454E-01	.800	-.582E-01
.805	-.617E-01	.810	-.556E-01	.815	-.406E-01	.820	-.194E-01	.825	.442E-02
.830	.270E-01	.835	.451E-01	.840	.564E-01	.845	.601E-01	.850	.567E-01
.855	.479E-01	.860	.357E-01	.865	.227E-01	.870	.115E-01	.875	.370E-02
.880	.546E-01	.885	.225E-02	.890	.401E-02	.895	.151E-01	.900	.241E-01
.905	.295E-01	.910	.239E-01	.915	.238E-01	.920	.109E-01	.925	-.774E-02
.930	-.297E-01	.935	-.519E-01	.940	-.710E-01	.945	-.842E-01	.950	-.898E-01
.955	-.377E-01	.960	-.792E-01	.965	-.656E-01	.970	-.528E-01	.975	-.405E-01
.980	-.316E-01	.985	-.270E-01	.990	-.254E-01	.995	-.286E-01	1.000	-.321E-01
1.005	-.353E-01	1.010	-.373E-01	1.015	-.375E-01	1.020	-.353E-01	1.025	-.344E-01
1.030	-.226E-01	1.035	-.315E-01	1.040	-.325E-01	1.045	-.346E-01	1.050	-.380E-01
1.055	-.422E-01	1.060	-.456E-01	1.065	-.514E-01	1.070	-.558E-01	1.075	-.599E-01
1.080	-.638E-01	1.085	-.673E-01	1.090	-.700E-01	1.095	-.715E-01	1.100	-.710E-01
1.105	-.681E-01	1.110	-.624E-01	1.115	-.540E-01	1.120	-.434E-01	1.125	-.318E-01
1.130	-.203E-01	1.135	-.103E-01	1.140	-.239E-02	1.145	.106E-02	1.150	.183E-02
1.155	-.192E-04	1.160	-.337E-02	1.165	-.558E-02	1.170	-.872E-02	1.175	-.849E-02
1.180	-.503E-02	1.185	-.451E-02	1.190	.914E-02	1.195	.129E-01	1.200	.185E-01
1.205	.221E-01	1.210	.233E-01	1.215	.223E-01	1.220	.201E-01	1.225	.178E-01
1.230	.167E-01	1.235	.177E-01	1.240	.317E-01	1.245	.278E-01	1.250	.356E-01
1.255	.437E-01	1.260	[illegible]	1.265	[illegible]	1.270	.595E-01	1.275	.601E-01
1.280	.567E-01	1.285	[illegible]	1.290	.532E-01	1.295	.507E-01	1.300	.492E-01
1.305	[illegible]	1.310	[illegible]	1.315	[illegible]	1.320	.511E-01	1.325	.513E-01
1.330	.564E-01	1.335	.479E-01	1.340	[illegible]	1.345	.383E-01	1.350	.324E-01
1.355	.272E-01	1.360	.176E-01	1.365	.112E-02	1.370	.227E-02	1.375	-.487E-02
1.380	-.115E-01	1.385	-.177E-01	1.390	-.230E-01	1.395	-.279E-01	1.400	-.323E-01
1.405	-.301E-01	1.410	-.342E-01	1.415	-.313E-01	1.420	-.439E-01	1.425	-.457E-01
1.430	-.472E-01	1.435	-.496E-01	1.440	-.522E-01	1.445	-.549E-01	1.450	-.572E-01
1.455	-.563E-01	1.460	-.572E-01	1.465	-.510E-01	1.470	-.454E-01	1.475	-.349E-01

1.530	[illegible]	1.535	-.513E-01	1.540	[illegible]	1.545	[illegible]	[illegible]	[illegible]
1.555	[illegible]	1.560	-.325E-01	1.565	[illegible]	1.570	-.436E-01	1.575	-.504E-01
1.580	[illegible]	1.585	-.559E-01	1.590	[illegible]	1.595	-.564E-01	1.600	-.447E-01
1.605	[illegible]	1.610	-.366E-01	1.615	[illegible]	1.620	-.339E-01	1.625	-.329E-01
1.630	-.361E-01	1.635	-.246E-01	1.640	-.158E-01	1.645	-.634E-02	1.650	-.163E-02
1.655	[illegible]	1.660	-.266E-02	1.665	-.107E-01	1.670	-.229E-01	1.675	-.354E-01
1.680	-.444E-01	1.685	-.457E-01	1.690	-.407E-01	1.695	-.272E-01	1.700	-.941E-02
1.705	.816E-02	1.710	.207E-01	1.715	[illegible]	1.720	.191E-01	1.725	.529E-02
1.730	-.127E-01	1.735	-.294E-01	1.740	-.334E-01	1.745	-.394E-01	1.750	-.283E-01
1.755	-.614E-02	1.760	.164E-01	1.765	.337E-01	1.770	.562E-01	1.775	.622E-01
1.780	.568E-01	1.785	.416E-01	1.790	.209E-01	1.795	-.192E-03	1.800	-.167E-01
1.805	-.250E-01	1.810	-.237E-01	1.815	[illegible]	1.820	.192E-02	1.825	.196E-01
1.830	.359E-01	1.835	.422E-01	1.840	.502E-01	1.845	.473E-01	1.850	.387E-01
1.855	.267E-01	1.860	.139E-01	1.865	.330E-02	1.870	-.376E-02	1.875	-.489E-02
1.880	.245E-03	1.885	.113E-01	1.890	.270E-01	1.895	.453E-01	1.900	.634E-01
1.905	.766E-01	1.910	.691E-01	1.915	.402E-01	1.920	.844E-01	1.925	.715E-01
1.930	.538E-01	1.935	.394E-01	1.940	.158E-01	1.945	.396E-02	1.950	-.213E-02
1.955	-.111E-02	1.960	.598E-02	1.965	.154E-01	1.970	.276E-01	1.975	.364E-01
1.980	.416E-01	1.985	.405E-01	1.990	.374E-01	1.995	.275E-01	2.000	.188E-01
2.005	.116E-01	2.010	.732E-02	2.015	.580E-02	2.020	.975E-02	2.025	.152E-01
2.030	.219E-01	2.035	.253E-01	2.040	.337E-01	2.045	.373E-01	2.050	.393E-01
2.055	.196E-01	2.060	.394E-01	2.065	.333E-01	2.070	.357E-01	2.075	.346E-01
2.080	.319E-01	2.085	.286E-01	2.090	.247E-01	2.095	.207E-01	2.100	.170E-01
2.105	.144E-01	2.110	.134E-01	2.115	.140E-01	2.120	.151E-01	2.125	.190E-01
2.130	.216E-01	2.135	.227E-01	2.140	.213E-01	2.145	.157E-01	2.150	.881E-02
2.155	-.166E-02	2.160	-.141E-01	2.165	-.264E-01	2.170	-.359E-01	2.175	-.442E-01
2.180	-.474E-01	2.185	-.464E-01	2.190	-.417E-01	2.195	-.349E-01	2.200	-.275E-01
2.205	-.212E-01	2.210	-.175E-01	2.215	-.171E-01	2.220	-.197E-01	2.225	-.246E-01
2.230	-.304E-01	2.235	-.356E-01	2.240	-.310E-01	2.245	-.398E-01	2.250	-.381E-01
2.255	-.345E-01	2.260	-.301E-01	2.265	-.252E-01	2.270	-.241E-01	2.275	-.243E-01
2.280	-.271E-01	2.285	-.320E-01	2.290	-.331E-01	2.295	-.444E-01	2.300	-.499E-01
2.305	-.538E-01	2.310	-.559E-01	2.315	-.561E-01	2.320	-.549E-01	2.325	-.527E-01
2.330	-.502E-01	2.335	-.477E-01	2.340	-.455E-01	2.345	-.436E-01	2.350	-.420E-01
2.355	-.405E-01	2.360	-.392E-01	2.365	-.377E-01	2.370	-.359E-01	2.375	-.362E-01
2.380	-.360E-01	2.385	-.364E-01	2.390	-.375E-01	2.395	-.391E-01	2.400	-.411E-01
2.405	-.433E-01	2.410	-.458E-01	2.415	-.434E-01	2.420	-.517E-01	2.425	-.559E-01
2.430	-.615E-01	2.435	-.687E-01	2.440	-.774E-01	2.445	-.870E-01	2.450	-.965E-01
2.455	-.104E+00	2.460	-.109E+00	2.465	-.110E+00	2.470	-.105E+00	2.475	-.968E-01
2.480	-.954E-01	2.485	-.735E-01	2.490	-.634E-01	2.495	-.573E-01	2.500	-.564E-01
2.505	-.605E-01	2.510	-.682E-01	2.515	[illegible]	2.520	-.833E-01	2.525	-.850E-01
2.530	-.804E-01	2.535	-.693E-01	2.540	-.531E-01	2.545	-.346E-01	2.550	-.168E-01
2.555	-.253E-02	2.560	.659E-02	2.565	.103E-01	2.570	.955E-02	2.575	.661E-02
2.580	.321E-02	2.585	.893E-03	2.590	.436E-04	2.595	-.674E-04	2.600	-.916E-03
2.605	-.407E-02	2.610	-.105E-01	2.615	-.290E-01	2.620	-.313E-01	2.625	-.422E-01
2.630	-.504E-01	2.635	-.541E-01	2.640	-.547E-01	2.645	-.497E-01	2.650	-.449E-01
2.655	-.420E-01	2.660	-.430E-01	2.665	-.438E-01	2.670	-.580E-01	2.675	-.676E-01
2.680	-.730E-01	2.685	-.723E-01	2.690	-.511E-01	2.695	-.402E-01	2.700	-.117E-01
2.705	.201E-01	2.710	.901E-01	2.715	[illegible]	2.720	.831E-01	2.725	.954E-01
2.730	.953E-01	2.735	.924E-01	2.740	.421E-01	2.745	.953E-01	2.750	.107E+00
2.755	.121E+00	2.760	.137E+00	2.765	.148E+00	2.770	.151E+00	2.775	.144E+00
2.780	.126E+00	2.785	.994E-01	2.790	.693E-01	2.795	.425E-01	2.800	.224E-01
2.805	.127E-01	2.810	.142E-01	2.815	.720E-01	2.820	.415E-01	2.825	.590E-01
2.830	.732E-01	2.835	.899E-01	2.840	.335E-01	2.845	.724E-01	2.850	.583E-01
2.855	.410E-01	2.860	.232E-01	2.865	.753E-02	2.870	-.434E-02	2.875	-.116E-01
2.880	-.144E-01	2.885	-.137E-01	2.890	-.107E-01	2.895	-.783E-02	2.900	-.635E-02
2.905	[illegible]	2.910	-.153E-01	2.915	-.202E-01	2.920	-.403E-01	2.925	-.581E-01
2.930	[illegible]	2.935	[illegible]	2.940	-.104E+00	2.945	-.110E+00	2.950	-.109E+00
2.955	-.103E+00	2.960	[illegible]	2.965	-.345E-01	2.970	-.775E-01	2.975	-.751E-01
2.980	[illegible]	2.985	[illegible]	2.990	-.277E-01	2.995	-.110E+00	3.000	-.120E+00
3.005	-.127E+00	3.010	-.130E+00	3.015	-.127E+00	3.020	-.122E+00	3.025	-.115E+00
3.030	[illegible]	3.035	-.102E+00	3.040	[illegible]	3.045	-.974E-01	3.050	-.978E-01
3.055	[illegible]	3.060	-.101E+00	3.065	-.106E+00	3.070	-.106E+00	3.075	-.109E+00
3.080	-.113E+00	3.085	-.110E+00	3.090	-.112E+00	3.095	-.119E+00	3.100	-.116E+00
3.105	[illegible]	3.110	-.971E-01	3.115	-.312E-01	3.120	-.602E-01	3.125	-.359E-01
				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

3.220	.249E+00	3.225	.233E+00								
3.245	.203E+00	3.250	.209E+00								
3.270	.253E+00	3.275	.277E+00								
3.295	.322E+00	3.300	.334E+00								
3.320	.353E+00	3.325	.390E+00								
3.345	.383E+00	3.350	.373E+00								
3.370	.321E+00	3.375	.306E+00								
3.395	.247E+00	3.400	.234E+00								
3.420	.195E+00	3.425	.186E+00								
3.445	.141E+00	3.450	.129E+00								
3.470	.998E-01	3.475	.969E-01								
3.495	.646E-01	3.500	.456E-01								
3.520	-.443E-01	3.525	-.584E-01								
3.545	-.611E-01	3.550	-.579E-01								
3.570	-.775E-01	3.575	-.861E-01								
3.595	-.833E-01	3.600	-.736E-01								
3.620	-.401E-01	3.625	-.350E-01								
3.645	-.106E-01	3.650	-.665E-02								
3.670	-.375E-01	3.675	-.526E-01								
3.695	-.646E-01	3.700	-.545E-01								
3.720	-.581E-01	3.725	-.798E-01								
3.745	-.152E+00	3.750	-.144E+00								
3.770	-.312E-01	3.775	-.811E-02								
3.795	-.329E-03	3.800	-.713E-02								
3.820	.608E-02	3.825	.170E-01								
3.845	.271E-01	3.850	.141E-01								
3.870	-.883E-01	3.875	-.116E+00								
3.895	-.151E+00	3.900	-.137E+00								
3.920	-.655E-01	3.925	-.629E-01								
3.945	-.899E-01	3.950	-.888E-01								
3.970	-.222E-01	3.975	-.499E-02								
3.995	-.314E-02	4.000	-.126E-01								
4.020	-.259E-01	4.025	-.248E-01								
4.045	-.505E-01	4.050	-.635E-01								
4.070	-.872E-01	4.075	-.815E-01								
4.095	-.353E-01	4.100	-.226E-01								
4.120	.328E-01	4.125	.483E-01								
4.145	.997E-01	4.150	.105E+00								
4.170	.871E-01	4.175	.744E-01								
4.195	.250E-01	4.200	.183E-01								
4.220	.152E-01	4.225	.168E-01								
4.245	.314E-01	4.250	.406E-01								
4.270	.955E-01	4.275	.108E+00								
4.295	.106E+00	4.300	.938E-01								
4.320	.295E-01	4.325	.132E-01								
4.345	-.371E-01	4.350	-.436E-01								
4.370	-.474E-01	4.375	-.465E-01								
4.395	-.434E-01	4.400	-.393E-01								
4.420	-.470E-04	4.425	.102E-01								
4.445	.212E-01	4.450	.197E-01								
4.470	.406E-01	4.475	.522E-01								
4.495	.522E-01	4.500	.477E-01								
4.520	-.412E-01	4.525	-.571E-01								
4.545	-.680E-01	4.550	-.649E-01								
4.570	-.685E-01	4.575	-.714E-01								
4.595	-.609E-01	4.600	-.533E-01								
4.620	-.183E-01	4.625	-.538E-02								
4.645	.914E-01	4.650	.122E+00								
4.670	.147E+00	4.675	.201E+00								
4.695	.235E+00	4.700	.257E+00								
4.720	.336E+00	4.725	.334E+00								
4.745	.255E+00	4.750	.256E+00								
4.770	.303E+00	4.775	.317E+00								

4.870	.557E-01	4.875	.246E-01		
4.895	.300E-02	4.900	.145E-01		
4.920	.212E-01	4.925	.538E-02		
4.945	-.515E-01	4.950	-.988E-01		
4.970	-.152E+00	4.975	-.187E+00		
4.995	-.328E+00	5.000	-.364E+00		
5.020	-.458E+00	5.025	-.470E+00		
5.045	-.492E+00	5.050	-.493E+00		
5.070	-.481E+00	5.075	-.477E+00		
5.095	-.468E+00	5.100	-.465E+00		
5.120	-.433E+00	5.125	-.420E+00		
5.145	-.374E+00	5.150	-.365E+00		
5.170	-.329E+00	5.175	-.316E+00		
5.195	-.242E+00	5.200	-.219E+00		
5.220	-.135E+00	5.225	-.119E+00		
5.245	-.597E-01	5.250	-.348E-01		
5.270	.600E-01	5.275	.783E-01		
5.295	.110E+00	5.300	.113E+00		
5.320	.140E+00	5.325	.149E+00		
5.345	.173E+00	5.350	.178E+00		
5.370	.211E+00	5.375	.222E+00		
5.395	.247E+00	5.400	.247E+00		
5.420	.217E+00	5.425	.201E+00		
5.445	.113E+00	5.450	.944E-01		
5.470	.810E-01	5.475	.882E-01		
5.495	.832E-01	5.500	.658E-01		
5.520	-.367E-01	5.525	-.592E-01		
5.545	-.103E+00	5.550	-.106E+00		
5.570	-.137E+00	5.575	-.157E+00		
5.595	-.264E+00	5.600	-.316E+00		
5.620	-.359E+00	5.625	-.365E+00		
5.645	-.343E+00	5.650	-.349E+00		
5.670	-.407E+00	5.675	-.418E+00		
5.695	-.398E+00	5.700	-.383E+00		
5.720	-.351E+00	5.725	-.368E+00		
5.745	-.376E+00	5.750	-.359E+00		
5.770	-.246E+00	5.775	-.225E+00		
5.795	-.212E+00	5.800	-.208E+00		
5.820	-.794E-01	5.825	-.251E-01		
5.845	.129E+00	5.850	.135E+00		
5.870	.114E+00	5.875	.122E+00		
5.895	.247E+00	5.900	.287E+00		
5.920	.376E+00	5.925	.381E+00		
5.945	.407E+00	5.950	.425E+00		
5.970	.510E+00	5.975	.522E+00		
5.995	.507E+00	6.000	.498E+00		
6.020	.500E+00	6.025	.510E+00		
6.045	.538E+00	6.050	.536E+00		
6.070	.471E+00	6.075	.439E+00		
6.095	.271E+00	6.100	.228E+00		
6.120	.116E+00	6.125	.102E+00		
6.145	.335E-01	6.150	.369E-02		
6.170	-.152E+00	6.175	-.191E+00		
6.195	-.320E+00	6.200	-.347E+00		
6.220	-.434E+00	6.225	-.447E+00		
6.245	-.455E+00	6.250	-.452E+00		
6.270	-.451E+00	6.275	-.470E+00		
6.295	-.521E+00	6.300	-.534E+00		
6.320	-.558E+00	6.325	-.571E+00		
6.345	-.535E+00	6.350	-.515E+00		
6.370	-.429E+00	6.375	-.412E+00		
6.395	-.373E+00	6.400	-.360E+00		
6.420	-.250E+00	6.425	-.225E+00		

6.520	.415E+00
6.545	.464E+00
6.570	.496E+00
6.595	.535E+00
6.620	.477E+00
6.645	.417E+00
6.670	.324E+00
6.695	.189E+00
6.720	.101E+00
6.745	-.196E-01
6.770	-.902E-01
6.795	-.231E+00
6.820	-.276E+00
6.845	-.222E+00
6.870	-.276E+00
6.895	-.185E+00
6.920	-.712E-02
6.945	.741E-01
6.970	.223E+00
6.995	.340E+00
7.020	.355E+00
7.045	.407E+00
7.070	.401E+00
7.095	.326E+00
7.120	.320E+00
7.145	.255E+00
7.170	.152E+00
7.195	.609E-01
7.220	-.742E-01
7.245	-.209E+00
7.270	-.289E+00
7.295	-.324E+00
7.320	-.326E+00
7.345	-.289E+00
7.370	-.293E+00
7.395	-.282E+00
7.420	-.249E+00
7.445	-.175E+00
7.470	.558E-02
7.495	.170E+00
7.520	.275E+00
7.545	.280E+00
7.570	.251E+00
7.595	.182E+00
7.620	.108E+00
7.645	.121E+00
7.670	.853E-01
7.695	.445E-01
7.720	-.155E-01
7.745	-.117E+00
7.770	-.150E+00
7.795	-.256E+00
7.820	-.342E+00
7.845	-.276E+00
7.870	-.300E+00
7.895	-.245E+00
7.920	-.144E+00
7.945	-.992E-01
7.970	-.731E-01
7.995	-.123E+00
8.020	-.125E+00
8.045	-.619E-01
8.070	-.136E-01

6.525	.434E+00
6.550	.487E+00
6.575	.504E+00
6.600	.534E+00
6.625	.460E+00
6.650	.407E+00
6.675	.294E+00
6.700	.171E+00
6.725	.772E-01
6.750	-.368E-01
6.775	-.111E+00
6.800	-.258E+00
6.825	-.262E+00
6.850	-.228E+00
6.875	-.276E+00
6.900	-.146E+00
6.925	.147E-01
6.950	.100E+00
6.975	.256E+00
7.000	.348E+00
7.025	.372E+00
7.050	.413E+00
7.075	.387E+00
7.100	.319E+00
7.125	.320E+00
7.150	.242E+00
7.175	.135E+00
7.200	.372E-01
7.225	-.103E+00
7.250	-.230E+00
7.275	-.298E+00
7.300	-.329E+00
7.325	-.319E+00
7.350	-.286E+00
7.375	-.294E+00
7.400	-.275E+00
7.425	-.241E+00
7.450	-.145E+00
7.475	.445E-01
7.500	.196E+00
7.525	.285E+00
7.550	.274E+00
7.575	.244E+00
7.600	.161E+00
7.625	.107E+00
7.650	.119E+00
7.675	.754E-01
7.700	.416E-01
7.725	-.386E-01
7.750	-.128E+00
7.775	-.162E+00
7.800	-.296E+00
7.825	-.331E+00
7.850	-.274E+00
7.875	-.302E+00
7.900	-.220E+00
7.925	-.133E+00
7.950	-.914E-01
7.975	-.842E-01
8.000	-.130E+00
8.025	-.115E+00
8.050	-.485E-01
8.075	-.111E-01

8.130	.4[illegible]E-01	8.135	[illegible]E-01	8.140	[illegible]	[illegible]	[illegible]		
8.155	.301E-01	8.160	.231E-01	8.165	.17[illegible]	8.170	.135E-01	8.175	.112E-01
8.180	.979E-02	8.185	[illegible]E-02	8.190	.7[illegible]	8.195	.609E-02	8.200	.396E-0[illegible]
8.205	.18[illegible]E-02	8.210	[illegible]E-02	8.215	.31[illegible]	8.220	.958E-03	8.225	.289E-0[illegible]
8.230	.513E-02	8.235	[illegible]E-02	8.240	[illegible]E-02	8.245	.470E-02	8.250	.271E-03
8.255	-.104E-02	8.260	-.133E-01	8.265	-.294E-01	8.270	-.253E-01	8.275	-.302E-01
8.280	-.321E-01	8.285	-.325E-01	8.290	-.323E-01	8.295	-.340E-01	8.300	-.374E-01
8.305	-.436E-01	8.310	-.527E-01	8.315	-.5[illegible]E-01	8.320	-.757E-01	8.325	-.863E-01
8.330	-.542E-01	8.335	[illegible]E-01	8.340	-.[illegible]11E-01	8.345	-.943E-01	8.350	-.881E-01
8.355	-.[illegible]11E-01	8.360	-.748E-01	8.365	-.702E-01	8.370	-.675E-01	8.375	-.662E-01
8.380	-.649E-01	8.385	[illegible]E-01	8.390	-.571E-01	8.395	-.485E-01	8.400	-.373E-01
8.405	-.244E-01	8.410	-.117E-01	8.415	-.135E-02	8.420	.378E-02	8.425	.433E-02
8.430	-.113E-03	8.435	-.82[illegible]E-02	8.440	-.131E-01	8.445	-.274E-01	8.450	-.339E-01
8.455	-.305E-01	8.460	-.349E-01	8.465	-.2[illegible]7E-01	8.470	-.222E-01	8.475	-.142E-01
8.480	-.706E-02	8.485	-.1[illegible]E-02	8.490	.291E-02	8.495	.417E-02	8.500	.562E-02
8.505	.712E-02	8.510	.[illegible]13E-02	8.515	.117E-01	8.520	.146E-01	8.525	.175E-01
8.530	.261E-01	8.535	.22[illegible]E-01	8.540	.2[illegible]E-01	8.545	.313E-01	8.550	.398E-01
8.555	.523E-01	8.560	.6[illegible]1E-01	8.565	.[illegible]3E-01	8.570	.111E+00	8.575	.133E+00
8.580	.151E+00	8.585	.154E+00	8.590	.171E+00	8.595	.172E+00	8.600	.168E+00
8.605	.161E+00	8.610	.155E+00	8.615	.151E+00	8.620	.151E+00	8.625	.155E+00
8.630	.161E+00	8.635	.15[illegible]E+00	8.640	.175E+00	8.645	.177E+00	8.650	.174E+00
8.655	.155E+00	8.660	.151E+00	8.665	.135E+00	8.670	.119E+00	8.675	.106E+00
8.680	.965E-01	8.685	.925E-01	8.690	.[illegible]27E-01	8.695	.952E-01	8.700	.972E-01
8.705	.95[illegible]E-01	8.710	.380E-01	8.715	.731E-01	8.720	.513E-01	8.725	.247E-01
8.730	-.350E-02	8.735	-.294E-01	8.740	-.4[illegible]4E-01	8.745	-.611E-01	8.750	-.639E-01
8.755	-.590E-01	8.760	-.495E-01	8.765	-.3[illegible]3E-01	8.770	-.326E-01	8.775	-.324E-01
8.780	-.4[illegible]2E-01	8.785	-.550E-01	8.790	-.740E-01	8.795	-.924E-01	8.800	-.107E+00
8.805	-.112E+00	8.810	-.106E+00	8.815	-.3[illegible]E-01	8.820	-.627E-01	8.825	-.324E-01
8.830	-.273E-02	8.835	.212E-01	8.840	.358E-01	8.845	.391E-01	8.850	.318E-01
8.855	.163E-01	8.860	-.355E-02	8.865	-.236E-01	8.870	-.396E-01	8.875	-.491E-01
8.880	-.508E-01	8.885	-.454E-01	8.890	-.347E-01	8.895	-.215E-01	8.900	-.854E-02
8.905	.158E-02	8.910	.732E-02	8.915	.367E-02	8.920	.479E-02	8.925	-.130E-02
8.930	-.798E-02	8.935	-.130E-01	8.940	-.144E-01	8.945	-.107E-01	8.950	-.199E-02
8.955	.120E-01	8.960	.293E-01	8.965	.436E-01	8.970	.696E-01	8.975	.881E-01
8.980	.104E+00	8.985	.116E+00	8.990	.12[illegible]E+00	8.995	.133E+00	9.000	.140E+00
9.005	.147E+00	9.010	.156E+00	9.015	.15[illegible]E+00	9.020	.177E+00	9.025	.188E+00
9.030	.198E+00	9.035	.206E+00	9.040	.21[illegible]E+00	9.045	.211E+00	9.050	.208E+00
9.055	.202E+00	9.060	.195E+00	9.065	.137E+00	9.070	.180E+00	9.075	.174E+00
9.080	.170E+00	9.085	.167E+00	9.090	.15[illegible]E+00	9.095	.154E+00	9.100	.163E+00
9.105	.162E+00	9.110	.160E+00	9.115	.1[illegible]E+00	9.120	.155E+00	9.125	.151E+00
9.130	.147E+00	9.135	.142E+00	9.140	.136E+00	9.145	.131E+00	9.150	.125E+00
9.155	.121E+00	9.160	.117E+00	9.165	.114E+00	9.170	.112E+00	9.175	.111E+00
9.180	.111E+00	9.185	.111E+00	9.190	.10[illegible]E+00	9.195	.105E+00	9.200	.981E-01
9.205	.[illegible]5E-01	9.210	.697E-01	9.215	.478E-01	9.220	.213E-01	9.225	-.846E-02
9.230	-.395E-01	9.235	-.[illegible]95E-01	9.240	-.[illegible]2E-01	9.245	-.118E+00	9.250	-.133E+00
9.255	-.142E+00	9.260	-.145E+00	9.265	-.147E+00	9.270	-.147E+00	9.275	-.151E+00
9.280	-.158E+00	9.285	-.170E+00	9.290	-.135E+00	9.295	-.206E+00	9.300	-.226E+00
9.305	-.244E+00	9.310	-.25[illegible]E+00	9.315	-.2[illegible]7E+00	9.320	-.270E+00	9.325	-.268E+00
9.330	-.251E+00	9.335	-.252E+00	9.340	-.24[illegible]E+00	9.345	-.227E+00	9.350	-.213E+00
9.355	-.197E+00	9.360	-.179E+00	9.365	-.1[illegible]E+00	9.370	-.138E+00	9.375	-.115E+00
9.380	-.916E-01	9.385	[illegible]E-01	9.390	-.[illegible]2E-01	9.395	-.344E-01	9.400	-.233E-01
9.405	-.173E-01	9.410	-.163E-01	9.415	-.1[illegible]E-01	9.420	-.271E-01	9.425	-.364E-01
9.430	-.460E-01	9.435	-.537E-01	9.440	-.[illegible]71E-01	9.445	-.541E-01	9.450	-.430E-01
9.455	-.230E-01	9.460	.5[illegible]E-02	9.465	.415E-01	9.470	.819E-01	9.475	.124E+00
9.480	.113E+00	9.485	.197E+00	9.490	.224E+00	9.495	.243E+00	9.500	.254E+00
9.505	.2[illegible]0E+00	9.510	.251E+00	9.515	.2[illegible]E+00	9.520	.252E+00	9.525	.265E+00
9.530	.270E+00	9.535	.27[illegible]E+00	9.540	.23[illegible]E+00	9.545	.289E+00	9.550	.291E+00
9.555	.2[illegible]E+00	9.560	.27[illegible]E+00	9.565	.2[illegible]E+00	9.570	.243E+00	9.575	.220E+00
9.580	.1[illegible]E+00	9.585	.17[illegible]E+00	9.590	.1[illegible]E+00	9.595	.155E+00	9.600	.160E+00
9.605	.175E+00	9.610	.3[illegible]E+00	9.615	.2[illegible]E+00	9.620	.250E+00	9.625	.287E+00
9.630	.3[illegible]7E+00	9.635	.31[illegible]E+00	9.640	.31[illegible]E+00	9.645	.298E+00	9.650	.274E+00
9.655	.243E+00	9.660	.29[illegible]E+00	9.665	.174E+00	9.670	.140E+00	9.675	.108E+00
9.680	.7[illegible]E-01	9.685	.416E-01	9.690	.5[illegible]E-02	9.695	-.332E-01	9.700	-.744E-01
9.705	-.11[illegible]E+00	9.710	-.157E+00	9.715	-.1[illegible]E+00	9.720	-.227E+00	9.725	-.253E+00
				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

9.820	-.359E+00	9.825	-.368E+00		
9.845	-.395E+00	9.850	-.390E+00		
9.870	-.420E+00	9.875	-.408E+00		
9.895	-.392E+00	9.900	-.378E+00		
9.920	-.279E+00	9.925	-.253E+00		
9.945	-.191E+00	9.950	-.182E+00		
9.970	-.120E+00	9.975	-.978E-01		
9.995	-.406E-01	10.000	-.361E-01		

SPECTRA FOR THE RECORDING AREA HISTORY FILE #
CALCULATED AT THE FOLLOWING FREQUENCIES (IN CPS)

.3000	.4000	.5000	1.0000	1.5000	1.5500	1.6000	1.6500	1.7000	1.7500
1.8000	1.9000	2.0000	1.9500	2.0000	2.5000	3.0000	3.5000	4.0000	4.5000
5.0000	5.5000	6.0000	6.5000	7.0000	7.5000	8.0000	9.0000	10.0000	12.0000
15.0000	20.0000	25.0000	30.0000						

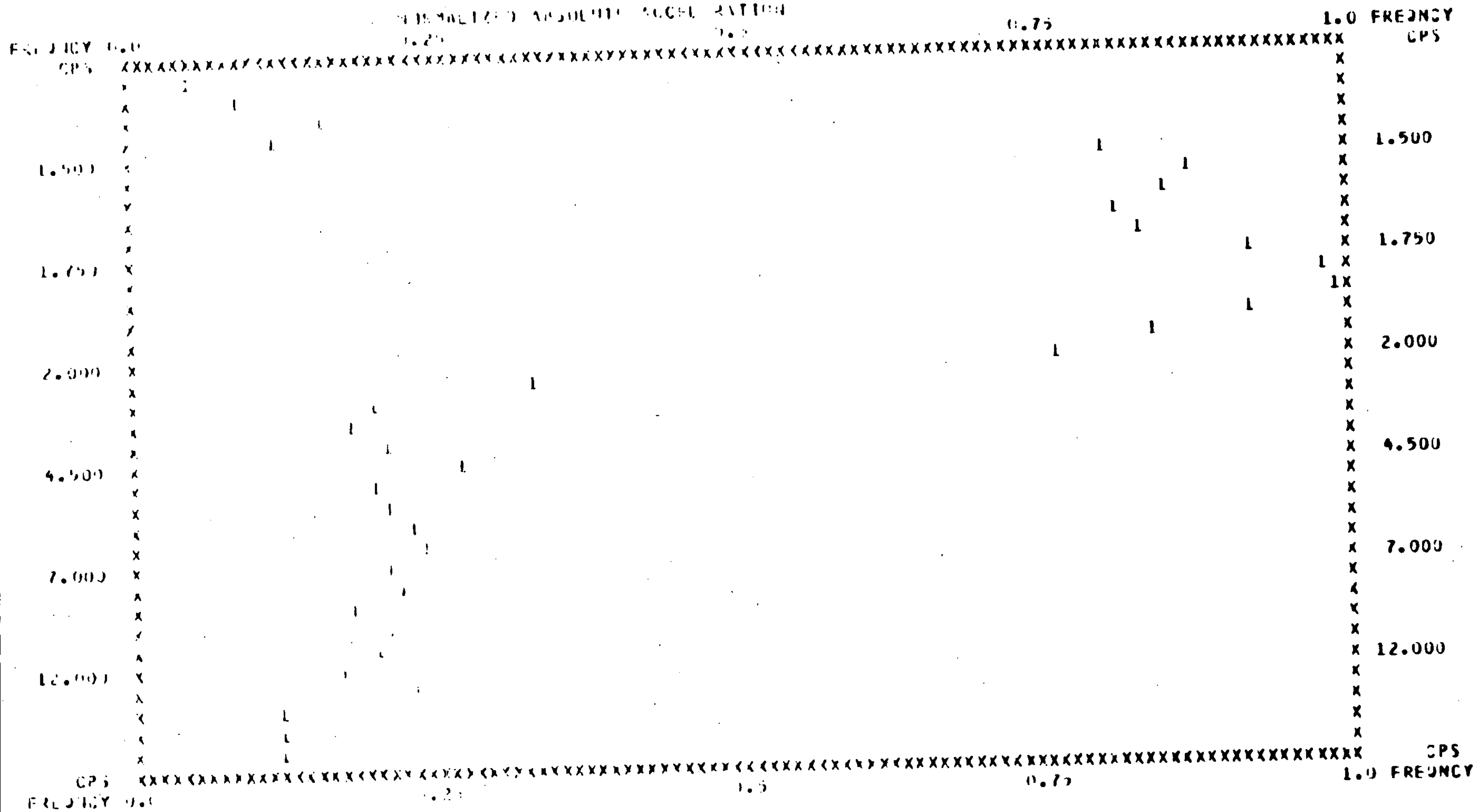
RESPONSE SPE[...]AT DAMPING = .0200 ...

FREQUENCY (CPS)	PERIOD (SECS)	ABSOLUTE ACCELERATION	PSEUDO VELOCITY	TIME MAXIMUM
.300	3.333	.2005E+00	.1493E+00	.9980E+01
.400	2.500	.4443E+00	.1560E+00	.1081E+02
.700	1.429	.7551E+00	.1703E+00	.6330E+01
1.000	1.000	.5755E+00	.9175E-01	.5280E+01
1.500	.667	.3540E+01	.3609E+00	.6130E+01
1.550	.645	.3406E+01	.4010E+00	.5790E+01
1.600	.625	.3625E+01	.3709E+00	.5760E+01
1.650	.606	.3520E+01	.3501E+00	.6740E+01
1.700	.588	.3720E+01	.3491E+00	.7290E+01
1.750	.571	.4120E+01	.3747E+00	.7535E+01
1.800	.556	.4371E+01	.2364E+00	.4050E+01
1.850	.541	.4446E+01	.3625E+00	.6905E+01
1.900	.526	.4119E+01	.3451E+00	.7965E+01
1.950	.513	.3731E+01	.3066E+00	.9380E+01
2.000	.500	.3396E+01	.2762E+00	.9140E+01
2.500	.400	.1522E+01	.9693E-01	.6580E+01
3.000	.333	.9425E+00	.5000E-01	.9540E+01
3.500	.286	.6313E+00	.3415E-01	.6305E+01
4.000	.250	.1010E+01	.4019E-01	.6575E+01
4.500	.222	.1240E+01	.4335E-01	.6560E+01
5.000	.200	.9352E+00	.2989E-01	.6550E+01
5.500	.182	.7774E+00	.2023E-01	.7950E+01
6.000	.167	.1072E+01	.2044E-01	.5100E+01
6.500	.154	.1120E+01	.2765E-01	.9780E+01
7.000	.143	.8655E+00	.2241E-01	.9770E+01
7.500	.133	.1025E+01	.2176E-01	.9755E+01
8.000	.125	.8735E+00	.1733E-01	.9745E+01
9.000	.111	.1019E+01	.1785E-01	.6355E+01
10.000	.100	.9337E+00	.1494E-01	.6335E+01
12.000	.083	.8277E+00	.1098E-01	.6305E+01
15.000	.067	.1085E+01	.1152E-01	.6060E+01
20.000	.050	.6003E+00	.4791E-02	.6425E+01
25.000	.040	.5771E+00	.3674E-02	.6330E+01
30.000	.033	.5747E+00	.3049E-02	.6325E+01

MAXIMUM ABSOLUTE SPECTRAL ACCELERATION .4446E+01
AT FREQUENCY (CPS) .1850E+01

NORMALIZED PLOT ... RESPONSE SP... ********

DAMPING VALUE	MAXIMUM VALUE	AT FREQUENCY	PLOT SYMBOL
.2000E-01	.4446E+01	.1830E+01	1



[illegible]

INPUT TIME HISTORY DATA

TIME HISTORY [illegible]		
NUMBER OF TIME POINTS	NTP	2001
INPUT CODE	INPT	1
TIME STEP	DEL	.0[illegible]?
ACCELERATION SCALE FACTOR	SCL	1.0000

COMPUTATION AND OUTPUT CONTROL

INPUT HISTORY INTEGRATION CODE	INTP	0
SPECTRUM COMPUTATION CODES	ISPC	1
	ISUP	0
SPECTRUM OUTPUT CODE	IOPT	0
NUMBER OF FREQUENCY POINTS	NFP	[illegible]
NUMBER OF DAMPINGS	NDP	1
FREQUENCY SCALE TYPE CODE	IFSC	2
LOWEST FREQUENCY IN CPS	F1	.3000
HIGHEST FREQUENCY IN CPS	F2	30.0000
TIME STEP TO PERIOD RATIO	DELP	.2000

FIELD LENGTH REQUIREMENTS
(IN OCTAL)

PROGRAM LENGTH	040437
BLANK COMMON REQUIRED	037647
FIELD LENGTH REQUIRED	050[illegible]

FORMAT OF INPUT TIME HISTORY IS

(3X7F9.1/7X,[illegible])

* * * INPUT [illegible] HISTORY * * * * *

TIME	ACCEL	TIME	ACCEL	TIME	ACCEL	TIME	ACCEL	TIME	ACCEL
.005	.117E-02	.010	.176E-02	.015	.1[illegible]E-02	.020	.475E-03	.025	-.134E-02
.030	-.[illegible]E-02	.035	-.519E-02	.040	-.3[illegible]E-02	.045	-.109E-01	.050	-.129E-01
.055	-.146E-01	.060	-.152E-01	.065	-.177E-01	.070	-.193E-01	.075	-.207E-01
.080	-.220E-01	.085	-.229E-01	.090	-.233E-01	.095	-.232E-01	.100	-.225E-01
.105	-.12[illegible]E-01	.110	-.153E-01	.115	-.170E-01	.120	-.142E-01	.125	-.109E-01
.130	-.722E-02	.135	-.314E-02	.140	.127E-02	.145	.590E-02	.150	.106E-01
.155	.152E-01	.160	.1[illegible]E-01	.165	.234E-01	.170	.270E-01	.175	.303E-01
.180	.33[illegible]E-01	.185	.361E-01	.190	.3[illegible]E-01	.195	.415E-01	.200	.440E-01
.205	.4[illegible]E-01	.210	.4[illegible]E-01	.215	.[illegible]E-01	.220	.520E-01	.225	.533E-01
.230	.54[illegible]E-01	.235	.5[illegible]E-01	.240	.[illegible]E-01	.245	.558E-01	.250	.571E-01
.255	.572E-01	.260	.570E-01	.265	.5[illegible]E-01	.270	.550E-01	.275	.552E-01
.280	.544E-01	.285	.534E-01	.290	.[illegible]E-01	.295	.510E-01	.300	.496E-01
.305	.478E-01	.310	.453E-01	.315	.437E-01	.320	.414E-01	.325	.392E-01
.330	.372E-01	.335	.333E-01	.340	.336E-01	.345	.321E-01	.350	.306E-01
.355	.2[illegible]E-01	.360	.275E-01	.365	.25[illegible]E-01	.370	.246E-01	.375	.234E-01
.380	.224E-01	.385	.210E-01	.390	.211E-01	.395	.207E-01	.400	.204E-01
.405	.201E-01	.410	.19[illegible]E-01	.415	.1[illegible]E-01	.420	.192E-01	.425	.190E-01
.430	.180E-01	.435	.1[illegible]E-01	.440	.1[illegible]E-01	.445	.152E-01	.450	.126E-01
.455	.932E-02	.460	.545E-02	.465	.11[illegible]E-02	.470	-.259E-02	.475	-.625E-02
.480	-.917E-02	.485	-.114E-01	.490	-.133E-01	.495	-.150E-01	.500	-.169E-01
.505	-.194E-01	.510	-.224E-01	.515	-.25[illegible]E-01	.520	-.294E-01	.525	-.327E-01
.530	-.355E-01	.535	-.377E-01	.540	-.3[illegible]E-01	.545	-.407E-01	.550	-.422E-01
.555	-.440E-01	.560	-.464E-01	.565	-.4[illegible]E-01	.570	-.524E-01	.575	-.554E-01
.580	-.561E-01	.585	-.604E-01	.590	-.624E-01	.595	-.643E-01	.600	-.667E-01
.605	-.698E-01	.610	-.739E-01	.615	-.7[illegible]E-01	.620	-.840E-01	.625	-.888E-01
.630	-.925E-01	.635	-.947E-01	.640	-.[illegible]E-01	.645	-.942E-01	.650	-.922E-01
.655	-.899E-01	.660	-.879E-01	.665	-.[illegible]E-01	.670	-.859E-01	.675	-.854E-01
.680	-.845E-01	.685	-.826E-01	.690	-.7[illegible]E-01	.695	-.739E-01	.700	-.673E-01
.705	-.598E-01	.710	-.521E-01	.715	-.450E-01	.720	-.388E-01	.725	-.335E-01
.730	-.289E-01	.735	-.246E-01	.740	-.[illegible]E-01	.745	-.150E-01	.750	-.915E-02
.755	-.265E-02	.760	.351E-02	.765	.[illegible]E-02	.770	.146E-01	.775	.186E-01
.780	.210E-01	.785	.237E-01	.790	.252E-01	.795	.263E-01	.800	.273E-01
.805	.28[illegible]E-01	.810	.290E-01	.815	.2[illegible]E-01	.820	.295E-01	.825	.293E-01
.830	.290E-01	.835	.237E-01	.840	.2[illegible]E-01	.845	.293E-01	.850	.302E-01
.855	.314E-01	.860	.32[illegible]E-01	.865	.331E-01	.870	.331E-01	.875	.323E-01
.880	.309E-01	.885	.291E-01	.890	.274E-01	.895	.259E-01	.900	.250E-01
.905	.245E-01	.910	.243E-01	.915	.240E-01	.920	.231E-01	.925	.214E-01
.930	.156E-01	.935	.163E-01	.940	.[illegible]E-02	.945	.447E-02	.950	-.148E-02
.955	-.757E-02	.960	-.1[illegible]E-01	.965	-.203E-01	.970	-.265E-01	.975	-.328E-01
.980	-.389E-01	.985	-.449E-01	.990	-.[illegible]E-01	.995	-.557E-01	1.000	-.604E-01
1.005	-.646E-01	1.010	-.6[illegible]E-01	1.015	-.720E-01	1.020	-.754E-01	1.025	-.788E-01
1.030	-.821E-01	1.035	-.[illegible]E-01	1.040	-.[illegible]E-01	1.045	-.907E-01	1.050	-.925E-01
1.055	-.937E-01	1.060	-.[illegible]E-01	1.065	-.[illegible]E-01	1.070	-.938E-01	1.075	-.932E-01
1.080	-.926E-01	1.085	-.920E-01	1.090	-.[illegible]E-01	1.095	-.910E-01	1.100	-.903E-01
1.105	-.[illegible]E-01	1.110	-.[illegible]E-01	1.115	-.[illegible]E-01	1.120	-.827E-01	1.125	-.790E-01
1.130	-.747E-01	1.135	-.697E-01	1.140	-.543E-01	1.145	-.586E-01	1.150	-.528E-01
1.155	-.[illegible]E-01	1.160	-.46[illegible]E-01	1.165	-.[illegible]E-01	1.170	-.289E-01	1.175	-.227E-01
1.180	-.163E-01	1.185	-.975E-02	1.190	-.2[illegible]E-02	1.195	.389E-02	1.200	.108E-01
1.205	.176E-01	1.210	.242E-01	1.215	.[illegible]E-01	1.220	.366E-01	1.225	.425E-01
1.230	.4[illegible]E-01	1.235	.537E-01	1.240	.5[illegible]E-01	1.245	.644E-01	1.250	.694E-01
1.255	.742E-01	1.260	.74[illegible]E-01	1.265	.[illegible]E-01	1.270	.854E-01	1.275	.897E-01
1.280	.927E-01	1.285	.9[illegible]E-01	1.290	.[illegible]E-01	1.295	.996E-01	1.300	.101E+00
1.305	.102E+00	1.310	.10[illegible]E+00	1.315	.1[illegible]E+00	1.320	.102E+00	1.325	.101E+00
1.330	.[illegible]E-01	1.335	.[illegible]E-01	1.340	.[illegible]E-01	1.345	.926E-01	1.350	.894E-01
1.355	.[illegible]E-01	1.360	.[illegible]E-01	1.365	.7[illegible]E-01	1.370	.705E-01	1.375	.641E-01
1.380	.571E-01	1.385	.[illegible]E-01	1.390	.41[illegible]E-01	1.395	.328E-01	1.400	.238E-01
1.405	.1[illegible]E-01	1.410	.[illegible]E-02	1.415	-.[illegible]E-02	1.420	-.148E-01	1.425	-.246E-01
1.430	-.[illegible]E-01	1.435	-.[illegible]E-01	1.440	-.5[illegible]E-01	1.445	-.635E-01	1.450	-.733E-01
		[illegible]	[illegible]	1.465	-.101E+00	1.470	-.109E+00	1.475	-.115E+00

1.575	-.734E-01
1.600	-.359E-01
1.625	-.806E-02
1.650	.219E-01
1.675	.366E-01
1.700	.379E-01
1.725	.364E-01
1.750	.172E-01
1.775	.990E-02
1.800	-.326E-02
1.825	-.984E-02
1.850	-.106E-01
1.875	-.338E-02
1.900	.486E-02
1.925	.328E-01
1.950	.509E-01
1.975	.626E-01
2.000	.677E-01
2.025	.643E-01
2.050	.499E-01
2.075	.384E-01
2.100	.225E-01
2.125	.664E-02
2.150	-.280E-02
2.175	-.182E-01
2.200	-.351E-01
2.225	-.466E-01
2.250	-.551E-01
2.275	-.583E-01
2.300	-.576E-01
2.325	-.553E-01
2.350	-.524E-01
2.375	-.450E-01
2.400	-.383E-01
2.425	-.336E-01
2.450	-.380E-01
2.475	-.563E-01
2.500	-.699E-01
2.525	-.890E-01
2.550	-.957E-01
2.575	-.863E-01
2.600	-.553E-01
2.625	-.283E-01
2.650	-.115E-02
2.675	.116E-01
2.700	.112E-01
2.725	.239E-01
2.750	.436E-01
2.775	.854E-01
2.800	.109E+00
2.825	.127E+00
2.850	.129E+00
2.875	.113E+00
2.900	.672E-01
2.925	.118E-01
2.950	-.620E-01
2.975	-.132E+00
3.000	-.191E+00
3.025	-.229E+00
3.050	-.243E+00
3.075	-.222E+00
3.100	-.188E+00
3.125	-.134E+00

3.220	.318E+00
3.225	.343E+00
3.230	.439E+00
3.235	.492E+00
3.240	.507E+00
3.245	.491E+00
3.250	.451E+00
3.255	.393E+00
3.260	.313E+00
3.265	.224E+00
3.270	.128E+00
3.275	.373E-01
3.280	-.359E-01
3.285	-.103E+00
3.290	-.152E+00
3.295	-.181E+00
3.300	-.186E+00
3.305	-.168E+00
3.310	-.117E+00
3.315	-.579E-01
3.320	-.399E-02
3.325	.398E-01
3.330	.396E-01
3.335	.271E-01
3.340	.525E-02
3.345	-.126E-01
3.350	-.277E-01
3.355	-.420E-01
3.360	-.805E-01
3.365	-.105E+00
3.370	-.128E+00
3.375	-.130E+00
3.380	-.113E+00
3.385	-.716E-01
3.390	-.356E-01
3.395	-.643E-02
3.400	.103E-01
3.405	.282E-01
3.410	.538E-01
3.415	.819E-01
3.420	.958E-01
3.425	.952E-01
3.430	.811E-01
3.435	.707E-01
3.440	.642E-01
3.445	.545E-01
3.450	.274E-01
3.455	-.485E-02
3.460	-.427E-01
3.465	-.690E-01
3.470	-.797E-01
3.475	-.656E-01
3.480	-.259E-01
3.485	.990E-02
3.490	.306E-01
3.495	.318E-01
3.500	.188E-01
3.505	-.912E-02
3.510	-.175E-01
3.515	.116E-01
3.520	.731E-01
3.525	.181E+00
3.530	.290E+00
3.535	.397E+00

4.960	.455E+00
4.965	.398E+00
4.970	.342E+00
4.975	.286E+00
4.980	.230E+00
4.985	.174E+00
4.990	.118E+00
4.995	.062E+00
5.000	.457E-01
5.005	-.148E-01
5.010	-.762E-01
5.015	-.138E+00
5.020	-.194E+00
5.025	-.251E+00
5.030	-.307E+00
5.035	-.363E+00
5.040	-.419E+00
5.045	-.475E+00
5.050	-.531E+00
5.055	-.587E+00
5.060	-.643E+00
5.065	-.699E+00
5.070	-.755E+00
5.075	-.811E+00
5.080	-.867E+00
5.085	-.923E+00
5.090	-.979E+00
5.095	-.103E+01
5.100	-.109E+01
5.105	-.114E+01
5.110	-.120E+01
5.115	-.126E+01
5.120	-.131E+01
5.125	-.137E+01
5.130	-.143E+01
5.135	-.148E+01
5.140	-.154E+01
5.145	-.160E+01
5.150	-.165E+01
5.155	-.171E+01
5.160	-.177E+01
5.165	-.182E+01
5.170	-.188E+01
5.175	-.194E+01
5.180	-.199E+01
5.185	-.205E+01
5.190	-.211E+01
5.195	-.216E+01
5.200	-.222E+01
5.205	-.228E+01
5.210	-.233E+01
5.215	-.239E+01
5.220	-.245E+01
5.225	-.250E+01
5.230	-.256E+01
5.235	-.262E+01
5.240	-.267E+01
5.245	-.273E+01
5.250	-.279E+01
5.255	-.284E+01
5.260	-.290E+01
5.265	-.296E+01
5.270	-.301E+01
5.275	-.307E+01
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5.285	-.318E+01
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5.295	-.330E+01
5.300	-.335E+01
5.305	-.341E+01
5.310	-.347E+01
5.315	-.352E+01
5.320	-.358E+01
5.325	-.364E+01
5.330	-.369E+01
5.335	-.375E+01
5.340	-.381E+01
5.345	-.386E+01
5.350	-.392E+01
5.355	-.398E+01
5.360	-.403E+01
5.365	-.409E+01
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5.380	-.426E+01
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5.415	-.466E+01
5.420	-.471E+01
5.425	-.477E+01
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5.440	-.494E+01
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5.460	-.517E+01
5.465	-.522E+01
5.470	-.528E+01
5.475	-.534E+01
5.480	-.539E+01
5.485	-.545E+01
5.490	-.551E+01
5.495	-.556E+01
5.500	-.562E+01
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5.515	-.579E+01
5.520	-.585E+01
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5.545	-.613E+01
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5.565	-.636E+01
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5.580	-.653E+01
5.585	-.658E+01
5.590	-.664E+01
5.595	-.670E+01
5.600	-.675E+01
5.605	-.681E+01
5.610	-.687E+01
5.615	-.692E+01
5.620	-.698E+01
5.625	-.704E+01
5.630	-.709E+01
5.635	-.715E+01
5.640	-.721E+01
5.645	-.726E+01
5.650	-.732E+01
5.655	-.738E+01
5.660	-.743E+01
5.665	-.749E+01
5.670	-.755E+01
5.675	-.760E+01
5.680	-.766E+01
5.685	-.772E+01
5.690	-.777E+01
5.695	-.783E+01
5.700	-.789E+01
5.705	-.794E+01
5.710	-.800E+01
5.715	-.806E+01
5.720	-.811E+01
5.725	-.817E+01
5.730	-.823E+01
5.735	-.828E+01
5.740	-.834E+01
5.745	-.840E+01
5.750	-.845E+01
5.755	-.851E+01
5.760	-.857E+01
5.765	-.862E+01
5.770	-.868E+01
5.775	-.874E+01
5.780	-.879E+01
5.785	-.885E+01
5.790	-.891E+01
5.795	-.896E+01
5.800	-.902E+01
5.805	-.908E+01
5.810	-.913E+01
5.815	-.919E+01
5.820	-.925E+01
5.825	-.930E+01
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5.835	-.942E+01
5.840	-.947E+01
5.845	-.953E+01
5.850	-.959E+01
5.855	-.964E+01
5.860	-.970E+01
5.865	-.976E+01
5.870	-.981E+01
5.875	-.987E+01
5.880	-.993E+01
5.885	-.998E+01
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5.895	-.101E+02
5.900	-.102E+02
5.905	-.103E+02
5.910	-.103E+02
5.915	-.104E+02
5.920	-.104E+02
5.925	-.105E+02
5.930	-.106E+02
5.935	-.106E+02
5.940	-.107E+02
5.945	-.107E+02
5.950	-.108E+02
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5.960	-.109E+02
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5.970	-.110E+02
5.975	-.111E+02
5.980	-.112E+02
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5.990	-.113E+02
5.995	-.113E+02
6.000	-.114E+02
6.005	-.115E+02
6.010	-.115E+02
6.015	-.116E+02
6.020	-.116E+02
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6.040	-.119E+02
6.045	-.119E+02
6.050	-.120E+02
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6.060	-.121E+02
6.065	-.122E+02
6.070	-.122E+02
6.075	-.123E+02
6.080	-.124E+02
6.085	-.124E+02
6.090	-.125E+02
6.095	-.125E+02
6.100	-.126E+02
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6.110	-.127E+02
6.115	-.128E+02
6.120	-.128E+02
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6.145	-.131E+02
6.150	-.132E+02
6.155	-.133E+02
6.160	-.133E+02
6.165	-.134E+02
6.170	-.134E+02
6.175	-.135E+02
6.180	-.136E+02
6.185	-.136E+02
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6.195	-.137E+02
6.200	-.138E+02
6.205	-.139E+02
6.210	-.139E+02
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6.220	-.140E+02
6.225	-.141E+02
6.230	-.142E+02
6.235	-.142E+02
6.240	-.143E+02
6.245	-.143E+02
6.250	-.144E+02
6.255	-.145E+02
6.260	-.145E+02
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6.360	-.157E+02
6.365	-.158E+02
6.370	-.158E+02
6.375	-.159E+02
6.380	-.160E+02
6.385	-.160E+02
6.390	-.161E+02
6.395	-.161E+02
6.400	-.162E+02
6.405	-.163E+02
6.410	-.163E+02
6.415	-.164E+02
6.420	-.164E+02
6.425	-.165E+02

6.505	.311E+00
6.520	.510E+00
6.545	.579E+00
6.570	.743E+00
6.595	.548E+00
6.620	.621E+00
6.645	.725E+00
6.670	.555E+00
6.695	.359E+00
6.720	.126E+00
6.745	-.103E+00
6.770	-.297E+00
6.795	-.451E+00
6.820	-.554E+00
6.845	-.578E+00
6.870	-.536E+00
6.895	-.442E+00
6.920	-.280E+00
6.945	-.678E-01
6.970	.155E+00
6.995	.402E+00
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7.170	.252E+00
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7.695	.260E-01
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7.920	-.291E+00
7.945	-.153E+00
7.970	-.475E-01
7.995	.280E-01
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8.045	.104E+00
8.070	.103E+00

6.500	.526E+00
6.525	.547E+00
6.550	.707E+00
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6.850	-.574E+00
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6.900	-.415E+00
6.925	-.240E+00
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7.000	.448E+00
7.025	.644E+00
7.050	.771E+00
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7.100	.762E+00
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7.750	-.265E+00
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7.875	-.406E+00
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8.245	-.422E-01
8.250	-.401E-01
8.270	-.325E-01
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8.425	-.795E-01
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8.450	-.757E-01
8.470	-.643E-01
8.475	-.605E-01
8.495	-.422E-01
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8.520	-.800E-02
8.525	-.705E-03
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8.550	.311E-01
8.570	.548E-01
8.575	.756E-01
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8.600	.133E+00
8.620	.176E+00
8.625	.187E+00
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8.650	.235E+00
8.670	.256E+00
8.675	.258E+00
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8.700	.252E+00
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8.725	.210E+00
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8.775	.150E-01
8.795	-.737E-01
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8.895	-.224E+00
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8.945	-.525E-01
8.950	-.326E-01
8.970	.491E-01
8.975	.701E-01
8.995	.154E+00
9.000	.174E+00
9.020	.249E+00
9.025	.266E+00
9.045	.324E+00
9.050	.335E+00
9.070	.355E+00
9.075	.369E+00
9.095	.355E+00
9.100	.360E+00
9.120	.325E+00
9.125	.314E+00
9.145	.255E+00
9.150	.237E+00
9.170	.192E+00
9.175	.142E+00
9.195	.685E-01
9.200	.513E-01
9.220	-.149E-01
9.225	-.319E-01
9.245	-.104E+00
9.250	-.122E+00
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9.275	-.202E+00
9.295	-.256E+00
9.300	-.269E+00
9.320	-.317E+00
9.325	-.327E+00
9.345	-.351E+00
9.350	-.366E+00
9.370	-.353E+00
9.375	-.356E+00
9.395	-.306E+00
9.400	-.288E+00
9.420	-.202E+00
9.425	-.178E+00
9.445	-.827E-01
9.450	-.587E-01
9.470	.457E-01
9.475	.747E-01
9.495	.197E+00
9.500	.227E+00
9.520	.349E+00
9.525	.365E+00
9.545	.452E+00
9.550	.470E+00
9.570	.520E+00
9.575	.525E+00
9.595	.513E+00
9.600	.503E+00
9.620	.448E+00
9.625	.432E+00
9.645	.354E+00
9.650	.344E+00
9.670	.252E+00
9.675	.226E+00
9.695	.105E+00
9.700	.701E-01
9.720	-.776E-01
9.725	-.116E+00

[illegible]	[illegible]
9.805	[illegible]
[illegible]	[illegible]47[illegible]
[illegible]	-.74[illegible]
[illegible]	-.6[illegible]
[illegible]	-.546[illegible]
9.930	-.376[illegible]
[illegible]	-.167[illegible]
[illegible]	-.436[illegible]
[illegible]	.147[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	-.751[illegible]
[illegible]	-.725[illegible]
[illegible]	-.641[illegible]
[illegible]	[illegible]
[illegible]	-.333[illegible]
[illegible]	-.15[illegible]
[illegible]	.30[illegible]

[illegible]	[illegible]
[illegible]	-.717[illegible]
[illegible]	-.731[illegible]
[illegible]	-.713[illegible]
[illegible]	-.619[illegible]
[illegible]	-.477[illegible]
[illegible]	[illegible]
[illegible]	-.113[illegible]
[illegible]	.524[illegible]

[illegible]	-.631E+00
[illegible]	-.730E+00
[illegible]	-.749E+00
[illegible]	-.698E+00
[illegible]	-.594E+00
9.920	-.442E+00
9.945	-.250E+00
9.970	-.756E-01
9.995	.926E-01

[illegible]	[illegible]
9.825	-.740E+00
9.850	-.744E+00
9.875	-.681E+00
9.900	-.568E+00
9.925	-.407E+00
9.950	-.223E+00
9.975	-.401E-01
10.000	.121E+00

SPECTRA FOR THE PRECEDING TIME HISTORY WILL BE
CALCULATED AT THE FOLLOWING FREQUENCIES (CPS)

.3000	.4000	.7000	1.0000	1.5000	1.5500	1.6000	1.6500	1.7000	1.7500
1.8000	1.8500	1.9000	1.9500	2.0000	2.5000	3.0000	3.5000	4.0000	4.5000
5.0000	5.5000	6.0000	6.5000	7.0000	7.5000	8.0000	9.0000	10.0000	12.0000
15.0000	20.0000	25.0000	30.0000						

RESPONSE SPECTRUM AT DAMPING = .020 * * * OUTPUT TO TAP

FREQUENCY (CPS)	PERIOD (SEC)	ABSOLUTE ACCELERATION	PSEUDO VELOCITY	TIME AT MAXIMUM
.300	3.333	.2974E+00	.1525E+01	.9375E+01
.400	2.500	.4144E+00	.1554E+01	.1579E+02
.700	1.429	.5735E+00	.1286E+01	.9375E+01
1.000	1.000	.6715E+00	.1053E+01	.5295E+01
1.500	.667	.4998E+01	.5246E+00	.6730E+01
1.550	.645	.5941E+01	.5876E+00	.6795E+01
1.600	.625	.5939E+01	.5330E+00	.6765E+01
1.650	.606	.5812E+01	.5124E+00	.7035E+01
1.700	.588	.5714E+01	.5329E+00	.7295E+01
1.750	.571	.6347E+01	.5773E+00	.7540E+01
1.800	.556	.6334E+01	.6053E+00	.8060E+01
1.850	.541	.7137E+01	.5183E+00	.8910E+01
1.900	.526	.6302E+01	.5663E+00	.7770E+01
1.950	.513	.6651E+01	.5347E+00	.7790E+01
2.000	.500	.6134E+01	.4643E+00	.8755E+01
2.500	.400	.3174E+01	.2021E+00	.9585E+01
3.000	.333	.1749E+01	.9260E-01	.9405E+01
3.500	.286	.1459E+01	.6611E-01	.9070E+01
4.000	.250	.1262E+01	.5022E-01	.6295E+01
4.500	.222	.1403E+01	.4994E-01	.7190E+01
5.000	.200	.1144E+01	.3642E-01	.6515E+01
5.500	.182	.1032E+01	.2996E-01	.6500E+01
6.000	.167	.1017E+01	.2693E-01	.6595E+01
6.500	.154	.9938E+00	.2437E-01	.9435E+01
7.000	.143	.9543E+00	.2191E-01	.9265E+01
7.500	.133	.9272E+00	.1968E-01	.9295E+01
8.000	.125	.9246E+00	.1849E-01	.9295E+01
9.000	.111	.9507E+00	.1681E-01	.9285E+01
10.000	.100	.9179E+00	.1460E-01	.9510E+01
12.500	.080	.8936E+00	.1172E-01	.6965E+01
15.000	.067	.8814E+00	.9140E-02	.6305E+01
20.000	.050	.9042E+00	.6877E-02	.6500E+01
25.000	.040	.9541E+00	.5431E-02	.6500E+01
30.000	.033	.9512E+00	.4516E-02	.6500E+01

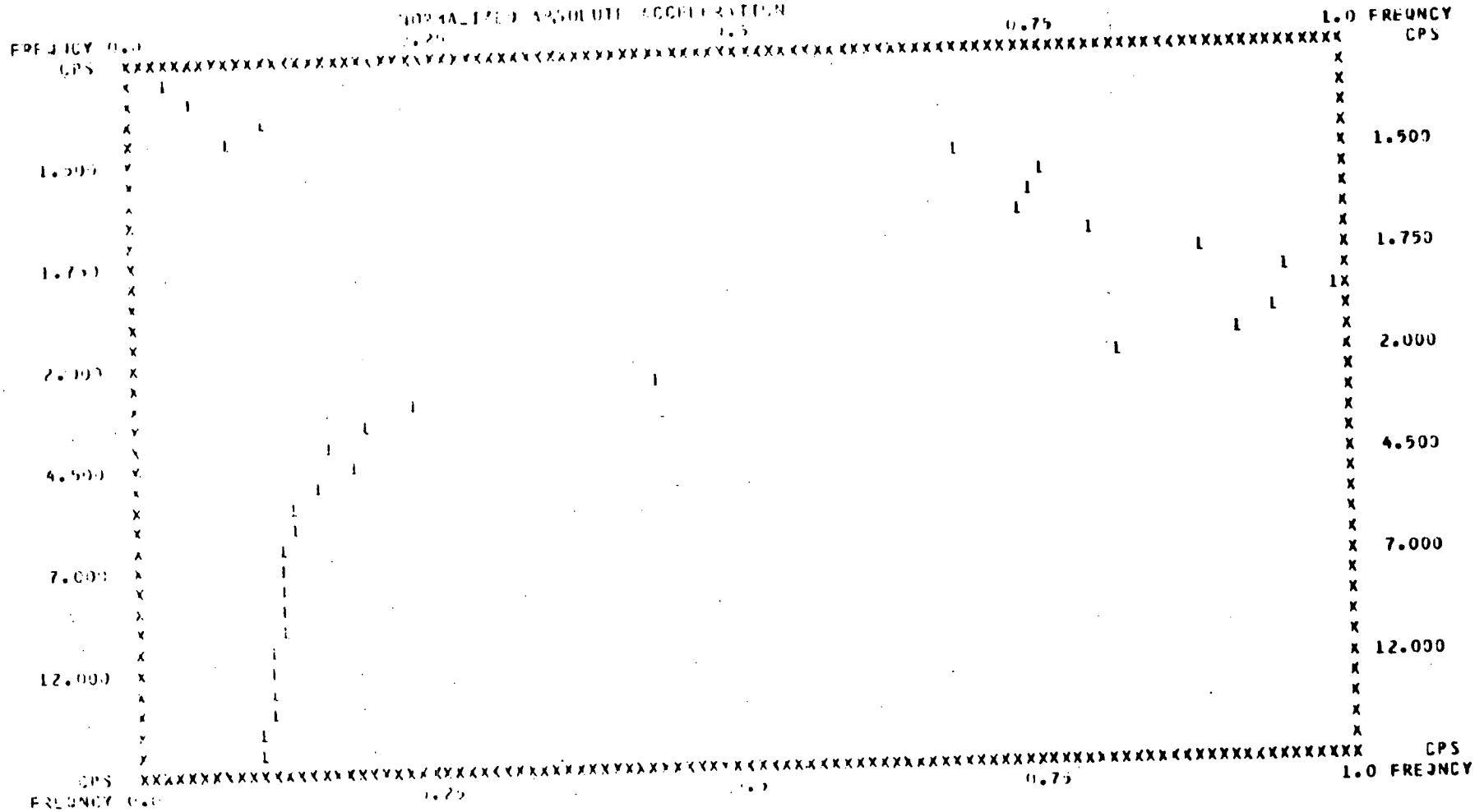
MAXIMUM ABSOLUTE SPECTRAL ACCELERATION .7187E+01
AT FREQUENCY (CPS) .1650E+01

Note 1

* * * * RESPONSE SPECTRA AT [illegible]

NORMALIZED PLOT OF RESPONSE SPECTRA.....

DAMPING VALUE	MAXIMUM VALUE	AT FREQUENCY	PLOT SYMBOL
.2000E-01	.7137E+01	.1500E+01	1



2% RESPONSE [illegible] 2H7. [illegible]

INPUT TIME HISTORY CONTROL

		4
TIME HISTORY NUMBER	NTP	2001
NUMBER OF TIME POINTS	INPT	1
INPUT CODE	[illegible]	.0050
TIME STEP	SFTR	1.0000
ACCELERATION SCALE FACTOR		

COMPUTATION AND OUTPUT CONTROL

	ITR	[illegible]
INPUT HISTORY INTEGRATION CODE	ISPC	1
SPECTRUM COMPUTATION CODES	IOUR	[illegible]
	IPUI	3
SPECTRUM OUTPUT CODE	NFP	34
NUMBER OF FREQUENCY POINTS	NDP	1
NUMBER OF DAMPINGS	IFSC	2
FREQUENCY SCALE TYPE CODE	F1	.3000
LOWEST FREQUENCY IN CPS	F2	30.000
HIGHEST FREQUENCY IN CPS	DELP	.2000
TIME STEP TO PERIOD RATIO		

FIELD LENGTH REQUIREMENTS (IN OCTAL)

	[illegible]437
PROGRAM LENGTH	[illegible]7647
BLANK COMMON REQUIRED	[illegible]
FIELD LENGTH REQUIRED	

FORMAT OF INPUT TIME HISTORY IS

[illegible](/1,(E16.3))

TIME	ACCEL
.020	.175E-01
.045	.473E-01
.070	-.496E-01
.095	-.547E-01
.120	-.872E-01
.145	-.488E-01
.170	.509E-01
.195	.723E-01
.220	.853E-01
.245	.851E-01
.270	.646E-01
.295	.756E-01
.320	.554E-01
.345	.237E-01
.370	.127E-01
.395	-.232E-02
.420	.122E-01
.445	.515E-01
.470	.477E-01
.495	-.420E-01
.520	-.246E-01
.545	-.617E-01
.570	-.558E-01
.595	-.323E-01
.620	-.733E-01
.645	-.157E+00
.670	-.159E+00
.695	-.115E+00
.720	-.119E+00
.745	.605E-01
.770	.134E-01
.795	.110E+00
.820	.851E-01
.845	-.127E-01
.870	.588E-01
.895	.392E-01
.920	.242E-01
.945	.109E+00
.970	-.130E-02
.995	-.850E-01
1.020	-.115E+00
1.045	-.151E+00
1.070	-.133E+00
1.095	-.109E+00
1.120	-.120E+00
1.145	-.126E+00
1.170	-.463E-01
1.195	-.691E-02
1.220	.528E-01
1.245	.106E+00
1.270	.110E+00
1.295	.152E+00
1.320	.154E+00
1.345	.147E+00
1.370	.142E+00
1.395	.965E-01
1.420	.156E-01
1.445	-.735E-01
1.470	-.158E+00

TIME	ACCEL
.025	.331E-01
.050	.311E-01
.075	-.576E-01
.100	-.559E-01
.125	-.921E-01
.150	-.247E-01
.175	.709E-01
.200	.711E-01
.225	.902E-01
.250	.788E-01
.275	.663E-01
.300	.747E-01
.325	.484E-01
.350	.201E-01
.375	.103E-01
.400	-.333E-02
.425	.196E-01
.450	.579E-01
.475	.321E-01
.500	-.492E-01
.525	-.205E-01
.550	-.742E-01
.575	-.414E-01
.600	-.421E-01
.625	-.810E-01
.650	-.178E+00
.675	-.147E+00
.700	-.128E+00
.725	-.842E-01
.750	.666E-01
.775	.136E-01
.800	.131E+00
.825	.535E-01
.850	-.525E-02
.875	.676E-01
.900	.248E-01
.925	.428E-01
.950	.104E+00
.975	-.304E-01
1.000	-.882E-01
1.025	-.126E+00
1.050	-.150E+00
1.075	-.128E+00
1.100	-.107E+00
1.125	-.127E+00
1.150	-.115E+00
1.175	-.327E-01
1.200	-.867E-03
1.225	.697E-01
1.250	.106E+00
1.275	.117E+00
1.300	.157E+00
1.325	.151E+00
1.350	.147E+00
1.375	.136E+00
1.400	.827E-01
1.425	-.201E-02
1.450	-.899E-01
1.475	-.193E+00

1.545	-.180E+00
1.570	-.118E+00
1.595	-.329E-01
1.620	.637E-02
1.645	.404E-01
1.670	.921E-01
1.695	.116E+00
1.720	.403E-01
1.745	.105E+00
1.770	-.535E-01
1.795	.597E-02
1.820	-.163E-01
1.845	-.812E-01
1.870	.175E-02
1.895	-.406E-01
1.920	-.458E-01
1.945	.105E+00
1.970	.915E-01
1.995	.107E+00
2.020	.129E+00
2.045	.663E-01
2.070	.442E-01
2.095	.315E-01
2.120	.456E-02
2.145	-.250E-01
2.170	.128E-01
2.195	-.272E-01
2.220	-.747E-01
2.245	-.634E-01
2.270	-.974E-01
2.295	-.708E-01
2.320	-.554E-01
2.345	-.636E-01
2.370	-.572E-01
2.395	-.405E-01
2.420	-.170E-01
2.445	.155E-01
2.470	.108E-01
2.495	-.855E-01
2.520	-.799E-01
2.545	-.159E+00
2.570	-.197E+00
2.595	-.127E+00
2.620	-.362E-01
2.645	.420E-01
2.670	.777E-01
2.695	.796E-01
2.720	-.670E-01
2.745	-.899E-02
2.770	-.193E-01
2.795	.182E+00
2.820	.213E+00
2.845	.181E+00
2.870	.252E+00
2.895	.155E+00
2.920	.849E-01
2.945	.290E-01
2.970	-.170E+00
2.995	-.251E+00
3.020	-.320E+00
3.045	-.396E+00
3.070	-.356E+00
3.095	-.273E+00
3.120	-.231E+00

1.575	-.934E-01
1.600	-.288E-01
1.625	.216E-01
1.650	.402E-01
1.675	.114E+00
1.700	.916E-01
1.725	.558E-01
1.750	.853E-01
1.775	-.669E-01
1.800	.256E-01
1.825	-.439E-01
1.850	-.668E-01
1.875	.615E-02
1.900	-.568E-01
1.925	-.185E-01
1.950	.119E+00
1.975	.823E-01
2.000	.121E+00
2.025	.116E+00
2.050	.598E-01
2.075	.410E-01
2.100	.292E-01
2.125	-.496E-02
2.150	-.206E-01
2.175	.151E-01
2.200	-.439E-01
2.225	-.717E-01
2.250	-.687E-01
2.275	-.982E-01
2.300	-.630E-01
2.325	-.578E-01
2.350	-.630E-01
2.375	-.551E-01
2.400	-.356E-01
2.425	-.123E-01
2.450	.227E-01
2.475	-.678E-02
2.500	-.945E-01
2.525	-.815E-01
2.550	-.183E+00
2.575	-.182E+00
2.600	-.117E+00
2.625	-.100E-01
2.650	.424E-01
2.675	.953E-01
2.700	.457E-01
2.725	-.654E-01
2.750	-.785E-02
2.775	.170E-02
2.800	.218E+00
2.825	.192E+00
2.850	.199E+00
2.975	.247E+00
2.900	.141E+00
2.925	.805E-01
2.950	-.343E-02
2.975	-.201E+00
3.000	-.257E+00
3.025	-.349E+00
3.050	-.393E+00
3.075	-.342E+00
3.100	-.257E+00
3.125	-.231E+00

3.195	.697E-01
3.220	.395E+00
3.245	.560E+00
3.270	.712E+00
3.295	.701E+00
3.320	.510E+00
3.345	.538E+00
3.370	.494E+00
3.395	.419E+00
3.420	.291E+00
3.445	.154E+00
3.470	.100E-01
3.495	-.121E+00
3.520	-.130E+00
3.545	-.231E+00
3.570	-.281E+00
3.595	-.290E+00
3.620	-.314E+00
3.645	-.254E+00
3.670	-.106E+00
3.695	.468E-01
3.720	.112E+00
3.745	.257E+00
3.770	.829E-01
3.795	.207E-01
3.820	-.225E-01
3.845	-.892E-01
3.870	.142E-01
3.895	.257E-01
3.920	-.151E+00
3.945	-.149E+00
3.970	-.250E+00
3.995	-.239E+00
4.020	-.137E+00
4.045	-.359E-01
4.070	.745E-01
4.095	.516E-01
4.120	.157E-01
4.145	-.101E-01
4.170	.612E-01
4.195	.171E+00
4.220	.150E+00
4.245	.144E+00
4.270	.438E-01
4.295	.174E-01
4.320	.851E-01
4.345	.112E+00
4.370	.529E-01
4.395	-.231E-01
4.420	-.134E+00
4.445	-.185E+00
4.470	-.182E+00
4.495	-.148E+00
4.520	.578E-01
4.545	.128E+00
4.570	.139E+00
4.595	.111E+00
4.620	.151E-01
4.645	-.129E+00
4.670	-.209E+00
4.695	-.114E+00
4.720	-.477E-01
4.745	.285E+00
4.770	.447E+00

3.200	.121E+00
3.225	.457E+00
3.250	.684E+00
3.275	.713E+00
3.300	.689E+00
3.325	.540E+00
3.350	.531E+00
3.375	.482E+00
3.400	.398E+00
3.425	.262E+00
3.450	.128E+00
3.475	-.226E-01
3.500	-.129E+00
3.525	-.139E+00
3.550	-.255E+00
3.575	-.276E+00
3.600	-.301E+00
3.625	-.305E+00
3.650	-.238E+00
3.675	-.624E-01
3.700	.523E-01
3.725	.150E+00
3.750	.255E+00
3.775	.463E-01
3.800	.254E-01
3.825	-.459E-01
3.850	-.793E-01
3.875	.370E-01
3.900	-.763E-02
3.925	-.165E+00
3.950	-.153E+00
3.975	-.271E+00
4.000	-.212E+00
4.025	-.125E+00
4.050	-.564E-02
4.075	.765E-01
4.100	.449E-01
4.125	.819E-02
4.150	-.528E-02
4.175	.860E-01
4.200	.181E+00
4.225	.175E+00
4.250	.130E+00
4.275	.256E-01
4.300	.299E-01
4.325	.966E-01
4.350	.107E+00
4.375	.305E-01
4.400	-.406E-01
4.425	-.156E+00
4.450	-.181E+00
4.475	-.187E+00
4.500	-.114E+00
4.525	.893E-01
4.550	.127E+00
4.575	.142E+00
4.600	.932E-01
4.625	-.626E-02
4.650	-.163E+00
4.675	-.192E+00
4.700	-.107E+00
4.725	.272E-03
4.750	.344E+00
4.775	.465E+00

4.845	.681E+00
4.850	.686E+00
4.870	.733E+00
4.875	.719E+00
4.895	.478E+00
4.900	.389E+00
4.920	.827E-01
4.925	.301E-01
4.945	-.150E+00
4.950	-.202E+00
4.970	-.414E+00
4.975	-.453E+00
4.995	-.526E+00
5.000	-.539E+00
5.020	-.637E+00
5.025	-.672E+00
5.045	-.801E+00
5.050	-.828E+00
5.070	-.917E+00
5.075	-.931E+00
5.095	-.935E+00
5.100	-.926E+00
5.120	-.878E+00
5.125	-.862E+00
5.145	-.754E+00
5.150	-.715E+00
5.170	-.537E+00
5.175	-.493E+00
5.195	-.332E+00
5.200	-.295E+00
5.220	-.136E+00
5.225	-.900E-01
5.245	.893E-01
5.250	.124E+00
5.270	.228E+00
5.275	.256E+00
5.295	.400E+00
5.300	.435E+00
5.320	.516E+00
5.325	.524E+00
5.345	.541E+00
5.350	.540E+00
5.370	.492E+00
5.375	.471E+00
5.395	.393E+00
5.400	.377E+00
5.420	.332E+00
5.425	.326E+00
5.445	.311E+00
5.450	.299E+00
5.470	.169E+00
5.475	.122E+00
5.495	-.139E-01
5.500	-.257E-01
5.520	-.352E-01
5.525	-.438E-01
5.545	-.137E+00
5.550	-.169E+00
5.570	-.259E+00
5.575	-.264E+00
5.595	-.229E+00
5.600	-.222E+00
5.620	-.293E+00
5.625	-.333E+00
5.645	-.480E+00
5.650	-.497E+00
5.670	-.507E+00
5.675	-.512E+00
5.695	-.600E+00
5.700	-.630E+00
5.720	-.571E+00
5.725	-.656E+00
5.745	-.593E+00
5.750	-.595E+00
5.770	-.539E+00
5.775	-.632E+00
5.795	-.476E+00
5.800	-.429E+00
5.820	-.352E+00
5.825	-.368E+00
5.845	-.277E+00
5.850	-.206E+00
5.870	.143E+00
5.875	.209E+00
5.895	.339E+00
5.900	.360E+00
5.920	.530E+00
5.925	.591E+00
5.945	.794E+00
5.950	.818E+00
5.970	.858E+00
5.975	.871E+00
5.995	.959E+00
6.000	.990E+00
6.020	.974E+00
6.025	.947E+00
6.045	.829E+00
6.050	.805E+00
6.070	.746E+00
6.075	.739E+00
6.095	.716E+00
6.100	.700E+00
6.120	.529E+00
6.125	.462E+00
6.145	.194E+00
6.150	.142E+00
6.170	-.347E-01
6.175	-.834E-01
6.195	-.321E+00
6.200	-.385E+00
6.220	-.641E+00
6.225	-.707E+00
6.245	-.977E+00
6.250	-.104E+01
6.270	-.119E+01
6.275	-.120E+01
6.295	-.119E+01
6.300	-.117E+01
6.320	-.118E+01
6.325	-.105E+01
6.345	-.940E+00
6.350	-.917E+00
6.370	-.795E+00
6.375	-.749E+00
6.395	-.515E+00
6.400	-.458E+00
6.420	-.287E+00
6.425	-.256E+00

6.480	[illegible]-01	6.485	[illegible]	6.490	[illegible]	6.495	.277E+00	6.500	.349E+00
6.505	.621E+00	6.510	[illegible]	6.515	[illegible]	6.520	.519E+00	6.525	.664E+00
6.530	.714E+00	6.535	[illegible]	6.540	[illegible]	6.545	.872E+00	6.550	.928E+00
6.555	[illegible]	6.560	[illegible]	6.565	[illegible]	6.570	.111E+01	6.575	.113E+01
6.580	.114E+01	6.585	.115E+01	6.590	[illegible]	6.595	.116E+01	6.600	.116E+01
6.605	.117E+01	6.610	.117E+01	6.615	[illegible]	6.620	.118E+01	6.625	.117E+01
6.630	.115E+01	6.635	.113E+01	6.640	.109E+01	6.645	.104E+01	6.650	.994E+00
6.655	.945E+00	6.660	[illegible]	6.665	[illegible]	6.670	.809E+00	6.675	.766E+00
6.680	.719E+00	6.685	[illegible]	6.690	.536E+00	6.695	.537E+00	6.700	.462E+00
6.705	.392E+00	6.710	[illegible]	6.715	.222E+00	6.720	.147E+00	6.725	.767E-01
6.730	.111E-01	6.735	-.523E-01	6.740	-.116E+00	6.745	-.181E+00	6.750	-.250E+00
6.755	-.321E+00	6.760	[illegible]	6.765	[illegible]	6.770	-.519E+00	6.775	-.570E+00
6.780	-.609E+00	6.785	[illegible]	6.790	[illegible]	6.795	-.675E+00	6.800	-.693E+00
6.805	-.717E+00	6.810	-.748E+00	6.815	-.736E+00	6.820	-.830E+00	6.825	-.874E+00
6.830	-.914E+00	6.835	-.944E+00	6.840	-.959E+00	6.845	-.959E+00	6.850	-.944E+00
6.855	-.915E+00	6.860	-.877E+00	6.865	[illegible]	6.870	-.797E+00	6.875	-.763E+00
6.880	-.737E+00	6.885	-.719E+00	6.890	-.708E+00	6.895	-.700E+00	6.900	-.691E+00
6.905	-.677E+00	6.910	-.654E+00	6.915	-.570E+00	6.920	-.572E+00	6.925	-.513E+00
6.930	-.444E+00	6.935	-.369E+00	6.940	[illegible]	6.945	-.215E+00	6.950	-.143E+00
6.955	-.709E-01	6.960	[illegible]	6.965	.447E-01	6.970	.103E+00	6.975	.163E+00
6.980	.228E+00	6.985	.299E+00	6.990	.376E+00	6.995	.459E+00	7.000	.545E+00
7.005	.631E+00	7.010	.715E+00	7.015	.733E+00	7.020	.855E+00	7.025	.929E+00
7.030	.954E+00	7.035	.103E+01	7.040	.107E+01	7.045	.111E+01	7.050	.114E+01
7.055	.117E+01	7.060	.119E+01	7.065	.122E+01	7.070	.124E+01	7.075	.126E+01
7.080	.127E+01	7.085	.123E+01	7.090	.127E+01	7.095	.126E+01	7.100	.123E+01
7.105	.119E+01	7.110	.113E+01	7.115	.107E+01	7.120	.100E+01	7.125	.936E+00
7.130	.869E+00	7.135	[illegible]	7.140	.745E+00	7.145	.667E+00	7.150	.629E+00
7.155	.576E+00	7.160	.505E+00	7.165	.435E+00	7.170	.350E+00	7.175	.281E+00
7.180	.200E+00	7.185	.120E+00	7.190	.427E-01	7.195	-.305E-01	7.200	-.987E-01
7.205	-.162E+00	7.210	-.221E+00	7.215	-.277E+00	7.220	-.331E+00	7.225	-.382E+00
7.230	-.432E+00	7.235	-.431E+00	7.240	-.528E+00	7.245	-.574E+00	7.250	-.618E+00
7.255	-.662E+00	7.260	-.709E+00	7.265	-.747E+00	7.270	-.787E+00	7.275	-.824E+00
7.280	-.858E+00	7.285	-.886E+00	7.290	[illegible]	7.295	-.928E+00	7.300	-.941E+00
7.305	-.951E+00	7.310	-.957E+00	7.315	[illegible]	7.320	-.953E+00	7.325	-.963E+00
7.330	-.958E+00	7.335	-.949E+00	7.340	[illegible]	7.345	-.910E+00	7.350	-.878E+00
7.355	-.839E+00	7.360	-.793E+00	7.365	-.741E+00	7.370	-.687E+00	7.375	-.632E+00
7.380	-.577E+00	7.385	-.524E+00	7.390	-.472E+00	7.395	-.422E+00	7.400	-.372E+00
7.405	-.322E+00	7.410	-.270E+00	7.415	-.219E+00	7.420	-.157E+00	7.425	-.117E+00
7.430	-.705E-01	7.435	-.293E-01	7.440	.430E-02	7.445	.312E-01	7.450	.497E-01
7.455	.516E-01	7.460	.649E-01	7.465	.742E-01	7.470	.798E-01	7.475	.880E-01
7.480	.596E-01	7.485	.116E+00	7.490	.135E+00	7.495	.157E+00	7.500	.181E+00
7.505	.237E+00	7.510	.237E+00	7.515	[illegible]	7.520	.294E+00	7.525	.330E+00
7.530	.377E+00	7.535	.415E+00	7.540	.451E+00	7.545	.508E+00	7.550	.552E+00
7.555	.593E+00	7.560	.622E+00	7.565	[illegible]	7.570	.683E+00	7.575	.706E+00
7.580	.727E+00	7.585	.749E+00	7.590	[illegible]	7.595	.789E+00	7.600	.805E+00
7.605	.815E+00	7.610	.811E+00	7.615	[illegible]	7.620	.771E+00	7.625	.734E+00
7.630	.687E+00	7.635	.634E+00	7.640	.579E+00	7.645	.525E+00	7.650	.472E+00
7.655	.422E+00	7.660	.374E+00	7.665	.327E+00	7.670	.279E+00	7.675	.229E+00
7.680	.175E+00	7.685	.119E+00	7.690	[illegible]	7.695	.144E-02	7.700	-.546E-01
7.705	-.167E+00	7.710	-.154E+00	7.715	[illegible]	7.720	-.229E+00	7.725	-.258E+00
7.730	-.285E+00	7.735	[illegible]	7.740	[illegible]	7.745	-.356E+00	7.750	-.398E+00
7.755	-.433E+00	7.760	[illegible]	7.765	[illegible]	7.770	-.528E+00	7.775	-.546E+00
7.780	-.553E+00	7.785	[illegible]	7.790	[illegible]	7.795	-.518E+00	7.800	-.500E+00
7.805	[illegible]	7.810	[illegible]	7.815	[illegible]	7.820	-.506E+00	7.825	-.531E+00
7.830	[illegible]	7.835	[illegible]	7.840	[illegible]	7.845	-.615E+00	7.850	-.612E+00
7.855	[illegible]	7.860	[illegible]	7.865	[illegible]	7.870	-.525E+00	7.875	-.505E+00
7.880	[illegible]	7.885	[illegible]	7.890	[illegible]	7.895	-.491E+00	7.900	-.494E+00
7.905	[illegible]	7.910	[illegible]	7.915	[illegible]	7.920	-.447E+00	7.925	-.417E+00
7.930	[illegible]	7.935	[illegible]	7.940	[illegible]	7.945	-.259E+00	7.950	-.231E+00
7.955	[illegible]	7.960	[illegible]	7.965	[illegible]	7.970	-.663E-01	7.975	-.126E-01
7.980	[illegible]	7.985	[illegible]	7.990	[illegible]	7.995	.188E+00	8.000	.224E+00
8.005	[illegible]	8.010	[illegible]	8.015	[illegible]	8.020	.312E+00	8.025	.315E+00
8.030	.212E+00	8.035	.306E+00	8.040	[illegible]	8.045	.285E+00	8.050	.272E+00
				8.065	[illegible]	8.070	.220E+00	8.075	.209E+00
								[illegible]	[illegible]

8.145	-.576E-01
8.170	-.599E-01
8.195	-.101E+00
8.220	-.102E+00
8.245	-.950E-01
8.270	-.343E-01
8.295	-.121E-01
8.320	.385E-01
8.345	.369E-01
8.370	-.401E-01
8.395	-.925E-01
8.420	-.175E+00
8.445	-.125E+00
8.470	-.107E+00
8.495	-.909E-01
8.520	-.323E-01
8.545	.218E-01
8.570	.187E-01
8.595	.607E-01
8.620	.211E+00
8.645	.259E+00
8.670	.400E+00
8.695	.423E+00
8.720	.388E+00
8.745	.369E+00
8.770	.944E-01
8.795	-.609E-01
8.820	-.307E+00
8.845	-.552E+00
8.870	-.470E+00
8.895	-.434E+00
8.920	-.316E+00
8.945	-.881E-01
8.970	.258E-01
8.995	.173E+00
9.020	.325E+00
9.045	.434E+00
9.070	.599E+00
9.095	.574E+00
9.120	.502E+00
9.145	.383E+00
9.170	.216E+00
9.195	.273E-01
9.220	-.596E-01
9.245	-.806E-01
9.270	-.231E+00
9.295	-.311E+00
9.320	-.357E+00
9.345	-.498E+00
9.370	-.592E+00
9.395	-.594E+00
9.420	-.389E+00
9.445	-.102E+00
9.470	.139E-01
9.495	.136E+00
9.520	.424E+00
9.545	.617E+00
9.570	.799E+00
9.595	.900E+00
9.620	.642E+00
9.645	.410E+00
9.670	.371E+00
9.695	.240E+00
9.720	.886E-01

8.175	-.766E-01
8.200	-.102E+00
8.225	-.103E+00
8.250	-.867E-01
8.275	-.263E-01
8.300	-.721E-02
8.325	.494E-01
8.350	.206E-01
8.375	-.489E-01
8.400	-.111E+00
8.425	-.176E+00
8.450	-.112E+00
8.475	-.111E+00
8.500	-.786E-01
8.525	-.219E-01
8.550	.289E-01
8.575	.136E-01
8.600	.916E-01
8.625	.227E+00
8.650	.287E+00
8.675	.423E+00
8.700	.408E+00
8.725	.396E+00
8.750	.330E+00
8.775	.498E-01
8.800	-.872E-01
8.825	-.380E+00
8.850	-.562E+00
8.875	-.451E+00
8.900	-.428E+00
8.925	-.269E+00
8.950	-.568E-01
8.975	.472E-01
9.000	.209E+00
9.025	.345E+00
9.050	.462E+00
9.075	.573E+00
9.100	.564E+00
9.125	.482E+00
9.150	.354E+00
9.175	.177E+00
9.200	-.224E-02
9.225	-.612E-01
9.250	-.101E+00
9.275	-.261E+00
9.300	-.312E+00
9.325	-.383E+00
9.350	-.522E+00
9.375	-.604E+00
9.400	-.570E+00
9.425	-.329E+00
9.450	-.618E-01
9.475	.237E-01
9.500	.188E+00
9.525	.474E+00
9.550	.649E+00
9.575	.833E+00
9.600	.876E+00
9.625	.575E+00
9.650	.406E+00
9.675	.349E+00
9.700	.216E+00
9.725	.379E-01

9.925	-.113E+01
9.930	-.111E+01
9.935	-.964E+00
9.940	-.756E+00
9.945	-.572E+00
9.950	-.265E+00
9.975	.195E-01
10.000	.279E+00

SPECTRA [illegible] (CPS)
CALCULATED AT THE FOLLOWING [illegible]

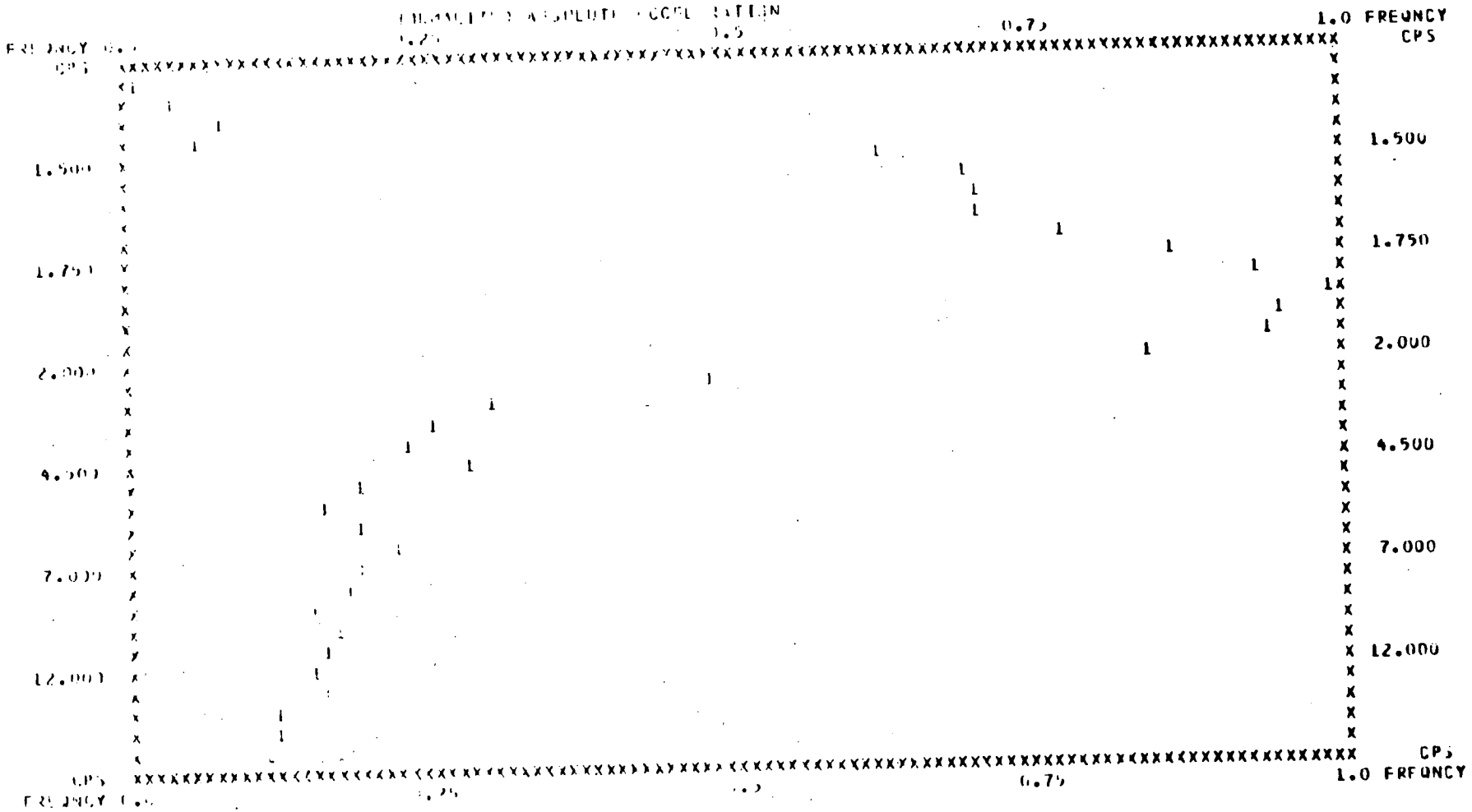
.[illegible]	.[illegible]	.7[illegible]	1.[illegible]	1.[illegible]	1.5500	1.6000	1.6500	1.7000	1.7500
1.[illegible]	1.[illegible]	1.[illegible]	1.9[illegible]	2.0000	2.5000	3.0000	3.5000	4.0000	4.5000
5.[illegible]	5.[illegible]	[illegible]	[illegible]	7.[illegible]	7.5000	8.0000	9.0000	10.0000	12.0000
15.[illegible]	[illegible]	[illegible]	[illegible]						

RESPONSE SP[illegible] [illegible] OUTPUT [illegible]

[illegible] 11

FREQUENCY (CPS)	PERIOD (SECS)	ABSOLUTE ACCELERATION	RELATIVE VELOCITY	TIME AT MAXIMUM
.300	3.333	.2444E+02	.1562E+01	.9375E+01
.400	2.500	.5243E+02	.1613E+00	.1077E+02
.700	1.429	.4662E+01	.2107E+00	.5720E+01
1.000	1.000	.7745E+00	.1233E+00	.5365E+01
1.500	.667	.6132E+01	.1725E+00	.6735E+01
1.550	.645	.7037E+01	.7195E+00	.5160E+01
1.600	.625	.7044E+01	.7007E+00	.7065E+01
1.650	.606	.7135E+01	.6382E+00	.7040E+01
1.700	.588	.7730E+01	.7247E+00	.7295E+01
1.750	.571	.9695E+01	.7571E+00	.7545E+01
1.800	.556	.9422E+01	.6331E+00	.7720E+01
1.850	.541	.1002E+02	.6618E+00	.5915E+01
1.900	.526	.9559E+01	.7032E+00	.7975E+01
1.950	.513	.9443E+01	.7707E+00	.7995E+01
2.000	.500	.8571E+01	.1765E+00	.9465E+01
2.500	.400	.4391E+01	.3107E+00	.6590E+01
3.000	.333	.3010E+01	.1634E+00	.9115E+01
3.500	.286	.2573E+01	.1173E+00	.5570E+01
4.000	.250	.2459E+01	.9783E-01	.7295E+01
4.500	.222	.2374E+01	.1023E+00	.7165E+01
5.000	.200	.2072E+01	.6596E-01	.5525E+01
5.500	.182	.1712E+01	.4953E-01	.6505E+01
6.000	.167	.2035E+01	.5317E-01	.9170E+01
6.500	.154	.2320E+01	.5661E-01	.9350E+01
7.000	.143	.2555E+01	.4673E-01	.9340E+01
7.500	.133	.1935E+01	.4202E-01	.9320E+01
8.000	.125	.1543E+01	.3277E-01	.9505E+01
9.000	.111	.1932E+01	.3240E-01	.6300E+01
10.000	.100	.1711E+01	.2724E-01	.6280E+01
12.000	.083	.1594E+01	.2113E-01	.6260E+01
15.000	.067	.1755E+01	.1072E-01	.6025E+01
20.000	.050	.1231E+01	.1027E-01	.7080E+01
25.000	.040	.1295E+01	.6243E-02	.7096E+01
30.000	.033	.1215E+01	.5333E-02	.7085E+01

MAXIMUM ABSOLUTE SPECTRAL ACCELERATION .1002E+02
AT FREQUENCY (CPS) .1250E+01


1.0 FREQNCY
CPS
1.500
1.750
2.000
4.500
7.000
12.000
0.75
0.5
0.25

```
,HEK     IMP     YC . SYSTEM 37  7 1.          .2.  ./537-IL.       5.21. 85/04/30.

07.53.31.CLRESP,T777,93.
07.53.31.USER,S0GGSI..
07.53.31.CHARGE,F00J.,0310 31155.
07.53.32.SPVILCC,PROCL..
07.53.32.SSETES,PROCL/ES=AD.
07.53.32.PROCL.
07.53.32.//LOADER  537        .005 CP       .162 KT//LOADER  014472/040000-040000 CM   1 TM
07.53.33.IFE,IT.EQ.TK),FLASHIT.
07.53.33.ENDIF,FLASHIT.
07.53.33.IFE,IT.EQ.CC0,BULLIT.
07.53.33.CHGETP.
07.53.33.      END  CHGETN
07.53.33.      1560C  MAXIMUM EXECUTION FL.
07.53.33.      0.002 CP SECONDS EXECUTION TIME.
07.53.34.GET,SYSBULL/UN=DSOPER,NA.
07.53.34.IFE,-ILE(SYSBULL,AS),OUTIT.
07.53.34.COPY,SYSBULL.
07.53.34. EOI ENCOUNTERED.
07.53.34.ENDIF,OUTIT.
07.53.34.ENDIF,BULLIT.
07.53.34.RETURN,PROCL.
07.53.35.REVERT.
07.53.35.ROUTE,OUTPUT,DC=PR,UN=C 3VAX1,JJN=VAX,FC=AC,DEF.
07.53.35. ROUTE COMPLETE.
07.53.35.REWIND,INPUT.
07.53.35.COPYSBF,INPUT,OUTPUT.
07.53.35. COPY COMPLETE.
07.53.35.REWIND,INPUT.
07.53.35.SKIPR,INPUT.
07.53.35.PURGE,CLRESTA/NA.
07.53.35.DEFINE,CLRESTA/M=W.
07.53.35.ATTACH,TAPE12=DECT.
07.53.37.GET,RESPLC/UN=IMPLIB.
07.53.37.RESPEC.
07.53.37.//LOADER  537        .005 CP       .121 KT//LOADER  014472/040000-040000 CM   1 TM
07.53.38.GET,ACCESSP/UN=OALPLIP.
07.53.38.BEGIN,ACCESSP,ACCESSP,2SPA.
07.53.39.OUTLOCODEXT 2520 ABS
07.53.39.REWIND,CLEEX.
07.53.39.GET,ACCESS /UN=OAPRLIE.
07.53.42.ACCESSP.
07.53.42.//LOADER  537        .007 CP       .101 KT//LOADER  014472/040000-040000 CM   1 TM
07.53.45.      END  ACCESS
07.53.45.      37600 MAXIMUM EXECUTION FL.
07.53.45.      0.426 CP SECONDS EXECUTION TIME.
07.53.45.REVERT.
07.53.45.ABS(INPUT,OUTPUT.PL=99999)
07.53.45.//LOADER  537        .006 CP       .393 KT//LOADER  014475/040000-040000 CM   1 TM
07.55.20.      END  RESPEC
07.55.20.      156400  FINAL EXECUTION FL.
07.55.20.      59.00  CP SECONDS EXECUTION TIME.
07.55.20.RETURN,ABS.
07.55.20.REVERT.
07.55.20.REWIND,TAPE  .
07.55.20.COPYSBF,TAPE ,CLRESTA.
07.55.20. EOI ENCOUNTERED.
07.55.21.UEAD.       0.102KUNS.
07.55.21.UEPT.       0.117KUNS.
07.55.21.UEMS.       0.274KUNS.
```

7.55.21.$OUT[illegible]=F)
7.55.21. NO [illegible] PROCESSED.
7.55.21.$DAYFILE(OUTPUT,JT=D)
3.53.19.UCLP, LP, HSOLLP2, 3.42*K_NS.

2.0 REVISED TEST PROBLEMS

2.2 Complete Quadratic Combination Method for Modal Combination

Test Problem II

This problem involved the calculation of pipe moments and support forces for the RHR piping system provided by the NRC using Impell's version of the CQC method for modal response combinations. For this problem, the geometry and properties of the piping system, input and output listings from the computer codes, and resulting moments and forces were given in Reference [1].

After the NRC reviewed the report, significant differences were observed between the NRC Consultant's results and Impell's results. Based on the attached Record of Conversation (ROC) between Mr. N.C. Tsai and Impell dated 4/22/86, Impell agreed to review the SUPERPIPE modeling of the piping system to be more compatible with the SAP4 model. A detailed review of both models and their associated frequencies led to the discovery that significant modeling differences existed between the two. The differences in modeling were:

a) Impell had modeled piping nodes 1, 63, and 77 as three directional guides (only translation restricted), as shown on Figure II.1; whereas, the SAP4 model had considered these supports as anchors.

b) Impell's SUPERPIPE model did not include factors to account for elbow flexibilities as per the NRC consultant's instructions. The consultant's request was based upon the assumption that SAP4 did not contain this capability. In reality, SAP4 did contain the capability to model elbow flexibility capability.

c) Impell's SUPERPIPE model contained a valve operator at Node 81 and SUPERPIPE internally calculated rotational mass moments of inertia for this element. The SAP4 model only contained translational masses for the valve operator.

Impell has revised the SUPERPIPE model to account for the above differences and a new analysis was performed. Missing mass effects from higher piping modes were not considered as per the NRC's consultant's instructions.

Deliverables

The input and output listings from the computer codes were required, as well as output resultant moments at 31 locations shown in Table 2.1, Reference [1], and the forces in all 24 supports. The results are provided for each of the three earthquake inputs. Directional combination between the components was not provided.

Results

The resulting moments and support reactions from the new SUPERPIPE model are attached in tabular form (Table II.1 and Table II.2), as well as in the new computer output.

To locate the results of the analysis, the pages of the computer output are identified below:

Freq.	Horiz. Mom.	Reactions	Vert. Mom. & Reaction
pg. 31	pg. 59-62 pg. 85-88	pg. 63-65 pg. 89-91	pg. 72-78

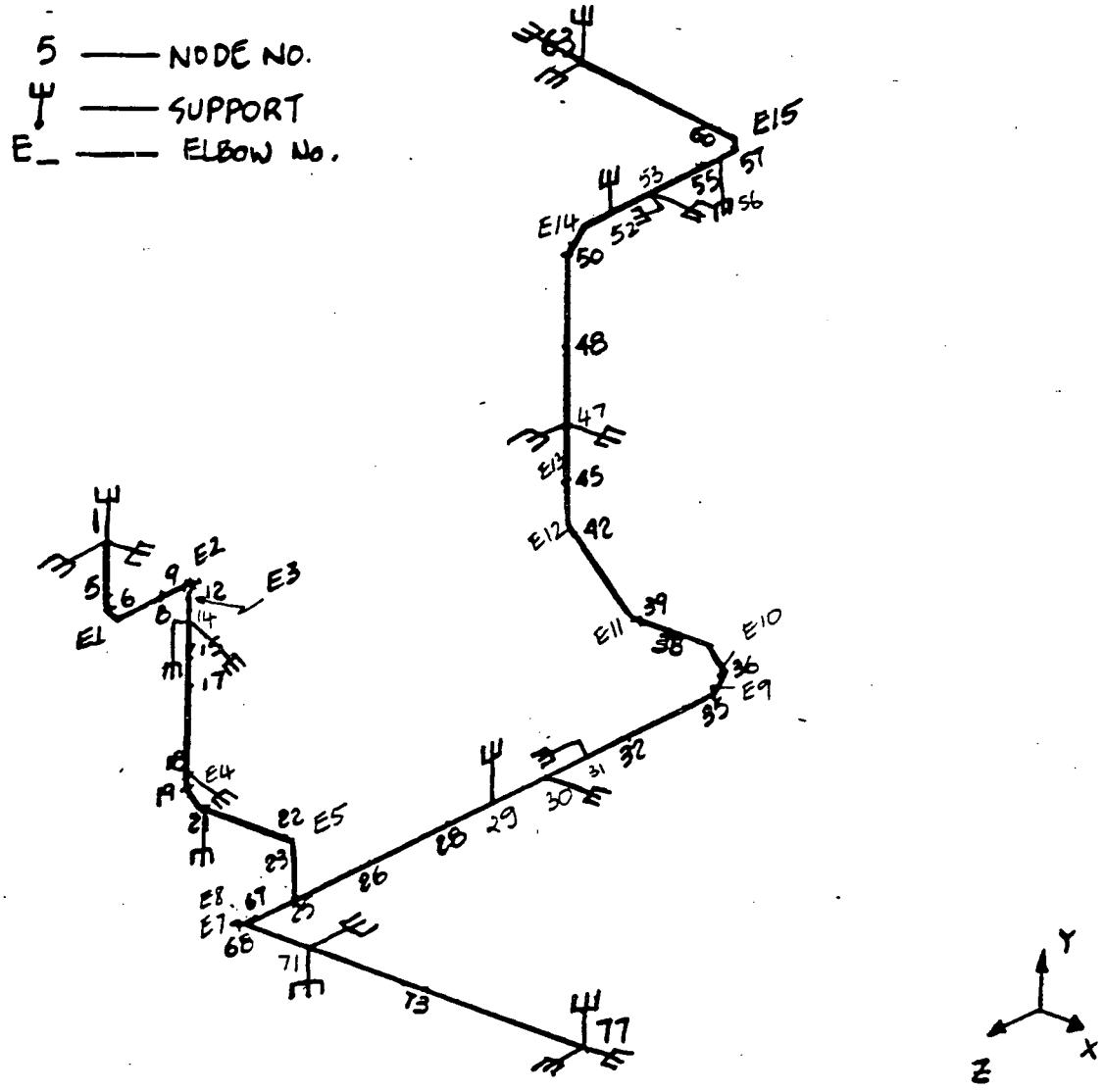


Figure II.1

RHR PIPING MODEL, PROBLEM II

IMPELL CORPORATION

Record of Conversation

File: 0310-054-1355

Copy: Impell, LA
MAManrique
AAsfura
WDGallo
GHau
HTYing

☒ Telephone ☐ Meeting ☐ Other

To: Tom Tsai

From: M. Swatta Mark

Company: NCT Engineering

Phone No.: 283-0471 Date: 4/22/85

Subject: Sample Five Test Problems

Summary of Conversation:

1. We discussed the results of the five test problems and Tom said that there were no problems with Nos. 1, 2, and 5. Problems 2 and 4 results were significantly different from his results. In addition, Tom wanted Impell to tabulate the moments and reactions for Problem 2 to make an easier comparison.

2. I agreed to review our modeling of the piping for Problem 2 to ensure that it matched SAP4. Tom also suggested that the difference in Problem 4 may be caused by the lack of consideration of "pseudo-static" response, modeling techniques and/or multi-level response spectrum vs. time history.

3. I agreed to review Problem 4 as well.

PIPE MOMENT RESULTANTS PROBLEM II

FT-LB

NODE POINT	WITHOUT MISSING MASS, ELBOW FLEXIBILITY INCLUDED			
	X-LOAD	Y-LOAD	Z-LOAD	
5	687	188	396	
6	592	185	282	
8	515	147	269.	
9	902	180	507	
12	541	194	219	
15	1086.	201	795	
17	1162.	174	882	
18	1089	400	452	
19	1107	428	407	
21	3363	1561	492	
22	1167	450	331	
23	1480	610	365	
25 (elem 21)	2231	914	563	
26	6577	2801	1127	
28	13,096	6028	1521	
32	5848	2625	984	
35	4548	2104	937	
36	5181	2394	1014	

47 0496

167931

47.0496

REV	BY	DATE	CHECKED	DATE
1	KH	4/24/85	AA	4/25/85

SCE SONGS1 Problem I

IMPELL CORPORATION

JOB NO 0310-063

CALC NO

PAGE

OF

47 0496

NODE POINT	WITH[illegible] MISS[illegible] MASS [illegible] ELBOW FLEXIBI[illegible] INCLUDED		
	X-[illegible]D	Y-L[illegible]D	Z-LO[illegible]
38	[illegible]3	21[illegible]	1037
39	4[illegible]8	22[illegible]	[illegible]267
42	7[illegible]7	35[illegible]	1012
[illegible]5	9[illegible]2	42[illegible]	[illegible]05[illegible]
4[illegible]	8[illegible]3	403	[illegible]64
50	16[illegible]8	90[illegible]	[illegible]306
55	25[illegible]	152[illegible]	[illegible]33
57	[illegible]	[illegible]3[illegible]	[illegible]98
6[illegible]	[illegible]	[illegible]	[illegible]
2[illegible]	[illegible]	15[illegible]	[illegible]07[illegible]
6[illegible]	2[illegible]	10[illegible]	62[illegible]
68	[illegible]	12[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

REACTIONS AT SUPPORTS.

F = LBS
M = IN-LBS

SUPPORT NODE	X-LOAD Fx/Mx	X-LOAD Fy/My	X-LOAD Fz/Mz	Y-LOAD Fx/Mx	Y-LOAD Fy/My	Y-LOAD Fz/Mz	Z-LOAD Fx/Mx	Z-LOAD Fy/My	Z-LOAD Fz/Mz
1	36/40300	121/5817	684/2145	16/5023 ✓	23/1806 ✓	84/439 ✓	14/31055	82/2684	525/1325
77	870/7451	287/11587	143/24429	291/3076 ✓	184/6167 ✓	81/14599 ✓	220/2152	71/23809	363/5265
63	582/2205	179/7633	192/12955	272/4148 ✓	302/3421 ✓	85/22785 ✓	270/6409	125/28872	503/8094
14(ZX)	372		372	68 ✓		68 ✓	280		280
14(Y)		3188			1489 ✓			435	
18 (ZX)	224		224	69 ✓		69 ✓	147		147
21		3729			1746 ✓			464	
29		1563			766 ✓			190	
30	1417			607 ✓			264		
31			759			354 ✓			381
47	1605		464	865 ✓		220 ✓	245		466
52		1271			678 ✓			226	
53	1538		165	726 ✓		97 ✓	283		1070

REV	BY	DATE	CHECKED	DATE
1	KH	4/24/85	AA	4/25/85

SCE SONGS 1 Problem II

IMPELL CORPORATION

JOB NO 0310-068

CALC NO

PAGE OF

SUPPORT NO.	X - LOAD			Y - LOAD			Z - LOAD		
	F_x	F_y	F_z	F_x	F_y	F_z	F_x	F_y	F_z
56		457			541 V			215	
71		714	856		384 V	379 V		135	548

REV 1
BY KH
DATE 4/24/85
CHECKED AA
DATE 4/25/85

IMPELL CORPORATION

SEE SERIES 1 Program 4

JOB NO 0310-062
CALC NO

PAGE
OF

OPERATING SYSTEM = NOS2.2 596/587-11. 84/01/ PRINTED = 85/04/24. 15.34.44.

UJN = VAK. FAMILY = SYSTEM JOB ORIGIN = BATCH.
CREATING JSN = VOSJ USER NAME = SJNGSI SERVICE CLASS = INSTALLATION CLASS 0.

```
 AAAAAAAAA   DDDDDDDDDD    33333333333  IIIIIIIIIIII VV          VV    000000  0  SSSSSSSSSS  KK        KK
AAAAAAAAAAA  DDDDDDDDDDD  333333333333  IIIIIIIIIIII VV          VV   0000000000 SSSSSSSSSSSS KK       KK
AA       AA  DD       DD  3          33      II      VV          VV  00        00 SS         S KK      KK
AA       AA  DD       DD             33      II       VV        VV   00      0 00 SS           KK     KK
AA       AA  DD       DD           33        II       VV        VV   00      0 00 SS           KK    KK
AA       AA  DD       DD         33          II       VV        VV   00     0  00 SS           KK   KK
AA       AA  DD       DD        33           II        VV      VV    00    0   00 SS           KK  KK
AAAAAAAAAAA  DD       DD       33            II        VV      VV    00   0    00 SSSSSSSSSSS  KK KK
AAAAAAAAAAA  DD       DD       333           II        VV      VV    00   0    00  SSSSSSSSSSS KKKKK
AA       AA  DD       DD         33          II         VV    VV     00   0    00           SS KKKKKK
AA       AA  DD       DD           33        II         VV    VV     00  0     00           SS KK    KK
AA       AA  DD       DD             33      II         VV    VV     00 0      00           SS KK     KK
AA       AA  DD       DD             33      II          V    V      00 0      00           SS KK      KK
AA       AA  DD       DD  3          33      II          VVVV        000      00  S         SS KK       KK
AA       AA  DDDDDDDDDDD  33333333333   IIIIIIIIIIII     VVVV        0000000000   SSSSSSSSSSSS KK        KK
AA       AA  DDDDDDDDDD    333333333    IIIIIIIIIIII      VV         0  000000     SSSSSSSSSS  KK         KK
```

Problem # II CQC

EXTENDED OPERATOR COVERAGE MAY BE ARRANGED

AS FOLLOWS:

SYSTEM BACKUP

MAINTENANCE + BACKUP

SYSTEM BACKUP + TESTING

SYSTEM BACKUP

SYSTEM BACKUP

NO OPERATORS ON SITE - SYSTEM AVAILABLE TO USERS.

TESTING NOS VERSION 2.3 .

THIS PERIOD WILL NEED TO CONTACT COMPUTER SERVICES

NOT ON SITE.

PHYSICAL DAMAGE. BACKUP TAPES ARE RECOMMENDED WHENEVER THE INFOR-

TIME CONSUMING TO RECREATE . PLEASE NOTE THAT IMPELL,CDC,

RECREATE A TAPE IF NO BACKUP EXISTS.

OVER A WEEK AGO,

0622 AND 0627

NUMBERS BEGINNING

0621091 MUST BE REQUESTED. A CONSOLIDATED

LIST OF THE ISUS SUGGESTED NEW NUMBERS WAS DISTRIBUTED TO

EACH DIVISION TO EXPEDITE THE REVIEW. THESE CHANGES ARE

BEING MADE TO SUIT ACCOUNTING DEPT. NUMBER CHANGES.

****

IN-WATS - (300)445-8114
4300 HASP -(415)947-4944

```
*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*
S                                                                                                   S
U                                    IMPELL CORPORATION                                             U
P                                    PROGRAM SUPERPIPE                                              P
E            DEV*VER:17.2            DATE:  06/01/84              SYSTEM: IMPELL - NOS              E
R                                                                                                   R
P     SUPERPIPE IS A COMPREHENSIVE COMPUTER PROGRAM FOR THE STRUCTURAL ANALYSIS AND                 P
I     CODE COMPLIANCE VERIFICATION OF PIPING SYSTEMS, WITH PARTICULAR EMPHASIS ON                   I
P     NUCLEAR POWER PIPING DESIGNED TO MEET THE REQUIREMENTS OF THE ASME BOILER AND                 P
E     PRESSURE VESSEL CODE, SECTION III, FOR CLASS 1, 2 AND 3 NUCLEAR PIPING SYSTEMS.               E
*     THE PROGRAM HAS THE FOLLOWING MAJOR FEATURES....                                              *
S                                                                                                   S
U          ** SPECIFICATION AND PLOT OF SYSTEM GEOMETRY.                                            U
P          ** STATIC AND THERMAL LOAD ANALYSIS.                                                     P
E          ** DETERMINATION OF DYNAMIC PROPERTIES.                                                  E
R          ** RESPONSE SPECTRUM ANALYSIS.                                                           R
P          ** FORCE AND EARTHQUAKE TIME-HISTORY ANALYSIS.                                           P
I          ** CODE COMPLIANCE CHECKS FOR ASME SECTION III.                                          I
P          ** PIPE BREAK LOCATION DETERMINATION.                                                    P
E          ** PIPE SUPPORT LOADS AND DISPLACEMENT SUMMARIES.                                        E
*                                                                                                   *
S     ********************************************************************************************  S
U                                                                                                   U
P     SUPERPIPE INCLUDES MANY USER ORIENTED OPTIONS SUCH AS...                                      P
E                                                                                                   E
R          ** COMPLETE PIPING ANALYSIS IN A SINGLE COMPUTER RUN OR                                  R
P             IN DISCRETE PHASES OVER A PERIOD OF TIME.                                             P
I          ** STORAGE OF DATA RESULTS AND RECALL FOR SUBSEQUENT USE.                                I
P          ** EXTENSIVE COORDINATE GENERATION CAPABILITY FOR MODEL GEOMETRY.                         P
I          ** LARGE LIBRARY OF STANDARD MATERIAL PROPERTIES,PIPING CROSS SECTIONS,                  E
*             AND FLEXIBILITY AND STRESS INTENSIFICATION FACTORS FOR COMPONENTS.                    *
S          ** EXTENSIVE ERROR AND WARNING MESSAGES TO AID DATA CHECKING.                            S
U          ** MULTIPLE LOAD CASES FOR THERMAL EXPANSION AND STATIC ANALYSIS.                        U
P          ** CAPABILITY TO EVALUATE STRESSES AND SUPPORT LOADS DUE TO INTERNAL                     P
E             PRESSURE LOADINGS.                                                                    E
R          ** VARIOUS RESPONSE SPECTRUM ANALYSIS OPTIONS FOR MODAL AND DIRECTIONAL                  R
P             COMBINATIONS AND MULTIPLE RESPONSE SPECTRA INPUT EXCITATION AT                        P
I             DIFFERENT SUPPORTS.                                                                   I
P          ** AUTOMATIC GENERATION OF MASS POINTS FOR DYNAMIC ANALYSIS TO OBTAIN                    P
E             THE DESIRED ACCURACY IN DYNAMIC CHARACTERISTICS.                                      E
*          ** OPTION TO ADD EXTRA DATA POINTS FOR CODE COMPLIANCE CHECKS WITHOUT                    *
S             RE-ANALYSIS.                                                                          S
U          ** OUTPUT OF RESULTS IN A FORMAT APPROPRIATE TO STRESS REPORTS.                          U
P                                                                                                   P
E     ********************************************************************************************  E
R                                                                                                   R
P                    SUPERPIPE HAS BEEN DEVELOPED, DOCUMENTED                                       I
I                    AND VERIFIED FOR PRINCIPAL USE ON ANALYSES                                     P
P                    RELATING TO NUCLEAR SAFETY.                                                    L
E                                                                                                   E
*                                                                                                   *
S                                                                                                   S
U                    SUPERPIPE IS A CONTROLLED PROGRAM AVAILABLE                                    U
P                    FOR USE EXCLUSIVELY THROUGH IMPELL CORP.                                       P
E                    FOR INFORMATION CONTACT....DIVISION MANAGER,                                   E
R                    ENGINEERING SERVICES DEVELOPMENT DIVISION.                                     R
P                    TELEPHONE (408) 449-7440.                                                      P
I                                                                                                   I
P                                                                                                   P
E                                                                                                   E
*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*SUPERPIPE*
```

SUPERPIPE NEWS

UPDATED : 05/12/84

****
SUPERPIPE VERSION 17A 05/12/84 PROGRAM RELEASE
****

SUPERPIPE VERSION 17A 05/12/84 IS RELEASED FOR PRODUCTION USE.
THIS VERSION ADDS THE FOLLOWING STRESS CHECKS TO THE PREVIOUS VERSION OF SUPERPIPE:

- ASME/ANSI B31.1,B31.3,B31.4,AND B31.8

- MITI CLASS 1,AND CLASS 3,4

N2C/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

DESIGN VERIFICATION

CLIENT Songs / SCE

JOB NO. 0310-068

CALC./PROB. NO. Prob # II

PREPARED BY: Kim Hoang DATE: 4/24/85

CHECKED BY: D. Myatt DATE: 4/25/85

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ECHO PRINT OF INPUT DATA

```
COLUMN                                                                                          INPUT
         1         2         3         4         5         6         7         8                 CARD
12345678901234567890123456789012345678901234567890123456789012345678901234567890           SEQUENCE

*NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**                       1
 NOEL                                                                                           2
 EXEC DYNP SPEC                                                                                 3
       FT                                                                                       4
 GEOM   2   1                                 PIPING GEOMETRY                                   5
 RUN1 CLS2            PIPING FROM NODE 1 TO NODE 25                                             6
    1                   DIR  -46.5    579.       -257.                                          7
    5                   DIR  -46.5    574.667    -257.                                          8
    6  TNP              TAN                                                                     9
   51  TIP  1.0         DIR  -46.5    573.333    -257.                                         10
    7  TNP              TAN                                                                    11
    8                   DIR  -46.5    573.333  -261.75                                         12
    9  TNP              TAN                                                                    13
   52  TIP  1.0         DIR  -46.5    573.333  -266.75                                         14
   10  TNP              TAN                                                                    15
   11                   DIR  -47.5    572.333  -256.75                                         16
   12  TNP              TAN                                                                    17
   53  TIP  1.0         DIR  -48.     571.833  -256.75                                         18
   13  TNP              TAN                                                                    19
   14                   DIR  -48.     570.999  -255.75                                         20
   35  KEP              DIR  -47.     570.999  -255.75                                         21
   15                   DIR  -48.     570.187  -256.75                                         22
   16                   DIR  -48.     569.5    -256.75                                         23
   17                   DIR  -48.     568.112  -256.75                                         24
   18                   DIR  -48.     559.062  -256.75                                         25
   84  KEP              DIR  -47.     559.0620 -257.75                                         26
   19  TNP              TAN                                                                    27
   54  TIP  1.0         DIR  -48.     557.25   -256.75                                         28
   20  TNP              TAN                                                                    29
   21                   DIR -46.6450  557.25   -256.75                                         30
   22  TNP              TAN                                                                    31
   55  TIP  1.0         DIR  -37.5    557.25   -256.75                                         32
   23  TNP              TAN                                                                    33
   56  TIP   1.0        DIR  -38.5    557.25   -265.75                                         34
   24  TNP              TAN                                                                    35
*  25  KEP              DIR  -38.5    553.75   -255.75                                         36
 RUN2 CLS2            RUN 2 PIPING FROM NODE 77 TO NODE 93                                     37
   77                   DIR -3.75     555.25   -253.584                                        38
   76                   DIR -13.50    555.25   -253.584                                        39
   75                   DIR -13.25    555.75   -253.584                                        40
```

NRC/KIR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ECHO PRINT OF INPUT DATA

COLUMN 1234567890			1234567890 (col. 3)		(col. 4)	(col. 5)	INPUT CARD SEQUENCE
74			DIR	-23.000	555.25	-258.584	41
73			DIR	-26.0833	555.25	-258.584	42
72			DIR	-29.1667	555.25	-258.584	43
71			DIR	-32.25	555.25	-258.584	44
70			DIR	-35.5	555.25	-258.584	45
69	TNP		TAN				46
E7	TIP	1.5	DIR	-38.5	555.25	-258.584	47
56	TNP		TAN				48
E8	TIP	1.5	DIR	-38.5	553.75	-260.084	49
57	TNP		TAN				50
25	GKP		OJP				51
26			DIR	-38.5	553.75	-273.5	52
27			DIR	-38.5	553.75	-276.2183	53
28			DIR	-38.5	553.75	-281.9367	54
29			DIR	-38.5	553.75	-287.655	55
30			DIR	-38.5	553.75	-291.009	56
31			DIR	-38.5	553.75	-292.342	57
32			DIR	-38.5	553.75	-295.9737	58
33			DIR	-38.5	553.75	-301.1053	59
34			DIR	-38.5	553.75	-305.2370	60
35	TNP		TAN				61
E9	TIP	1.0	DIR	-38.5	553.75	-307.029	62
36	TNP		TAN				63
E10	TIP	1.5	DIR	-38.5	556.25	-307.929	64
37	TNP		TAN				65
38			DIR	-43.5	556.25	-307.929	66
39	TNP		TAN				67
E11	TIP	1.5	DIR	-46.25	556.25	-307.929	68
40	TNP		TAN				69
41			DIR	-48.75	558.75	-307.929	70
42	TNP		TAN				71
E12	TIP	1.5	DIR	-51.25	561.25	-307.929	72
43	TNP		TAN				73
44			DIR	-52.0	562.3130	-307.7790	74
45	TNP		TAN				75
E13	TIP		DIR	-52.75	563.376	-308.529	76
46	TNP		TAN				77
47			DIR	-52.750	567.061	-308.529	78
48			DIR	-52.750	570.862	-308.529	79
49			DIR	-52.750	574.723	-308.5290	80

NRC/PWR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ECHO PRINT OF INPUT DATA

```
COLUMN                                                                                          INPUT
           1         2         3         4         5         6         7         8             CARD
12345678901234567890123456789012345678901234567890123456789012345678901234567890            SEQUENCE

   50  TNP              TAN                                                                      81
  EL4  TIP  1.5         DIR  -52.75    580.084   -308.529                                        82
   51  TNP              TAN                                                                      83
   52                   DIR  -52.75    580.084   -311.029                                        84
   53                   DIR  -52.75    580.084   -314.029                                        85
   54                   DIR  -52.75    580.084   -317.029                                        86
   55                   DIR  -52.75    580.084   -320.029                                        87
   56                   DIR  -52.75    580.084   -323.029                                        88
   57  TNP              TAN                                                                      89
  EL5  TIP  1.5         DIR  -52.75    580.084   -325.529                                        90
   58  TNP              TAN                                                                      91
   59                   DIR  -55.2641  580.084   -325.9052                                       92
   50                   DIR  -56.5001  580.084   -326.0902                                       93
   51                   DIR  -60.3328  580.084   -326.6623                                       94
   52                   DIR  -64.1654  580.084   -327.2355                                       95
*  53                   DIR  -67.9981  580.084   -327.3082                                       96
*  31  MND              DIR  -55.2641  582.084   -325.9052                                       97
 STRP  SAP4N01          12.75       .4056                                                        98
                 MASS   9.375                                                                    99
 BELB  SAP4N01B         12.75       .4056                                                       100
                 MASS   9.375                                                                   101
 STRP  SAP4N02          3.6256      .3216                                                       102
                 MASS   4.6567                                                                  103
 BELB  SAP4N02B         3.6256      .3216                                                       104
                 MASS   4.6567                                                                  105
 VALV  SAP4N03          3.6256      .5444                                                       106
                 MASS   33.15                                                                   107
 VALV  SAP4N04          12.75      2.6244                                                       108
                 MASS   101.8333                                                                109
 STRP  SAP4N05          12.75      1.3116                                                       110
                 MASS   17.325                                                                  111
 BELB  SAP4N05          12.75      1.3116                                                       112
                 MASS   17.325                                                                  113
*VLIP  VALVE IP         12.75      2.6244                                                       114
 SA304 SS        SS13                                                                           115
                 TEMP   70.                                                                     116
                 YM0025300600.0                                                                 117
                 ALPH   .3                                                                      118
*                CL2S 17500.                                                                    119
   AL STRP  SAP4N01  SA304 SS          5                                                        120
```

HRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ECHO PRINT OF INPUT DATA

```
COLUMN                                                                                 INPUT
         1         2         3         4         5         6         7         8        CARD
12345678901234567890123456789012345678901234567890123456789012345678901234567890   SEQUENCE

   A2 STRP SAP4N02  SA304 SS           5                                                121
  A31 BELB SAP4N023 SA304 SS           7                                                122
   A4 STRP SAP4N02                     9                                                123
  A32 BELB SAP4N023                   10                                                124
   A5 STRP SAP4N02                    12                                                125
  A33 BELB SAP4N02B                   13                                                126
   A6 STRP SAP4N02                    15                                                127
   A7 VALV SAP4N03  SA304 SS          17                                                128
   A8 STRP SAP4N02                    19                                                129
   A9 BELB SAP4N023                   20                                                130
  A10 STRP SAP4N02                    22                                                131
  A11 BELB SAP4N024                   23                                                132
  A12 BELB                            24                                                133
* A13 STRP                            25                                                134
   B1 STRP SAP4N01  SA304 SS          63                                                135
  B31 BELB SAP4N01B SA304 SS          65                                                136
  B32 BELB SAP4N01B SA304 SS          67                                                137
   B3 STRP SAP4N01                    35                                                138
  B33 BELB                            36                                                139
  B34 BELB                            37                                                140
   B4 STRP                            39                                                141
  B35 BELB                            40                                                142
   B5 STRP                            42                                                143
  B36 BELB                            43                                                144
   B6 STRP                            45                                                145
  B37 BELB                            46                                                146
   B7 STRP                            50                                                147
  B38 BELB                            51                                                148
   B8 STRP                            57                                                149
   B9 BELB                            58                                                150
  B9A VALV SAP4N04  SA304 SS          60                                                151
* B10 STRP SAP4N05  SA304 SS          63                                                152
 MISC                VALVE OPERATOR                                                     153
* OP1 VLOP VALVE OP SA304 SS          59     51                                         154
*  81   81              1018.     1018.     1018.                                       155
   1X     1 SNGL        .01E+12   1.0E+20                       X                       156
   1Y     1 SNGL        .01E+12   1.0E+20                       Y                       157
   1Z     1 SNGL        .01E+12   1.0E+20                       Z                       158
  77X    77 SNGL        .01E+12   1.0E+20                       X                       159
  77Y    77 SNGL        .01E+12   1.0E+20                       Y                       160
```

NRC/BNL PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ECHO PRINT OF INPUT DATA

```
COLUMN                                                                                        INPUT
         1         2         3         4         5         6         7         8              CARD
12345678901234567890123456789012345678901234567890123456789012345678901234567890          SEQUENCE

 77Z     77 SNGL          .01E+12    1.0E+20                      Z                           161
 63X     63 SNGL          .01E+12    1.0E+20                      X                           162
 63Y     63 SNGL          .01E+12    1.0E+20                      Y                           163
 63Z     63 SNGL          .01E+12    1.0E+20                      Z                           164
 14ZX    14 SNGL          .01E+12                              INCL     83                    165
 14Y     14 SNGL          .01E+12                                 Y                           166
 18ZZ    18 SNGL          .01E+12                              INCL     84                    167
 21Y     21 SNGL          .01E+12                                 Y                           168
 29Y     29 SNGL          .01E+12                                 Y                           169
 30X     30 SNGL          .01E+12                                 X                           170
 31Z     31 SNGL          .01E+12                                 Z                           171
 47X     47 SNGL          .01E+12                                 X                           172
 47Z     47 SNGL          .01E+12                                 Z                           173
 52Y     52 SNGL          .01E+12                                 Y                           174
 53X     53 SNGL          .01E+12                                 X                           175
 53Z     53 SNGL          .01E+12                                 Z                           176
 55Y     55 SNGL          .01E+12                                 Y                           177
 71Y     71 SNGL          .01E+12                                 Y                           178
* 71Z    71 SNGL          .01E+12                                 Z                           179
*                                                                                             180
 DYNP         33          PRN2      PMOD                   DYNAMIC PROPERTY                   181
*TEMP         70                                                                              182
 HORZ  F-G  MAT      HORIZONTAL RESPONSE SPECTRA  3% DAMPING                                  183
   35.       .4225     30.      .4225    25.       .4234     20.        .4306                 184
   15.       .4441     12.      .4690    10.       .50        9.        .5123                 185
   8.0       .5518     7.5      .5318    7.0       .6953     6.5        .8646                 186
   5.0      1.2176     5.5     1.8291    5.0      1.6733     4.5       1.7312                 187
   4.0      2.5551     3.71    2.2541    3.5      2.0232     3.0       1.0956                 188
   2.5      1.7319     2.0     1.1116    1.5       .6133     1.0        .3032                 189
*   .7       .2119     .4       .1048    .3        .3776                                      190
 VERT  F-G  MAT      VERTICAL   RESPONSE SPECTRA  3% DAMPING                                  191
   35.       .1698     30.      .1698    25.       .1576     20.        .1875                 192
   15.       .2268     12.      .3456    11.35     .3433     10.        .2868                 193
   9.0       .2678     8.0      .2553    7.5       .2719     7.0        .3503                 194
   6.5      0.4091     6.0     0.5347    5.5      0.7305     5.0       1.2145                 195
   4.5      0.9126     4.00    0.7090    3.5      0.5364     3.0       0.4397                 196
   2.5      0.4044     2.0     0.3561    1.5       .2668     1.0        .1763                 197
*   .7       .1321     .4       .0696    .3        .0596                                      198
 HORI  F G  LOG      HORIZONTAL RESPONSE SPECTRA  3% DAMPING                                  199
   35.       .4225     30.      .4225    25.       .4234     20.        .4306                 200
```

NRC/BNL PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ECHO PRINT OF INPUT DATA

```
COLUMN                                                                                           INPUT
         1         2         3         4         5         6         7         8                 CARD
12345678901234567890123456789012345678901234567890123456789012345678901234567890             SEQUENCE

   15.        .4441      12.        .4690     10.         .50        9.       .5123                201
   3.0        .5513      7.5        .5318      7.0        .6958      6.5       .8645               202
   5.0       1.2176      5.5       1.8291      5.0       1.5736      4.5      1.7312               203
   4.0       2.5551      3.71      2.2541      3.5       2.0282      3.0      1.0956               204
   2.5       1.7319      2.0       1.1116      1.5        .6133      1.0       .3032               205
*   .7        .2118       .4        .1048       .3        .0776                                    206
*VERT  FIG  LOG       VERTICAL     RESPONSE SPECTRA  3% DAMPING                                    207
   35.        .1698      30.        .1698     25.         .1696     20.        .1876               208
   15.        .2256      12.        .3456     11.35       .3433     10.       .2868                209
   9.0        .2678      8.0        .2553      7.5        .2719      7.0       .3509               210
   6.5       0.4091      6.0       0.5847      5.5       0.9305      5.0      1.2145               211
   4.5       0.9126      4.00      0.7080      3.5       0.5364      3.0      0.4397               212
   2.5       0.4043      2.0       0.3561      1.5        .2668      1.0       .1763               213
*   .7        .1321       .4        .0696       .3        .0506                                    214
 C00X SMPL        NORM MCOC                 ALLA               X RESPONSE                          215
 HORZ                                                                                              216
    0                                                                                              217
 C00Y SMPL        NORM MCOC                                    Y RESPONSE                          218
     VERT                                                                                          219
    0                                                                                              220
 C00Z SMPL        NORM MCOC                                    Z RESPONSE                          221
          HORZ                                                                                     222
    0                                                                                              223
 C01X SMPL        NORM MCOC                 ALLA               X RESPONSE                          224
 HORZ                                                                                              225
    0                                                                                              226
 C01Y SMPL        NORM MCOC                                    Y RESPONSE                          227
     VERT                                                                                          228
    0                                                                                              229
*C01Z SMPL        NORM MCOC                                    Z RESPONSE                          230
          HORZ                                                                                     231
    0                                                                                              232
```

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

DATA STORAGE INDICATORS

DATA FILE = MODEL (NO FILE)

REMAINING INDICATORS IGNORED

ANALYSIS CONTROL INDICATORS

DATA EXECUTION = EXEC (EXECUTION REQUIRED)

ANALYSES TO BE EXECUTED

DYNP (COMPUTE DYNAMIC PROPERTIES)
SPEC (RESPONSE SPECTRUM ANALYSIS)

UNITS SPECIFICATION

TEMPERATURE SCALE	=	(DEFAULT TO F)
COORDINATE INPUT	= FT	
COMPONENT DIMENSIONS	=	(DEFAULT TO IN)
DISPLACEMENTS, ETC.	=	(DEFAULT TO IN)
SUPPORT, ETC. STIFFNESSES	=	(DEFAULT TO LBIN)
FORCES AND MOMENTS	=	(DEFAULT TO LBIN)
COMPONENT WTS, UNIF LOADS	=	(DEFAULT TO LBIN)
STRESSES, MODULI, PRESSURES	=	(DEFAULT TO LBIN)

INC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

GEOMETRY DATA CONTROL INFORMATION

DATA NAME = GEOM
DATA TITLE = PIPING GEOMETRY

NO. OF PIPE RUNS = 2
NO. OF MISC. MEMBER GROUPS = 1

ASME CODE EDITION = (BLANK - DEFAULTS TO 8-80)

COORDINATE CODE = (BLANK - NO COORDINATE TRANSFORMATION)

ARC/KHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

CONTROL POINT COORDINATES, AS COMPUTED AND STORED

RUN NAME	POINT NAME	POINT TYPE	GLOBAL COORDINATES X (FT)	Y (FT)	Z (FT)
RUN1					
	1		-46.500	579.000	-257.000
	5		-46.500	574.667	-257.000
	6	TNP	-46.500	574.333	-257.000
	11	TIP	-46.500	573.333	-257.000
	7	TNP	-46.500	573.333	-258.000
	8		-46.500	573.333	-261.750
	9	TNP	-46.500	573.333	-265.750
	12	TIP	-46.500	573.333	-266.750
	10	TNP	-47.207	572.626	-266.750
	11		-47.500	572.333	-266.750
	12	TNP	-47.707	572.126	-266.750
	13	TIP	-48.000	571.833	-266.750
	13	TNP	-48.000	571.419	-266.750
	14		-48.000	570.999	-266.750
	93	REP	-47.000	570.999	-265.750
	15		-48.000	570.187	-266.750
	16		-48.000	569.500	-266.750
	17		-48.000	568.812	-266.750
	18		-48.000	559.062	-266.750
	84	REP	-47.000	559.062	-267.750
	19	TNP	-48.000	559.250	-266.750
	14	TIP	-48.000	557.250	-266.750
	20	TNP	-47.000	557.250	-266.750
	21		-46.645	557.250	-266.750
	22	TNP	-39.914	557.250	-266.750
	85	TIP	-39.500	557.250	-266.751
	23	TNP	-39.207	557.250	-266.457
	86	TIP	-39.500	557.250	-265.750
	24	TNP	-38.500	555.250	-265.750
	25	REP	-38.000	553.750	-265.750
RUN2					
	77		-8.750	555.250	-268.534
	76		-13.500	555.250	-268.534
	75		-18.250	555.250	-268.534
	74		-23.000	555.250	-268.534
	73		-26.143	555.250	-268.534
	72		-29.167	555.250	-268.534
	71		-32.250	555.250	-268.534
	70		-36.000	555.250	-268.534
	[illegible]	TNP	-37.000	555.250	-268.534
	87	TIP	-37.500	555.250	-268.534
	[illegible]	TNP	-38.500	554.165	-269.545
	[illegible]	TIP	-38.500	553.750	-269.534
	67	TNP	-38.500	553.750	-269.705

UPC/KHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

CONTROL POINT COORDINATES, AS COMPUTED AND STORED (CONTD.)

RUN NAME	POINT NAME	POINT TYPE	GLOBAL COORDINATES X (FT)	Y (FT)	Z (FT)
PUMP (CONT.)					
	25	ANP	-38.500	553.750	-265.750
	26		-38.500	553.750	-270.500
	27		-38.500	553.750	-276.218
	28		-38.500	553.750	-281.937
	29		-38.500	553.750	-287.655
	30		-38.500	553.750	-291.009
	31		-34.500	553.750	-292.842
	32		-38.500	553.750	-296.474
	33		-38.500	553.750	-301.105
	34		-38.500	553.750	-305.237
	35	TNP	-38.500	553.750	-306.029
	[illegible]	TIP	-38.500	553.750	-307.029
	36	TNP	-38.500	554.750	-307.029
	[illegible]10	TIP	-38.500	555.250	-307.029
	37	TNP	-40.000	556.250	-307.029
	38		-43.500	556.250	-307.029
	39	TNP	-45.629	555.250	-307.029
	[illegible]11	TIP	-46.259	555.250	-307.029
	40	TNP	-46.689	556.689	-307.029
	41		-48.750	558.750	-307.029
	42	TNP	-50.952	560.952	-307.029
	[illegible]12	TIP	-51.250	561.250	-307.029
	43	TNP	-51.460	561.548	-307.239
	44		-52.000	562.313	-307.779
	45	TNP	-52.440	562.937	-308.219
	[illegible]13	TIP	-52.750	563.376	-308.529
	46	TNP	-52.750	563.996	-308.529
	47		-52.750	567.001	-308.529
	48		-52.750	570.862	-308.529
	49		-52.750	574.723	-308.529
	50	TNP	-52.750	578.584	-308.529
	[illegible]14	TIP	-52.750	580.084	-308.529
	51	TNP	-52.750	580.084	-310.029
	52		-52.750	580.084	-311.029
	53		-52.750	580.084	-314.029
	54		-52.750	580.084	-317.029
	55		-52.750	580.084	-320.029
	56		-52.750	580.084	-323.029
	57	TNP	-52.750	580.084	-324.237
	[illegible]15	TIP	-52.750	580.584	-325.529
	58	TNP	-54.325	580.084	-325.729
	[illegible]		-55.694	580.084	-325.905
	[illegible]		-56.500	580.084	-326.029
	[illegible]		-60.333	580.084	-326.553
	[illegible]		-60.155	580.084	-327.136
	[illegible]		-62.333	580.084	-327.553

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

CONTROL POINT COORDINATES, AS COMPUTED AND STORED (CONTD.)

RUN NAME	POINT NAME	POINT TYPE	GLOBAL COORDINATES X (FT)	Y (FT)	Z (FT)
MISC. NODES					
	C1	MND	-55.264	582.084	-325.905

ARC/RHR PIPING MODEL PROBLEM 11***EL2OW FLEX. INCLUDED NO MISSING MASS**

COMPONENT PROPERTIES

LENGTH UNIT = IN , WEIGHT UNIT = LB/IN OR LB

COMP TYPE	SECTION NAME	SECT TYPE	CARD TYPE	ITEM 1	ITEM 2	ITEM 3	ITEM 4	ITEM 5	ITEM 6	ITEM LIST
STRP	SAP4N11									
			NAME	12.750	.406	0.000	0.000			DS,TS,DK,TK
			NAME**	12.750	.406	12.750	.406			DS,TS,DK,TK
			XDIM**	0.000	.355	0.000				DDIF/T,TM,A
			MASS	9.375	0.000	0.000	0.000	0.000		UWC,UWF,UWI,MAXF,MAXD
			MASS**	9.375	0.000	0.000	30.000	85.265		UWC,UWF,UWI,MAXF,MAXD
BELB	SAP4N11B									
			NAME	12.750	.406	0.000	0.000	0.000	0.000	DS,TS,DK,TK,R/DN,DN
			NAME**	12.750	.406	12.750	.406	0.000	0.000	DS,TS,DK,TK,R/DN,DN
			XDIM**	0.000	.355	0.000				DDIF/T,TM,A
			MASS	9.375	0.000	0.000	0.000	0.000		UWC,UWF,UWI,MAXF,MAXD
			MASS**	9.375	0.000	0.000	30.000	85.265		UWC,UWF,UWI,MAXF,MAXD
STRP	SAP4N12									
			NAME	8.626	.322	0.000	0.000			DS,TS,DK,TK
			NAME**	8.626	.322	8.626	.322			DS,TS,DK,TK
			XDIM**	0.000	.281	0.000				DDIF/T,TM,A
			MASS	4.657	0.000	0.000	0.000	0.000		UWC,UWF,UWI,MAXF,MAXD
			MASS**	4.657	0.000	0.000	30.000	71.196		UWC,UWF,UWI,MAXF,MAXD
BELB	SAP4N12B									
			NAME	8.626	.322	0.000	0.000	0.000	0.000	DS,TS,DK,TK,R/DN,DN
			NAME**	8.626	.322	8.626	.322	0.000	0.000	DS,TS,DK,TK,R/DN,DN
			XDIM**	0.000	.281	0.000				DDIF/T,TM,A
			MASS	4.657	0.000	0.000	0.000	0.000		UWC,UWF,UWI,MAXF,MAXD
			MASS**	4.657	0.000	0.000	30.000	71.196		UWC,UWF,UWI,MAXF,MAXD
VALV	SAP4N13									
			NAME	8.626	.644	0.000	0.000	0.000	0.000	DS,TS,DK,TK,DP,TP
			NAME**	8.626	.644	8.626	.644	7.337	.644	DS,TS,DK,TK,DP,TP
			MASS	33.150	0.000	0.000				UWC,UWF,UWI
VALV	SAP4N14									
			NAME	12.750	2.624	0.000	0.000	0.000	0.000	DS,TS,DK,TK,DP,TP
			NAME**	12.750	2.624	12.750	2.624	7.501	2.624	DS,TS,DK,TK,DP,TP
			MASS	101.333	0.000	0.000				UWC,UWF,UWI
STRP	SAP4N15									
			NAME	12.750	1.312	0.000	0.000			DS,TS,DK,TK
			NAME**	12.750	1.312	12.750	1.312			DS,TS,DK,TK
			XDIM**	0.000	1.149	0.000				DDIF/T,TM,A
			MASS	17.325	0.000	0.000	0.000	0.000		UWC,UWF,UWI,MAXF,MAXD
			MASS**	17.325	0.000	0.000	30.000	92.895		UWC,UWF,UWI,MAXF,MAXD

NRC/PHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

COMPONENT PROPERTIES (CONTD.)

LENGTH UNIT = IN , WEIGHT UNIT = LB/IN OR LB

COMP TYPE	SECTION NAME	SEAM TYPE	CARD TYPE	ITEM 1	ITEM 2	ITEM 3	ITEM 4	ITEM 5	ITEM 6	ITEM LIST
BELB	SAP4N15									
			NAME	12.750	1.312	0.000	0.000	0.000	0.000	DS,TS,DK,TK,R/DN,DN
			NAME**	12.750	1.312	12.750	1.312	0.000	0.000	DS,TS,DK,TK,R/DN,DN
			XDIM**	0.000	1.146	0.000				DDIF/T,TM,A
			MASS	17.325	0.000	0.000	0.000	0.000		UWC,UWF,UWI,MAXF,MAXD
			MASS**	17.325	0.000	0.000	30.000	92.895		UWC,UWF,UWI,MAXF,MAXD
VLOP	VALVE OP									
			NAME	.1285+02	.2621+01					DK,TK

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

MATERIAL PROPERTIES, AS STORED

TEMP SCALE = F, MODULUS AND STRESS UNITS = LB/SQ.IN

MATERIAL NAME	DATA TYPE	ITEM 1	ITEM 2	ITEM 3	ITEM 4	ITEM 5	ITEM 6	ITEM 7	ITEM 8
SA304 SS									NONSTANDARD MATER
	TEMP	70.							
	YMOD	28299600.							
	ALPH	.300E+00							
	CL2S	17500.00							
	NCYC**	.100E+02	.200E+02	.500E+02	.100E+03	.200E+03	.500E+03	.100E+04	.200E+04
	ETGS**	550000.00	470000.00	317000.00	240000.00	185000.00	136000.00	109000.00	89000.00
	NCYC**	.500E+04	.100E+05	.200E+05	.500E+05	.100E+06	.200E+06	.500E+06	.100E+07
	ETGS**	70000.00	59000.00	51000.00	42500.00	37500.00	33000.00	28500.00	26000.00

FATG. PARAM. M = 1.70, N = .30 (DEFAULT) C4 = 1.3 (DEFAULT)

RRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MISCELLANEOUS MEMBERS, GROUP NO. 1 (MISC) VALVE OPERATOR

MEMB NAME	COMP TYPE	SECTION NAME	MATERIAL NAME	NODE I	NODE J	POINT K	LENGTH (FT)	POINT L	POINT M	END RELEASE CODES ---I---	---J---
OP1	VLOP	VALVE OP	SA304 SS	59	81		2.00				

N4C/R4R PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

COMPONENT ALIGNMENT SUMMARY, PIPE RUN NO. 1 RUN NAME = RUN1

SEGM NO.	SEGM TYPE	DCP LIST	DCP TYPE	COMP NAME	COMP TYPE	SECTION NAME	MATERIAL NAME	BRANCH ANGLE (DEG)	SEGM LENGTH (FT)	COMP LENGTH (FT)	EXTRA MASSES	CURVE RADIUS (FT)	CURVE ANGLE (DEG)
1	STRT								4.67				
		1											
				A1	STRP	SAP4N01	SA304 SS			4.33	0		
		5											
				A2	STRP	SAP4N02	SA304 SS			.33	0		
2	CURV	6	TNP						1.57			1.00	90.00
				AB1	BELB	SAP4N028	SA304 SS			1.57	0		
3	STRT	7	TNP						7.75				
				A4	STRP	SAP4N02	SA304 SS			3.75	0		
		8											
				A4	STRP	SAP4N02	SA304 SS			4.00	0		
4	CURV	9	TNP						1.57			1.00	90.00
				AB2	BELB	SAP4N028	SA304 SS			1.57	0		
5	STRT	10	TNP						.71				
				A5	STRP	SAP4N02	SA304 SS			.41	0		
		11											
				A5	STRP	SAP4N02	SA304 SS			.29	0		
6	CURV	12	TNP						.79			1.00	45.00
				AB3	BELB	SAP4N023	SA304 SS			.79	0		
7	STRT	13	TNP						13.17				
				A6	STRP	SAP4N02	SA304 SS			.42	0		
		14											
				A6	STRP	SAP4N02	SA304 SS			.31	0		
		15											
				A7	VALV	SAP4N03	SA304 SS			.59	0		
		16											
				A7	VALV	SAP4N03	SA304 SS			.59	0		
		17											
				A8	STRP	SAP4N02	SA304 SS			9.75	1		
		18											
				A8	STRP	SAP4N02	SA304 SS			.81	0		
8	CURV	19	TNP						1.57			1.00	90.00
				A9	BELB	SAP4N028	SA304 SS			1.57	0		
9	STST	20	TNP						7.09				
				A10	STRP	SAP4N02	SA304 SS			.36	0		
		21											
				A10	STRP	SAP4N02	SA304 SS			6.73	1		
10	CURV	22	TNP						.79			1.00	45.00

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

COMPONENT ALIGNMENT SUMMARY, PIPE RUN NO. 1 (CONTD.) RUN NAME = RUN1

SEGM NO.	SEGM TYPE	DCP LIST	DCP TYPE	COMP NAME	COMP TYPE	SECTION NAME	MATERIAL NAME	BRANCH ANGLE (DEG)	SEGM LENGTH (FT)	COMP LENGTH (FT)	EXTRA MASSES	CURVE RADIUS (FT)	CURVE ANGLE (DEG)
				A11	BELB	SAP4N028	SA304 SS			.79	0		
11	CURV	23	TNP						1.57			1.00	90.00
				A12	BELB	SAP4N029	SA304 SS			1.57	0		
12	STRT	24	TNP						2.50				
				A13	STRP	SAP4N02	SA304 SS			2.50	0		
		25	RRP					90.00					

COMPONENT ALIGNMENT SUMMARY, PIPE RUN NO. 2 RUN NAME = RUN2

SEGM NO.	SEGM TYPE	DCP LIST	DCP TYPE	COMP NAME	COMP TYPE	SECTION NAME	MATERIAL NAME	BRANCH ANGLE (DEG)	SEGM LENGTH (FT)	COMP LENGTH (FT)	EXTRA MASSES	CURVE RADIUS (FT)	CURVE ANGLE (DEG)
1	STRT	77							28.25				
				P1	STRP	SAP4N01	SA304 SS			4.75	0		
		76											
				B1	STRP	SAP4N01	SA304 SS			4.75	0		
		75											
				B1	STRP	SAP4N01	SA304 SS			4.75	0		
		74											
				P1	STRP	SAP4N01	SA304 SS			3.03	0		
		73											
				B1	STRP	SAP4N01	SA304 SS			3.03	0		
		72											
				B1	STRP	SAP4N01	SA304 SS			3.03	0		
		71											
				P1	STRP	SAP4N01	SA304 SS			4.25	0		
		70											
				B1	STRP	SAP4N01	SA304 SS			.50	0		
2	CURV	69	TNP						2.36			1.50	90.00
				3P1	BELB	SAP4N013	SA304 SS			2.36	0		
3	CURV	68	TNP						1.13			1.50	45.00
				3P2	BELB	SAP4N013	SA304 SS			1.13	0		
4	STRT	67	TNP						45.32				
				B3	STRP	SAP4N01	SA304 SS			5.04	0		
		25	RRP										
				P1	STRP	SAP4N01	SA304 SS			4.75	0		
		26											
				P3	STRP	SAP4N01	SA304 SS			5.72	0		
		27											

NRC/KHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

COMPONENT ALIGNMENT SUMMARY, PIPE RUN NO. 2 (CONTD.) RUN NAME = RUN2

SEGM NO.	SEGM TYPE	DCP LIST	DCP TYPE	COMP NAME	COMP TYPE	SECTION NAME	MATERIAL NAME	BRANCH ANGLE (DEG)	SEGM LENGTH (FT)	COMP LENGTH (FT)	EXTRA MASSES	CURVE RADIUS (FT)	CURVE ANGLE (DEG)
				B4	STRP	SAP4NO1	SA304 SS			5.72	0		
		28		B3	STRP	SAP4NO1	SA304 SS			5.72	0		
		29		B3	STRP	SAP4NO1	SA304 SS			3.35	0		
		30		B3	STRP	SAP4NO1	SA304 SS			1.33	0		
		31		B3	STRP	SAP4NO1	SA304 SS			4.13	0		
		32		B3	STRP	SAP4NO1	SA304 SS			4.13	0		
		33		B3	STRP	SAP4NO1	SA304 SS			4.13	0		
		34		B3	STRP	SAP4NO1	SA304 SS			.79	0		
5	CURV	35	TNP	BB3	BELB	SAP4NO13	SA304 SS		1.57	1.57	0	1.00	90.00
6	CURV	36	TNP	BB4	BELB	SAP4NO18	SA304 SS		2.36	2.36	0	1.50	90.00
7	STRT	37	TNP	B4	STRP	SAP4NO1	SA304 SS		5.63	3.50	0		
		38		B4	STRP	SAP4NO1	SA304 SS			2.13	0		
8	CURV	39	TNP	BB5	BELB	SAP4NO13	SA304 SS		1.13	1.13	0	1.50	45.00
9	STRT	40	TNP	B5	STRP	SAP4NO1	SA304 SS		6.03	2.91	0		
		41		B5	STRP	SAP4NO1	SA304 SS			3.11	0		
10	CURV	42	TNP	BB6	BELB	SAP4NO13	SA304 SS		.82	.82	0	1.50	31.38
11	STRT	43	TNP	B6	STRP	SAP4NO1	SA304 SS		1.96	1.03	0		
		44		B6	STRP	SAP4NO1	SA304 SS			.93	0		
12	CURV	45	TNP	BB7	BELB	SAP4NO13	SA304 SS		1.18	1.13	0	1.50	44.94
13	STRT	46	TNP						14.59				

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

COMPONENT ALIGNMENT SUMMARY, PIPE RUN NO. 2 (CONTD.) RUN NAME = RUN2

SEGM NO.	SEGM TYPE	OCP LIST	OCP TYPE	COMP NAME	COMP TYPE	SECTION NAME	MATERIAL NAME	BRANCH ANGLE (DEG)	SEGM LENGTH (FT)	COMP LENGTH (FT)	EXTRA MASSES	CURVE RADIUS (FT)	CURVE ANGLE (DEG)
				B7	STRP	SAP4N01	SA304 SS			3.00	0		
		47											
				P7	STRP	SAP4N01	SA304 SS			3.86	0		
		48											
				E7	STRP	SAP4N01	SA304 SS			3.86	0		
		49											
				B7	STRP	SAP4N01	SA304 SS			3.86	0		
14	CURV	50	TNP						2.35			1.50	90.00
				1B9	BELB	SAP4N013	SA304 SS			2.36	0		
15	STRT	51	TNP						14.21				
				P6	STRP	SAP4N01	SA304 SS			1.00	0		
		52											
				56	STRP	SAP4N01	SA304 SS			3.00	0		
		53											
				B6	STRP	SAP4N01	SA304 SS			3.00	0		
		54											
				86	STRP	SAP4N01	SA304 SS			3.00	0		
		55											
				P6	STRP	SAP4N01	SA304 SS			3.00	0		
		56											
				P8	STRP	SAP4N01	SA304 SS			1.21	0		
16	CURV	57	TNP						2.13			1.50	81.50
				F9	BELB	SAP4N013	SA304 SS			2.13	0		
17	STRT	58	TNP						14.13				
				B9A	VALV	SAP4N04	SA304 SS			1.25	0		
		59											
				B9A	VALV	SAP4N04	SA304 SS			1.25	0		
		60											
				B1C	STRP	SAP4N05	SA304 SS			3.83	0		
		61											
				31C	STRP	SAP4N05	SA304 SS			3.33	0		
		62											
				31C	STRP	SAP4N05	SA304 SS			3.83	0		
		63											

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

LUMPED WEIGHTS (LB)

NAME	LOCN	WEIGHT					
AL	81	6 VALUES ==>	.10180E+04	.10180E+04	.10180E+04	0.	0.	0.

NPC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

SUPPORT LOCATIONS AND PROPERTIES

SUPP NAME	SUPP LOCN	SUPP TYPE	PARTICIPATION CODES THRM	GRAV	STAT	DYN	TRANSLATIONAL STIFFNESS (LB/IN)	ROTATIONAL STIFFNESS (LB.IN/RAD)	EFFECTIVE WEIGHT (LB)	ANCHOR CODE	DIRN CODE	POINT J	POINT K
1X	1	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		X		
1Y	1	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		Y		
1Z	1	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		Z		
77X	77	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		X		
77Y	77	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		Y		
77Z	77	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		Z		
63X	63	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		X		
63Y	63	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		Y		
63Z	63	SNGL	T	G	S	D	.10000E+11	.10000E+21	0.000		Z		
14ZX	14	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		INCL	83	
14Y	14	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Y		
13XZ	13	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		INCL	84	
21Y	21	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Y		
29Y	29	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Y		
30X	30	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		X		
31Z	31	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Z		
47X	47	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		X		
47Z	47	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Z		
52Y	52	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Y		
53X	53	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		X		
53Z	53	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Z		
55Y	55	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Y		
71Y	71	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Y		
71Z	71	SNGL	T	G	S	D	.10000E+11	ZERO	0.000		Z		

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NI MISSING MASS**

OUTPUT POINT SPECIFICATION

NO OUTPUT POINT SPECIFICATION

PROPERTIES AT STRESS OUTPUT POINTS

SUP NO.	DCP NAME	COMP NAME	COMP TYPE	SECTION NAME	OUTSIDE DIAM (IN)	WALL THCKNS (IN)	SIF	SUP NO.	DCP NAME	COMP NAME	COMP TYPE	SECTION NAME	OUTSIDE DIAM (IN)	WALL THCKNS (IN)	SIF
RUN NAME = RUN1															
1	1	A1	STRP	SAP4N01	12.750	.406	1.00	2L	5	A1	STRP	SAP4N01	12.750	.406	1.00
2R	5	A2	STRP	SAP4N02	8.626	.322	1.00	3L	6	A2	STRP	SAP4N02	8.626	.322	1.00
3R	6	AB1	BELB	SAP4N02B	8.626	.322	2.44	4L	7	AB1	BELB	SAP4N02B	8.626	.322	2.44
4R	7	A4	STRP	SAP4N02	8.626	.322	1.00	5	8	A4	STRP	SAP4N02	8.626	.322	1.00
6L	9	A4	STRP	SAP4N02	8.626	.322	1.00	6R	9	AB2	BELB	SAP4N02B	8.626	.322	2.44
7L	10	AB2	BELB	SAP4N02B	8.626	.322	2.44	7R	10	A5	STRP	SAP4N02	8.626	.322	1.00
8	11	A5	STRP	SAP4N02	8.626	.322	1.00	9L	12	A5	STRP	SAP4N02	8.626	.322	1.00
9R	12	AB3	BELB	SAP4N02B	8.626	.322	2.44	10L	13	AB3	BELB	SAP4N02B	8.626	.322	2.44
10R	13	A6	STRP	SAP4N02	8.626	.322	1.00	11	14	A6	STRP	SAP4N02	8.626	.322	1.00
12L	15	A6	STRP	SAP4N02	8.626	.322	1.00	12R	15	A7	VALV	SAP4N03			N/A
13	16	A7	VALV	SAP4N03			N/A	14L	17	A7	VALV	SAP4N03			N/A
14R	17	A8	STRP	SAP4N02	8.626	.322	1.00	15	18	A8	STRP	SAP4N02	8.626	.322	1.00
16L	19	A8	STRP	SAP4N02	8.626	.322	1.00	16R	19	A9	BELB	SAP4N02B	8.626	.322	2.44
17L	20	A9	BELB	SAP4N02B	8.626	.322	2.44	17R	20	A10	STRP	SAP4N02	8.626	.322	1.00
18	21	A10	STRP	SAP4N02	8.626	.322	1.00	19L	22	A10	STRP	SAP4N02	8.626	.322	1.00
19R	22	A11	BELB	SAP4N02B	8.626	.322	2.44	20	23	A11	BELB	SAP4N02B	8.626	.322	2.44
21L	24	A12	BELB	SAP4N02B	8.626	.322	2.44	21R	24	A13	STRP	SAP4N02	8.626	.322	1.00
22	25	A13	STRP	SAP4N02	8.626	.322	1.00								
RUN NAME = RUN2															
23	77	B1	STRP	SAP4N01	12.750	.406	1.00	24	76	B1	STRP	SAP4N01	12.750	.406	1.00
25	75	B1	STRP	SAP4N01	12.750	.406	1.00	26	74	B1	STRP	SAP4N01	12.750	.406	1.00
27	73	B1	STRP	SAP4N01	12.750	.406	1.00	28	72	B1	STRP	SAP4N01	12.750	.406	1.00
29	71	B1	STRP	SAP4N01	12.750	.406	1.00	30	70	B1	STRP	SAP4N01	12.750	.406	1.00
31L	69	B1	STRP	SAP4N01	12.750	.406	1.00	31R	69	BB1	BELB	SAP4N01B	12.750	.406	2.71
32	68	BB1	BELA	SAP4N01B	12.750	.406	2.71	33L	67	BB2	BELB	SAP4N01B	12.750	.406	2.71
33R	67	B3	STRP	SAP4N01	12.750	.406	1.00	34	25	B3	STRP	SAP4N01	12.750	.406	1.00
35	26	B3	STRP	SAP4N01	12.750	.406	1.00	36	27	B3	STRP	SAP4N01	12.750	.406	1.00
37	28	B3	STRP	SAP4N01	12.750	.406	1.00	38	29	B3	STRP	SAP4N01	12.750	.406	1.00
39	30	B3	STRP	SAP4N01	12.750	.406	1.00	40	31	B3	STRP	SAP4N01	12.750	.406	1.00
41	32	B3	STRP	SAP4N01	12.750	.406	1.00	42	33	B3	STRP	SAP4N01	12.750	.406	1.00
43	34	B3	STRP	SAP4N01	12.750	.406	1.00	44L	35	B3	STRP	SAP4N01	12.750	.406	1.00
44R	35	BB3	BELB	SAP4N01B	12.750	.406	3.55	45	36	BB3	BELB	SAP4N01B	12.750	.406	3.55

ABC/SHK PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

PROPERTIES AT STRESS OUTPUT POINTS (CONTD.)

SOP NO.	DCP NAME	COMP NAME	COMP TYPE	SECTION NAME	OUTSIDE DIAM (IN)	WALL THCKNS (IN)	SIF	SOP NO.	DCP NAME	COMP NAME	COMP TYPE	SECTION NAME	OUTSIDE DIAM (IN)	WALL THCKNS (IN)	SIF
RUN NAME = RUN2 (CONTD.)															
46L	37	BB4	BELB	SAP4N01B	12.750	.406	2.71	46R	37	B4	STRP	SAP4N01	12.750	.406	1.00
47	38	B4	STRP	SAP4N01	12.750	.406	1.00	48L	39	B4	STRP	SAP4N01	12.750	.406	1.00
48R	39	BB5	BELB	SAP4N01B	12.750	.406	2.71	49L	40	BB5	BELB	SAP4N01B	12.750	.406	2.71
49R	40	B5	STRP	SAP4N01	12.750	.406	1.00	50	41	B5	STRP	SAP4N01	12.750	.406	1.00
51L	42	B5	STRP	SAP4N01	12.750	.406	1.00	51R	42	BB6	BELB	SAP4N01B	12.750	.406	2.71
52L	43	BB6	BELB	SAP4N01B	12.750	.406	2.71	52R	43	B6	STRP	SAP4N01	12.750	.406	1.00
53	44	B6	STRP	SAP4N01	12.750	.406	1.00	54L	45	B6	STRP	SAP4N01	12.750	.406	1.00
54R	45	BB7	BELB	SAP4N01B	12.750	.406	2.71	55L	46	BB7	BELB	SAP4N01B	12.750	.406	2.71
55R	46	B7	STRP	SAP4N01	12.750	.406	1.00	56	47	B7	STRP	SAP4N01	12.750	.406	1.00
57	48	B7	STRP	SAP4N01	12.750	.406	1.00	58	49	B7	STRP	SAP4N01	12.750	.406	1.00
59L	50	B7	STRP	SAP4N01	12.750	.406	1.00	59R	50	BB8	BELB	SAP4N01B	12.750	.406	2.71
60L	51	BB8	BELB	SAP4N01B	12.750	.406	2.71	60R	51	B8	STRP	SAP4N01	12.750	.406	1.00
61	52	B8	STRP	SAP4N01	12.750	.406	1.00	62	53	B8	STRP	SAP4N01	12.750	.406	1.00
63	54	B8	STRP	SAP4N01	12.750	.406	1.00	64	55	B8	STRP	SAP4N01	12.750	.406	1.00
65	56	B8	STRP	SAP4N01	12.750	.406	1.00	66L	57	B8	STRP	SAP4N01	12.750	.406	1.00
66R	57	B9	BELB	SAP4N01B	12.750	.406	2.71	67L	58	B9	BELB	SAP4N01B	12.750	.406	2.71
67R	58	B9A	VALV	SAP4N04			N/A	68	59	B9A	VALV	SAP4N04			N/A
69L	60	B9A	VALV	SAP4N04			N/A	69R	60	B10	STRP	SAP4N05	12.750	1.312	1.00
70	61	B10	STRP	SAP4N05	12.750	1.312	1.00	71	62	B10	STRP	SAP4N05	12.750	1.312	1.00
72	63	B10	STRP	SAP4N05	12.750	1.312	1.00								

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

NODE RENUMBERING INFORMATION

(1) STATIC CASE

NUMBER OF NODES IN SYSTEM	=	72
STIFFNESS MATRIX LENGTH BEFORE RENUMBERING	=	4932
STIFFNESS MATRIX LENGTH AFTER RENUMBERING	=	4824

(2) DYNAMIC CASE

NUMBER OF NODES IN SYSTEM	=	74
STIFFNESS MATRIX LENGTH BEFORE RENUMBERING	=	5046
STIFFNESS MATRIX LENGTH AFTER RENUMBERING	=	4938

APPROXIMATE FIELD LENGTH REQUIREMENTS (OCTAL) FOR THIS GEOMETRY

GEOMETRY INPUT PHASE	=	162000
STATIC ANALYSIS PHASE	=	147000
DYNAMIC PROPERTIES PHASE	=	127000

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

DYNAMIC PROPERTIES CONTROL INFORMATION

PROPERTIES NAME = DYNP
PROPERTIES TITLE = DYNAMIC PROPERTY

MAX. NO. OF MODES REQUIRED = 9
CUT-OFF FREQUENCY = 33.

NO. OF SUPPORT LEVELS = 0

PRINT CODE = PFN2 (FREQUENCIES AND MODE SHAPES)

MASS REDISTRIBUTION CODE = (NO REDISTRIBUTION - SUBSPACE ITERATION WILL BE USED)

MINIMUM SUBSPACE SIZE = 3

PROPERTY MODIFICATION CODE = PMOD (PROPERTIES TO BE MODIFIED)

JRC/PHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

PROPERTY MODIFICATION DATA

CARD TYPE	RUN GROUP	UP FIRST DCP,MMB	LAST DCP,MMB	ITEM 1	ITEM 2	ITEM 3	ITEM LIST
TEMP				70.00			T(HOT)

RC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDES NO MISSING MASS**

ELEMENT PROPERTIES FOR CURRENT STIFFNESS

RUN OR GROUP	ELEM NO.	NODE I	NODE J	NO. OF SUBELS	COMP NAME	COMP TYPE	SECTION NAME	MATERIAL NAME	HOT MODULUS	UNIT WEIGHT	TOTAL WEIGHT	FLEX FACTOR
RUN1												
	1	1	5	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	487.46	1.000
	2	5	6	1	A2	STRP	SAP4N02	SA304 SS	28298600.	4.66	18.66	1.000
	3	6	7	1	A81	ELB	SAP4N023	SA304 SS	28298600.	4.66	87.78	7.371
	4	7	8	1	A4	STRP	SAP4N02	SA304 SS	28298600.	4.66	209.55	1.000
	5	8	9	1	A4	STRP	SAP4N02	SA304 SS	28298600.	4.66	223.52	1.000
	6	9	10	1	A82	ELB	SAP4N023	SA304 SS	28298600.	4.66	87.78	7.371
	7	10	11	1	A5	STRP	SAP4N02	SA304 SS	28298600.	4.66	23.15	1.000
	8	11	12	1	A5	STRP	SAP4N02	SA304 SS	28298600.	4.66	16.37	1.000
	9	12	13	1	A83	ELB	SAP4N023	SA304 SS	28298600.	4.66	43.89	7.371
	10	13	14	1	A6	STRP	SAP4N02	SA304 SS	28298600.	4.66	23.46	1.000
	11	14	15	1	A6	STRP	SAP4N02	SA304 SS	28298600.	4.66	45.37	1.000
	12	15	16	1	A7	VALV	SAP4N03	SA304 SS	28298600.	33.15	273.29	1.000
	13	16	17	1	A7	VALV	SAP4N03	SA304 SS	28298600.	33.15	273.69	1.000
	14	17	18	2	A8	STRP	SAP4N02	SA304 SS	28298600.	4.66	544.83	1.000
	15	18	19	1	A8	STRP	SAP4N02	SA304 SS	28298600.	4.66	45.37	1.000
	17	19	20	1	A9	ELB	SAP4N023	SA304 SS	28298600.	4.66	87.78	7.371
	18	20	21	1	A10	STRP	SAP4N02	SA304 SS	28298600.	4.66	19.84	1.000
	19	21	22	2	A10	STRP	SAP4N02	SA304 SS	28298600.	4.66	376.12	1.000
	21	22	23	1	A11	ELB	SAP4N023	SA304 SS	28298600.	4.66	43.89	7.371
	22	23	24	1	A12	ELB	SAP4N023	SA304 SS	28298600.	4.66	87.78	7.371
	23	24	25	1	A13	STRP	SAP4N02	SA304 SS	28298600.	4.66	139.70	1.000
RUN2												
	24	77	76	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	534.37	1.000
	25	76	75	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	534.37	1.000
	26	75	74	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	534.37	1.000
	27	74	73	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	346.87	1.000
	28	73	72	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	346.88	1.000
	29	72	71	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	346.87	1.000
	30	71	70	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	478.13	1.000
	31	70	69	1	A1	STRP	SAP4N01	SA304 SS	28298600.	9.33	55.25	1.000
	32	69	68	1	A81	ELB	SAP4N013	SA304 SS	28298600.	9.33	265.07	8.610
	33	68	67	1	A82	ELB	SAP4N013	SA304 SS	28298600.	9.33	132.54	8.610
	34	67	25	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	567.53	1.000
	35	25	26	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	534.37	1.000
	36	26	27	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	643.31	1.000
	37	27	28	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	643.32	1.000
	38	28	29	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	643.31	1.000
	39	29	30	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	377.32	1.000
	40	30	31	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	205.21	1.000
	41	31	32	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	464.92	1.000
	42	32	33	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	464.80	1.000
	43	33	34	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	464.82	1.000
	44	34	35	1	A3	STRP	SAP4N01	SA304 SS	28298600.	9.33	89.10	1.000
	45	35	36	1	A84	ELB	SAP4N013	SA304 SS	28298600.	9.33	176.71	12.915

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

ELEMENT PROPERTIES FOR CURRENT STIFFNESS (CONTD.)

RUN OR GROUP	ELEM NO.	NODE I	NODE J	NO. OF SUBELS	COMP NAME	COMP TYPE	SECTION NAME	MATERIAL NAME	HOT MODULUS	UNIT WEIGHT	TOTAL WEIGHT	FLEX FACTOR
RUN2 (CONTD.)	46	36	37	1	884	ELB	SAP4ND1B	SA304 SS	28298600.	9.33	265.07	8.610
	47	37	38	1	34	STRP	SAP4ND1	SA304 SS	28298600.	9.33	391.75	1.000
	48	38	39	1	34	STRP	SAP4ND1	SA304 SS	28298600.	9.33	239.48	1.000
	49	39	40	1	885	ELB	SAP4ND1B	SA304 SS	28298600.	9.33	132.54	8.610
	50	40	41	1	35	STRP	SAP4ND1	SA304 SS	28298600.	9.33	327.85	1.000
	51	41	42	1	35	STRP	SAP4ND1	SA304 SS	28298600.	9.33	350.34	1.000
	52	42	43	1	886	ELB	SAP4ND1B	SA304 SS	28298600.	9.33	92.43	8.610
	53	43	44	1	36	STRP	SAP4ND1	SA304 SS	28298600.	9.33	121.53	1.000
	54	44	45	1	36	STRP	SAP4ND1	SA304 SS	28298600.	9.33	99.15	1.000
	55	45	46	1	887	ELB	SAP4ND1B	SA304 SS	28298600.	9.33	132.35	8.610
	56	46	47	1	37	STRP	SAP4ND1	SA304 SS	28298600.	9.33	338.02	1.000
	57	47	48	1	37	STRP	SAP4ND1	SA304 SS	28298600.	9.33	434.36	1.000
	58	48	49	1	37	STRP	SAP4ND1	SA304 SS	28298600.	9.33	434.35	1.000
	59	49	50	1	37	STRP	SAP4ND1	SA304 SS	28298600.	9.33	434.35	1.000
	60	50	51	1	888	ELB	SAP4ND1B	SA304 SS	28298600.	9.33	265.07	8.610
	61	51	52	1	38	STRP	SAP4ND1	SA304 SS	28298600.	9.33	112.50	1.000
	62	52	53	1	38	STRP	SAP4ND1	SA304 SS	28298600.	9.33	337.50	1.000
	63	53	54	1	38	STRP	SAP4ND1	SA304 SS	28298600.	9.33	337.50	1.000
	64	54	55	1	38	STRP	SAP4ND1	SA304 SS	28298600.	9.33	337.50	1.000
	65	55	56	1	38	STRP	SAP4ND1	SA304 SS	28298600.	9.33	337.50	1.000
	66	56	57	1	38	STRP	SAP4ND1	SA304 SS	28298600.	9.33	135.85	1.000
	67	57	58	1	39	ELB	SAP4ND1B	SA304 SS	28298600.	9.33	240.03	8.610
	68	58	59	1	89A	VALV	SAP4ND4	SA304 SS	28298600.	101.83	1527.05	1.000
	69	59	60	1	89A	VALV	SAP4ND4	SA304 SS	28298600.	101.83	1527.22	1.000
	70	60	61	1	810	STRP	SAP4ND5	SA304 SS	28298600.	17.33	805.66	1.000
	71	61	62	1	810	STRP	SAP4ND5	SA304 SS	28298600.	17.33	805.64	1.000
	72	62	63	1	810	STRP	SAP4ND5	SA304 SS	28298600.	17.33	805.66	1.000
MISC	73	59	91	1	VPI	VLOP	VALVE OP	SA304 SS	28298600.	0.00	0.00	1.000

TOTAL DISTRIBUTED WEIGHT = 23380.92

NRC/RHR PIPING MODEL PROBLEM II**ELBO4 FLEX. INCLUDED NO MISSING MASS**

NO. OF MODES BELOW CUT-OFF = 17
NO. OF MODES TO BE FOUND = 17

REQUIRED FIELD LENGTH (OCTAL) = 0127565
AVAILABLE FIELD LENGTH (OCTAL) = 0376000
SUBSPACE SIZE = 3

NRC/KHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

NATURAL MODE FREQUENCIES

MODE NO.	1	2	3	4	5	6	7	8	9	10
FREQUENCY (CPS)	3.805	8.079	9.309	10.714	12.235	13.589	14.923	16.636	19.722	21.459
PERIOD (SEC)	.2628	.1238	.1074	.0933	.0817	.0736	.0670	.0601	.0507	.0466

MODE NO.	11	12	13	14	15	16	17
FREQUENCY (CPS)	22.154	23.089	23.545	26.853	27.508	29.701	32.493
PERIOD (SEC)	.0451	.0433	.0425	.0372	.0364	.0337	.0308

ORTHOGONALITY CHECK

MAX. DIAGINAL TERM = .1000E+01
MIN. DIAGINAL TERM = .1000E+01
MAX. OFF-DIAGONAL TERM = .1786E-05

MASS PARTICIPATION

MODE NO.	MASS PARTICIPATION FACTORS X-AXIS	Y-AXIS	Z-AXIS	EFFECTIVE WEIGHT RATIOS X-AXIS	Y-AXIS	Z-AXIS
1	.0331	.0544	-.0034	.0173	.0468	.0002
2	.0625	-.0099	.0145	.0618	.0015	.0054
3	-.0068	-.0605	-.0050	.0706	.0580	.0004
4	.0478	-.0719	-.0067	.0962	.1217	.0007
5	.0611	-.0059	-.0473	.0991	.1225	.0356
6	-.0262	.0056	-.0574	.1064	.1225	.0521
7	-.0054	-.0290	-.0049	.1065	.1333	.0524
8	.0114	-.0315	-.0075	.1070	.1457	.0529
9	-.0148	.1228	.0155	.1084	.2745	.0538
10	-.0397	.0170	.0163	.1249	.2946	.0542
11	.0138	.0152	-.0655	.1257	.2967	.0681
12	.0463	-.0077	.0016	.1340	.2989	.0690
13	-.0135	-.0719	-.0126	.1369	.3117	.0715
14	-.0024	-.0172	-.0093	.1371	.3147	.0727
15	.0093	.0204	-.0009	.1374	.3166	.0730
16	.0123	.0112	-.0029	.1378	.3176	.0731
17	-.0092	-.0036	.0933	.1387	.3184	.1592
ACCUMULATED EFFECTIVE WEIGHT RATIOS				.3275	.5522	.3142

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 1 THRU 10

RUN NAME	DCP NAME	DISP DIRN	1	2	3	4	5	6	7	8	9	10
RUN1												
	1	X	.000000	-.000000	.000000	-.000000	-.000000	.000000	-.000000	.000000	.000000	-.000000
	1	Y	-.000000	.000000	-.000000	.000000	-.000000	.000000	-.000000	-.000000	.000000	.000000
	1	Z	.000000	.000000	-.000000	.000000	-.000000	.000000	-.000001	.000001	.000000	-.000000
	5	X	-.000214	.004081	-.001680	.001756	-.008969	.000211	.003389	.002392	.000323	-.000245
	5	Y	-.000006	.000105	-.000050	.000074	-.000456	.000037	-.000041	-.000075	.000001	.000005
	5	Z	.000553	.013400	-.002393	.021479	-.183227	.027043	-.354176	.058004	.001463	-.001265
	6	X	-.000267	.004907	-.002084	.002086	-.010450	.000163	.004186	.002108	.000373	-.000262
	6	Y	-.000036	.000120	-.000057	.000084	-.000522	.000042	-.000047	-.000086	.000001	.000005
	6	Z	.000686	.014978	-.002616	.024173	-.206461	.030521	-.061139	.065670	.001649	-.001434
	7	X	.000327	-.003316	.001932	-.003189	.020936	-.002549	.010233	.008262	.000566	-.000616
	7	Y	-.000981	.005801	-.005001	-.002107	.036549	-.008948	.022230	-.034317	-.000392	.000916
	7	Z	.001343	.014580	-.000197	.030272	-.269438	.041900	-.086439	.098986	.002207	-.002258
	8	X	.010073	-.131138	.071400	-.065485	.329457	-.006888	-.035582	.147046	-.001453	-.004461
	8	Y	-.005616	.059787	-.037103	.020061	-.049450	-.016295	.362317	-.132164	-.003054	.003821
	8	Z	.001351	.014984	-.000299	.030824	-.273912	.042529	-.087704	.100159	.002239	-.002279
	9	X	.023228	-.317737	.166705	-.159579	.818831	-.022861	-.088191	.282832	-.005518	-.007607
	9	Y	-.008866	.098977	-.061069	.036571	-.123181	-.020154	.092923	-.191962	.001220	.005180
	9	Z	.001359	.015412	-.000408	.031397	-.278533	.043163	-.088901	.101287	.002269	-.002298
	10	X	.023622	-.346474	.172706	-.184658	1.000000	-.047205	-.048624	.212450	-.006856	-.005547
	10	Y	-.004799	.050298	-.032782	.015305	-.037610	-.015266	.060742	-.111528	.003849	.002813
	10	Z	-.002552	.084984	-.031761	.073016	-.523190	.061630	-.097415	.096119	.003848	-.002113
	11	X	.021945	-.328305	.161153	-.173982	.986630	-.052625	-.026932	.172576	-.006542	-.004528
	11	Y	-.003122	.032651	-.021239	.010251	-.024401	-.009828	.039026	-.071640	.000537	.001794
	11	Z	-.004635	.121403	-.046638	.094259	-.645992	.070484	-.099952	.092406	.004653	-.002014
	12	X	.020736	-.316079	.152842	-.174965	.976963	-.056507	-.011318	.144019	-.006318	-.003803
	12	Y	-.001913	.019941	-.012934	.006249	-.014853	-.005933	.023474	-.043074	.000314	.001067
	12	Z	-.006136	.147458	-.058019	.109336	-.732668	.076625	-.101339	.089371	.005222	-.001938
	13	X	.015849	-.265377	.120094	-.159078	.938954	-.071265	.046792	.037183	-.005559	-.001193
	13	Y	.000931	-.009914	.000008	-.000309	.000075	-.000011	.000025	-.000031	.000000	.000001
	13	Z	-.010351	.207955	-.086133	.133391	-.887486	.083480	-.093968	.059273	.005650	-.001144
	14	X	.012519	-.231377	.093406	-.148591	.914712	-.080918	.084009	-.030912	-.005158	.000387
	14	Y	.000009	.000365	.000053	.000001	.000031	-.000000	-.000000	-.000001	.000000	-.000000
	14	Z	-.012519	.231377	-.093396	.148591	-.914719	.080918	-.084008	.030911	.005158	-.000387

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 1 THRU 10 (CONTD.)

RUN NAME	DCP NAME	DISP DIR	1	2	3	4	5	6	7	8	9	10
MODAL (CONTD.)												
	15	X	.005874	-.154177	.055195	-.124266	.870654	-.100452	.157960	-.155446	-.004430	.003481
	15	Y	.000174	.000207	.001187	.000580	.000415	-.000054	-.000125	-.000301	.000032	-.000008
	15	Z	-.016928	.276410	-.122458	.103354	-.951536	.073289	-.059472	-.030941	.004043	.001216
	16	X	.000145	-.106380	.018335	-.119690	.831401	-.116680	.219355	-.277342	-.003819	.005995
	16	Y	.000251	.000298	.001708	.000435	.000597	-.000078	-.000180	-.000432	.000046	-.000012
	16	Z	-.020777	.314726	-.142938	.175302	-.969756	.064983	-.035461	-.086407	.003016	.002598
	17	X	-.005646	-.043008	-.018690	-.092305	.790095	-.132510	.279643	-.386970	-.003203	.008413
	17	Y	.000327	.000388	.002229	.001089	.000780	-.000102	-.000235	-.000564	.000059	-.000015
	17	Z	-.026694	.352124	-.163347	.135688	-.979039	.055469	-.009361	-.143451	.001945	.003978
		X	-.046353	.361675	-.260588	.039759	.419978	-.210308	.591334	-.940341	.000887	.017961
		Y	.001371	.001627	.009337	.004664	.003264	-.000427	-.000986	-.002361	.000249	-.000063
		Z	-.053417	.573233	-.295332	.208010	-.671227	-.056241	.252349	-.562757	-.004139	.011354
	18	X	-.037810	.690070	-.397807	.157537	.037811	-.209691	.614827	-.923073	.002742	.010928
	18	Y	.002415	.002366	.016441	.008035	.005746	-.000752	-.001736	-.004153	.000438	-.000111
	18	Z	-.037810	.690070	-.397807	.157537	.037810	-.209691	.614828	-.923075	.002742	.010928
	19	X	-.081771	.731907	-.406069	.173476	-.006453	-.204493	.596729	-.875104	.002667	.008741
	19	Y	.002589	.003372	.017623	.008613	.006158	-.000806	-.001961	-.004451	.000469	-.000119
	19	Z	-.081299	.701123	-.414240	.146953	.154451	-.236456	.687139	-.986586	.006015	.010351
	20	X	-.082816	.757409	-.403620	.146145	-.026567	-.199956	.577619	-.831399	.002646	.006971
	20	Y	.001951	.003321	.017043	.010690	.000514	.000805	-.007377	.010589	.000368	-.000642
	20	Z	-.076879	.666393	-.393456	.108424	.292535	-.242805	.567733	-1.000000	.010611	.009094
	21	X	-.082820	.757384	-.403589	.146116	-.026531	-.199913	.577521	-.831306	.002641	.006962
	21	Y	-.000030	-.000001	-.000004	-.000002	-.000001	.000003	.000001	.000000	-.000000	.000003
	21	Z	-.074307	.571471	-.378599	.101130	.288530	-.231686	.518606	-.972774	.009690	.009105
		X	-.082857	.757956	-.403234	.145307	-.025868	-.199433	.575695	-.826857	.002594	.006873
		Y	-.041520	-.146375	-.333195	-.197037	-.038354	-.004914	.110232	-.116679	-.010081	.010230
		Z	-.050937	.247040	-.239839	.033715	.201747	-.116936	.130610	-.681832	-.000538	.009029
	22	X	-.082890	.756566	-.399766	.143428	-.025223	-.198844	.573451	-.821960	.002545	.006768
	22	Y	-.100675	-.335652	-.778529	-.471287	-.076848	.010542	.159381	-.146163	-.041411	.026456
	22	Z	-.032411	-.020775	-.120985	-.013541	.064196	-.001137	-.337513	-.374702	-.014359	.009332
	23	X	-.083186	.764053	-.403077	.146382	-.015135	-.204860	.598510	-.832222	.004464	.006312
	23	Y	-.111360	-.373336	-.859158	-.531280	-.071439	.018982	.163491	-.093307	-.052271	.030108
	23	Z	-.031021	-.047430	-.140656	-.024017	.038255	.015896	-.407338	-.338522	-.018639	.010152

N2C/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 1 THRU 10 (CONTD.)

RUN NAME	OCP NAME	DISP DIRN	1	2	3	4	5	6	7	8	9	10
RUN1 (CONT'D.)												
	24	X	-.084133	.712784	-.404346	.132516	.024351	-.157157	.420924	-.588082	-.039159	.017733
	24	Y	-.113704	-.413820	-.684364	-.540594	-.056106	.042564	.138395	.091770	-.072978	.034757
	24	Z	-.026457	-.031398	-.097481	-.023895	.024602	.014551	-.316256	-.250504	-.015802	.008031
	25	X	-.074451	.708472	-.297511	.065099	.124120	-.005113	-.225393	.027608	-.208433	.066192
	25	Y	-.113790	-.413999	-.884846	-.580712	-.056274	.042456	.138450	.091209	-.072832	.034701
	25	Z	.000599	-.002784	.002166	-.000215	.001322	.000011	.000086	-.001731	-.000187	.001539
RUN2												
	77	X	-.000000	.000001	-.000001	.000000	.000000	-.000000	.000000	-.000002	-.000001	.000000
	77	Y	.000000	.000000	.000000	.000000	.000000	.000000	-.000002	-.000002	.000000	-.000000
	77	Z	.000000	-.000000	.000000	.000000	-.000000	-.000000	.000000	.000000	.000000	-.000000
	76	X	-.000098	.001504	-.000910	.000319	.000118	-.000338	.000375	-.002108	-.000886	.000359
	76	Y	.003227	.023068	.062570	.054268	.014796	.003979	-.213819	-.179700	.016132	-.000873
	76	Z	.002047	-.001788	.015993	.005390	-.002430	-.001678	.031165	.030520	.025829	-.036031
	75	X	-.000196	.003006	-.001818	.000637	.000236	-.000675	.000749	-.004211	-.001770	.000717
	75	Y	.003408	.046913	.175919	.151569	.040757	.010810	-.572184	-.470847	.040511	-.002135
	75	Z	.006084	-.005102	.045220	.013536	-.006696	-.004558	.083397	.079968	.064864	-.088140
	74	X	-.000293	.004506	-.002725	.000955	.000353	-.001013	.001121	-.006305	-.002648	.001072
	74	Y	.013791	.093744	.249100	.210181	.055393	.014393	-.745201	-.594013	.047758	-.002408
	74	Z	.009118	-.007270	.063669	.027072	-.009097	-.006069	.108615	.100886	.076468	-.099378
	73	X	-.000357	.005479	-.003313	.001161	.000429	-.001231	.001362	-.007658	-.003215	.001301
	73	Y	.013490	.089737	.235078	.196534	.050965	.013020	-.561212	-.512089	.038553	-.001855
	73	Z	.008724	-.006956	.060340	.025327	-.008371	-.005490	.096373	.086973	.061728	-.076549
	72	X	-.000420	.006451	-.003900	.001367	.000505	-.001448	.001602	-.009004	-.003777	.001528
	72	Y	.009232	.060243	.156754	.123619	.032688	.008178	-.405320	-.302228	.020696	-.000923
	72	Z	.006002	-.004679	.040066	.015567	-.005369	-.003448	.059076	.051330	.033138	-.038084
	71	X	-.000484	.007422	-.004486	.001572	.000581	-.001665	.001841	-.010344	-.004336	.001753
	71	Y	-.000000	-.000000	-.000001	-.000001	-.000000	.000000	.000000	.000000	-.000000	.000000
	71	Z	-.000000	.000001	-.000001	.000000	.000000	-.000000	.000000	-.000000	.000000	-.000000
	70	X	-.000571	.008753	-.005293	.001853	.000685	-.001962	.002169	-.012176	-.005097	.002060
	70	Y	-.021426	-.133824	-.336655	-.254385	-.066653	-.018313	.723101	.463381	-.016325	-.001414
	70	Z	-.012745	-.003171	-.030367	-.035503	.009865	.008537	-.106568	-.070867	-.033781	.024533

NRC/PNR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 1 THRU 10 (CONTD.)

RUN NAME	DCP NAME	DISP DIRN	1	2	3	4	5	6	7	8	9	10
RUN2 (CONT'D.)												
	59	X	-.000581	.008914	-.005387	.001387	.000697	-.001996	.002207	-.012390	-.005186	.002095
	59	Y	-.024777	-.159495	-.380053	-.297245	-.075724	-.021630	.814367	.513512	-.015641	-.002345
	59	Z	-.014077	-.003336	-.089741	-.042063	.010837	.010325	-.120461	-.075635	-.036338	.025752
	64	X	.000959	.122541	.044216	.060759	.034681	.010435	-.184176	-.052450	-.062853	.024045
	64	Y	-.042210	-.258405	-.555875	-.423059	-.107064	-.028599	1.000000	.559621	.001629	-.002200
	64	Z	-.003725	-.019648	-.022661	-.017200	.003950	.006386	-.055457	-.024588	-.007362	.006567
	67	X	-.007847	.238665	.008953	.072506	.060570	.017182	-.261098	-.036916	-.117293	.042608
	67	Y	-.053547	-.295011	-.619387	-.462296	-.099856	-.013762	.860553	.497116	-.015388	.008362
	67	Z	.000731	-.003536	.003333	-.000271	.001245	.000144	.000012	-.001050	-.000189	.001782
	25	X	-.074451	.708472	-.297511	.065099	.124120	-.005113	-.225303	.027608	-.208433	.066192
	25	Y	-.113790	-.413999	-.884646	-.589712	-.056294	.042456	.138850	.091209	-.072832	.034701
	25	Z	.000598	-.002784	.002666	-.000215	.001322	.000011	.000036	-.001731	-.000187	.001539
	26	X	-.133863	.991369	-.471868	.023590	.189744	.019901	-.296734	.371584	-.176405	.040514
	26	Y	-.164092	-.459983	-1.000000	-.570361	-.025467	.063619	-.396670	-.276491	-.069349	.027610
	26	Z	.000493	-.002297	.002201	-.000178	.001092	.000009	.000071	-.001432	-.000155	.001275
	27	X	-.179330	1.000000	-.482546	-.044935	.226926	.071006	-.358281	.756166	-.008489	-.027089
	27	Y	-.188842	-.432525	-.858299	-.385162	-.004304	.049633	-.553778	-.465798	-.006052	-.008163
	27	Z	.000367	-.001711	.001639	-.000132	.000814	.000006	.000053	-.001069	-.000116	.000955
	28	X	-.172180	.696670	-.309594	-.034734	.174034	.090212	-.270325	.723034	.146445	-.068128
	28	Y	-.143220	-.227526	-.454050	-.124156	.003411	.014142	-.435652	-.306845	.045495	-.029987
	28	Z	.000241	-.001123	.001076	-.000087	.000535	.000004	.000035	-.000703	-.000076	.000629
	29	X	-.089639	.235947	-.082106	-.056615	.060177	.049385	-.083147	.271327	.122724	-.040629
	29	Y	.000030	-.000300	-.000061	-.000001	-.000020	.000000	-.000001	-.000001	-.000031	.000000
	29	Z	.000115	-.000534	.000517	-.000042	.000255	.000001	.000016	-.000334	-.000036	.000300
	30	X	.000000	.000001	-.000001	.000000	.000000	-.000000	-.000001	.000002	-.000001	.000000
	30	Y	.136678	.119318	.173434	-.033300	-.005857	.019540	.174940	.100518	-.087755	.044168
	30	Z	.000041	-.000189	.000181	-.000015	.000090	-.000000	.000005	-.000118	-.000013	.000107
	31	X	.063174	-.089319	.008832	.044270	-.020491	-.032740	.015021	-.090013	-.099450	.024685
	31	Y	.224331	.175118	.231610	-.158389	-.009555	.036193	.227449	.120149	-.139277	.069021
	31	Z	.000000	-.000003	.000000	-.000000	.000000	-.000001	-.000001	.000000	.000000	.000001
	32	X	.232633	-.193607	-.050524	.165398	-.034459	-.097649	-.013524	-.147084	-.336423	.071768
	32	Y	.443341	.272095	.275455	-.415384	-.017588	.077572	.232798	.093634	-.222602	.108782
	32	Z	.000022	.000373	.000109	-.000483	-.000163	-.001262	-.000591	.000532	.000086	.000560

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 1 THRU 10 (CONTD.)

RUN NAME	DCP NAME	DISP DIRN	1	2	3	4	5	6	7	8	9	10
RUN2 (CONTD.)												
	33	X	.423430	-.193021	-.193488	.296305	-.011097	-.113322	-.085605	-.058485	-.491373	.090391
	33	Y	.677199	.328351	.219900	-.678417	-.023399	.110319	.101398	-.034802	-.223549	.114153
	33	Z	.000044	.000146	.000216	-.000766	-.000326	-.002521	-.001161	.001064	.000171	.001117
	34	X	.516495	-.131115	-.349141	.425619	.037973	-.045043	-.151836	.085401	-.522255	.079898
	34	Y	.909489	.352095	.100360	-.913301	-.026436	.126044	-.115065	-.188063	-.146412	.099467
	34	Z	.000057	.000219	.000324	-.001448	-.000489	-.003778	-.001739	.001594	.000257	.001672
	35	X	.652488	-.115449	-.381799	.450380	.049227	-.020413	-.160433	.110752	-.518524	.076308
	35	Y	.951657	.354740	.074668	-.954594	-.026802	.127263	-.160622	-.217568	-.127037	.097894
	35	Z	.000071	.000233	.000345	-.001540	-.000520	-.004018	-.001850	.001695	.000273	.001778
	36	X	.641616	-.120365	-.476585	.575331	.063186	-.007681	-.080445	.136907	-.274736	-.018401
	36	Y	1.000000	.357535	.043709	-1.000000	-.026919	.125952	-.218175	-.248744	-.103806	.115722
	36	Z	.043945	.003647	-.023056	-.043471	-.000212	-.004403	-.056808	-.025900	.019433	.035079
	37	X	.548641	-.171293	-.562117	.739784	.064737	-.081748	-.309367	.188272	.051796	-.158092
	37	Y	.899588	.294597	-.037022	-.776342	-.023186	.052671	-.166728	-.187834	.186337	-.017763
	37	Z	.053072	.002391	-.005953	-.161206	-.030544	-.164982	-.140327	-.020238	.008623	.133638
	38	X	.548656	-.170471	-.561954	.739086	.064747	-.081805	-.309434	.188604	.053308	-.158163
	38	Y	.838102	.110500	-.193272	-.212301	-.009146	-.102723	-.108030	-.026045	.650602	-.263614
	38	Z	-.025904	-.005868	.108478	-.319758	-.111620	-.657893	-.223740	.153682	-.013204	.097840
	39	X	.548650	-.170590	-.561765	.739491	.064735	-.081813	-.309471	.188708	.054189	-.158071
	39	Y	.476342	.005721	-.266578	.047239	-.001653	-.185596	-.078021	.065767	.868952	-.375055
	39	Z	-.061940	-.009475	.178136	-.402110	-.156423	-.939274	-.270232	.261888	-.020867	.053434
	40	X	.515522	-.180189	-.557692	.821810	.064657	-.089102	-.305813	.198439	.067525	-.154011
	40	Y	.396093	-.025335	-.266676	.179551	-.000731	-.209136	-.066795	.075042	.917971	-.381222
	40	Z	-.075550	-.008209	.180500	-.416503	-.164874	-1.000000	-.281763	.292728	-.026113	.035264
	41	X	.363113	-.148427	-.481613	.805368	.058984	-.093085	.009021	.212024	.037439	-.060701
	41	Y	.243621	-.054309	-.193296	.165366	-.006312	-.213162	-.052392	.108808	.885357	-.287883
	41	Z	-.055975	.000397	.144641	-.357457	-.139427	-.865931	-.251838	.274739	-.053869	.023870
	42	X	.206849	-.176662	-.371426	.716437	.049572	-.079535	.021748	.202451	-.041655	.059678
	42	Y	.087206	-.023557	-.083743	.074542	-.015498	-.199595	-.039362	.079512	.802601	-.167167
	42	Z	-.037702	.003367	.103242	-.250710	-.100730	-.647352	-.188173	.228682	-.096629	-.013789
	43	X	.172177	-.164429	-.323152	.653724	.045545	-.071441	.019742	.188552	-.063987	.106028
	43	Y	.053773	-.014776	-.057441	.047109	-.014144	-.164722	-.032039	.080361	.773943	-.132119
	43	Z	-.033691	.000545	.087217	-.207910	-.087600	-.570645	-.164034	.208209	-.118106	-.025582

NRC/BNR PIPING MODEL PROBLEM 11***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 1 THRU 10 (CONTD.)

RUN NAME	DCP NAME	DISP DIRN	1	2	3	4	5	6	7	8	9	10
RUN2 (CONTD.)												
	44	X	.136659	-.137988	-.275140	.546343	.037872	-.061563	.308562	.160956	-.085671	.185251
	44	Y	.035613	-.000785	-.032541	.012754	-.006670	-.081165	-.015403	.038270	.732480	-.084835
	44	Z	-.029439	-.005738	.064772	-.145093	-.069353	-.461840	-.129155	.175891	-.153018	-.038152
	45	X	.108946	-.115492	-.227290	.451729	.031384	-.053846	-.000923	.137745	-.101577	.247203
	45	Y	.019236	.011100	-.011703	-.017043	-.000756	-.013137	-.001575	.003139	.700988	-.049655
	45	Z	-.026419	-.011092	.045685	-.093485	-.054510	-.372907	-.100125	.149086	-.179844	-.050573
	46	X	.070900	-.080874	-.156061	.312489	.021782	-.039067	-.006018	.099523	-.098639	.254893
	46	Y	.009037	.020398	.003307	-.041684	.002539	.030737	.007328	-.021659	.693740	-.038549
	46	Z	-.019399	-.012125	.025987	-.045059	-.034970	-.246396	-.063979	.103485	-.173328	-.046314
	47	X	.000000	-.000001	-.000001	.000003	.000000	-.000003	.000000	.000001	-.000002	-.000002
	47	Y	.008924	.020383	.003161	-.040891	.002642	.030947	.007898	-.021663	.689441	-.037482
	47	Z	-.000000	-.000000	.000000	-.000000	-.000000	-.000002	-.000001	.000001	.000001	-.000003
	48	X	-.049936	.054569	.110416	-.213764	-.016019	.031069	.011414	-.084548	.078526	-.428968
	48	Y	.008778	.019673	.003018	-.039353	.002709	.031193	.007980	-.021643	.682813	-.036039
	48	Z	.011980	.010922	-.013650	.015244	.019721	.143363	.037810	-.063937	.258014	.014660
	49	X	-.065346	.064303	.138349	-.265952	-.020387	.042354	.023776	-.117811	.111925	-.796680
	49	Y	.008632	.014257	.002854	-.038793	.002774	.031413	.008053	-.021596	.674957	-.034521
	49	Z	.012501	.014592	-.013847	.002332	.017711	.132405	.034989	-.061791	.398532	.000175
	50	X	-.060841	.048609	.117315	-.211190	-.017454	.040269	.034042	-.112883	.138779	-1.000000
	50	Y	.008485	.013835	.002689	-.037713	.002838	.031605	.008119	-.021521	.665887	-.032928
	50	Z	.005463	.009504	-.001114	-.013129	.004457	.037145	.009731	-.019840	.293334	-.015307
	51	X	-.035694	.028994	.070689	-.128624	-.010779	.025348	.021794	-.073545	.128254	-.695625
	51	Y	.002730	.006773	.001648	-.015278	.000189	.005562	.001334	-.005326	.272374	-.009748
	51	Z	.000037	-.000106	-.000093	.000232	.000112	.000790	.000214	-.000346	-.000027	.000237
	52	X	-.025206	.021063	.050773	-.093310	-.007731	.018172	.015193	-.053150	.092444	-.500886
	52	Y	.000000	.000000	.000000	-.000001	-.000000	-.000000	-.000000	.000000	.000008	-.000002
	52	Z	.000028	-.000005	-.000070	.000174	.000084	.000593	.000160	-.000260	-.000020	.000178
	53	X	-.000000	.000000	.000001	-.000001	-.000000	.000000	.000000	-.000001	.000001	-.000004
	53	Y	-.004345	-.010267	-.002429	.024200	-.000476	-.010176	-.002734	.009358	-.602526	-.006219
	53	Z	.000000	.000000	-.000000	.000000	.000000	.000001	.000000	-.000000	.000002	.000001
	54	X	.011156	-.009598	-.023147	.042362	.003586	-.008373	-.006916	.025096	-.037695	.247301
	54	Y	-.004313	-.012241	-.002638	.027134	-.000594	-.011774	-.003324	.010853	-.837489	-.029449
	54	Z	-.000019	.000016	.000093	-.000361	-.000034	.000012	.000004	-.000015	.001394	.000620

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 1 THRU 10 (CONTD.)

RUN NAME	DCP NAME	DISP DIRN	1	2	3	4	5	6	7	8	9	10
RUN2 (CONTD.)												
	55	X	.011616	-.010037	-.024162	.045035	.003783	-.008851	-.007355	.026809	-.033555	.272042
	55	Y	-.002901	-.007258	-.001506	.016360	-.000376	-.007386	-.002218	.006785	-.638971	-.037341
	55	Z	-.000037	.000031	.000066	-.000122	-.000008	.000022	.000009	-.000029	.002785	.001238
	56	X	.005831	-.005057	-.012214	.022310	.001927	-.004510	-.003735	.013845	-.009085	.146790
	56	Y	-.000000	-.000000	-.000000	.000000	-.000000	-.000000	.000000	.000000	.000013	.000002
	56	Z	-.000056	.000047	.000099	-.000183	-.000012	.000033	.000013	-.000044	.004173	.001854
	57	X	.002748	-.002392	-.005850	.010348	.000922	-.002157	-.001832	.006722	.001147	.074985
	57	Y	.001077	.002735	.000490	-.006141	.000195	.003057	.001059	-.002756	.387305	.036613
	57	Z	-.000064	.000053	.000112	-.000207	-.000014	.000037	.000015	-.000049	.004730	.002101
	58	X	-.000127	.000111	.000280	-.000521	-.000047	.000104	.000101	-.000368	-.003425	-.005834
	58	Y	.002131	.002765	-.001916	-.003323	.000849	.005109	.003111	-.002921	1.000000	.118957
	58	Z	.001519	-.001331	-.003280	.006148	.000536	-.001238	-.001196	.004075	.015667	.054062
	59	X	-.000138	.000121	.000309	-.000578	-.000053	.000117	.000115	-.000424	-.004429	-.007084
	59	Y	.001938	.002118	-.002200	-.001667	.000854	.004565	.002942	-.002309	.980122	.120332
	59	Z	.001558	-.001371	-.003402	.006386	.000563	-.001295	-.001190	.004362	.022664	.061609
	60	X	-.000140	.000124	.000317	-.000593	-.000055	.000122	.000121	-.000449	-.005035	-.007794
	60	Y	.001723	.001557	-.002336	-.000364	.000829	.004002	.002733	-.001771	.935369	.117902
	60	Z	.001531	-.001353	-.003375	.006347	.000564	-.001295	-.001198	.004442	.027113	.065550
	61	X	-.000099	.000089	.000231	-.000436	-.000041	.000091	.000094	-.000352	-.004431	-.006572
	61	Y	.000970	.000437	-.001636	.001317	.000555	.002197	.001334	-.000623	.626956	.083367
	61	Z	.001059	-.000946	-.002384	.004504	.000436	-.000934	-.000886	.003315	.025259	.052918
	62	X	-.000025	.000023	.000063	-.000119	-.000012	.000026	.000029	-.000109	-.001829	-.002333
	62	Y	.000298	.000041	-.000677	.000731	.000176	.000668	.000625	-.000114	.217669	.029830
	62	Z	.000358	-.000331	-.000840	.001593	.000145	-.000334	-.000321	.001208	.010035	.020092
	63	X	.000000	-.000000	-.000000	.000000	.000000	-.000000	-.000000	.000000	-.000001	.000002
	63	Y	.000000	-.000000	-.000000	.000000	.000000	.000000	.000000	.000000	.000007	.000001
	63	Z	.000000	-.000000	-.000000	.000000	.000000	-.000000	-.000000	.000000	.000000	.000001
MISC. NODES												
	81	Y	-.000493	-.001116	-.000411	.003250	-.000044	-.001143	-.000059	.001028	-.113734	-.015994
	81	Y	.001936	.002115	-.002200	-.001568	.000854	.004566	.002943	-.002310	.980525	.120391
	81	Z	.001736	.001478	-.003899	-.000343	.000331	.001094	-.001210	.000974	.391541	.114291

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 1 THRU 10 (CONTD.)

RUN NAME	OCP NAME	DISP RTRN	1	2	3	4	5	6	7	8	9	10
NORMALIZING FACTORS			.7677E-01	.9632E-01	.9811E-01	.9603E-01	.7044E-01	.5554E-01	.8774E-01	.9572E-01	.1437E+00	.5688E-01

NRC/R4R PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 11 THRU 17

RUN NAME	DCP NAME	DISP DIRN	11	12	13	14	15	16	17
RUN1									
	1	X	.000000	.000000	.000000	-.000001	.000000	-.000001	-.000000
	1	Y	-.000000	-.000000	-.000000	.000000	-.000000	.000001	.000000
	1	Z	.000000	.000000	.000000	-.000000	-.000000	-.000001	-.000001
	3	X	.000623	.000274	.000694	-.015388	.021484	-.048579	-.007036
	3	Y	-.000013	-.000060	-.000035	.000424	-.000275	.001025	.000396
	5	Z	.003230	.005181	.001593	-.045805	-.000098	-.112486	-.097959
	6	X	.000660	.000055	.000656	-.016161	.023622	-.052575	-.007418
	6	Y	-.000015	-.000069	-.000040	.000485	-.000315	.001173	.000453
	6	Z	.003662	.005939	.001849	-.052165	.000224	-.127834	-.110469
	7	X	.001577	.001332	.002240	-.034590	.047254	-.098120	-.011151
	7	Y	-.002478	-.004289	-.004079	.052291	-.021670	.114678	.055704
	7	Z	.005047	.012002	.004627	-.093272	.013221	-.220453	-.164342
	8	X	.012543	.060477	.032885	-.302498	.194345	-.569989	-.097797
	8	Y	-.010640	-.045355	-.023566	.253333	-.129488	.522227	.185941
	8	Z	.005901	.012049	.004628	-.093767	.013021	-.221591	-.165574
	9	X	.021927	.124910	.064627	-.533250	.283714	-.916415	-.161731
	9	Y	-.014610	-.071225	-.036715	.353771	-.178870	.664468	.176704
	9	Z	.005945	.012070	.004617	-.093792	.012764	-.221929	-.166106
	10	X	.016481	.108750	.055332	-.424072	.204572	-.670612	-.104462
	10	Y	-.007952	-.040514	-.020618	.190319	-.092507	.341254	.076628
	10	Z	.005037	-.000311	-.001114	-.054372	.008253	-.157573	-.129794
	11	X	.013593	.093935	.047783	-.353410	.170250	-.542714	-.075231
	11	Y	-.005064	-.025711	-.013076	.122208	-.058231	.213434	.047364
	11	Z	.004635	-.006731	-.004014	-.034239	.007251	-.125644	-.111636
	12	X	.011532	.073376	.042404	-.303216	.145894	-.452147	-.054549
	12	Y	-.003003	-.015162	-.007702	.071055	-.033894	.122931	.026761
	12	Z	.004299	-.011345	-.006090	-.019786	.006676	-.102863	-.098653
	13	X	.004236	.046946	.023871	-.137654	.065904	-.167297	.005207
	13	Y	-.000014	-.000018	-.000008	.000135	-.000052	.000319	.000118
	13	Z	.002067	-.021764	-.011077	.023398	-.007276	-.025590	-.056598
	14	X	-.000154	.025497	.013095	-.045141	.022026	-.019313	.033148
	14	Y	-.000000	.000000	.000002	.000004	-.000003	.000006	.000001
	14	Z	.000154	-.025497	-.013095	.045142	-.022027	.019321	-.033147

NRC/RHR PIPING MODEL PROBLEM II***ELBOW F_EX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.01, MODES 11 THRU 17 (CONTD.)

RUN NAME	DCP NAME	DISP DIRN	11	12	13	14	15	16	17
RUN1 (CONTD.)									
	15	X	-.008630	-.015295	-.007464	.125973	-.060249	.253210	.083306
	15	Y	-.000186	.000147	.000681	.001377	-.001014	.001947	.000342
	15	Z	-.003876	-.033013	-.017134	.071786	-.050990	.106900	.012289
	16	X	-.015594	-.048254	-.024019	.261287	-.124588	.461381	.119549
	16	Y	-.000267	.000212	.000980	.001980	-.001458	.002799	.000492
	16	Z	-.007333	-.039051	-.020322	.124339	-.073949	.175664	.048443
	17	X	-.022226	-.079849	-.039840	.337068	-.184546	.651482	.150924
	17	Y	-.000349	.000276	.001278	.002583	-.001902	.003651	.000642
	17	Z	-.010771	-.044750	-.023283	.162721	-.095359	.239380	.082405
		X	-.048427	-.202406	-.097292	.747489	-.336853	1.000000	.143735
		Y	-.001459	.001157	.005349	.010401	-.007952	.015257	.002680
		Z	-.029244	-.072974	-.032770	.266018	-.144733	.355401	.158332
	18	X	-.031356	-.105279	-.033494	.143639	-.007128	-.175537	-.123294
	18	Y	-.002564	.002334	.009398	.018966	-.013961	.026771	.004698
	18	Z	-.031357	-.105279	-.033494	.143641	-.007129	-.175537	-.123295
	19	X	-.026256	-.075651	-.014713	.009692	.067282	-.391403	-.159327
	19	Y	-.002747	.002179	.010070	.020316	-.014955	.028673	.005031
	19	Z	-.031291	-.119576	-.036079	.126273	.020939	-.295981	-.192746
	20	X	-.023289	-.051568	.003616	-.076421	.114776	-.517431	-.174938
	20	Y	-.001394	.009172	.013972	-.009194	.001434	-.010705	.000731
	20	Z	-.030278	-.126752	-.037591	.037750	-.041548	-.430393	-.286122
	21	X	-.023259	-.051472	.003659	-.077181	.114998	-.517646	-.174931
	21	Y	.000001	-.000001	-.000002	-.000003	.000003	-.000005	-.000001
	21	Z	-.030120	-.117453	-.035261	.074484	-.080340	-.420216	-.284036
		X	-.022960	-.050119	.004069	-.080494	.116951	-.518866	-.173749
		Y	.033973	-.128765	-.240619	.000353	.053152	.009775	-.029222
		Z	-.027502	-.022279	-.011585	-.048149	-.417537	-.274009	-.222883
	22	X	-.022623	-.049075	.004472	-.083518	.118614	-.516548	-.171936
	22	Y	.086016	-.233394	-.504116	-.136913	.145692	.002895	-.019737
	22	Z	-.024953	.074112	.011214	-.136223	-.633354	-.054838	-.096368
	23	X	-.021662	-.054925	.003057	-.084402	.125941	-.532225	-.177877
	23	Y	.101637	-.173472	-.536577	-.144283	.203923	.003823	.001862
	23	Z	-.026458	.[illegible]	.013937	-.139291	-.654250	-.017281	-.077429

NRC/KHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 11 THRU 17 (CONTD.)

RUN NAME	DCP NAME	DISP DIRN	11	12	13	14	15	16	17
RUN1 (CONTD.)									
	24	X	.009058	.107231	.044702	-.324374	.157631	-.417877	-.044130
	24	Y	.126362	-.127718	-.526508	-.238312	.357371	.051044	.381280
	24	Z	-.017521	.006065	.014013	-.090196	-.464695	-.016441	-.059907
	25	X	.066882	.677475	.243072	-1.000000	.174447	-.037709	.319010
	25	Y	.126199	-.127884	-.525923	-.297373	.356832	.050532	.080890
	25	Z	.018335	-.009405	.013986	.013086	-.014271	-.001592	-.008349
RUN2									
	77	X	.000000	.000003	.000001	-.000005	.000000	-.000001	.000002
	77	Y	.000000	-.000002	-.000004	-.000000	.000005	-.000003	.000000
	77	Z	-.000014	.000001	-.000002	-.000001	.000000	.000000	.000000
	76	X	.000141	.003603	.001341	-.006580	.000293	-.001097	.002432
	76	Y	.326647	-.214479	-.374793	-.004373	.437810	-.002738	.326996
	76	Z	-.373658	.111598	-.203124	-.109258	.016052	.001298	.017011
	75	X	.000261	.007190	.002675	-.013122	.000594	-.002187	.004743
	75	Y	.364598	-.512381	-.885600	-.010885	.966441	-.005801	.054135
	75	Z	-.904141	.265083	-.480504	-.244066	.035455	.002750	.034112
	74	X	.000391	.010750	.004000	-.019598	.000872	-.003263	.007368
	74	Y	.071447	-.551487	-.941140	-.010321	.893541	-.004839	.039707
	74	Z	-1.000000	.286283	-.513063	-.231416	.032781	.002318	.025020
	73	X	.000474	.013039	.004851	-.023749	.001056	-.003951	.008912
	73	Y	.053877	-.403090	-.676687	-.006386	.532084	-.002480	.014438
	73	Z	-.754045	.207249	-.366739	-.143180	.019520	.001175	.009129
	72	X	.000556	.015308	.005694	-.027849	.001238	-.004628	.010429
	72	Y	.029823	-.182230	-.296063	-.001390	.136733	-.000198	-.005432
	72	Z	-.361434	.094598	-.160455	-.042356	.005016	.000094	-.003423
	71	X	.000638	.017553	.006528	-.031890	.001417	-.005293	.011914
	71	Y	.000091	-.000358	-.000007	-.000301	.000012	.000000	.000031
	71	Z	-.000036	.000082	-.000004	-.000004	.000000	-.000000	.000001
	70	X	.000750	.020622	.007560	-.037349	.001659	-.006188	.013930
	70	Y	-.013543	-.000439	-.034767	.013169	.592044	-.012239	.356545
	70	Z	.163354	-.046036	-.017544	-.111539	.020365	.006159	.038628

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 11 THRU 17 (CONTD.)

RUN NAME	DOF NAME	DISP DIRN	11	12	13	14	15	16	17
RUN2 (CONTD.)									
	67	X	.000762	.020457	.007792	-.037981	.001697	-.006291	.014128
	69	Y	-.014660	-.017425	-.060097	.033765	.688418	-.016351	.060968
	69	Z	.166578	-.017684	-.030651	-.125582	.023251	.011233	.042752
	68	X	.035947	.253559	.173214	-.310405	-.143315	.014078	.110238
	63	Y	.066278	-.234935	-.277760	.141012	1.000000	-.029037	.035406
	63	Z	.048041	-.019743	-.018656	-.014965	-.024093	.009352	-.000832
	67	X	.056704	.439503	.249061	-.555272	-.123344	.024259	.201887
	67	Y	.115707	-.246070	-.354135	.960886	.959987	-.005271	.054196
	67	Z	.022247	-.011135	.012970	.015596	-.014678	-.001172	-.008470
	25	X	.066882	.697376	.243072	-1.000000	.174447	-.037709	.319010
	25	Y	.126199	-.129884	-.525923	-.297773	.356832	.050532	.080390
	25	Z	.018835	-.009405	.010988	.013086	-.014271	-.001592	-.008349
	25	X	.041151	.540655	.101330	-.730137	.288960	.043880	.215477
	25	Y	.008658	.038356	-.311709	-.301334	-.321583	.014473	.011109
	25	Z	.015627	-.007807	.009124	.010388	-.011879	-.001327	-.006976
	27	X	-.015368	-.073308	-.133313	.258316	.106422	.149254	-.120196
	27	Y	-.150540	.177675	.215518	.057651	-.637678	-.058653	-.078037
	27	Z	.011693	-.005445	.006833	.009170	-.008916	-.000998	-.005255
	28	X	-.051086	-.559452	-.222795	.916156	-.187392	.096460	-.278442
	28	Y	-.160548	.137799	.443663	.304444	-.257361	-.063209	-.064585
	28	Z	.007702	-.003852	.004503	.005391	-.005884	-.000659	-.003477
	29	X	-.031715	-.392077	-.099792	.510762	-.195412	-.018837	-.099374
	29	Y	.000030	.000031	-.000004	-.000004	-.000009	-.000003	-.000031
	29	Z	.003672	-.001837	.002148	.002573	-.002807	-.000315	-.001663
	30	X	.000030	.000002	-.000001	.000002	.000002	.000003	-.000033
	30	Y	.115265	-.038294	-.506847	-.422203	-.363776	.024762	-.009484
	30	Z	.001380	-.000651	.000761	.000912	-.000993	-.000111	-.000590
	31	X	.019641	.267646	.034601	-.243012	.162493	.066480	-.010096
	31	Y	.168279	-.037521	-.753975	-.625183	-.619016	.029165	-.026330
	31	Z	.000092	-.000102	.000003	.000003	.000000	.000003	-.000033
	32	X	.056142	.805157	.057212	-.545249	.503892	.255738	-.127558
	32	Y	.196440	-.007638	-1.000000	-.737156	-.983158	.016553	-.063686
	32	Z	-.000347	-.000598	.001427	.001089	.002341	.000382	-.001926

N3C/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 11 THRU 17 (CONTD.)

RUN NAME	DCP NAME	DISP DIRN	11	12	13	14	15	16	17
RUN2 (CONTD.)									
	33	X	.065730	1.000000	.019588	-.411406	.592822	.333976	-.225549
	33	Y	.107527	.038951	-.657646	-.409086	-.743129	-.015143	-.075137
	33	Z	-.000695	-.001392	.002847	.002172	.004752	.000761	-.003839
	34	X	.044816	.799730	-.040104	.065758	.385872	.233580	-.204921
	34	Y	-.074324	.066384	.165734	.373967	.073190	-.045182	-.067920
	34	Z	-.001042	-.002082	.004258	.003246	.007104	.001138	-.005730
	35	X	.038451	.734987	-.050178	.173530	.328662	.201123	-.189050
	35	Y	-.114469	.067167	.350760	.548498	.265218	-.049341	-.068429
	35	Z	-.001118	-.002214	.004527	.003450	.007551	.001209	-.006099
	36	X	.019155	.251104	-.066916	.355715	.056334	.011392	-.038793
	36	Y	-.171285	.047605	.605399	.764166	.545086	-.047888	-.094291
	36	Z	-.060415	-.035177	.262809	.213493	.298956	.006372	-.049610
	37	X	.019648	-.206387	-.113010	.292276	-.182218	-.125376	.137903
	37	Y	-.160638	-.295066	.575197	.621442	.365095	-.128412	.061534
	37	Z	-.123780	-.060392	.528511	.339343	.669672	.057300	-.213658
	38	X	.019395	-.209950	-.118912	.292787	-.184659	-.126662	.138721
	38	Y	-.088599	-.571364	.454275	-.025386	.154945	-.077425	.268365
	38	Z	-.046289	.001318	.205356	.040159	.352652	.096749	-.288787
	39	X	.013224	-.211009	-.118731	.292706	-.185884	-.127237	.138946
	39	Y	-.040588	-.652535	.357116	-.424354	.039335	-.019382	.332930
	39	Z	.007551	.037421	-.019688	-.124864	.101917	.101101	-.281554
	40	X	.025984	-.206950	-.142577	.235435	-.210086	-.114677	.119619
	40	Y	-.021900	-.649086	.300222	-.579153	-.017853	.012075	.304262
	40	Z	.022712	.036249	-.022098	-.131452	-.005921	.078803	-.222732
	41	X	.046190	-.122424	-.253886	.061022	-.309000	-.059283	-.052412
	41	Y	-.001040	-.559932	.187363	-.752761	-.115375	.068517	.131136
	41	Z	.023898	-.003352	-.142611	.024177	-.173570	-.022381	.026441
	42	X	.059912	.002303	-.352616	-.045376	-.375270	-.008867	-.239315
	42	Y	.013342	-.423774	.086203	-.836290	-.180582	.119717	-.057362
	42	Z	.037351	.011142	-.227023	.135531	-.351054	-.123533	.285690
	43	X	.050615	.014152	-.333027	-.046054	-.342217	.002337	-.281455
	43	Y	.009284	-.402396	.095203	-.842387	-.157059	.126395	-.088225
	43	Z	.043239	.045271	-.244524	.225390	-.367592	-.135960	.314630

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 11 THRU 17 (CONTD.)

RPT NAME	DCP NAME	DISP DIRN	11	12	13	14	15	16	17
RUN2 (CONT'D.)									
	44	X	.021620	-.016221	-.239335	-.027566	-.247523	.012259	-.319237
	44	Y	-.006356	-.375101	.141979	-.794717	-.080742	.133252	-.119990
	44	Z	.051162	.111396	-.272512	.274154	-.354673	-.136357	.307989
	45	X	-.002443	-.044409	-.162687	-.011319	-.169581	.018675	-.341374
	45	Y	-.018091	-.353558	.181541	-.757810	-.016797	.139259	-.143936
	45	Z	.050320	.107646	-.291031	.308253	-.341832	-.134343	.297022
	46	X	-.018710	-.059319	-.087479	.000188	-.095848	.017839	-.296764
	46	Y	-.025324	-.347323	.213377	-.749304	.028496	.145026	-.153099
	46	Z	.051380	.179772	-.249262	.272095	-.264626	-.110875	.236307
	47	X	.000001	.000004	-.000003	.000001	-.000001	.000001	-.000001
	47	Y	-.025012	-.342765	.211462	-.742643	.029350	.144721	-.154026
	47	Z	.000000	-.000000	-.000001	-.000001	-.000001	.000000	.000000
	48	X	.069317	.240494	-.020880	.059184	.073818	-.000737	.280059
	48	Y	-.024550	-.336149	.208518	-.733554	.030356	.143804	-.154549
	48	Z	-.038644	-.213212	.214914	-.420695	.181892	.124126	-.227823
	49	X	.151305	.533476	-.136563	.145663	.079870	.014058	.310213
	49	Y	-.024053	-.328704	.205040	-.722018	.031256	.142301	-.154318
	49	Z	-.042747	-.297039	.257323	-.607380	.176999	.159918	-.265101
	50	X	.215260	.771413	-.283103	.228770	.035802	.030495	.388209
	50	Y	-.023490	-.320449	.201036	-.708074	.032046	.140217	-.153333
	50	Z	-.018479	-.186946	.126987	-.386925	.047483	.084272	-.110076
	51	X	.154768	.574814	-.213508	.195491	.029237	.024328	-.098307
	51	Y	-.005592	-.100393	.061789	-.243575	.003058	.046836	-.047334
	51	Z	-.000142	-.000524	.000964	-.001508	.001359	.000734	-.001727
	52	X	.110953	.413557	-.151490	.142434	.023930	.018057	-.090137
	52	Y	-.000001	-.000011	.000035	-.000018	-.000001	.000003	-.000012
	52	Z	-.000144	-.000393	.000724	-.001131	.001020	.000551	-.001288
	53	X	.000001	.000004	-.000001	.000002	.000001	.000000	.000035
	53	Y	.000253	.001284	-.072635	.355304	-.008933	-.074812	.086977
	53	Z	-.000000	-.000000	.000001	-.000001	.000001	.000000	.000030
	54	X	-.054321	-.202535	.073833	-.079343	-.013039	-.012570	.220264
	54	Y	-.003057	.025665	-.050334	.343417	-.012344	-.078409	.100667
	54	Z	-.000024	.000187	-.000062	.000570	.000069	-.000467	.025341

NSC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.0), MODES 11 THRU 17 (CONTD.)

RUN NAME	DCP NAME	DISP DIRN	11	12	13	14	15	16	17
RUN2 (CONTD.)									
	55	X	-.059306	-.214724	.080397	-.075072	-.014152	-.016811	.398859
	55	Y	-.013638	-.053405	-.001605	.144537	-.009152	-.039679	.359330
	55	Z	-.000047	.000615	-.000164	.001140	.000136	-.000934	.050578
	56	X	-.031355	-.114605	.041939	-.038265	-.007154	-.012125	.382778
	56	Y	.000031	.000010	-.000005	.000012	.000000	-.000002	-.000002
	56	Z	-.000070	.000921	-.000246	.001707	.000202	-.001398	.075556
	57	X	-.015590	-.055105	.020400	-.015518	-.003331	-.008105	.300933
	57	Y	.014655	.102131	-.034434	.022078	.005133	.003314	-.020126
	57	Z	-.000080	.001044	-.000279	.001934	.000229	-.001583	.085702
	58	X	.000979	.002647	-.001083	-.000010	.000024	.001440	-.076146
	58	Y	.049497	.380190	-.153576	.242793	.005915	-.025559	-.047530
	58	Z	-.010132	-.031740	.012115	-.004010	-.001378	-.010202	.470644
	59	X	.001165	.003034	-.001251	-.000253	.000013	.001917	-.101482
	59	Y	.050757	.395109	-.162546	.274728	.004850	-.031697	-.072436
	59	Z	-.011187	-.033660	.012965	-.002952	-.001247	-.013388	.641655
	60	X	.001269	.003229	-.001339	-.000441	.000035	.002246	-.119331
	60	Y	.050275	.395595	-.164990	.292789	.003904	-.035822	-.090834
	60	Z	-.011684	-.034112	.013292	-.000581	-.001130	-.015552	.763920
	61	X	.001055	.002608	-.001093	-.000366	-.000036	.002112	-.113998
	61	Y	.036309	.241913	-.124675	.241035	.001715	-.032263	-.093184
	61	Z	-.009195	-.025903	.010208	.001427	-.000694	-.014486	.739113
	62	X	.000358	.000807	-.001354	-.000301	-.000020	.000855	-.047653
	62	Y	.013142	.106161	-.046192	.093224	.000441	-.012989	-.039382
	62	Z	-.003463	-.007592	.003818	.000328	-.000236	-.005898	.307047
	63	X	-.000010	-.000102	.000001	-.000001	-.000000	-.000003	-.000007
	63	Y	.000039	.000004	-.000002	.000004	.000000	-.000001	-.000002
	63	Z	-.000000	-.000001	.000000	-.000000	-.000000	-.000003	.000014
MISC. NODES									
	81	X	-.000457	-.000944	-.000558	.025525	-.003611	-.003968	-.190339
	81	Y	.050743	.395332	-.162641	.274338	.004854	-.031726	-.072517
	81	Z	.000330	.000373	-.000165	.000359	.011676	-.030107	1.000000

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

MODE SHAPES (GLOBAL DISPLS AT MASS POINTS, NORMALIZED TO MAX. DISPL = 1.01, MODES 11 THRU 17 (CONTD.)

RUN NAME	DSP NAME	DISP DIRN	11	12	13	14	15	16	17
NORMALIZING FACTORS			.6024E-01	.1095E+00	.1009E+00	.1278E+00	.1069E+00	.6069E-01	.1035E+00

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ACCELERATION SPECTRUM NO. 1

SPECTRUM NAME = H1PZ
SPECTRUM TITLE = HORIZONTAL RESPONSE SPECTRA 3% DAMPING

PERIOD/FREQUENCY CODE = F (FREQUENCIES SPECIFIED)
UNITS CODE = G (MULTIPLES OF GRAVITY)

INTERPOLATION TYPE = NATURAL

FREQUENCY	ACCELERATION
35.0000	.4225
30.0000	.4225
25.0000	.4234
20.0000	.4306
15.0000	.4441
12.0000	.4690
10.0000	.5030
9.0000	.5123
8.0000	.5518
7.5000	.6318
7.0000	.6958
6.5000	.8646
6.0000	1.2176
5.5000	1.8291
5.0000	1.6738
4.5000	1.7312
4.0000	2.5551
3.7100	2.2541
3.5000	2.0242
3.0000	1.0956
2.5000	1.7319
2.0000	1.1116
1.5000	.6133
1.0000	.3032
.7000	.2116
.4000	.1048
.3000	.0776

'NC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ACCELERATION SPECTRUM NO. 2

SPECTRUM NAME = V-RT
SPECTRUM TITLE = VERTICAL RESPONSE SPECTRA 3% DAMPING

PERIOD/FREQUENCY CODE = F (FREQUENCIES SPECIFIED)
UNITS CODE = G (MULTIPLES OF GRAVITY)

INTERPOLATION TYPE = NATURAL

FREQUENCY	ACCELERATION
35.0000	.1698
30.0000	.1698
25.0000	.1696
20.0000	.1876
15.0000	.2268
12.0000	.3456
11.3500	.3433
10.0000	.2868
9.0000	.2678
8.0000	.2553
7.5000	.2719
7.0000	.3519
6.5000	.4091
6.0000	.5847
5.5000	.9315
5.0000	1.2145
4.5000	.9120
4.0000	.7040
3.5000	.5854
3.0000	.4397
2.5000	.4048
2.0000	.3561
1.5000	.2668
1.0000	.1753
.7000	.1321
.4000	.0676
.3000	.0506

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ACCELERATION SPECTRUM NO. 3

SPECTRUM NAME = NOR1
SPECTRUM TITLE = HORIZONTAL RESPONSE SPECTRA 3% DAMPING

PERIOD/FREQUENCY CODE = F (FREQUENCIES SPECIFIED)
UNITS CODE = G (MULTIPLES OF GRAVITY)

INTERPOLATION TYPE = LOGARITHMIC

FREQUENCY	ACCELERATION
35.0000	.4225
30.0000	.4225
25.0000	.4234
20.0000	.4336
15.0000	.4441
12.0000	.4590
10.0000	.5000
9.0000	.5123
8.0000	.5518
7.5000	.6318
7.0000	.6958
6.5000	.3646
6.0000	1.2176
5.5000	1.8291
5.0000	1.6735
4.5000	1.7312
4.0000	2.5551
3.7500	2.2541
3.5000	2.0232
3.0000	1.0956
2.5000	1.7319
2.0000	1.1116
1.5000	.6133
1.0000	.3032
.7000	.2118
.4000	.1043
.3000	.0776

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

ACCELERATION SPECTRUM NO. 4

SPECTRUM NAME = VERT
SPECTRUM TITLE = VERTICAL RESPONSE SPECTRA 3% DAMPING

PERIOD/FREQUENCY CODE = 1 (FREQUENCIES SPECIFIED)
UNITS CODE = 6 (MULTIPLES OF GRAVITY)

INTERPOLATION TYPE = LOGARITHMIC

FREQUENCY	ACCELERATION
35.0000	.1698
30.0000	.1698
25.0000	.1696
20.0000	.1876
15.0000	.2268
12.0000	.3456
11.3500	.3413
10.0000	.2884
9.0000	.2678
8.0000	.2553
7.5000	.2719
7.0000	.3509
6.5000	.4091
6.0000	.5817
5.5000	.9305
5.0000	1.2145
4.5000	.9126
4.0000	.7030
3.5000	.5364
3.0000	.4337
2.5000	.4048
2.0000	.3561
1.5000	.2658
1.0000	.1753
.7000	.1321
.4000	.0636
.3000	.0506

PRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

SPECTRAL ACCELERATIONS (MULTIPLES OF GRAVITY) AT MODE FREQUENCIES

MODE NUMBER	1	2	3	4	5	6	7	8	9	10
FREQUENCY	3.805	8.078	8.309	10.714	12.235	13.589	14.923	16.636	19.722	21.459
SPECTRUM 1	2.353	.549	.509	.489	.467	.456	.445	.440	.431	.428
SPECTRUM 2	.661	.256	.274	.317	.336	.283	.230	.214	.190	.182
SPECTRUM 3	2.356	.549	.508	.488	.467	.455	.445	.439	.431	.428
SPECTRUM 4	.663	.256	.274	.318	.335	.279	.230	.213	.190	.182

MODE NUMBER	11	12	13	14	15	16	17
FREQUENCY	22.154	23.089	23.545	26.253	27.508	29.701	32.493
SPECTRUM 1	.427	.426	.425	.423	.423	.423	.423
SPECTRUM 2	.180	.176	.175	.170	.170	.170	.170
SPECTRUM 3	.427	.426	.425	.423	.423	.423	.423
SPECTRUM 4	.179	.176	.174	.170	.170	.170	.170

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 X RESPONSE

RESULTS SET NAME (INERTIA ONLY) = CJCX

EXCITATION OPTION = SMPL (SIMPLE EXCITATION)

RESULTS SET NAME (INERT + ANCH) = (NO ANCHOR MOVEMENTS)

MISSING MASS OPTION = NOMM (NO CORRECTION)

MODE COMBINATION OPTION = MCQC (CQC METHOD)

DAMPING RATIO (ALL MODES) = 0.005

ACCELERATIONS CODE = ALLA (CALCULATE FOR ALL POINTS)
ACCELERATION CUT-OFF (G) = 0.00

NO. OF VLH SUPPORT LEVELS = 0

RESPONSE SPECTRA

X SPECTRUM	Y SPECTRUM	Z SPECTRUM	SCALE FACTOR
RUPZ			1.000

CQC COMBINATION CASE = WHITE NOISE

NRC/BNR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (DUCX), FORCES AND MOMENTS IN LOCAL COORDINATES (MISC. MEMB. ONLY)

PUT GROUP	SUP MMB	DCF NAME	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	XX MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)
MISC								
	DP1	59	93.33	10.26	57.62	0.00	1382.99	246.18
		81	93.33	10.26	57.62	0.00	.00	.30

NRC/KWR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (COCX). GLOBAL DISPLACEMENTS AT DISPLACEMENT OUTPUT POINTS

RUN NAME	DOP NO.	DCP NAME	X DISPL (IN)	Y DISPL (IN)	Z DISPL (IN)	XX ROTN (RAD)	YY ROTN (RAD)	ZZ ROTN (RAD)
RUN1								
	1	1	.000	.000	.000	.00000	.00000	.00000
	2	5	.000	.000	.005	.00014	.00005	.00002
	3	6	.000	.000	.006	.00014	.00006	.00002
	4	7	.001	.001	.007	.00010	.00023	.00006
	5	8	.014	.005	.007	.00011	.00034	.00016
	6	9	.033	.007	.008	.00003	.00046	.00027
	7	10	.037	.005	.015	.00040	.00075	.00045
	8	11	.036	.003	.019	.00041	.00075	.00046
	9	12	.035	.002	.022	.00041	.00075	.00047
	10	13	.031	.000	.027	.00042	.00073	.00051
	11	14	.029	.000	.029	.00042	.00072	.00052
	12	15	.025	.000	.032	.00042	.00070	.00054
	13	16	.023	.000	.034	.00042	.00070	.00055
	14	17	.022	.000	.037	.00042	.00069	.00055
	15	18	.067	.002	.067	.00041	.00058	.00039
	16	19	.070	.002	.069	.00039	.00058	.00034
	17	20	.072	.002	.064	.00018	.00062	.00041
	18	21	.072	.000	.062	.00017	.00062	.00048
	19	22	.072	.078	.023	.00015	.00040	.00113
	20	23	.072	.086	.022	.00021	.00008	.00096
	21	24	.071	.089	.019	.00059	.00059	.00022
	22	25	.065	.089	.000	.00068	.00084	.00041
RUN2								
	23	77	.000	.000	.000	.00000	.00000	.00000
	24	76	.000	.004	.002	.00007	.00005	.00011
	25	75	.000	.011	.005	.00013	.00005	.00011
	26	74	.000	.015	.007	.00020	.00002	.00003
	27	73	.000	.015	.007	.00024	.00004	.00007
	28	72	.000	.010	.005	.00028	.00009	.00020
	29	71	.001	.000	.000	.00037	.00016	.00034
	30	70	.001	.022	.009	.00038	.00016	.00048
	31	69	.001	.025	.010	.00039	.00015	.00048
	32	68	.007	.040	.003	.00050	.00061	.00043
	33	67	.014	.043	.001	.00071	.00086	.00038
	34	25	.065	.089	.000	.00068	.00084	.00041
	35	26	.107	.122	.000	.00049	.00066	.00063
	36	27	.135	.136	.000	.00021	.00027	.00091
	37	28	.124	.109	.000	.00036	.00055	.00119
	38	29	.093	.090	.003	.00032	.00131	.00148
	39	30	.060	.094	.000	.00060	.00183	.00165
	40	31	.044	.124	.000	.00064	.00210	.00174
	41	32	.169	.305	.000	.00116	.00253	.00195
	42	33	.299	.495	.000	.00124	.00268	.00216
	43	34	.423	.623	.000	.00113	.00261	.00237
	44	35	.447	.653	.000	.00110	.00258	.00241
	45	36	.443	.656	.000	.00106	.00175	.00320

NRC/RHP PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (ROCKI. GLOBAL DISPLACEMENTS AT DISPLACEMENT OUTPUT POINTS (CONT.)

RUN NAME	DOP NO.	DCP NAME	X DISPL (IN)	Y DISPL (IN)	Z DISPL (IN)	XX ROTN (RAD)	YY ROTN (RAD)	ZZ ROTN (RAD)
RUN2 (CONT.)								
	46	37	.377	.617	.037	.00138	.00139	.00421
	47	38	.377	.437	.020	.00165	.00122	.00433
	48	39	.377	.327	.049	.00151	.00112	.00435
	49	40	.354	.272	.054	.00146	.00090	.00426
	50	41	.250	.157	.040	.00127	.00075	.00416
	51	42	.144	.090	.027	.00104	.00061	.00391
	52	43	.120	.040	.024	.00091	.00081	.00327
	53	44	.095	.025	.021	.00083	.00076	.00312
	54	45	.076	.013	.019	.00077	.00072	.00298
	55	46	.059	.007	.014	.00045	.00107	.00162
	56	47	.060	.006	.003	.00029	.00102	.00110
	57	48	.035	.006	.008	.00009	.00097	.00047
	58	49	.046	.006	.009	.00006	.00091	.00057
	59	50	.043	.006	.004	.00014	.00086	.00014
	60	51	.025	.002	.000	.00017	.00062	.00014
	61	52	.018	.000	.000	.00014	.00058	.00014
	62	53	.004	.003	.000	.00005	.00036	.00012
	63	54	.008	.004	.000	.00002	.00011	.00010
	64	55	.008	.002	.000	.00005	.00006	.00008
	65	56	.004	.000	.000	.00006	.00014	.00006
	66	57	.002	.001	.000	.00007	.00015	.00006
	67	58	.000	.002	.001	.00003	.00001	.00001
	68	59	.000	.002	.001	.00003	.00000	.00001
	69	60	.000	.002	.001	.00003	.00000	.00001
	70	61	.000	.001	.001	.00002	.00001	.00002
	71	62	.000	.001	.000	.00001	.00001	.00002
	72	63	.000	.000	.000	.00000	.00000	.00000
MISC. NODES								
	73	81	.000	.002	.002	.00003	.00000	.00001

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (COCX), ABSOLUTE GLOBAL ACCELERATIONS (MULTIPLES OF GRAVITY)

POINT NAME	X ACCEL	Y ACCEL	Z ACCEL	X-Z ACCEL	X-Y-Z ACCEL
1	.423	.000	.000	.423	.423
5	.423	.000	.076	.429	.429
6	.423	.000	.095	.431	.431
7	.423	.018	.112	.437	.438
8	.450	.057	.114	.454	.457
9	.560	.089	.115	.572	.579
10	.607	.041	.216	.644	.645
11	.600	.026	.257	.657	.658
12	.596	.016	.304	.669	.669
13	.590	.000	.371	.698	.698
14	.571	.000	.394	.688	.688
15	.556	.001	.403	.676	.676
16	.545	.001	.415	.685	.685
17	.535	.001	.424	.683	.683
18	.520	.007	.303	.602	.602
19	.529	.008	.317	.617	.617
20	.534	.008	.305	.615	.615
21	.534	.000	.271	.600	.600
22	.534	.337	.070	.538	.635
23	.535	.373	.066	.539	.656
24	.524	.389	.053	.527	.654
25	.527	.389	.003	.527	.655
27	.423	.000	.000	.423	.423
26	.423	.056	.045	.425	.429
75	.423	.139	.109	.436	.458
74	.423	.155	.121	.440	.459
73	.423	.137	.092	.432	.434
72	.423	.030	.045	.425	.432
71	.423	.000	.000	.423	.423
70	.423	.150	.037	.424	.450
69	.423	.170	.041	.424	.457
68	.423	.254	.014	.428	.493
67	.440	.231	.004	.440	.522
25	.527	.389	.003	.527	.655
26	.602	.441	.003	.602	.745
27	.614	.337	.002	.614	.731
28	.543	.235	.001	.548	.595
29	.448	.000	.001	.448	.448
30	.423	.163	.000	.423	.454
31	.432	.259	.000	.432	.503
32	.514	.438	.000	.514	.707
33	.642	.723	.001	.642	.967
34	.798	.958	.001	.798	1.247
35	.817	1.002	.001	.817	1.293
36	.810	1.053	.002	.811	1.329
37	.756	.941	.134	.762	1.211
38	.756	.869	.153	.772	1.021
39	.756	.522	.216	.787	.944

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (COCX). ABSOLUTE GLOBAL ACCELERATIONS (MULTIPLES OF GRAVITY) (CONTD.)

POINT NAME	X ACCEL	Y ACCEL	Z ACCEL	X-Z ACCEL	X-Y-Z ACCEL
40	.733	.450	.229	.768	.870
41	.622	.297	.194	.651	.716
42	.524	.142	.143	.543	.562
43	.503	.115	.126	.519	.531
44	.480	.091	.103	.491	.499
45	.465	.078	.088	.474	.480
46	.447	.075	.066	.451	.458
47	.423	.074	.000	.423	.429
48	.452	.073	.054	.455	.461
49	.506	.072	.067	.511	.515
50	.549	.070	.040	.546	.551
51	.486	.023	.000	.486	.486
52	.456	.000	.000	.456	.459
53	.423	.034	.000	.423	.424
54	.431	.041	.001	.431	.433
55	.433	.033	.002	.433	.434
56	.426	.006	.003	.426	.426
57	.423	.028	.003	.423	.424
58	.423	.030	.025	.423	.433
59	.423	.092	.031	.424	.433
60	.423	.091	.035	.424	.434
61	.423	.065	.032	.424	.429
62	.423	.024	.013	.423	.423
63	.423	.000	.000	.423	.423
11	.423	.092	.057	.426	.436

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (CQCX). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS

RUN NAME	SUP NO.	PCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	IM/Z (PSI)
RUN1											
	1	1	STRP	120.78	36.15	683.59	5816.81	40299.88	2145.44	866.62	866.62
	2L	5	STRP	120.78	36.15	683.59	5816.81	4939.09	3115.86	175.19	175.19
	2R	5	STRP	120.73	35.83	664.75	5316.81	4939.09	3115.86	490.83	490.83
	3L	6	STRP	120.73	35.83	664.75	5816.81	2509.19	3226.44	423.34	423.34
	3R	6	BELB	120.72	660.29	35.77	5816.81	3226.44	2509.19	423.34	1033.44
	4L	7	BELB	660.29	120.72	35.77	3573.06	5549.34	4618.93	479.71	1171.04
	4R	7	STRP	644.08	122.33	35.55	3573.06	5549.34	4618.93	479.71	479.71
	5L	8	STRP	644.08	122.33	35.55	3573.06	4808.07	1509.35	367.87	367.87
	5R	8	STRP	620.11	115.86	45.96	3573.06	4808.07	1509.35	367.87	367.87
	6L	9	STRP	620.11	115.86	45.96	3573.06	5978.59	6639.54	573.01	573.01
	6R	9	BELB	602.61	135.24	45.07	3573.06	1620.16	8736.47	573.01	1398.78
	7L	10	BELB	135.24	602.61	45.07	2081.12	4012.35	4400.81	375.66	917.04
	7R	10	STRP	151.30	45.79	590.70	2081.12	4400.81	4012.35	375.66	375.66
	8L	11	STRP	151.30	45.79	590.70	2081.12	3677.94	4156.09	352.95	352.95
	8R	11	STRP	157.03	47.59	545.43	2081.12	3677.94	4156.09	352.95	352.95
	9L	12	STRP	157.03	47.59	545.43	2081.12	4440.13	4252.17	386.50	386.50
	9R	12	BELB	155.76	51.45	576.31	2081.12	4440.13	4252.17	386.50	993.49
	10L	13	BELB	105.41	137.88	576.31	3971.22	7835.62	4297.65	582.35	1421.59
	10R	13	STRP	105.41	150.97	563.88	3971.22	7835.62	4297.65	582.35	582.35
	11L	14	STRP	105.41	150.97	563.88	3971.22	10381.68	4324.32	710.23	710.23
	11R	14	STRP	3151.67	226.49	234.02	3971.22	10381.68	4324.32	710.23	710.23
	12L	15	STRP	3151.67	226.49	234.02	3971.22	11871.28	3524.80	776.04	776.04
	12R	15	VALV	3151.62	182.13	177.35	3971.22	11871.28	3524.80	N/A	
	13	15	VALV	3151.62	182.13	177.35	3971.22	12797.63	3626.12	N/A	
	14L	17	VALV	3151.48	127.55	99.08	3971.22	12906.70	3496.45	N/A	
	14R	17	STRP	3151.30	123.21	116.95	3971.22	12906.70	3496.45	830.65	830.65
	15L	18	STRP	3150.56	120.87	178.34	3971.22	5816.70	11006.48	778.12	778.12
	15R	18	STRP	3149.80	210.89	41.88	3971.22	5816.70	11006.48	778.12	778.12
	16L	19	STRP	3149.81	210.89	41.38	3971.22	5065.58	11623.54	791.20	791.20
	16R	19	BELB	3149.46	214.42	94.02	3971.22	5065.58	11623.54	791.20	1931.43
	17L	20	BELB	214.42	3149.46	94.02	4010.82	3615.71	26743.05	1624.65	3965.97
	17R	20	STRP	218.97	3149.22	105.42	4010.82	3615.71	26743.05	1624.65	1624.65
	18L	21	STRP	218.97	3149.22	105.42	4010.82	3547.75	39089.51	2402.57	2402.57
	18R	21	STRP	231.30	586.73	129.33	4010.82	3547.75	39089.51	2402.57	2402.57
	19L	22	STRP	263.37	567.20	155.33	4010.82	11416.84	7058.15	834.21	834.21
	19R	22	BELB	287.37	159.80	939.98	4010.82	7058.15	11416.84	834.21	2036.40
	20L	23	BELB	244.81	220.17	939.98	6481.48	10793.06	12521.75	1057.37	2581.18
	20R	23	BELB	259.31	523.68	225.28	6481.48	12521.75	10773.06	1057.37	2581.18
	21L	24	BELB	523.63	259.31	225.28	13599.41	7174.77	17103.43	1369.55	3343.23
	21R	24	STRP	496.34	327.98	154.71	13599.41	7699.87	16373.55	1369.55	1369.55
	22	25	STRP	496.34	327.98	154.71	13599.41	5589.54	22372.45	1594.20	1594.20

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (COCX). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

RUN NAME	SGP NO.	DCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	IM/Z (PSI)
RUN2											
	23	77	STRP	869.81	286.84	142.98	7450.65	11586.94	24428.59	596.07	596.07
	24L	76	STRP	869.81	286.84	142.98	7450.65	3757.50	8294.23	249.91	249.91
	24R	76	STRP	869.47	266.88	126.88	7450.65	3757.50	8294.23	249.91	249.91
	25L	75	STRP	869.47	266.88	126.88	7450.65	3962.67	7261.45	236.62	236.62
	25R	75	STRP	868.30	222.61	101.04	7450.65	3962.67	7261.45	236.62	236.62
	26L	74	STRP	868.30	222.61	101.04	7450.65	8954.85	19449.77	481.86	481.86
	26R	74	STRP	867.97	190.36	102.29	7450.65	8954.85	19449.77	481.86	481.86
	27L	73	STRP	867.97	190.36	102.29	7450.65	11780.76	25388.66	624.93	624.93
	27R	73	STRP	867.17	177.69	114.44	7450.65	11780.76	25388.66	624.93	624.93
	28L	72	STRP	867.17	177.69	114.44	7450.65	14824.97	31513.90	756.96	756.96
	28R	72	STRP	866.24	172.30	122.05	7450.65	14824.97	31513.90	756.96	756.96
	29L	71	STRP	866.24	172.30	122.05	7450.65	18318.27	36824.19	888.39	888.39
	29R	71	STRP	864.35	571.29	755.09	7450.65	18318.27	36824.19	888.39	888.39
	30L	70	STRP	864.36	571.29	755.09	7450.65	22973.21	9658.07	552.92	552.92
	30R	70	STRP	863.99	537.71	761.36	7450.65	22973.21	9658.07	552.92	552.92
	31L	69	STRP	853.99	537.71	751.36	7450.65	27379.37	7538.34	624.01	624.01
	31R	69	BELB	863.37	811.53	426.79	7450.65	22869.95	16935.15	624.01	1689.56
	32L	68	BELB	811.53	863.39	425.79	29314.28	9141.44	15792.35	733.90	1987.10
	32R	68	BELB	793.73	411.88	857.11	29314.28	15792.35	9141.44	733.90	1987.10
	33L	67	BELB	757.93	474.56	857.11	17161.32	21023.37	9821.24	613.41	1660.88
	33R	67	STRP	758.52	398.69	832.05	17161.32	21023.37	9921.24	613.41	613.41
	34L	25	STRP	758.52	398.69	332.05	17161.32	35270.53	21347.31	955.30	955.30
	34R	25	STRP	618.28	730.34	622.10	27657.80	26716.95	18334.69	905.46	905.46
	35L	26	STRP	618.23	730.34	622.10	27657.80	50339.84	54128.19	1677.45	1677.45
	35R	26	STRP	618.97	612.09	507.85	27657.80	50339.84	54128.19	1677.45	1677.45
	36L	27	STRP	613.97	612.09	507.85	27657.80	76634.55	91473.46	2603.86	2603.86
	36R	27	STRP	619.54	558.98	476.62	27657.80	76634.55	91473.46	2603.86	2603.86
	37L	28	STRP	619.54	558.96	476.62	27657.80	95440.03	121755.32	3340.22	3340.22
	37R	28	STRP	619.91	554.00	530.57	27657.80	95440.03	121755.32	3340.22	3340.22
	38L	29	STRP	619.91	554.00	530.57	27657.80	113182.36	150128.75	4039.06	4039.06
	38R	29	STRP	620.35	1113.13	552.72	27657.80	113182.36	150128.75	4039.06	4039.06
	39L	30	STRP	520.95	1113.13	552.72	27657.80	125978.92	105920.74	3547.27	3547.27
	39R	30	STRP	620.38	1071.82	1044.83	27657.80	125978.92	105920.74	3547.27	3547.27
	40L	31	STRP	620.04	1071.82	1044.83	27657.80	103307.13	82797.58	2874.64	2874.64
	40R	31	STRP	206.10	994.67	1023.50	27657.80	103307.13	82797.58	2874.64	2874.64
	41L	32	STRP	206.10	994.67	1023.50	27657.80	53860.08	35485.34	1491.59	1491.59
	41R	32	STRP	205.93	787.24	915.75	27657.80	53860.08	35485.34	1491.59	1491.59
	42L	33	STRP	205.98	787.24	915.75	27657.80	14510.31	13110.59	719.95	719.95
	42R	33	STRP	205.76	487.73	729.24	27657.80	14510.31	13110.59	719.95	719.95
	43L	34	STRP	205.76	487.73	724.24	27657.80	30106.82	29755.12	1074.70	1074.70
	43R	34	STRP	205.55	291.45	575.50	27657.80	30106.82	29755.12	1074.70	1074.70
	44L	35	STRP	205.55	291.45	575.50	27657.80	34936.39	31536.51	1160.26	1160.26
	44R	35	BELB	205.45	245.92	504.01	27657.80	34936.39	31536.51	1160.26	4116.57
	45L	36	BELB	245.92	205.45	504.01	40224.20	32971.24	34070.95	1321.51	4688.67
	45R	36	BELB	312.50	400.67	197.43	40224.20	34070.95	32971.24	1321.51	3578.12
	46L	37	BELB	430.67	318.66	197.43	36507.07	37797.16	35724.50	1350.54	3656.72

ORC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (COCX). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

ROW NAME	SUP NO.	OCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	IM/Z (PSI)
ROW2 (CONT).)											
46R	37	STRP		336.92	563.09	172.91	36507.07	37797.16	35724.50	1350.54	1350.54
47_	38	STRP		336.92	563.09	172.91	36507.07	33542.72	21181.90	1145.86	1145.86
47R	38	STRP		335.70	742.57	148.33	36507.07	33542.72	21181.90	1145.86	1145.86
48L	39	STRP		335.70	742.57	148.33	36507.07	31003.57	21585.66	1116.59	1116.59
48R	39	BELB		454.13	820.97	143.57	36507.07	31003.57	21585.66	1116.59	3023.27
49_	40	BELB		671.42	654.59	143.57	46413.35	10208.14	25949.45	1150.83	3115.98
49R	40	STRP		635.73	811.23	154.38	46413.35	10208.14	25949.45	1150.83	1150.83
50L	41	STRP		635.73	811.23	154.38	46413.35	14029.37	43662.58	1386.81	1386.81
50R	41	STRP		710.08	972.05	146.06	46413.35	14029.37	43662.58	1386.81	1386.81
51L	42	STRP		710.08	972.05	146.06	46413.35	18863.48	75539.71	1927.46	1927.46
51R	42	BELB		728.21	470.23	935.97	46413.35	67351.72	39150.82	1927.46	5218.80
52L	43	BELB		739.03	453.64	935.97	76628.77	42047.83	41875.31	2059.96	5577.54
52R	43	STRP		743.02	839.72	657.36	76628.77	51930.46	28719.14	2059.96	2059.96
53_	44	STRP		743.02	839.72	657.36	76628.77	57251.89	39079.90	2196.18	2196.18
53R	44	STRP		747.28	850.35	678.08	76628.77	57251.89	39079.90	2196.18	2196.18
54_	45	STRP		747.28	850.35	678.08	76628.77	62267.46	47795.92	2331.54	2331.54
54R	45	BELB		751.92	858.15	695.49	76628.77	62267.46	47795.92	2331.54	6312.87
55L	46	BELB		1019.07	513.13	695.49	9333.71	104604.60	55713.72	2526.77	6841.47
55R	46	STRP		1025.14	860.11	243.22	9333.71	34947.33	113246.75	2526.77	2526.77
56_	47	STRP		1025.14	860.11	243.22	9333.71	42617.67	135338.85	3022.28	3022.28
56R	47	STRP		1035.55	856.22	237.75	9333.71	42617.67	135338.85	3022.28	3022.28
57L	48	STRP		1035.55	856.22	237.75	9333.71	31928.56	96079.56	2161.02	2161.02
57R	48	STRP		1047.44	876.65	243.30	9333.71	31928.56	96079.56	2161.02	2161.02
58_	49	STRP		1047.44	876.65	243.30	9333.71	21091.67	55795.69	1283.02	1283.02
58R	49	STRP		1060.65	911.07	250.45	9333.71	21091.67	55795.69	1283.02	1283.02
59_	50	STRP		1060.65	911.07	250.45	9333.71	10511.58	13737.88	417.76	417.76
59R	50	BELB		1071.25	253.20	950.06	9333.71	13737.88	10511.59	417.76	1131.13
60L	51	BELB		253.20	1071.25	950.06	3743.11	23960.78	12669.68	581.55	1574.59
60R	51	STRP		253.22	1073.21	956.76	3743.11	23960.78	12669.68	581.55	581.55
61L	52	STRP		253.22	1073.21	956.76	3743.11	35124.31	25445.29	925.27	925.27
61R	52	STRP		253.23	205.09	982.43	3743.11	35124.31	25445.29	925.27	925.27
62_	53	STRP		253.23	205.09	982.43	3743.11	69952.26	18433.98	1539.59	1539.59
62R	53	STRP		201.14	208.35	561.39	3743.11	69952.26	18433.98	1539.59	1539.59
63_	54	STRP		201.14	208.35	561.39	3743.11	49808.80	11707.71	1090.40	1090.40
63R	54	STRP		200.94	210.19	569.66	3743.11	49808.80	11707.71	1090.40	1090.40
64L	55	STRP		200.94	210.19	569.66	3743.11	29342.60	6547.89	643.93	643.93
64R	55	STRP		200.55	209.70	579.97	3743.11	29342.60	6547.89	643.93	643.93
65L	56	STRP		200.55	209.70	579.97	3743.11	8507.86	7634.75	256.33	256.33
65R	56	STRP		200.14	323.56	534.13	3743.11	8507.85	7634.75	256.33	256.33
66L	57	STRP		200.14	323.56	534.13	3743.11	885.30	3313.62	107.90	107.90
66R	57	BELB		199.77	585.82	818.53	3743.11	3313.62	835.30	107.90	292.16
67_	58	BELB		601.41	146.27	313.53	2824.54	5604.05	8261.49	220.51	597.04
67R	58	VALV		601.59	240.34	127.90	2823.36	8261.49	5604.65	N/A	
68_	59	VALV		601.67	240.34	127.90	2823.36	7780.75	8591.06	N/A	
68L	60	VALV		591.97	44.28	32.67	3659.80	6765.43	8501.32	N/A	

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (CODCX). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

RUN NAME	SOP NO.	OCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	I*M/Z (PSI)
RU12 (CONT).)											
	69R	60	STRP	602.26	111.56	92.61	3661.68	6765.43	8300.51	93.59	93.59
	70L	61	STRP	602.26	111.56	92.61	3661.68	2675.88	3676.32	47.66	47.66
	70R	61	STRP	602.40	161.03	106.35	3661.61	2675.88	3676.40	47.66	47.66
	71L	62	STRP	602.40	161.03	106.35	3661.61	2499.17	4516.73	51.66	51.66
	71R	62	STRP	602.47	179.32	113.09	3661.59	2499.17	4516.74	51.66	51.66
	72	63	STRP	602.47	179.32	113.09	3661.59	7633.19	12620.83	124.06	124.06

NRC/KHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (COCX), SUPPORT FORCES AND DEFORMATIONS

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
1X	1	SNGL	X						
				FORC	(LB)	GLBL	36.15	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	40299.88	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
1Y	1	SNGL	Y						
				FORC	(LB)	GLBL	0.00	120.78	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	5816.81	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
1Z	1	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	683.59
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	2145.44
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77X	77	SNGL	X						
				FORC	(LB)	GLBL	869.31	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	7450.65	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77Y	77	SNGL	Y						
				FORC	(LB)	GLBL	0.00	246.84	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	11536.94	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77Z	77	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	142.98
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	24428.59
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
93X	93	SNGL	X						
				FORC	(LB)	GLBL	532.28	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	2204.73	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
93Y	93	SNGL	Y						
				FORC	(LB)	GLBL	0.00	179.33	0.00
				DISP	(IN)	GLBL	.000	.000	.000

HRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (COCX), SUPPORT FORCES AND DEFORMATIONS (CONTD.)

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
63Y (CONTD.)									
				MOMT	(LB.IN)	GLBL	0.00	7633.19	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
64Z	63	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	191.60
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	12954.96
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
147X	14	SNGL	INCL						
				FORC	(LB)	LOCL	526.53		
				FORC	(LB)	GLBL	372.31	0.00	372.31
				DISP	(IN)	LOCL	.000	.000	.041
14Y	14	SNGL	Y						
				FORC	(LB)	GLBL	0.00	3106.29	0.00
				DISP	(IN)	GLBL	.029	.000	.029
18XZ	18	SNGL	INCL						
				FORC	(LB)	LOCL	316.22		
				FORC	(LB)	GLBL	223.60	0.00	223.60
				DISP	(IN)	LOCL	.000	.002	.095
21Y	21	SNGL	Y						
				FORC	(LB)	GLBL	0.00	3728.94	0.00
				DISP	(IN)	GLBL	.072	.000	.062
29Y	29	SNGL	Y						
				FORC	(LB)	GLBL	0.00	1562.81	0.00
				DISP	(IN)	GLBL	.063	.000	.000
30X	30	SNGL	X						
				FORC	(LB)	GLBL	1416.67	0.00	0.00
				DISP	(IN)	GLBL	.000	.094	.000
31Z	31	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	759.10
				DISP	(IN)	GLBL	.044	-.154	.000
47X	47	SNGL	X						
				FORC	(LB)	GLBL	1604.63	0.00	0.00
				DISP	(IN)	GLBL	.030	.006	.000

NRC/PHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (CQCX), SUPPORT FORCES AND DEFORMATIONS (CONTD.)

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
47X (CONTD.)									
47Z	47	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	464.15
				DISP	(IN)	GLBL	.000	.006	.000
52Y	52	SNGL	Y						
				FORC	(LB)	GLBL	0.00	1271.20	0.00
				DISP	(IN)	GLBL	.013	.000	.000
53X	53	SNGL	X						
				FORC	(LB)	GLBL	1538.38	0.00	0.00
				DISP	(IN)	GLBL	.000	.003	.000
53Z	53	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	164.52
				DISP	(IN)	GLBL	.000	.003	.000
55Y	55	SNGL	Y						
				FORC	(LB)	GLBL	0.00	457.16	0.00
				DISP	(IN)	GLBL	.004	.000	.000
71Y	71	SNGL	Y						
				FORC	(LB)	GLBL	0.00	713.93	0.00
				DISP	(IN)	GLBL	.001	.000	.000
71Z	71	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	855.92
				DISP	(IN)	GLBL	.001	.000	.000

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 Y RESPONSE

RESULTS SET NAME (INERTIA ONLY) = COCY

EXCITATION OPTION = SMP_ (SIMPLE EXCITATION)

RESULTS SET NAME (INERT + ANCH) = (NO ANCHOR MOVEMENTS)

MISSING MASS OPTION = NORM (NO CORRECTION)

MODE COMBINATION OPTION = MCOC (COC METHOD)

DAMPING RATIO (ALL MODES) = 0.000

ACCELERATIONS CODE = (NO ACCELERATION POINTS)
ACCELERATION CUT-OFF (G) = 0.00

NO. OF NON SUPPORT LEVELS = 0

RESPONSE SPECTRA

X SPECTRUM	Y SPECTRUM	Z SPECTRUM	SCALE FACTOR
	V*9T		1.000

COC COMBINATION CASE = WHITE NOISE

ARC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (CQCY), FORCES AND MOMENTS IN LOCAL COORDINATES (MISC. MEMB. ONLY)

RUN GROUP	SUP NAME	DCP NAME	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	XX MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)
MISC								
	OPE	59	163.60	19.08	67.09	0.00	1610.20	457.96
		81	163.60	19.08	67.09	0.00	.00	.00

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDE) NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (CQCY), GLOBAL DISPLACEMENTS AT DISPLACEMENT OUTPUT POINTS

RUN NAME	DOP NO.	DCP NAME	X DISPL (IN)	Y DISPL (IN)	Z DISPL (IN)	XX ROTN (RAD)	YY ROTN (RAD)	ZZ ROTN (RAD)
RUN1								
	1	1	.000	.000	.000	.00000	.00000	.00000
	2	5	.000	.000	.001	.00002	.00001	.00000
	3	6	.000	.000	.001	.00002	.00002	.00001
	4	7	.000	.000	.001	.00004	.00007	.00002
	5	8	.004	.002	.001	.00003	.00009	.00006
	6	9	.009	.003	.001	.00001	.00011	.00010
	7	10	.009	.002	.002	.00010	.00015	.00017
	8	11	.009	.001	.003	.00010	.00015	.00017
	9	12	.008	.001	.003	.00010	.00015	.00018
	10	13	.007	.000	.005	.00015	.00016	.00023
	11	14	.006	.000	.006	.00015	.00016	.00024
	12	15	.004	.000	.007	.00016	.00016	.00024
	13	16	.003	.000	.008	.00016	.00016	.00025
	14	17	.003	.000	.009	.00016	.00017	.00025
	15	18	.025	.001	.026	.00012	.00018	.00014
	16	19	.023	.001	.027	.00011	.00018	.00012
	17	20	.028	.001	.026	.00006	.00021	.00019
	18	21	.029	.000	.025	.00006	.00021	.00022
	19	22	.028	.036	.011	.00007	.00013	.00053
	20	23	.023	.040	.010	.00010	.00003	.00040
	21	24	.023	.041	.009	.00028	.00025	.00013
	22	25	.024	.041	.000	.00032	.00035	.00020
RUN2								
	23	77	.000	.000	.000	.00000	.00000	.00000
	24	76	.000	.002	.001	.00003	.00003	.00006
	25	75	.000	.006	.003	.00005	.00003	.00006
	26	74	.001	.008	.003	.00008	.00001	.00002
	27	73	.000	.006	.003	.00010	.00002	.00005
	28	72	.000	.005	.002	.00012	.00004	.00011
	29	71	.000	.005	.000	.00013	.00007	.00018
	30	70	.000	.011	.004	.00016	.00008	.00024
	31	69	.000	.013	.005	.00016	.00007	.00024
	32	68	.002	.019	.001	.00028	.00023	.00019
	33	67	.003	.023	.000	.00033	.00035	.00016
	34	25	.024	.041	.000	.00032	.00035	.00020
	35	26	.043	.056	.000	.00023	.00030	.00036
	36	27	.058	.062	.000	.00011	.00011	.00042
	37	28	.065	.060	.000	.00004	.00021	.00056
	38	29	.073	.050	.000	.00003	.00058	.00059
	39	30	.083	.043	.000	.00120	.00094	.00077
	40	31	.089	.071	.000	.00131	.00097	.00091
	41	32	.074	.141	.000	.00146	.00117	.00091
	42	33	.134	.215	.000	.00150	.00124	.00100
	43	34	.195	.288	.000	.00145	.00121	.00110
	44	35	.207	.301	.000	.00143	.00119	.00117
	45	36	.253	.317	.014	.00140	.00081	.00149

NRC/BNR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDE) NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (CJCY), GLOBAL DISPLACEMENTS AT DISPLACEMENT OUTPUT POINTS (CONT.)

RUN NAME	DJP NO.	DCP NAME	X DISPL (IN)	Y DISPL (IN)	Z DISPL (IN)	XX ROTN (RAD)	YY ROTN (RAD)	ZZ ROTN (RAD)
R2N2 (CONT.)								
	46	37	.174	.285	.017	.00047	.00064	.00195
	47	38	.174	.202	.011	.00076	.00056	.00201
	48	39	.174	.151	.024	.00070	.00052	.00202
	49	40	.164	.125	.026	.00067	.00041	.00196
	50	41	.116	.077	.019	.00058	.00035	.00192
	51	42	.067	.028	.013	.00048	.00028	.00181
	52	43	.056	.019	.012	.00042	.00038	.00152
	53	44	.045	.012	.010	.00039	.00036	.00145
	54	45	.030	.007	.009	.00036	.00034	.00139
	55	46	.023	.004	.006	.00021	.00050	.00076
	56	47	.000	.004	.000	.00014	.00047	.00052
	57	48	.017	.004	.004	.00004	.00045	.00022
	58	49	.022	.004	.004	.00003	.00042	.00003
	59	50	.023	.004	.002	.00007	.00040	.00007
	60	51	.012	.001	.000	.00012	.00029	.00008
	61	52	.008	.000	.000	.00011	.00027	.00008
	62	53	.000	.003	.000	.00005	.00017	.00007
	63	54	.004	.004	.000	.00001	.00005	.00007
	64	55	.004	.003	.000	.00005	.00003	.00006
	65	56	.002	.003	.000	.00010	.00006	.00006
	66	57	.001	.002	.000	.00011	.00007	.00006
	67	58	.000	.004	.001	.00007	.00000	.00002
	68	59	.000	.004	.001	.00006	.00000	.00002
	69	60	.000	.004	.001	.00006	.00000	.00002
	70	61	.000	.003	.000	.00003	.00000	.00004
	71	62	.000	.001	.000	.00002	.00000	.00003
	72	63	.000	.000	.000	.00000	.00000	.00000
MISC. NODES								
	73	81	.000	.004	.002	.00006	.00000	.00002

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (COCY), ABSOLUTE GLOBAL ACCELERATIONS (MULTIPLES OF GRAVITY)

POINT NAME	X ACCEL	Y ACCEL	Z ACCEL	X-Z ACCEL	X-Y-Z ACCEL
1	.000	.170	.000	.000	.170
5	.002	.170	.010	.010	.170
6	.002	.170	.011	.012	.170
7	.004	.170	.016	.017	.171
8	.032	.171	.016	.036	.175
9	.067	.173	.016	.069	.186
10	.068	.171	.026	.072	.185
11	.063	.170	.032	.071	.184
12	.060	.170	.036	.070	.184
13	.052	.170	.045	.068	.183
14	.047	.170	.047	.067	.183
15	.044	.170	.053	.069	.183
16	.046	.170	.057	.074	.185
17	.052	.170	.062	.081	.188
18	.110	.170	.110	.156	.239
19	.110	.170	.125	.173	.242
20	.110	.170	.120	.169	.240
21	.110	.170	.115	.165	.237
22	.118	.255	.050	.128	.245
23	.120	.270	.051	.130	.303
24	.103	.278	.040	.111	.309
25	.086	.278	.002	.086	.291
27	.000	.170	.000	.000	.170
76	.000	.179	.031	.031	.181
75	.001	.217	.075	.075	.230
74	.001	.230	.031	.081	.244
73	.001	.210	.060	.060	.219
72	.002	.182	.028	.028	.185
71	.002	.170	.000	.002	.170
70	.002	.201	.022	.022	.203
69	.002	.209	.024	.025	.210
68	.034	.240	.008	.035	.243
67	.048	.246	.002	.048	.251
25	.086	.278	.002	.086	.291
26	.117	.291	.001	.117	.313
27	.136	.256	.001	.136	.299
28	.122	.212	.001	.122	.245
29	.058	.170	.000	.058	.179
30	.000	.177	.000	.000	.197
31	.037	.231	.000	.047	.234
32	.131	.320	.000	.131	.346
33	.229	.406	.000	.229	.466
34	.323	.507	.001	.323	.602
35	.341	.530	.001	.341	.633
36	.344	.557	.002	.347	.657
37	.333	.496	.035	.344	.604
38	.333	.369	.088	.345	.505
39	.333	.322	.111	.351	.476

N2C/2HR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (CUCY), ABSOLUTE GLOBAL ACCELERATIONS (MULTIPLES OF GRAVITY) (CONTD.)

POINT NAME	X ACCEL	Y ACCEL	Z ACCEL	X-Z ACCEL	X-Y-Z ACCEL
40	.324	.302	.117	.345	.459
41	.270	.258	.101	.288	.386
42	.219	.221	.078	.224	.315
43	.189	.215	.071	.202	.295
44	.155	.210	.062	.167	.264
45	.129	.207	.058	.141	.253
46	.089	.207	.047	.101	.230
47	.000	.206	.000	.000	.206
48	.066	.205	.052	.054	.222
49	.090	.205	.075	.117	.236
50	.093	.204	.051	.106	.230
51	.064	.176	.000	.064	.187
52	.046	.170	.000	.046	.176
53	.093	.196	.000	.000	.196
54	.022	.216	.006	.022	.219
55	.024	.199	.001	.024	.200
56	.013	.170	.001	.013	.170
57	.007	.131	.002	.008	.131
58	.001	.236	.009	.009	.236
59	.002	.234	.012	.012	.234
60	.002	.229	.013	.014	.229
61	.002	.199	.013	.013	.199
62	.001	.174	.005	.005	.174
63	.000	.170	.000	.000	.170
31	.019	.234	.056	.059	.244

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (COGY). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS

2D1 NAME	SOP NO.	DCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	I*M/Z (PSI)
RUN1											
	1	1	STRP	23.19	15.56	83.88	1805.77	5022.77	438.99	113.83	113.83
	2L	5	STRP	23.19	15.56	83.88	1805.77	843.65	1065.15	48.03	48.03
	2R	5	STRP	23.18	15.47	81.66	1805.77	843.65	1065.15	134.57	134.57
	3L	6	STRP	23.18	15.47	81.66	1805.77	637.93	1123.35	132.21	132.21
	3R	6	BELB	23.18	81.13	15.46	1805.77	1123.35	637.93	132.21	322.75
	4L	7	BELB	81.13	23.18	15.46	1299.83	1636.79	621.18	129.84	316.97
	4R	7	STRP	79.22	23.09	15.26	1299.83	1636.79	621.18	129.84	129.84
	5L	8	STRP	79.22	23.09	15.26	1299.83	1056.10	563.03	105.22	105.22
	5R	8	STRP	76.43	21.47	12.83	1299.83	1056.10	563.03	105.22	105.22
	6L	9	STRP	76.43	21.47	12.83	1299.83	817.78	1521.40	128.73	128.73
	6R	9	BELB	74.44	17.27	19.12	1299.83	722.02	1569.11	128.73	314.24
	7L	10	BELB	17.27	74.44	19.12	912.48	1480.87	1367.38	131.75	321.63
	7R	10	STRP	19.37	19.29	73.09	912.48	1367.38	1480.87	131.75	131.75
	8L	11	STRP	19.37	19.29	73.09	912.48	1359.54	1552.07	134.35	134.35
	8R	11	STRP	20.12	19.41	72.49	912.48	1359.54	1552.07	134.35	134.35
	9L	12	STRP	20.12	19.41	72.49	912.48	1411.48	1602.37	138.28	138.28
	9R	12	BELB	21.27	19.61	71.46	912.48	1411.48	1602.37	138.28	337.56
	10L	13	BELB	20.50	20.41	71.46	601.92	1854.07	1697.28	153.91	375.72
	10R	13	STRP	20.50	21.78	70.05	601.92	1854.07	1697.28	153.91	153.91
	11L	14	STRP	20.50	21.78	70.05	601.92	2060.48	1725.33	164.00	164.00
	11R	14	STRP	1476.20	58.28	52.69	601.92	2060.48	1725.33	164.00	164.00
	12L	15	STRP	1476.20	58.28	52.69	601.92	1904.96	1341.87	143.31	143.31
	12R	15	VALV	1476.18	56.08	46.44	601.92	1904.96	1341.87	N/A	
	13	16	VALV	1476.18	56.08	46.44	601.92	1831.39	1112.44	N/A	
	14L	17	VALV	1476.11	51.50	36.35	601.92	1742.84	971.08	N/A	
	14R	17	STRP	1476.11	47.46	30.32	601.92	1742.84	971.08	124.10	124.10
	15L	18	STRP	1475.93	38.64	31.50	601.92	2119.44	4261.59	285.68	285.68
	15R	18	STRP	1475.24	101.54	36.33	601.92	2119.44	4261.59	285.68	285.68
	16L	19	STRP	1475.24	101.54	36.33	601.92	1791.68	4791.76	306.18	306.18
	16R	19	BELB	1475.06	104.39	37.00	601.92	1791.68	4791.76	306.18	747.43
	17L	20	BELB	104.39	1475.06	37.00	1375.31	497.67	12425.55	745.03	1818.71
	17R	20	STRP	106.95	1474.93	38.68	1375.31	497.67	12425.55	745.03	745.03
	18L	21	STRP	106.95	1474.93	38.68	1375.31	541.86	18679.12	1115.79	1115.79
	18R	21	STRP	112.77	273.65	44.19	1375.31	541.86	18679.12	1115.79	1115.79
	19L	22	STRP	125.64	263.40	52.63	1375.31	4052.03	3299.87	321.78	321.78
	19R	22	BELB	134.76	55.37	243.46	1375.31	3299.87	4052.03	321.78	785.50
	20L	23	BELB	104.34	101.17	243.46	2592.41	5100.72	4572.24	436.14	1064.68
	20R	23	BELB	110.45	241.33	103.67	2592.41	4572.24	5100.72	436.14	1064.68
	21L	24	BELB	241.33	110.45	103.67	5312.56	2930.28	7742.70	585.76	1429.90
	21R	24	STRP	228.23	148.14	59.47	5312.56	3529.94	7438.83	585.76	585.76
	22	25	STRP	228.23	148.14	59.47	5312.56	2079.92	9354.42	652.98	652.98

RHC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (COCY). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

RUN NAME	SUP NO.	DCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	I*M/Z (PSI)
RUN2											
	23	77	STRP	290.94	183.79	80.89	3076.16	6167.29	14598.51	343.12	343.12
	24L	76	STRP	290.38	183.79	80.89	3076.16	1796.56	4411.98	120.52	120.52
	24R	76	STRP	290.78	161.13	58.06	3076.16	1796.56	4411.98	120.52	120.52
	25L	75	STRP	290.78	161.13	58.06	3076.16	2416.80	5188.92	138.12	138.12
	25R	75	STRP	290.58	116.25	47.67	3076.16	2416.80	5198.92	138.12	138.12
	26L	74	STRP	290.58	116.25	47.67	3076.16	4560.83	11126.57	263.81	263.81
	26R	74	STRP	290.34	100.93	52.69	3076.16	4560.83	11126.57	263.81	263.81
	27L	73	STRP	290.34	100.93	52.69	3076.16	5614.96	13704.55	321.50	321.50
	27R	73	STRP	290.10	109.64	64.71	3076.16	5614.96	13704.55	321.50	321.50
	28L	72	STRP	290.10	109.64	64.71	3076.16	6965.22	15953.53	375.72	375.72
	28R	72	STRP	289.83	117.55	71.29	3076.16	6965.22	15953.53	375.72	375.72
	29L	71	STRP	289.83	117.55	71.29	3076.16	8803.74	18471.28	439.79	439.79
	29R	71	STRP	289.45	305.97	330.11	3076.16	8803.74	18471.28	439.79	439.79
	30L	70	STRP	289.45	305.97	330.11	3076.16	8605.32	4512.14	217.57	217.57
	30R	70	STRP	289.16	283.79	327.52	3076.16	8605.32	4512.14	217.57	217.57
	31L	69	STRP	289.16	283.79	327.52	3076.16	10516.92	3920.33	247.35	247.35
	31R	69	BELB	288.99	390.31	162.48	3076.16	9719.70	5612.66	247.35	669.73
	32L	66	BELB	390.31	288.99	162.48	11999.09	4241.88	7749.87	316.70	857.50
	32R	66	BELB	377.43	151.41	238.64	11999.09	7749.87	4241.88	316.70	857.50
	33L	67	BELB	325.29	244.14	248.64	7269.88	9400.55	4463.44	269.81	730.53
	33R	67	STRP	325.54	199.80	235.71	7269.88	9400.55	4463.44	269.81	269.81
	34L	25	STRP	325.54	199.80	235.71	7269.88	9733.54	11353.71	353.42	353.42
	34R	25	STRP	271.29	337.56	276.47	12886.73	7514.97	10238.91	385.17	385.17
	35L	26	STRP	271.29	337.56	276.47	12886.73	17443.88	25674.10	714.32	714.32
	35R	26	STRP	271.50	290.57	236.97	12886.73	17443.88	25674.10	714.32	714.32
	36L	27	STRP	271.69	290.57	236.97	12886.73	32054.86	42236.51	1159.77	1159.77
	36R	27	STRP	271.86	279.90	192.26	12886.73	32054.86	42236.51	1159.77	1159.77
	37L	28	STRP	271.86	279.90	192.26	12886.73	43443.81	56377.34	1537.34	1537.34
	37R	28	STRP	272.03	284.79	168.67	12886.73	43443.81	56377.34	1537.34	1537.34
	38L	29	STRP	272.03	284.79	168.67	12886.73	52082.74	70481.85	1882.69	1882.69
	38R	29	STRP	272.19	533.88	162.57	12886.73	52082.74	70481.85	1882.69	1882.69
	39L	30	STRP	272.10	533.88	162.57	12886.73	56819.85	49554.02	1625.65	1625.65
	39R	30	STRP	272.11	511.61	480.62	12886.73	56819.85	49554.02	1625.65	1625.65
	40L	31	STRP	272.11	511.61	480.62	12886.73	46298.36	38710.90	1311.60	1311.60
	40R	31	STRP	116.27	471.09	470.16	12886.73	46298.36	38710.90	1311.60	1311.60
	41L	32	STRP	116.27	471.09	470.16	12886.73	23196.47	16978.32	669.56	669.56
	41R	32	STRP	116.19	368.50	417.11	12886.73	23196.47	16978.32	669.56	669.56
	42L	33	STRP	116.19	368.50	417.11	12886.73	3816.51	7243.74	324.50	324.50
	42R	33	STRP	116.04	231.11	324.89	12886.73	3816.51	7243.74	324.50	324.50
	43L	34	STRP	116.04	231.11	324.89	12886.73	13805.47	13851.39	497.78	497.78
	43R	34	STRP	115.91	149.79	250.86	12886.73	13805.47	13851.39	497.78	497.78
	44L	35	STRP	115.91	149.79	250.86	12886.73	16081.02	14595.53	536.72	536.72
	44R	35	BELB	115.74	148.22	217.48	12886.73	16081.02	14595.53	536.72	1904.28
	45L	36	BELB	149.22	115.74	217.48	10517.22	15322.52	15747.23	610.72	2166.80
	45R	36	BELB	149.14	174.76	110.00	10517.22	15747.23	15322.52	610.72	1653.58
	46L	37	BELB	174.76	149.14	110.00	15985.58	17419.69	16470.75	624.47	1690.81

IRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (COCY). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

RUN NAME	SUP NO.	PCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	IM/Z (PSI)
RUN2 (CONTD.)											
	45R	37	STRP	173.96	306.62	92.98	16985.58	17419.69	16470.75	624.47	624.47
	47L	38	STRP	173.96	306.62	92.98	16985.58	15694.81	11873.54	552.53	552.53
	47R	38	STRP	229.48	384.29	75.94	16985.58	15694.81	11873.54	552.53	552.53
	48L	39	STRP	229.48	384.29	75.94	16985.58	14723.76	14374.41	572.90	572.90
	49R	39	BELB	276.90	416.18	59.21	16985.58	14723.76	14374.41	572.90	1551.17
	49L	40	BELB	397.60	302.15	59.21	21441.71	6367.25	17121.32	598.68	1621.00
	49R	40	STRP	421.06	376.43	69.37	21441.71	6367.25	17121.32	598.68	598.68
	50L	41	STRP	421.06	376.43	69.37	21441.71	7896.00	22850.84	686.83	686.83
	50R	41	STRP	458.64	458.86	81.78	21441.71	7896.00	22850.84	686.83	686.83
	51L	42	STRP	458.58	458.86	81.78	21441.71	9536.50	35619.65	906.60	906.60
	51R	42	BELB	484.81	224.78	445.96	21441.71	31605.54	18994.58	906.60	2454.70
	52L	43	BELB	433.76	312.13	445.96	35377.19	19952.86	19806.11	960.43	2600.46
	52R	43	STRP	441.15	394.58	400.86	35377.19	24585.91	13635.67	960.43	960.43
	53L	44	STRP	441.15	394.58	400.86	35377.19	26495.25	18246.54	1016.31	1016.31
	53R	44	STRP	449.07	401.09	415.33	35377.19	26495.25	18246.54	1016.31	1016.31
	54L	45	STRP	449.07	401.09	415.33	35377.19	28731.50	22213.97	1077.59	1077.59
	54R	45	BELB	457.65	406.36	427.36	35377.19	28731.50	22213.97	1077.59	2917.68
	55L	46	BELB	521.23	320.68	427.36	5380.31	48325.87	25735.33	1169.30	3165.99
	55R	46	STRP	533.92	544.27	111.51	5380.31	16306.93	52256.45	1169.30	1169.30
	56L	47	STRP	533.92	544.27	111.51	5380.31	19772.81	64215.42	1432.65	1432.65
	56R	47	STRP	556.86	399.12	130.29	5380.31	19772.81	64215.42	1432.65	1432.65
	57L	48	STRP	556.86	399.12	130.29	5380.31	14844.29	45780.71	1029.27	1029.27
	57R	48	STRP	545.42	415.37	124.55	5380.31	14844.29	45730.71	1029.27	1029.27
	58L	49	STRP	545.42	415.37	124.55	5380.31	10496.08	26568.96	617.84	617.84
	58R	49	STRP	616.34	437.76	120.76	5380.31	10496.09	26568.96	617.84	617.84
	59L	50	STRP	616.34	437.76	120.76	5380.31	6997.49	6403.55	231.78	231.78
	59R	50	BELB	642.55	120.86	455.27	5380.31	6403.55	6997.49	231.78	627.56
	60L	51	BELB	120.86	642.55	455.27	2484.45	11071.99	6190.35	274.73	743.86
	60R	51	STRP	120.87	648.38	451.46	2484.45	11071.99	6190.35	274.73	274.73
	61L	52	STRP	120.87	648.38	451.46	2484.45	16163.82	13723.76	453.76	453.76
	61R	52	STRP	120.88	122.57	456.91	2484.45	16163.82	13723.76	453.76	453.76
	62L	53	STRP	120.88	122.57	456.91	2484.45	32496.78	13145.07	746.93	746.93
	62R	53	STRP	112.34	105.19	252.29	2484.45	32496.78	13145.07	746.93	746.93
	63L	54	STRP	112.34	105.19	252.29	2484.45	23063.04	12393.01	564.06	564.06
	63R	54	STRP	112.73	94.92	255.31	2484.45	23063.04	12393.01	564.06	564.06
	64L	55	STRP	112.73	94.92	255.31	2484.45	13519.00	12034.17	389.13	389.13
	64R	55	STRP	112.52	100.61	253.65	2484.45	13519.00	12034.17	389.13	389.13
	65L	56	STRP	112.52	100.61	253.65	2484.45	3868.81	11001.94	253.44	253.44
	65R	56	STRP	112.30	555.99	259.87	2484.45	3868.81	11001.94	253.44	253.44
	66L	57	STRP	112.30	555.99	259.87	2484.45	465.74	3072.88	84.57	84.57
	66R	57	BELB	112.10	270.33	544.18	2484.45	3072.88	465.74	84.57	228.98
	67L	58	BELB	279.21	87.67	544.18	5786.01	8123.65	3756.43	226.52	613.32
	67R	58	VALV	279.32	399.76	82.75	5783.54	3756.43	8125.40	N/A	
	68	59	VALV	279.32	399.76	82.75	5783.54	3615.75	13998.71	N/A	
	69L	60	VALV	249.56	23.96	89.27	7380.56	3103.55	13620.01	N/A	

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (CUCY). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

RUN NAME	SUP NO.	DCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	I*/Z (PSI)
RU 12 (CONTD.)											
	69R	60	STRP	280.66	190.05	42.94	7384.16	3103.55	13618.06	128.97	128.97
	70L	61	STRP	280.66	190.05	42.94	7384.16	1199.10	4335.40	72.71	72.71
	70R	61	STRP	280.72	272.80	47.84	7384.03	1199.10	4835.61	72.71	72.71
	71L	62	STRP	280.72	272.80	47.84	7384.03	1138.98	7351.46	89.07	89.07
	71R	62	STRP	280.75	301.63	50.30	7384.00	1138.98	7351.48	89.07	89.07
	72	63	STRP	280.75	301.63	50.30	7384.00	3420.64	21950.67	191.10	191.10

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (COCY), SUPPORT FORCES AND DEFORMATIONS

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
LX	1	SNGL	X						
				FORC	(LB)	GLBL	15.56	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	5022.77	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
LY	1	SNGL	Y						
				FORC	(LB)	GLBL	0.00	23.19	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	1805.77	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
LZ	1	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	83.68
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	438.99
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77X	77	SNGL	X						
				FORC	(LB)	GLBL	290.38	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	3076.16	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77Y	77	SNGL	Y						
				FORC	(LB)	GLBL	0.00	183.79	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	1157.29	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77Z	77	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	80.89
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	14598.51
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
83X	83	SNGL	X						
				FORC	(LB)	GLBL	272.18	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	4143.23	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
83Y	83	SNGL	Y						
				FORC	(LB)	GLBL	0.00	321.63	0.00
				DISP	(IN)	GLBL	.000	.000	.000

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 2 (COCY), SUPPORT FORCES AND DEFORMATIONS (CONTD.)

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
63Y (CONTD.)				MOMT	(LB.IN)	GLBL	0.00	3420.64	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
63Z	63	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	85.24
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	22784.81
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
147X	14	SNGL	INCL						
				FORC	(LB)	LOCL	96.31		
				FORC	(LB)	GLBL	68.10	0.00	68.10
				DISP	(IN)	LOCL	.000	.000	.008
14Y	14	SNGL	Y						
				FORC	(LB)	GLBL	0.00	1488.77	0.00
				DISP	(IN)	GLBL	.006	.000	.006
19XZ	19	SNGL	INCL						
				FORC	(LB)	LOCL	97.47		
				FORC	(LB)	GLBL	68.92	0.00	68.92
				DISP	(IN)	LOCL	.000	.001	.037
21Y	21	SNGL	Y						
				FORC	(LB)	GLBL	0.00	1746.21	0.00
				DISP	(IN)	GLBL	.029	.000	.025
29Y	29	SNGL	Y						
				FORC	(LB)	GLBL	0.00	755.55	0.00
				DISP	(IN)	GLBL	.023	.000	.000
30X	30	SNGL	X						
				FORC	(LB)	GLBL	607.49	0.00	0.00
				DISP	(IN)	GLBL	.000	.043	.000
31Z	31	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	353.82
				DISP	(IN)	GLBL	.029	.071	.000
47X	47	SNGL	X						
				FORC	(LB)	GLBL	354.99	0.00	0.06
				DISP	(IN)	GLBL	.000	.004	.000

NRC/PNR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS** .

RESPONSE SPECTRUM ANALYSIS NO. 2 (OBEY), SUPPORT FORCES AND DEFORMATIONS (CONTD.)

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
47X (CONT.)									
47Z	47	SNGL	Z						
				FORC	(LB)	GLBL	1.00	0.00	220.32
				DISP	(IN)	GLBL	.000	.004	.000
52Y	52	SNGL	Y						
				FORC	(LB)	GLBL	0.00	677.67	0.00
				DISP	(IN)	GLBL	.003	.000	.000
53X	53	SNGL	X						
				FORC	(LB)	GLBL	726.28	0.00	0.00
				DISP	(IN)	GLBL	.000	.003	.000
53Z	53	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	97.29
				DISP	(IN)	GLBL	.000	.003	.000
56Y	56	SNGL	Y						
				FORC	(LB)	GLBL	0.00	541.00	0.00
				DISP	(IN)	GLBL	.002	.000	.000
71Y	71	SNGL	Y						
				FORC	(LB)	GLBL	0.00	334.30	0.00
				DISP	(IN)	GLBL	.000	.000	.000
71Z	71	SNGL	Z						
				FORC	(LB)	GLBL	1.00	0.00	379.23
				DISP	(IN)	GLBL	.000	.000	.000

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 Z RESPONSE

RESULTS SET NAME (INERTIA ONLY) = COCZ

EXCITATION OPTION = SMPL (SIMPLE EXCITATION)

RESULTS SET NAME (INERT + ANCH) = (NO ANCHOR MOVEMENTS)

MISSING MASS OPTION = NOMM (NO CORRECTION)

MODE COMBINATION OPTION = MCQC (CQC METHOD)

DAMPING RATIO (ALL MODES) = 0.000

ACCELERATIONS CODE = (NO ACCELERATION POINTS)
ACCELERATION CUT-OFF (G) = 0.00

NO. OF NEW SUPPORT LEVELS = 0

RESPONSE SPECTRA

X SPECTRUM	Y SPECTRUM	Z SPECTRUM	SCALE FACTOR
		HORZ	1.000

CQC COMBINATION CASE = WHITE NOISE

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (COQZ), FORCES AND MOMENTS IN LOCAL COORDINATES (MISC. MEMB. ONLY)

ROW GROUP	SUP MMB	DCP NAME	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	XX MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)
MISC								
	DPL	59	62.62	74.71	390.71	0.00	9377.11	1793.10
		61	62.62	74.71	390.71	0.00	.00	.00

NPC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (COCZ), GLOBAL DISPLACEMENTS AT DISPLACEMENT OUTPUT POINTS

RUN NAME	DOP NO.	DCP NAME	X DISPL (IN)	Y DISPL (IN)	Z DISPL (IN)	XX ROTN (RAD)	YY ROTN (RAD)	ZZ ROTN (RAD)
RUN1								
	1	1	.000	.000	.000	.00000	.00000	.00000
	2	5	.000	.000	.004	.00011	.00002	.00001
	3	6	.000	.000	.004	.00011	.00003	.00001
	4	7	.000	.001	.006	.00003	.00012	.00002
	5	8	.007	.002	.006	.00005	.00018	.00004
	6	9	.018	.003	.006	.00001	.00026	.00008
	7	10	.021	.001	.011	.00024	.00048	.00013
	8	11	.021	.001	.013	.00024	.00048	.00013
	9	12	.021	.000	.015	.00024	.00048	.00013
	10	13	.021	.000	.019	.00014	.00043	.00016
	11	14	.019	.000	.019	.00012	.00042	.00016
	12	15	.018	.000	.020	.00010	.00041	.00016
	13	16	.017	.000	.020	.00009	.00040	.00017
	14	17	.015	.000	.021	.00009	.00039	.00017
	15	18	.013	.000	.013	.00026	.00020	.00013
	16	19	.014	.000	.014	.00025	.00019	.00011
	17	20	.014	.000	.014	.00013	.00015	.00005
	18	21	.014	.000	.013	.00012	.00016	.00006
	19	22	.014	.009	.003	.00006	.00013	.00014
	20	23	.014	.011	.003	.00005	.00006	.00013
	21	24	.013	.011	.002	.00007	.00009	.00016
	22	25	.013	.011	.000	.00008	.00013	.00014
RUN2								
	23	77	.000	.000	.000	.00000	.00000	.00000
	24	76	.000	.001	.003	.00002	.00009	.00002
	25	75	.000	.002	.008	.00004	.00006	.00002
	26	74	.001	.003	.009	.00006	.00003	.00001
	27	73	.000	.003	.007	.00007	.00008	.00002
	28	72	.000	.002	.003	.00008	.00010	.00003
	29	71	.000	.000	.000	.00009	.00007	.00005
	30	70	.000	.003	.002	.00011	.00002	.00007
	31	69	.000	.004	.002	.00011	.00002	.00007
	32	68	.002	.006	.001	.00010	.00012	.00011
	33	67	.004	.007	.000	.00009	.00015	.00012
	34	25	.011	.011	.000	.00008	.00013	.00014
	35	26	.013	.014	.000	.00006	.00009	.00015
	36	27	.021	.015	.000	.00004	.00005	.00017
	37	28	.017	.011	.000	.00011	.00011	.00019
	38	29	.008	.000	.000	.00022	.00017	.00022
	39	30	.000	.013	.000	.00027	.00021	.00023
	40	31	.005	.016	.000	.00030	.00023	.00024
	41	32	.017	.032	.000	.00033	.00026	.00026
	42	33	.030	.049	.000	.00034	.00028	.00028
	43	34	.044	.065	.000	.00033	.00029	.00030
	44	35	.060	.068	.000	.00032	.00028	.00031
	45	36	.066	.071	.000	.00028	.00029	.00035

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (COQZ), GLOBAL DISPLACEMENTS AT DISPLACEMENT OUTPUT POINTS (CONT.)

RUN NAME	DOP NO.	DCP NAME	X DISPL (IN)	Y DISPL (IN)	Z DISPL (IN)	XX ROTN (RAD)	YY ROTN (RAD)	ZZ ROTN (RAD)
RUN2 (CONTD.)								
	46	37	.039	.054	.006	.00021	.00032	.00045
	47	38	.039	.046	.017	.00020	.00031	.00046
	48	39	.039	.034	.024	.00020	.00029	.00046
	49	40	.037	.029	.026	.00025	.00015	.00044
	50	41	.026	.018	.022	.00027	.00011	.00043
	51	42	.015	.008	.017	.00028	.00008	.00041
	52	43	.013	.006	.015	.00030	.00010	.00034
	53	44	.010	.003	.012	.00030	.00010	.00033
	54	45	.008	.002	.010	.00029	.00009	.00031
	55	46	.006	.002	.006	.00020	.00012	.00018
	56	47	.000	.002	.000	.00014	.00012	.00013
	57	48	.004	.001	.004	.00004	.00011	.00036
	58	49	.006	.001	.004	.00003	.00011	.00032
	59	50	.006	.001	.001	.00006	.00011	.00033
	60	51	.004	.000	.000	.00004	.00009	.00004
	61	52	.003	.000	.000	.00003	.00008	.00004
	62	53	.000	.001	.000	.00002	.00005	.00004
	63	54	.001	.001	.000	.00000	.00003	.00004
	64	55	.002	.001	.000	.00002	.00001	.00005
	65	56	.002	.000	.000	.00003	.00003	.00005
	66	57	.001	.001	.000	.00003	.00003	.00005
	67	58	.000	.001	.002	.00005	.00004	.00001
	68	59	.000	.001	.002	.00005	.00003	.00001
	69	60	.000	.001	.003	.00005	.00002	.00001
	70	61	.000	.001	.003	.00003	.00002	.00001
	71	62	.000	.000	.001	.00002	.00003	.00001
	72	63	.000	.000	.000	.00000	.00000	.00000
MISC. NODES								
	73	81	.001	.001	.004	.00006	.00003	.00001

ARC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (CQCQZ). ABSOLUTE GLOBAL ACCELERATIONS (MULTIPLES OF GRAVITY)

POINT NAME	X ACCEL	Y ACCEL	Z ACCEL	X-Z ACCEL	X-Y-Z ACCEL
1	.000	.000	.423	.423	.423
5	.004	.000	.428	.428	.428
6	.005	.000	.430	.430	.430
7	.008	.025	.436	.436	.437
8	.112	.075	.436	.450	.456
9	.267	.032	.437	.512	.518
10	.314	.034	.457	.556	.559
11	.312	.022	.471	.566	.565
12	.309	.012	.493	.574	.574
13	.296	.000	.508	.588	.588
14	.289	.000	.517	.588	.588
15	.278	.000	.518	.588	.588
16	.270	.000	.522	.587	.587
17	.262	.000	.524	.586	.586
18	.138	.003	.445	.466	.466
19	.143	.003	.454	.476	.476
20	.146	.002	.467	.489	.489
21	.146	.000	.465	.487	.487
22	.145	.071	.425	.449	.455
23	.143	.079	.424	.449	.456
24	.111	.095	.424	.438	.448
25	.156	.095	.423	.450	.460
77	.000	.000	.423	.423	.423
76	.001	.028	.457	.457	.458
75	.002	.056	.597	.597	.601
74	.003	.072	.630	.630	.634
73	.004	.055	.550	.550	.553
72	.004	.028	.455	.455	.456
71	.005	.000	.423	.423	.423
70	.006	.044	.430	.430	.432
69	.006	.049	.430	.430	.433
68	.051	.070	.423	.426	.432
67	.091	.083	.423	.432	.440
25	.156	.095	.423	.450	.460
26	.150	.072	.423	.449	.454
27	.144	.099	.423	.446	.457
28	.155	.090	.423	.450	.459
29	.061	.000	.423	.427	.427
30	.003	.066	.423	.423	.424
31	.025	.096	.423	.423	.434
32	.084	.131	.423	.431	.450
33	.121	.121	.423	.440	.456
34	.112	.132	.423	.437	.457
35	.109	.143	.423	.436	.459
36	.079	.154	.424	.432	.462
37	.100	.137	.443	.454	.474
38	.100	.149	.537	.547	.555
39	.100	.176	.623	.641	.646

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDE) NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (CQCZ), ABSOLUTE GLOBAL ACCELERATIONS (MULTIPLES OF GRAVITY) (CONTD.)

POINT NAME	X ACCEL	Y ACCEL	Z ACCEL	X-Z ACCEL	X-Y-Z ACCEL
40	.096	.173	.641	.648	.671
41	.079	.130	.589	.595	.609
42	.113	.109	.534	.546	.557
43	.124	.097	.517	.531	.540
44	.133	.074	.491	.509	.514
45	.139	.070	.473	.493	.493
46	.121	.074	.469	.455	.471
47	.000	.074	.423	.423	.429
48	.125	.074	.438	.455	.461
49	.171	.074	.440	.473	.478
50	.164	.073	.425	.456	.462
51	.119	.024	.423	.449	.440
52	.089	.000	.423	.432	.432
53	.000	.045	.423	.423	.425
54	.093	.056	.423	.433	.435
55	.159	.039	.423	.452	.453
56	.144	.000	.423	.449	.449
57	.116	.021	.424	.439	.440
58	.029	.058	.459	.460	.464
59	.039	.061	.439	.490	.494
60	.045	.063	.514	.516	.520
61	.044	.051	.509	.511	.513
62	.013	.020	.439	.439	.439
63	.000	.000	.423	.423	.423
31	.073	.062	.571	.575	.579

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (CQUZ). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS

PIPE NAME	SUP NO.	DCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	I*M/Z (PSI)
RUN1											
	1	1	STRP	82.11	13.69	525.25	2684.43	31054.62	1324.69	663.10	663.10
	2L	5	STRP	82.11	13.69	525.25	2684.43	3758.66	1113.53	100.98	100.98
	2R	5	STRP	82.07	12.91	509.77	2684.43	3758.66	1113.53	282.92	282.92
	3L	6	STRP	82.07	12.91	509.77	2684.43	1740.05	1116.50	201.77	201.77
	3R	6	BELB	82.06	506.12	12.74	2684.43	1116.50	1740.05	201.77	492.54
	4L	7	BELB	506.12	82.06	12.74	1140.64	2714.26	3432.19	269.28	657.34
	4R	7	STRP	492.82	83.34	12.82	1140.64	2714.26	3432.19	269.28	269.28
	5L	8	STRP	492.82	83.34	12.82	1140.64	2937.39	728.16	192.59	192.59
	5R	8	STRP	473.42	79.82	29.76	1140.64	2937.39	728.16	192.59	192.59
	6L	9	STRP	473.42	79.82	29.76	1140.64	4301.38	4142.88	362.05	362.05
	6R	9	BELB	459.48	100.90	21.99	1140.64	399.17	5958.69	362.05	883.82
	7L	10	BELB	100.90	459.48	21.99	341.22	1160.56	1902.16	129.25	315.52
	7R	10	STRP	112.76	26.47	450.29	341.22	1802.16	1160.56	129.25	129.25
	8L	11	STRP	112.76	26.47	450.29	341.22	1040.35	1137.69	94.02	94.02
	8R	11	STRP	116.98	29.02	446.26	341.22	1040.35	1137.69	94.02	94.02
	9L	12	STRP	116.98	29.02	446.26	341.22	2352.64	1119.61	156.48	156.48
	9R	12	BELB	123.43	33.36	439.28	341.22	2352.64	1119.61	156.48	381.98
	10L	13	BELB	75.47	103.20	439.28	3045.14	5425.54	915.87	374.48	914.16
	10R	13	STRP	75.47	113.06	429.86	3045.14	5425.54	915.87	374.48	374.48
	11L	14	STRP	75.47	113.06	429.86	3045.14	7574.13	1030.29	489.97	489.97
	11R	14	STRP	390.21	163.82	146.77	3045.14	7574.13	1030.29	489.97	489.97
	12L	15	STRP	390.21	163.82	146.77	3045.14	8930.95	1415.21	568.17	568.17
	12R	15	VALV	390.19	121.14	100.48	3045.14	8930.95	1415.21	N/A	
	13	16	VALV	390.19	121.14	100.48	3045.14	9701.69	2259.44	N/A	
	14L	17	VALV	390.15	53.40	29.61	3045.14	9792.56	2605.57	N/A	
	14R	17	STRP	390.53	39.47	75.29	3045.14	9792.56	2605.57	630.08	630.08
	15L	18	STRP	389.93	72.16	130.47	3045.14	2344.30	3835.44	323.32	323.32
	15R	18	STRP	389.56	96.51	33.33	3045.14	2344.30	3835.44	323.32	323.32
	16L	19	STRP	389.56	96.51	33.33	3045.14	2151.17	3146.67	290.52	290.52
	16R	19	BELB	399.44	101.82	31.50	3045.14	2151.17	3146.67	290.52	709.20
	17L	20	BELB	101.82	389.44	31.50	1897.08	2853.54	3353.05	285.91	697.93
	17R	20	STRP	106.75	389.41	33.15	1897.08	2853.54	3353.05	285.91	285.91
	18L	21	STRP	106.75	389.41	33.15	1897.08	2765.61	4855.89	351.42	351.42
	18R	21	STRP	117.17	81.55	43.67	1897.08	2765.61	4855.89	351.42	351.42
	19L	22	STRP	138.19	77.40	60.98	1897.08	2627.71	2236.22	236.18	236.18
	19R	22	BELB	152.39	63.91	72.72	1897.08	2286.22	2627.71	236.18	576.54
	20L	23	BELB	122.85	110.10	72.72	2823.64	1760.47	2344.01	260.66	636.30
	20R	23	BELB	129.77	70.37	114.33	2823.64	2844.01	1760.47	260.66	636.30
	21L	24	BELB	70.37	129.77	114.33	3179.59	1875.05	2210.27	256.20	625.42
	21R	24	STRP	68.29	169.99	66.18	3179.59	1179.91	2547.44	256.20	256.20
	22	25	STRP	68.29	169.99	66.18	3179.59	1634.73	5729.44	402.16	402.16

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (COCZ). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

RUN NAME	SUP NO.	DCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	I*M/Z (PSI)
RUN2											
	23	77	STRP	219.76	70.84	363.41	2151.57	23809.17	5264.56	520.28	520.28
	24L	76	STRP	219.76	70.84	363.41	2151.57	3108.57	1337.55	85.59	85.59
	24R	76	STRP	219.48	58.55	270.22	2151.57	3108.57	1337.55	85.59	85.59
	25L	75	STRP	219.48	58.55	270.22	2151.57	12309.79	2158.78	269.53	269.53
	25R	75	STRP	218.93	35.78	45.83	2151.57	12309.79	2158.78	269.53	269.53
	26L	74	STRP	218.93	35.78	45.83	2151.57	14864.85	3810.05	329.34	329.34
	26R	74	STRP	218.25	35.68	161.57	2151.57	14864.85	3810.05	329.34	329.34
	27L	73	STRP	219.25	35.68	161.57	2151.57	8963.55	4232.55	216.04	216.04
	27R	73	STRP	217.62	45.87	283.42	2151.57	8963.55	4282.55	216.04	216.04
	28L	72	STRP	217.62	45.87	283.42	2151.57	2283.30	4791.47	121.73	121.73
	28R	72	STRP	216.88	51.82	341.83	2151.57	2283.30	4791.47	121.73	121.73
	29L	71	STRP	216.88	51.82	341.83	2151.57	14382.83	5704.09	332.02	332.02
	29R	71	STRP	215.99	97.66	225.40	2151.57	14382.83	5704.09	332.02	332.02
	30L	70	STRP	215.99	97.66	225.40	2151.57	6514.78	2755.27	157.14	157.14
	30R	70	STRP	215.13	91.27	242.52	2151.57	6514.78	2755.27	157.14	157.14
	31L	69	STRP	215.13	91.27	242.52	2151.57	6298.18	2821.49	153.64	153.64
	31R	69	9ELB	214.68	169.37	207.71	2151.57	4976.57	4791.39	153.64	416.01
	32L	68	8ELB	169.37	214.68	207.71	6469.16	2242.31	2692.47	156.37	423.39
	32R	68	8ELB	175.26	204.94	210.04	6469.16	2692.47	2242.31	156.37	423.39
	33L	67	8ELB	257.40	80.38	210.04	5697.00	2977.98	3338.48	159.13	430.87
	33R	67	STRP	260.75	68.19	197.23	5697.00	2977.98	3338.48	159.13	159.13
	34L	25	STRP	260.75	68.19	197.23	5697.00	10193.94	6018.05	279.22	279.22
	34R	25	STRP	253.24	94.76	117.25	3182.24	8527.64	4997.57	220.60	220.60
	35L	26	STRP	253.24	94.76	117.25	3182.24	11156.66	6941.38	287.35	287.35
	35R	26	STRP	257.50	86.19	92.18	3182.24	11156.66	6941.38	287.35	287.35
	36L	27	STRP	257.50	86.19	92.18	3182.24	12940.60	10605.56	361.98	361.98
	36R	27	STRP	261.00	71.62	99.92	3182.24	12940.60	10605.56	361.98	361.98
	37L	28	STRP	261.00	71.62	99.92	3182.24	12099.54	13294.71	388.01	388.01
	37R	28	STRP	263.31	91.80	143.51	3182.24	12099.54	13294.71	388.01	388.01
	38L	29	STRP	263.31	91.80	143.51	3182.24	12418.40	16050.91	436.77	436.77
	38R	29	STRP	264.18	145.78	166.74	3182.24	12418.40	16050.91	436.77	436.77
	39L	30	STRP	264.18	145.78	166.74	3182.24	16058.04	11455.29	424.66	424.66
	39R	30	STRP	264.36	132.51	153.47	3182.24	16058.04	11455.29	424.66	424.66
	40L	31	STRP	264.36	132.51	153.47	3182.24	13464.28	9455.26	356.17	356.17
	40R	31	STRP	263.25	112.80	143.94	3182.24	13464.28	9455.26	356.17	356.17
	41L	32	STRP	263.25	112.80	143.94	3182.24	9377.45	6410.23	250.72	250.72
	41R	32	STRP	262.30	86.90	125.53	3182.24	9377.45	6410.23	250.72	250.72
	42L	33	STRP	262.30	86.90	125.53	3182.24	8634.03	4510.19	217.81	217.81
	42R	33	STRP	262.20	78.42	103.45	3182.24	8634.03	4510.19	217.81	217.81
	43L	34	STRP	262.20	78.42	103.45	3182.24	9804.47	3540.61	231.65	231.65
	43R	34	STRP	261.57	71.23	93.91	3182.24	9804.47	3540.61	231.65	231.65
	44L	35	STRP	261.57	71.23	93.91	3182.24	10178.73	3546.87	238.87	238.87
	44R	35	8ELB	261.73	72.11	99.67	3182.24	10178.73	3546.87	238.87	847.52
	45L	36	8ELB	72.11	291.25	99.67	10694.07	3601.14	4556.96	258.65	917.69
	45R	36	9ELB	95.35	97.77	239.20	10694.07	4556.96	3601.14	258.65	700.33
	46L	37	9ELB	97.73	95.66	239.20	6822.46	6278.79	4261.46	247.33	569.68

VRC/EPP PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (COCZ), FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

RUN NAME	SUP NO.	DCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORS MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	IM/Z (PSI)
RUN2 (CONTD.)											
46R	37	STRP		89.00	105.23	258.39	8822.46	6278.79	4261.46	247.33	247.33
47L	37	STRP		89.00	105.23	258.39	8822.46	7306.34	4872.23	264.58	264.58
47R	38	STRP		91.46	111.22	158.56	8822.46	7306.34	4872.23	264.58	264.58
48L	39	STRP		91.46	111.22	158.56	8822.46	10738.00	6172.10	323.20	323.20
48R	39	BELB		97.74	117.78	91.37	8822.46	10738.00	6172.10	323.20	875.10
49L	40	BELB		134.35	73.30	31.37	5250.54	13788.37	6524.54	343.75	930.73
49R	40	STRP		141.60	98.80	61.10	5250.54	13788.37	6524.54	343.75	343.75
50L	41	STRP		141.60	98.80	61.10	5250.54	12555.73	6860.77	323.93	323.93
50R	41	STRP		155.82	127.45	180.23	5250.54	12555.73	6960.77	323.93	323.93
51L	42	STRP		155.82	127.45	180.23	5250.54	6635.74	8713.29	258.15	258.15
51R	42	BELB		166.84	221.28	173.26	5250.54	8359.01	7076.83	258.15	698.97
52L	43	BELB		184.45	206.86	170.26	8791.45	4854.76	5934.31	248.15	671.89
52R	43	STRP		191.32	222.79	193.24	8791.45	6707.08	3746.67	248.15	248.15
53L	44	STRP		191.32	222.79	193.24	8791.45	6424.30	4334.15	249.09	249.09
53R	44	STRP		198.40	230.09	209.58	8791.45	6424.30	4334.15	249.09	249.09
54L	45	STRP		198.90	238.09	209.58	8791.45	6885.52	6002.81	269.46	269.46
54R	45	BELB		207.34	249.22	225.21	8791.45	6885.52	6002.81	269.46	729.60
55L	46	BELB		167.67	277.46	225.21	1438.00	12444.03	8832.16	326.51	884.05
55R	46	STRP		167.31	180.16	346.74	1438.00	9509.87	11978.60	326.51	326.51
56L	47	STRP		167.31	180.16	346.74	1438.00	21608.23	15127.16	561.45	561.45
56R	47	STRP		170.46	120.82	131.50	1438.00	21608.23	15127.16	561.45	561.45
57L	48	STRP		170.46	120.82	131.50	1438.00	16174.10	11275.06	420.16	420.16
57R	48	STRP		179.33	102.47	153.34	1438.00	16174.10	11275.06	420.16	420.16
58L	49	STRP		179.33	102.47	153.34	1438.00	9461.89	7558.54	259.20	259.20
58R	49	STRP		192.99	115.10	185.22	1438.00	9461.89	7558.54	259.20	259.20
59L	50	STRP		192.99	115.10	185.22	1438.00	2301.01	2473.94	78.04	78.04
59R	50	BELB		206.73	195.27	143.16	1438.00	2473.94	2301.01	78.04	211.31
60L	51	BELB		195.27	206.73	143.16	760.52	2943.28	3136.74	92.84	251.38
60R	51	STRP		195.38	209.64	153.36	760.52	2943.28	3136.74	92.84	92.84
61L	52	STRP		195.38	209.64	153.36	760.52	4601.57	4878.56	143.45	143.45
61R	52	STRP		195.43	46.45	153.58	760.52	4601.57	4878.56	143.45	143.45
62L	53	STRP		195.43	46.45	153.58	760.52	10266.25	4330.37	237.78	237.78
62R	53	STRP		1110.84	45.65	146.01	760.52	10266.25	4330.37	237.78	237.78
63L	54	STRP		1110.84	45.65	146.01	760.52	7320.34	4025.73	178.30	178.30
63R	54	STRP		1107.57	49.33	126.01	760.52	7320.34	4025.73	178.30	178.30
64L	55	STRP		1107.57	49.33	126.01	760.52	6537.39	3780.57	161.32	161.32
64R	55	STRP		1101.04	53.91	98.84	760.52	6537.39	3780.57	161.32	161.32
65L	56	STRP		1101.04	53.91	98.84	760.52	6632.90	4036.43	165.82	165.82
65R	56	STRP		1094.17	215.23	90.98	760.52	6632.90	4036.43	165.82	165.82
66L	57	STRP		1094.17	215.23	90.98	760.52	6681.01	2517.42	152.60	152.60
66R	57	BELB		1088.00	91.76	211.30	760.52	2517.42	6681.01	152.60	413.19
67L	58	BELB		178.51	1077.17	211.30	4139.77	3282.80	10239.37	244.89	663.07
67R	59	VALV		130.56	161.00	915.66	4138.91	10239.37	3283.88	N/A	
68	59	VALV		130.56	161.00	915.66	4138.91	23917.97	5680.39	N/A	
69L	60	VALV		107.54	13.67	133.82	6253.59	25981.02	5936.83	N/A	

NRC/RHR PIPING MODEL PROBLEM II**ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 1 (COCZ). FORCES, MOMENTS AND STRESSES ALONG PIPE RUNS (CONTD.)

RUN NAME	SUP NO.	PCP NAME	COMP TYPE	AXIAL FORCE (LB)	Y FORCE (LB)	Z FORCE (LB)	TORSN MOMENT (LB.IN)	YY MOMENT (LB.IN)	ZZ MOMENT (LB.IN)	M/Z (PSI)	IM/Z (PSI)
RUN2 (CONTD.)											
	69R	60	STRP	199.73	69.82	207.51	6253.16	25981.02	5937.28	223.46	223.46
	70L	61	STRP	199.73	69.82	207.51	6253.16	16339.26	2874.53	144.73	144.73
	70R	61	STRP	200.75	109.26	434.16	6253.20	16339.26	2874.44	144.73	144.73
	71L	62	STRP	200.75	109.26	434.16	6253.20	4045.67	2594.34	64.38	64.38
	71R	62	STRP	201.27	124.56	534.04	6253.20	4045.67	2594.35	64.38	64.38
	72	63	STRP	201.27	124.56	534.04	6253.20	28872.33	8214.68	250.30	250.30

NRC/PNR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (CQCZ), SUPPORT FORCES AND DEFORMATIONS

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
1X	1	SNGL	X						
				FORC	(LB)	GLBL	13.69	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	31054.62	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
1Y	1	SNGL	Y						
				FORC	(LB)	GLBL	0.00	82.11	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	2684.43	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
1Z	1	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	525.25
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	1324.69
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77X	77	SNGL	X						
				FORC	(LB)	GLBL	219.76	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	2151.57	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77Y	77	SNGL	Y						
				FORC	(LB)	GLBL	0.00	70.84	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	23809.17	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
77Z	77	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	363.41
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	5264.56
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
63X	63	SNGL	X						
				FORC	(LB)	GLBL	270.39	0.00	0.00
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	6408.59	0.00	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
63Y	63	SNGL	Y						
				FORC	(LB)	GLBL	0.00	124.56	0.00
				DISP	(IN)	GLBL	.000	.000	.000

4RC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (DOCZ), SUPPORT FORCES AND DEFORMATIONS (CONTD.)

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
63Y (CONTD.)									
				MOMT	(LB.IN)	GLBL	0.00	28872.33	0.00
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
63Z	63	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	502.60
				DISP	(IN)	GLBL	.000	.000	.000
				MOMT	(LB.IN)	GLBL	0.00	0.00	8093.90
				ROTN	(RAD)	GLBL	.0000	.0000	.0000
14ZX	14	SNGL	INCL						
				FORC	(LB)	LOCL	396.53		
				FORC	(LB)	GLBL	280.42	0.00	280.42
				DISP	(IN)	LOCL	.000	.000	.027
14Y	14	SNGL	Y						
				FORC	(LB)	GLBL	0.00	435.30	0.00
				DISP	(IN)	GLBL	.019	.000	.019
18XZ	18	SNGL	INCL						
				FORC	(LB)	LOCL	207.21		
				FORC	(LB)	GLBL	146.52	0.00	146.52
				DISP	(IN)	LOCL	.000	.000	.019
21Y	21	SNGL	Y						
				FORC	(LB)	GLBL	0.00	454.22	0.00
				DISP	(IN)	GLBL	.014	.000	.013
29Y	29	SNGL	Y						
				FORC	(LB)	GLBL	0.00	190.35	0.00
				DISP	(IN)	GLBL	.003	.000	.000
30X	30	SNGL	X						
				FORC	(LB)	GLBL	264.38	0.00	0.00
				DISP	(IN)	GLBL	.000	.010	.000
31Z	31	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	381.35
				DISP	(IN)	GLBL	.005	.015	.000
47X	47	SNGL	X						
				FORC	(LB)	GLBL	245.27	0.00	0.00
				DISP	(IN)	GLBL	.000	.002	.000

NRC/RHR PIPING MODEL PROBLEM II***ELBOW FLEX. INCLUDED NO MISSING MASS**

RESPONSE SPECTRUM ANALYSIS NO. 3 (CODE), SUPPORT FORCES AND DEFORMATIONS (CONTD.)

SUPP NAME	SUPP LOCN	SUPP TYPE	DIRN CODE	RESULT TYPE	RESULT UNIT	AXIS TYPE	X-AXIS	Y-AXIS	Z-AXIS
47X (CONTD.)									
47Z	47	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	466.34
				DISP	(IN)	GLBL	.000	.002	.000
52Y	52	SNGL	Y						
				FORC	(LB)	GLBL	0.00	225.91	0.00
				DISP	(IN)	GLBL	.003	.000	.000
53X	53	SNGL	X						
				FORC	(LB)	GLBL	293.20	0.00	0.00
				DISP	(IN)	GLBL	.000	.001	.000
53Z	53	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	1069.76
				DISP	(IN)	GLBL	.000	.001	.000
55Y	55	SNGL	Y						
				FORC	(LB)	GLBL	0.00	215.43	0.00
				DISP	(IN)	GLBL	.002	.000	.000
71Y	71	SNGL	Y						
				FORC	(LB)	GLBL	0.00	134.65	0.00
				DISP	(IN)	GLBL	.000	.000	.000
71Z	71	SNGL	Z						
				FORC	(LB)	GLBL	0.00	0.00	548.47
				DISP	(IN)	GLBL	.000	.000	.000

2.0 REVISED TEST PROBLEMS

2.3 Primary/Secondary Interaction Using FLORA/SUPERPIPE

Test Problem IV

This problem involved the calculation of the response of two secondary piping systems by using the program SUPERPIPE and the floor spectra for the pipes attachment points generated from the program FLORA considering primary/secondary system interaction. The primary structure and the ground input spectrum were the same as Problem III, Reference [1]. The secondary structures (Case 1 and Case 2) are attached to the primary structure at node 4 for Case 1, and nodes 4, 7 and 1[illegible] for Case 2, respectively. A figure of the secondary structures, the secondary structural properties, and the results of the analysis were provided in Reference [1].

After the NRC reviewed the original report, significant differences were found to exist between Impell's results and the NRC consultant's results for the Case 2 model. Several additional studies were requested to resolve the differences between two groups such as a fine vs. crude mass model, and the inclusion of the pseudo-static response. After the studies were concluded and reviewed, the NRC's consultant still felt a modeling problem remained.

A close review of the test problem showed that the coupled primary/secondary model could not be analyzed as an uncoupled system because of the fixed attachment points between the primary structure and the secondary structure. The fixity at each attachment point causes support rotational inertia forces and support rotational displacement forces to be induced into the secondary system. These support rotational forces could not be easily duplicated with the uncoupled model.

In order to eliminate any question of a modeling problem, NRC's consultant suggested a revised Case 2 piping model (see attached record of conversation 6/6[illegible]) in which the horizontal members of the secondary system [illegible] the primary structure, [illegible] the [illegible] that the [illegible] would [illegible] secondary [illegible]

After analyzing these new models, the results of the uncoupled primary/secondary system using the multilevel response spectrum technique were found to be very conservative when compared to the time history analysis results. It was determined that this test problem is an ill-conditioned example for demonstrating the multilevel response spectrum (MLRS) method. The absolute summation method used in combining the multilevel responses introduced significant conservatism into the resultant responses.

The NRC consultants felt that since the MLRS response from the latest problem was higher than the time history results, the MLRS technique was acceptable. SCE considers this test problem as a non-representative test of the adequacy of the multilevel response spectrum method and, therefore, has decided to discontinue any further efforts on this test problem.

Conclusions

SCE feels the multilevel response spectrum technique is valid and intends to utilize this methodology in conformance with the criteria set forth in NUREG 1061, Appendix A. Furthermore, SCE intends to perform the new benchmark piping problem to be provided by the NRC at a future date.

REFERENCES

[1] "Methodology Test Problems SONGS-1 Long Term Service Program" Impell Report No. 01-0310-1389, April 15, 1985.