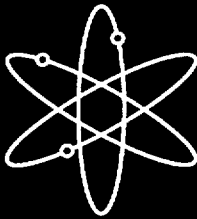


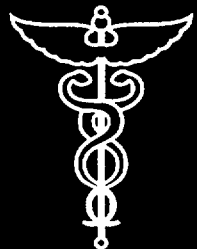
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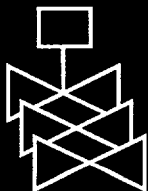
Appendices



Los Alamos National Laboratory



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TRAC-M/F77, Version 5.5 Developmental Assessment Manual

Appendices

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**TRAC-M/F77, VERSION 5.5
DEVELOPMENTAL ASSESSMENT MANUAL**

VOLUME II: APPENDICES

by

B. E. Boyack, J. F. Lime, D. A. Pimentel, J. W. Spore, and J. L. Steiner

ABSTRACT

Los Alamos National Laboratory has developed the Transient Reactor Analysis Code (TRAC) to provide advanced, best-estimate simulations of real and postulated transients in pressurized water reactors (PWRs) and for many related thermal-hydraulic facilities. The modernized TRAC-M/F77, Version 5.5, is the latest release version. The previous release code, TRAC-PF1/MOD2, Version 5.4, was modified by removing nonstandard FORTRAN constructs to produce a standard FORTRAN 77 (F77) code. In the process, a more uniform programming style was established. TRAC-M/F77 (1) is more portable and maintainable than Version 5.4; (2) retains TRAC's essential features, a one- and/or three-dimensional, two-fluid treatment for the thermal hydraulics; (3) has other necessary modeling capabilities to model a reactor system; and (4) has a newly enhanced reflood model.

This Developmental Assessment Manual describes the TRAC-M/F77, Version 5.5, assessment calculations that were compared with analytical calculations and experimental data. The manual is issued in two volumes. Volume I contains the assessment sections, and Volume II contains the appendices. The appendices to the manual include the input listings of the assessment problems, and code-data comparison of assessments exercised with different reflood, grid spacer, and noding modeling options. The comparisons were performed to determine the accuracy and applicability of TRAC-M/F77. Based on these assessments against analytical solutions, separate-effects tests, and integral tests, we believe that TRAC-M/F77 is a viable calculational tool for analyzing PWRs during a loss-of-coolant accident and operational transients. In addition, the developmental assessment calculations demonstrate that TRAC-M/F77 is applicable to a wide range of test facilities and is accurate in terms of predicting major trends.

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APPENDIX A

ANALYTICAL TEST PROBLEMS INPUT LISTINGS

This appendix contains the input listings for the analytical test problems of Section 3 as follows:

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1D RADIAL STEADY-STATE CONDUCTION INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numtcr          ieos          inopt          namt          id2o
8 *          11              0              1              1              0
9 *--*--*TEST PROBLEM HCOND1 , Time = 5.0 s
10 2 d heat conduction problem with
11 transient heatup & noflow liquid
12 case : cond2d01 fine radial nodding case
13 hydraulic-channel cells = 2
14 number of radial nodes = 11
15 number of axial node rows = 3
16 rod radius = 5.0 mm
17 heat conduction = 2.0 w/k/m
18 fluid temperature = 300.0 and 500.0 k
19 initial rod temperature = 300.0 k
20 *
21 *          #####
22 *          # break# alpha=0.0
23 *          # 92 # tl=500.0 k
24 *          node          #####
25 *          row          2
26 * tw=300.0 k 3 ++++++---##### vl=0.0 m/s
27 *          +          +---# cell # alpha=0.0
28 *          +          +---# 2 # tl=500.0 k
29 * tw=300.0 k 2 +++rod99+++---#pipe01# vl=0.0 m/s
30 *          +          +---# cell # alpha=0.0
31 *          +          +---# 1 # tl=300.0 k
32 * tw=300.0 k 1 ++++++---##### vl=0.0 m/s
33 *          0mm          5mm          1
34 *          #####
35 *          no # fill # alpha=0.0
36 *          flow # 91 # tl=300.0 k
37 *          #####
38 *
39 *****
40 * namelist data *
41 *****
42 *
43 &inopts
44 nrslv=1, nhtstr=1, iconht=1, htcwl=1000.0, htcwv=0.0,
45 iddiag=4, nsdl=0, nsdu=5, nspl=0, nspu=5, cpuflg=1
46 &end
47 *
48 *          dstep          timet
49 *          0          0.0000e+00
50 *          stdyst          transi          ncomp          njun          ipak
51 *          0          1          4          2          0
52 *          epsc          epss
53 *          1.0000e-03          1.0000e-05
54 *          oitmax          sitmax          isolut          ncontr          nccfl
55 *          10          0          10          0          0
56 *          ntsv          ntcb          ntcf          ntrp          ntcp
57 *          1          0          0          1          0
58 *
59 *****
60 * component-number data *
61 *****
62 *
63 * iorder*          1          91          92          99e
64 *
65 *****
66 * material-properties data *
67 *****
68 *
69 * math *          51e
70 * ptbln *          2e
71 *
72 *          prptb(1,i)          prptb(2,i)          prptb(3,i)          prptb(4,i)          prptb(5,i)
73 *          2.0000e+02          1.0000e+00          1.0000e+00          2.0000e+00          1.0000e+00
74 *          4.0000e+05          1.0000e+00          1.0000e+00          2.0000e+00          1.0000e+00
75 e
76 *
77 *****
78 * control-parameter data *
79 *****
80 *
81 *
82 * signal variables
83 *          idsv          isvn          ilcn          icn1          icn2
84 *          1          0          0          0          0
85 *
86 * trips
87 *          ntse          ntct          ntsf          ntcp          ntsd
88 *          0          0          0          0          0

```



```

89 *      idtp      isrt      iset      itst      idsg
90      101        2          0          1          1
91 *      setp(1)   setp(2)
92      0.0000e+00  1.0000e-05
93 *      dtsp(1)   dtsp(2)
94      0.0000e+00  0.0000e+00
95 *      ifsp(1)   ifsp(2)
96      0          0
97 *
98 *****
99 * component data *
100 *****
101 *
102 ***** type          num          id          ctitle
103 fill          91          91
104 *      jun1      ifty      ioff
105      1          1          0
106 *      twtold    rfmx      concn      felv
107      0.0000e+00  1.0000e+20  0.0000e+00  0.0000e+00
108 *      dxin      volin     alpin      vlin      tlin
109      1.0000e-01  3.1416e-02  0.0000e+00  0.0000e+00  3.0000e+02
110 *      pin       pain      flowin     vvin      tvin
111      1.0000e+07  0.0000e+00  0.0000e+00  0.0000e+00  3.0000e+02
112 *
113 ***** type          num          id          ctitle
114 pipe          1          1 test section
115 *      ncells    nodes     jun1      jun2      epsw
116      2          0          1          2          0.0000e+00
117 *      ichf      iconc     iacc      ipow
118      0          0          0          0
119 *      radin     th        houtl     houtv     toutl
120      1.0000e-01  0.0000e+00  0.0000e+00  0.0000e+00  3.0000e+02
121 *      toutv
122      3.0000e+02
123 *
124 * dx * f 1.0000e-01e
125 * vol * f 3.1416e+02e
126 * fa * f 3.1416e+03e
127 * fric * f 0.0000e+00e
128 * grav * f 1.0000e+00e
129 * hd * f 2.0000e-01e
130 * nff * f 0e
131 * alp * f 0.0000e+00e
132 * vl * f 0.0000e+00e
133 * vv * f 0.0000e+00e
134 * tl * 3.0000e+02 5.0000e+02e
135 * tv * 3.0000e+02 5.0000e+02e
136 * p * f 1.0000e+07e
137 * pa * f 0.0000e+00e
138 *
139 ***** type          num          id          ctitle
140 break          92          92 upper boundary
141 *      jun1      ibty      isat      ioff
142      2          0          0          1
143 *      dxin      volin     alpin      tin      pin
144      1.0000e-01  3.1416e+02  0.0000e+00  5.0000e+02  1.0000e+07
145 *      pain      concn     rbmx      poff      belv
146      0.0000e+00  0.0000e+00  1.0000e+20  0.0000e+00  0.0000e+00
147 *
148 ***** type          num          id          ctitle
149 rod           99          99 test heat conductor
150 *      ncrx      ncrz
151      1          2
152 *      nopowr    nrldr     modez     liqlev    iaxcnd
153      0          1          0          0          1
154 *      idbci     idbco     hdri      hdro
155      0          2          0.0000e+00  2.0000e-01
156 *      nrods     nodes     irftr     nzmax
157      1          11         101      30
158 *      dtxht(1)  dtxht(2)  dznht     hgapo     shelv
159      1.0000e+03  1.0000e+03  1.0000e+02  1.0000e+03  0.0000e+00
160 *      izppty     ndgx      ndhx
161      5          0          -11
162 *      izpwtr     izpwsv    nzpwtb    nzpwsv    nzpwrfl
163      0          1          1          0
164 *      nmwrx     nfci      nfcil
165      0          0          0
166 *      nzpwz     nzpwi     nfbpwt
167      0          0          0
168 *      react     tneut     rpwoff    rrpwmx    rpwscl
169      0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00  1.0000e+00
170 *      rpowri     zpwin     zpwoff    rrpwmx
171      1.0000e+03  0.0000e+00  0.0000e+00  1.0000e+20
172 *      extsou     pldr      pdrat     fucrac
173      0.0000e+00  0.0000e+00  1.0000e+01  1.0000e+00
174 *      nhcomo*   91r02    1          92e
175 *      nhcelo*  r02     1          2          1e
176 *      z * 0.0000e+00 1.0000e-01 2.0000e-01e
177 *      grav * f 1.0000e+00e
178 *      idrod * 1e
179 *      rdx * 1.0000e+00e
180 *      radrd * 0.0000e+00 5.0000e-04 1.0000e-03 1.5000e-03 2.0000e-03

```

```

181 * radrd *      2.5000e-03  3.0000e-03  3.5000e-03  4.0000e-03  4.5000e-03
182 * radrd *      5.0000e-03e
183 * matrd * f      51e
184 * nfax * f      9e
185 * rftn * f      3.0000e+02e
186 * rdpr * f      1.0000e+00e
187 * cpwr *      1.0000e+00e
188 * zpwtb * f     1.0000e+00e
189 * fpuo2 *      0.0000e+00e
190 * ftd *        1.0000e+00e
191 * gmix *      1.0000e+00r06 0.0000e+00e
192 * gmles *      1.0000e+00e
193 * pgapt *      1.0000e+00e
194 * plvol *      1.0000e+00e
195 * pslen *      1.0000e+00e
196 * clenm *      1.0000e+00e
197 * burn * f     1.0000e+00e
198 *
199 end
200 *
201 *****
202 * time-step data *
203 *****
204 *
205 *      dtmin      dtmax      tend      rtwfp
206 * 1.0000e-03  1.0000e-01  1.0000e+00  1.0000e+03
207 *      edint      gfint      dmpint      sedint
208 * 1.0000e-01  1.0000e+01  1.0000e+06  1.0000e+06
209 *
210 *****
211 * time-step data *
212 *****
213 *
214 *      dtmin      dtmax      tend      rtwfp
215 * 1.0000e-03  1.0000e-01  5.0000e+00  1.0000e+03
216 *      edint      gfint      dmpint      sedint
217 * 1.0000e+00  1.0000e+01  1.0000e+06  1.0000e+06
218 *
219 *****
220 * time-step data *
221 *****
222 *
223 *      endflag
224 *      -1.0000e+00

```

2D RADIAL AND AXIAL STEADY-STATE CONDUCTION INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *      numtcr      ieos      inopt      nmat      id2o
8 *          14          0          1          2          0
9 *--*TEST PROBLEM HCOND2 , Time = 5.0 s
10 * 1 d radial heat conduction problem
11 * transient heatup & noflow liquid
12 * case : cond1d01 fine radial noding case
13 * hydraulic-channel cells = 1
14 * number of radial nodes = 18
15 * number of axial node rows = 2
16 * rod radius = 6.35 mm
17 * clad inner radius = 6.426 mm
18 * clad outer radius = 7.239 mm
19 * rod heat conduction = 2.0 w/k/m
20 * clad heat conduction = 13.8 w/k/m
21 * fluid temperature = 300.0 k
22 * initial rod temperature = 300.0 k
23 *
24 *
25 *          #####
26 *          # break# alpha=0.0
27 *          # 92 # tl=500.0 k
28 *          #####
29 *          node
30 *          row 2
31 *          +
32 *          +
33 *          +
34 *          +
35 *          +
36 *          +
37 *          +
38 *          +
39 *          +
40 *          +
41 *          +
42 *          +
43 *          +
44 *          +
45 *          +
46 *          +
47 *          +
48 *          +
49 *          +
50 *          +
51 *          +
52 *          +
53 *          +
54 *          +
55 *          +
56 *          +
57 *          +
58 *          +
59 *          +
60 *          +
61 *          +
62 *          +
63 *          +
64 *          +
65 *          +
66 *          +
67 *          +
68 *          +
69 *          +
70 *          +
71 *          +
72 *          +
73 *          +
74 *          +
75 *          +
76 *          +
77 *          +
78 *          +
79 *          +
80 *          +
81 *          +
82 *          +
83 *          +
84 *          +
85 *          +
86 *          +
87 *          +
88 *          +

```

```

89      1      0      0      0      0
90 *
91 * trips
92 *      ntse      ntct      ntsf      ntdd      ntsd
93      0      0      0      0      0
94 *      idtp      isrt      iset      itst      idsg
95      101      2      0      1      1
96 *      setp(1)      setp(2)
97      1.0000e+02      1.0001e+02
98 *      dtsp(1)      dtsp(2)
99      0.0000e+00      0.0000e+00
100 *      ifsp(1)      ifsp(2)
101      0      0
102 *
103 *****
104 * component data *
105 *****
106 *
107 ***** type      num      id      ctitle
108 fill      91      91
109 *      jun1      ifty      ioff
110      1      1      0
111 *      twtold      rfmx      concin      felv
112      0.0000e+00      1.0000e+20      0.0000e+00      0.0000e+00
113 *      dxin      volin      alpin      vlin      tlin
114      1.0000e-01      3.1416e-02      0.0000e+00      0.0000e+00      3.0000e+02
115 *      pain      pain      flowin      vvin      tvin
116      1.0000e+07      0.0000e+00      0.0000e+00      0.0000e+00      3.0000e+02
117 *
118 ***** type      num      id      ctitle
119 pipe      1      1 test section
120 *      ncells      nodes      jun1      jun2      epsw
121      1      0      1      2      0.0000e+00
122 *      ichf      iconc      iacc      ipow
123      0      0      0      0
124 *      radin      th      houtl      houtv      toutl
125      1.0000e-01      0.0000e+00      0.0000e+00      0.0000e+00      3.0000e+02
126 *      toutv
127      3.0000e+02
128 *
129 * dx *      1.0000e-01e
130 * vol *      3.1416e+02e
131 * fa * f      3.1416e+03e
132 * fric * f      0.0000e+00e
133 * grav * f      1.0000e+00e
134 * hd * f      2.0000e-01e
135 * nff * f      0e
136 * alp *      0.0000e+00e
137 * vl * f      0.0000e+00e
138 * vv * f      0.0000e+00e
139 * tl *      3.0000e+02e
140 * tv *      3.0000e+02e
141 * p *      1.0000e+07e
142 * pa *      0.0000e+00e
143 *
144 ***** type      num      id      ctitle
145 break      92      92 upper boundary
146 *      jun1      ibty      isat      ioff
147      2      0      0      1
148 *      dxin      volin      alpin      tin      pin
149      1.0000e-01      3.1416e+02      0.0000e+00      5.0000e+02      1.0000e+07
150 *      pain      concin      rbmx      poff      belv
151      0.0000e+00      0.0000e+00      1.0000e+20      0.0000e+00      0.0000e+00
152 *
153 ***** type      num      id      ctitle
154 rod      99      99 test heat conductor
155 *      ncrx      ncrz
156      1      1
157 *      nopowr      nrldr      modez      liqlev      iaxcnd
158      0      1      0      0      0
159 *      idbci      idbco      hdri      hdro
160      0      2      0.0000e+00      2.0000e-01
161 *      nrods      nodes      irftr      nzmax
162      1      18      101      30
163 *      dtxht(1)      dtxht(2)      dznht      hgapo      shelv
164      1.0000e+03      1.0000e+03      1.0000e+02      1.0000e+03      0.0000e+00
165 *      irpwtj      ndgx      ndhx      nrts      nhist
166      5      0      -11      10      0
167 *      izpwtr      izpwsv      nzpwtb      nzpwsv      nzpwrf
168      0      1      1      0      0
169 *      nmwrx      nfcil      nfcil
170      0      0      0
171 *      nzpwz      nzpwi      nfbpwt
172      0      0      0
173 *      react      tneut      rpwoff      rrpwmx      rpwscl
174      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00      1.0000e+00
175 *      rpowri      zpin      zpwoff      rrpwmx
176      1.0000e+03      0.0000e+00      0.0000e+00      1.0000e+20
177 *      extsou      pldr      pdrat      fucrac
178      0.0000e+00      0.0000e+00      1.0000e+01      1.0000e+00
179 * nhcomo*      91      1      92e
180 * nhcelo* f      1e

```

```

181 * z * 0.0000e+00 1.0000e-01e
182 * grav * 1.0000e+00e
183 * idrod * 1e
184 * rdx * 1.0000e+00e
185 * radrd * 0.0000e+00 1.8300e-03 2.5900e-03 3.1750e-03 3.6700e-03
186 * radrd * 4.1000e-03 4.4900e-03 4.8500e-03 5.1850e-03 5.5000e-03
187 * radrd * 5.8000e-03 6.0800e-03 6.3500e-03 6.4260e-03 6.6700e-03
188 * radrd * 6.8400e-03 7.0400e-03 7.2390e-03e
189 * matrdr * r12 51 3r04 52e
190 * nfax * 1e
191 * rftn * f 3.0000e+02e
192 * rdpwr * r13 1.0000e+00r05 0.0000e+00e
193 * cpowr * 1.0000e+00e
194 * zpwtb * f 1.0000e+00e
195 * fpuo2 * 0.0000e+00e
196 * ftd * 1.0000e+00e
197 * gmix * 1.0000e+00r06 0.0000e+00e
198 * gmles * 1.0000e+00e
199 * pgapt * 1.0000e+00e
200 * plvol * 1.0000e+00e
201 * pslen * 1.0000e+00e
202 * clenm * 1.0000e+00e
203 * burn * f 1.0000e+00e
204 *
205 end
206 *
207 *****
208 * time-step data *
209 *****
210 *
211 * dtmin dtmax tend rtwfp
212 * 1.0000e-03 1.0000e-01 1.0000e+00 1.0000e+03
213 * edint gfint dmpint sedint
214 * 1.0000e-01 1.0000e+01 1.0000e+06 1.0000e+06
215 *
216 *****
217 * time-step data *
218 *****
219 *
220 * dtmin dtmax tend rtwfp
221 * 1.0000e-03 1.0000e-01 5.0000e+00 1.0000e+03
222 * edint gfint dmpint sedint
223 * 1.0000e+00 1.0000e+01 1.0000e+06 1.0000e+06
224 *
225 *****
226 * time-step data *
227 *****
228 *
229 * endflag
230 * -1.0000e+00

```

2D RADIAL AND FINE-MESH AXIAL STEADY-STATE CONDUCTION INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numtcr          ieos          inopt          nmat          id2o
8 *          11              0              1              1              0
9 *--*TEST PROBLEM HCOND3 , Time = 5.0 s
10 2 d heat conduction problem with
11 transient heatup & noflow liquid
12 case : cond2d02 fine radial noding with axial renoding
13 hydraulic-channel cells = 2
14 number of radial nodes = 11
15 number of axial node rows = 3 to 21
16 rod radius = 5.0 mm
17 heat conduction = 2.0 w/k/m
18 fluid temperature = 300.0 and 500.0 k
19 initial rod temperature = 300.0 k
20 *
21 *          #####
22 *          # break# alpha=0.0
23 *          # 92 # tl=500.0 k
24 *          node          #####
25 *          row          2
26 * tw=300.0 k 3 ++++++-----##### vl=0.0 m/s
27 *          +          +---# cell # alpha=0.0
28 *          +          +---# 2 # tl=500.0 k
29 * tw=300.0 k 2 +++rod99++++-#pipe01# vl=0.0 m/s
30 *          +          +---# cell # alpha=0.0
31 *          +          +---# 1 # tl=300.0 k
32 * tw=300.0 k 1 ++++++-----##### vl=0.0 m/s
33 *          0mm          5mm          1
34 *          #####
35 *          no # fill # alpha=0.0
36 *          flow # 91 # tl=300.0 k
37 *          #####
38 *
39 *****
40 * namelist data *
41 *****
42 *
43 &inopts
44 nrslv=1, nhtstr=1, iconht=1, htcwl=1000.0, htcwv=0. ,
45 idiag=4, nsdl=0, nsdu=5, nspl=0, nspu=5, cpufig=1
46 &end
47 *
48 *          dstep          timet
49 *          0          0.0000e+00
50 *          stdyst          transi          ncomp          njun          ipak
51 *          0          1          4          2          0
52 *          epso          epss
53 *          1.0000e-03          1.0000e-05
54 *          oitmax          sitmax          isolut          ncontr          nccfl
55 *          10          0          10          0          0
56 *          ntsv          ntcb          ntcf          ntrp          ntcp
57 *          1          0          0          1          0
58 *
59 *****
60 * component-number data *
61 *****
62 *
63 * iorder*          1          91          92          99e
64 *
65 *****
66 * material-properties data *
67 *****
68 *
69 * matb *          51e
70 * ptbin *          2e
71 *
72 *          prpth(1,i)          prpth(2,i)          prpth(3,i)          prpth(4,i)          prpth(5,i)
73 *          2.0000e+02          1.0000e+00          1.0000e+00          2.0000e+00          1.0000e+00
74 *          4.0000e+05          1.0000e+00          1.0000e+00          2.0000e+00          1.0000e+00
75 e
76 *
77 *****
78 * control-parameter data *
79 *****
80 *
81 *
82 * signal variables
83 *          idsv          isvn          ilcn          icn1          icm2
84 *          1          0          0          0          0
85 *

```

```

86 * trips
87 *      ntse      ntct      ntsf      ntdp      ntsd
88 *      0          0          0          0          0
89 *      idtp      isrt      iset      itst      idsg
90 *      101       2          0          1          1
91 *      setp(1)   setp(2)
92 *      0.0000e+00 1.0000e-05
93 *      dtsp(1)   dtsp(2)
94 *      0.0000e+00 0.0000e+00
95 *      ifsp(1)   ifsp(2)
96 *      0          0
97 *
98 *****
99 * component data *
100 *****
101 *
102 ***** type      num      id      ctitle
103 fill      91      91
104 *      jun1      ifty      ioff
105 *      1          1          0
106 *      twtold    rfmix      concin      felv
107 *      0.0000e+00 1.0000e+20 0.0000e+00 0.0000e+00
108 *      dxin      volin      alpin      vlin      tlin
109 *      1.0000e-01 3.1416e-02 0.0000e+00 0.0000e+00 3.0000e+02
110 *      pin      pain      flowin      vvin      tvin
111 *      1.0000e+07 0.0000e+00 0.0000e+00 0.0000e+00 3.0000e+02
112 *
113 ***** type      num      id      ctitle
114 pipe      1          1 test section
115 *      ncells    nodes      jun1      jun2      epsw
116 *      2          0          1          2          0.0000e+00
117 *      ichf      iconc      iacc      ipow
118 *      0          0          0          0
119 *      radin      th      hout1      houtv      tout1
120 *      1.0000e-01 0.0000e+00 0.0000e+00 0.0000e+00 3.0000e+02
121 *      toutv
122 *      3.0000e+02
123 *
124 * dx * f 1.0000e-01e
125 * vol * f 3.1416e+02e
126 * fa * f 3.1416e+03e
127 * fric * f 0.0000e+00e
128 * grav * f 1.0000e+00e
129 * hd * f 2.0000e-01e
130 * nff * f 0e
131 * alp * f 0.0000e+00e
132 * vl * f 0.0000e+00e
133 * vv * f 0.0000e+00e
134 * tl * 3.0000e+02 5.0000e+02e
135 * tv * 3.0000e+02 5.0000e+02e
136 * p * f 1.0000e+07e
137 * pa * f 0.0000e+00e
138 *
139 ***** type      num      id      ctitle
140 break     92      92 upper boundary
141 *      jun1      ibty      isat      ioff
142 *      2          0          0          1
143 *      dxin      volin      alpin      tin      pin
144 *      1.0000e-01 3.1416e+02 0.0000e+00 5.0000e+02 1.0000e+07
145 *      pain      concin      rbmx      poff      belv
146 *      0.0000e+00 0.0000e+00 1.0000e+20 0.0000e+00 0.0000e+00
147 *
148 ***** type      num      id      ctitle
149 rod      99      99 test heat conductor
150 *      ncrx      ncrz
151 *      1          2
152 *      nopowr    nridr      modez      liqlev      iaxcnd
153 *      0          1          0          0          1
154 *      idbci      idbco      hdri      hdro
155 *      0          2          0.0000e+00 2.0000e-01
156 *      nrods     nodes      irftr      nzmax
157 *      1          11       101      100
158 *      dtxht(1) dtxht(2) dznht      hgapo      shelv
159 *      1.0000e+00 1.0000e+01 1.0000e-04 1.0000e+03 0.0000e+00
160 *      irpwty     ndgx      ndhx      nrts      nhist
161 *      5          0          -11     10          0
162 *      izpwtr     izpwsv    nzpwtb    nzpwsv    nzpwrif
163 *      0          1          1          0          0
164 *      nmwrx      nfc1      nfcil
165 *      0          0          0
166 *      nzpwz      nzpwi      nfbpwt
167 *      0          0          0
168 *      react     tneut      rpwoff     rrpwmix    rpwscl
169 *      0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 1.0000e+00
170 *      rpowri     zpwin      zpwoff     rzpwmix
171 *      1.0000e+03 0.0000e+00 0.0000e+00 1.0000e+20
172 *      extsou     pldr      pdrat      fucrac
173 *      0.0000e+00 0.0000e+00 1.0000e+01 1.0000e+00
174 * nhcomo* 91r02 1 92e
175 * nhcelo* r02 1 2 1e
176 * z * 0.0000e+00 1.0000e-01 2.0000e-01e
177 * grav * f 1.0000e+00e

```

```

178 * idrod * 1e
179 * rdx * 1.0000e+00e
180 * radrd * 0.0000e+00 5.0000e-04 1.0000e-03 1.5000e-03 2.0000e-03
181 * radrd * 2.5000e-03 3.0000e-03 3.5000e-03 4.0000e-03 4.5000e-03
182 * radrd * 5.0000e-03e
183 * matr * f 51e
184 * nfax * f 48e
185 * rftn * f 3.0000e+02e
186 * rdpwr * f 1.0000e+00e
187 * cpwr * 1.0000e+00e
188 * zpwtb * f 1.0000e+00e
189 * fpuo2 * 0.0000e+00e
190 * ftd * 1.0000e+00e
191 * gmix * 1.0000e+00r06 0.0000e+00e
192 * gmles * 1.0000e+00e
193 * pgapt * 1.0000e+00e
194 * plvol * 1.0000e+00e
195 * pslen * 1.0000e+00e
196 * clen * 1.0000e+00e
197 * burn * f 1.0000e+00e
198 *
199 end
200 *
201 *****
202 * time-step data *
203 *****
204 *
205 * dtmin dtmax tend rtwfp
206 1.0000e-03 1.0000e-01 1.0000e+00 1.0000e+03
207 * edint gfint dmpint sedint
208 1.0000e-01 1.0000e+01 1.0000e+06 1.0000e+06
209 *
210 *****
211 * time-step data *
212 *****
213 *
214 * dtmin dtmax tend rtwfp
215 1.0000e-03 1.0000e-01 5.0000e+00 1.0000e+03
216 * edint gfint dmpint sedint
217 1.0000e+00 1.0000e+01 1.0000e+06 1.0000e+06
218 *
219 *****
220 * time-step data *
221 *****
222 *
223 * endflag
224 -1.0000e+00

```


1D DRAIN AND FILL TEST PROBLEM INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *      numtcr      ieos      inopt      nmat      id2o
8 *      4          1          1          0          0
9 *--*TEST PROBLEM DRAIN , Time = 195.0 s
10 *****
11 * 12-inch diameter double-standpipe drain model *
12 *****
13 *
14 *      #####
15 *      # break#      p = 1.0000e+05 pa
16 *      # 702 #      alpha=1.0, tv=298.3 k
17 *      #####
18 *      702
19 *      #####
20 *      #cell15#
21 *      #-----#
22 *      #cell14#
23 *      #-----#
24 *      #cell13#      o
25 *      #-----#      |
26 *      #cell12#      |
27 *      #-----#      |
28 *      #cell11#      alpha=1.0, tv=298.3 k
29 *      #-----#      --- initial condition
30 *      #cell10#      alpha=0.0, tl=298.3 k
31 *      #-----#
32 *      #cell 9#      |
33 *      #-----#      |
34 *      #cell 8#      o
35 *      #-----#
36 *      #cell 7#
37 *      #-----#
38 *      #cell 6#      pipe
39 *      #-----#      700
40 *      #cell 5#
41 *      #-----#
42 *      #cell 4#
43 *      #-----#      o
44 *      #cell 3#      |
45 *      #-----#      |
46 *      #cell 2#      |
47 *      #-----#      fa=0.14593 m2
48 *      #cell 1#
49 *      #####      fa=0.01 m2, k-factor=1.0
50 *      701
51 *      #####
52 *      # fill #      liquid mass flow
53 *      # 701 #      vs time
54 *      #####
55 *
56 *****
57 * namelist data *
58 *****
59 *
60 &inopts
61 iadded=10, icflow=2, ikfac=1, noair=1, cpuflg=1,
62 idiag=4, nsdl=0, nsdu=5, nsp1=0, nspu=5
63 &end
64 *
65 *      dstep      timet
66 *      0          0.0000e+00
67 *      stdyst      transi      ncomp      njun      ipak
68 *      0          1          3          2          1
69 *      epso      epss
70 *      1.0000e-05  1.0000e-04
71 *      oitmax      sitmax      isolut      ncontr      nccfl
72 *      10          10          0          0          0
73 *      ntsv      ntcdb      ntcf      ntrp      ntcp
74 *      1          0          0          0          1
75 *
76 *****
77 * component-number data *
78 *****
79 *
80 * iorder*      700      701      702e
81 *
82 *****
83 * control-parameter data *
84 *****
85 *
86 * signal variables
87 *      idsv      isvn      ilcn      icn1      icn2
88 *      1          0          0          0          0

```

```

89 *
90 *****
91 * component data *
92 *****
93 *
94 ***** type          num          id          ctitle
95 pipe          700          700 $700$ u-tube double standpipe
96 *          ncells        nodes        jun1        jun2        epsw
97 *          15            0            701        702        3.0000e-06
98 *          ichf          iconc        iacc        ipow
99 *          0            0            0          0
100 *          radin        th          hout1        houtv        tout1
101 *          1.5240e-01    1.2700e-02  0.0000e+00  0.0000e+00  2.9830e+02
102 *          toutv
103 *          2.9830e+02
104 *
105 * dx          * f          1.0000e+00e
106 * vol        * f          1.4593e-01e
107 * fa         *          1.0000e-02r15 1.4593e-01e
108 * fric       *          1.0000e+00r15 0.0000e+00e
109 * grav       * f          1.0000e+00e
110 * hd         * f          3.0480e-01e
111 * icflg      * f          0e
112 * nff        * f          1e
113 * alp        * r10    0.0000e+00r05 1.0000e+00e
114 * vl         * f          0.0000e+00e
115 * vv         * f          0.0000e+00e
116 * tl         * f          2.9830e+02e
117 * tv         * f          2.9830e+02e
118 * p          * f          1.0000e+05e
119 * pa         * f          0.0000e+00e
120 *
121 ***** type          num          id          ctitle
122 fill          701          701 $701$ mass flow bc
123 *          jun1        ifty        ioff
124 *          701        5            0
125 *          ifr        ifsv        nftb        nfsv        nfrf
126 *          0            1            8            0
127 *          twtold      rfm        concin        felv
128 *          0.0          1.0000e+11  0.0000e+00  0.0000e+00
129 *          dxin        volin        alpin        vlin        tlin
130 *          1.0000e+00    1.4593e-01  0.0000e+00  0.0000e+00  2.9830e+02
131 *          pin        pain        flowin        vvin        tvin
132 *          2.4700e+05    0.0000e+00  0.0000e+00  0.0000e+00  2.9830e+02
133 *          vmscl      vvscl
134 *          1.0000e+00    1.0000e+00
135 *
136 * vmtbm - liquid mass flow vs time table
137 *
138 * time (s) mass flow (kg/s)
139 *
140 * 0.0000e+00 0.0000e+00s
141 * 1.0000e+01 0.0000e+00s
142 * 2.0000e+01 -1.0000e+01s
143 * 9.5000e+01 -1.0000e+01s
144 * 9.5100e+01 0.0000e+00s
145 * 1.1000e+02 0.0000e+00s
146 * 1.2000e+02 1.0000e+01s
147 * 1.9500e+02 1.0000e+01e
148 *
149 ***** type          num          id          ctitle
150 break          702          702 $702$ pressure bc
151 *          jun1        ibty        isat        ioff
152 *          702        0            0            0
153 *          dxin        volin        alpin        tin        pin
154 *          1.0000e+00    1.4593e-01  1.0000e+00  2.9830e+02  1.0000e+05
155 *          pain        concin        rbmx        poff        belv
156 *          0.0000e+00    0.0000e+00  0.0000e+00  0.0000e+00  1.6000e+01
157 *
158 * end
159 *
160 *****
161 * time-step data *
162 *****
163 *
164 * dtmin        dtmax        tend        rtwfp
165 * 1.0000e-03    2.0000e-02  1.0000e+01  1.0000e+03
166 * edint        gfint        dmpint        sedint
167 * 1.0000e+01    5.0000e-01  2.0000e+02  5.0000e+00
168 *
169 * dtmin        dtmax        tend        rtwfp
170 * 1.0000e-03    3.0000e-02  2.0000e+01  1.0000e+03
171 * edint        gfint        dmpint        sedint
172 * 1.0000e+01    5.0000e-01  2.0000e+02  5.0000e+00
173 *
174 * dtmin        dtmax        tend        rtwfp
175 * 1.0000e-03    4.0000e-02  3.0000e+01  1.0000e+03
176 * edint        gfint        dmpint        sedint
177 * 1.0000e+01    5.0000e-01  2.0000e+02  5.0000e+00
178 *
179 * dtmin        dtmax        tend        rtwfp
180 * 1.0000e-03    5.0000e-02  4.0000e+01  1.0000e+03

```

```
181 *      edint      gfint      dmpint      sedint
182 *      1.0000e+01  5.0000e-01  2.0000e+02  5.0000e+00
183 *
184 *      dtmin      dtmax      tend      rtwfp
185 *      1.0000e-03  1.0000e-01  1.9500e+02  1.0000e+03
186 *      edint      gfint      dmpint      sedint
187 *      1.0000e+01  5.0000e-01  2.0000e+02  5.0000e+00
188 *
189 *      endflag
190 *      -1.0000e+00
```

U-TUBE TEST PROBLEM INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *      numtcr      ieos      inopt      nmat
8 *      4          1          1          0
9 *--*TEST PROBLEM UTUBE , Time = 100.0
10 *****
11 a 12-inch diameter u-tube standpipe model
12 *****
13 *
14 *****
15 * namelist data *
16 *****
17 *
18 $inopts
19 iadded=10,icflow=2,idiag=1,ielv=1,ikfac=1,noair=1
20 $end
21 *
22 *      dstep      timet
23 *      -1        0.0000e+00
24 *      stdyst      transi      ncomp      njun      ipak
25 *      0          1          3          2          1
26 *      epso      epss
27 *      1.0000e-05  1.0000e-04
28 *      oitmax      sitmax      isolut      ncontr
29 *      10         10         0          0
30 *      ntsv      ntcb      ntcf      ntrp      ntcp
31 *      1         0         0          0          1
32 *
33 *****
34 * component-number data *
35 *****
36 *
37 * iorder*      700      701      702e
38 *
39 *****
40 * control-parameter data *
41 *****
42 *
43 * signal variables
44 *
45 * problem time
46 *      idsv      isvn      ilcn      icn1      icn2
47 *      1         0         0         0         0
48 *
49 *****
50 * component data *
51 *****
52 *
53 *****
54 ***** type      num      id      ctitle
55 pipe      700      700 $700$ u-tube standpipe
56 *      ncells      nodes      jun1      jun2      epsw
57 *      15         0         701      702      3.0000e-06
58 *      ichf      iconc      iacc      ipow
59 *      0         0         0         0
60 *      radin      th      houtl      houtv      toutl
61 *      1.5240e-01  1.2700e-02  0.0000e+00  0.0000e+00  2.9830e+02
62 *      toutv
63 *      2.9830e+02
64 *
65 * dx      * f      1.0000e+00e
66 * vol     * f      1.4593e-01e
67 * fa     * f      1.4593e-01e
68 * fric   * f      0.0000e+00e
69 * elev   *      6.5000e+00  5.5000e+00  4.5000e+00  3.5000e+00  2.5000e+00
70 * elev   *      1.5000e+00  5.0000e-01  -3.3640e-01  5.0000e-01  1.5000e+00
71 * elev   *      2.5000e+00  3.5000e+00  4.5000e+00  5.5000e+00  6.5000e+00
72 * elev   * e
73 * hd     * f      3.0480e-01e
74 * icflg  * f      0e
75 * nff    * f      1e
76 * alp    * r05  1.0000e+00  3.0000e-01r03  0.0000e+00  0.0000e+00r05  1.0000e+00
77 * alp    * e
78 * vl     * f      0.0000e+00e
79 * vv     * f      0.0000e+00e
80 * tl     * f      2.9830e+02e
81 * tv     * f      2.9830e+02e
82 * p      * r05  1.0000e+05  1.0400e+05  1.1400e+05  1.2200e+05  1.1400e+05
83 * p      *      1.0400e+05r05  1.0000e+05e
84 * pa     * f      0.0000e+00e
85 *
86 *****
87 ***** type      num      id      ctitle

```

```

88 break          701          701 $701$ pressure bc
89 *             jun1         ibty         isat         ioff
90              701          0          0          0
91 *             dxin         volin        alpin        tin          pin
92              1.0000e+00    1.4593e-01  1.0000e+00    2.9830e+02    1.0000e+05
93 *             pain         concin       rbmx         poff         belv
94              0.0000e+00    0.0000e+00    1.0000e+10    0.0000e+00    7.5000e+00
95 *
96 *
97 *****
98 ***** type          num          id          ctitle
99 break          702          702 $702$ pressure bc
100 *            jun1         ibty         isat         ioff
101             702          0          0          0
102 *            dxin         volin        alpin        tin          pin
103             1.0000e+00    1.4593e-01  1.0000e+00    2.9830e+02    1.0000e+05
104 *            pain         concin       rbmx         poff         belv
105             0.0000e+00    0.0000e+00    0.0000e+00    0.0000e+00    7.5000e+00
106 *
107 end
108 *
109 *****
110 * time-step data *
111 *****
112 *
113 *            dtmin        dtmax        tend         rtwfp
114             1.0000e-03    1.0000e-02    1.0000e+01    1.0000e+03
115 *            edint        gfint        dmpint       sedint
116             1.0000e+01    1.0000e-01    2.0000e+01    5.0000e+00
117 *
118 *            dtmin        dtmax        tend         rtwfp
119             1.0000e-03    2.0000e-02    2.0000e+01    1.0000e+03
120 *            edint        gfint        dmpint       sedint
121             1.0000e+01    1.0000e-01    2.0000e+01    5.0000e+00
122 *
123 *            dtmin        dtmax        tend         rtwfp
124             1.0000e-03    3.0000e-02    3.0000e+01    1.0000e+03
125 *            edint        gfint        dmpint       sedint
126             1.0000e+01    1.0000e-01    2.0000e+01    5.0000e+00
127 *
128 *            dtmin        dtmax        tend         rtwfp
129             1.0000e-03    4.0000e-02    4.0000e+01    1.0000e+03
130 *            edint        gfint        dmpint       sedint
131             1.0000e+01    1.0000e-01    2.0000e+01    5.0000e+00
132 *
133 *            dtmin        dtmax        tend         rtwfp
134             1.0000e-03    5.0000e-02    5.0000e+01    1.0000e+03
135 *            edint        gfint        dmpint       sedint
136             1.0000e+01    1.0000e-01    2.0000e+01    5.0000e+00
137 *
138 *
139 ***** end of input *****
140 *
141              -1.0000e+00

```

APPENDIX B

BANKOFF CCFL INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *      numtr      ieos      inopt      nmat
8 *      3          1          1          0
9 bankoff air-water ccfl model
10 bankoff perforated plate flooding experiment
11 with air and water injection
12 *
13 *****
14 * namelist data *
15 *****
16 *
17 $inopts icflow=0, ikfac=1, iadded=20,nhtstr=0,noair=1 $
18 *      dstep      timet
19 *      0          0.0000e+00
20 *      stdyst      transi      ncomp      njun      ipak
21 *      0          1          11          10          1
22 *      epso      epss
23 *      1.0000e-03  1.0000e-04
24 *      oitmax      sitmax      isolut      ncontr      nccfl
25 *      10          10          0          0          3
26 *      ntsv      ntcb      ntcf      ntrp      ntcp
27 *      1          0          0          0          0
28 *
29 *****
30 * component-number data *
31 *****
32 *
33 * iorder*      1      2      3      4      5 s
34 * iorder*      6      7      8      9      10 s
35 * iorder*      11 e
36 *
37 *****
38 * ccfl input parameters *
39 *****
40 *
41 *      cbeta
42 *      0.0          1.0          -1.00 e
43 *      ccflm
44 *      1.0          1.7          0.000 e
45 *      ccflc
46 *      1.0          1.7          0.000000 e
47 *      nholes      tp      gamma      diah      ctrans
48 *      15          0.02      0.4232      0.0105      000.0
49 *
50 *****
51 * control-parameter data *
52 *****
53 *
54 * signal variables
55 *      idsv      isvn      ilcn      icn1      icn2
56 *      1          0          0          0          0
57 *
58 *
59 *****
60 * component data *
61 *****
62 *
63 ***** type      num      id      ctitle
64 vessel      1      1 $1$ bankoff test section
65 *      nasx      nrsx      ntsx      ncsr      ivssbf
66 *      11          1          1          5          0
67 *      idcu      idcl      idcr      icru      icrl
68 *      0          0          0          0          0
69 *      icrr      ilcsp      iucsp      iuhp      iconc
70 *      0          0          0          0          0
71 *      igeo      nvent      nvvtb      nsgrid
72 *      1          0          0          0
73 *      shelv      epw
74 *      0.0000e+00  0.0000
75 * z      *      0.2  0.4  0.6  0.8  0.98 s
76 * z      *      1.13 1.259 1.387 1.397 1.700 s
77 * z      *      2.0 e
78 * rad *f 7.1500e-02e
79 * th *f 4.2900e-02e
80 *
81 *      lisrl      lisrc      lisrf      ljuns
82 *      3          1          3          1
83 *      8          1          3          3

```

84		9	1	3	5
85		1	1	3	7
86		11	1	3	8
87	*				
88	* level	1			
89	*				
90	* cfzl-t*	-1.0000e+00e			
91	* cfzl-z*	-1.0000e+00e			
92	* cfzl-r*	-1.0000e+00e			
93	* cfzv-t*	0.0000e+00e			
94	* cfzv-z*	0.0000e+00e			
95	* cfzv-r*	0.0000e+00e			
96	*	lccfl			
97		0e			
98	* vol *	1.0000e+01e			
99	* fa-t *	1.0000e+00e			
100	* fa-z *	1.0000e+00e			
101	* fa-r *	1.0000e+00e			
102	* hd-t *	1.0000e+00e			
103	* hd-z *	5.3600e-02e			
104	* hd-r *	4.3000e-02e			
105	* alpn *	1.0000e+00e			
106	* vvn-t *	0.0000e+00e			
107	* vvn-z *	0.0000e+00e			
108	* vvn-r *	0.0000e+00e			
109	* vln-t *	0.0000e+00e			
110	* vln-z *	0.0000e+00e			
111	* vln-r *	0.0000e+00e			
112	* tvn *	3.7316e+02e			
113	* tln *	3.7316e+02e			
114	* pn *	1.0000e+05e			
115	* pan *	0.0000e+00e			
116	*				
117	* level	2			
118	*				
119	* cfzl-t*	0.0000e+00e			
120	* cfzl-z*	0.0000e+00e			
121	* cfzl-r*	0.0000e+00e			
122	* cfzv-t*	0.0000e+00e			
123	* cfzv-z*	0.0000e+00e			
124	* cfzv-r*	0.0000e+00e			
125	*	lccfl			
126		0e			
127	* vol *	1.0000e+00e			
128	* fa-t *	1.0000e+00e			
129	* fa-z *	1.0000e+00e			
130	* fa-r *	1.0000e+00e			
131	* hd-t *	1.0000e+00e			
132	* hd-z *	5.3600e-02e			
133	* hd-r *	4.3000e-02e			
134	* alpn *	1.0000e+00e			
135	* vvn-t *	0.0000e+00e			
136	* vvn-z *	0.0000e+00e			
137	* vvn-r *	0.0000e+00e			
138	* vln-t *	0.0000e+00e			
139	* vln-z *	0.0000e+00e			
140	* vln-r *	0.0000e+00e			
141	* tvn *	3.7316e+02e			
142	* tln *	3.7316e+02e			
143	* pn *	1.0000e+05e			
144	* pan *	0.0000e+00e			
145	*				
146	* level	3			
147	*				
148	* cfzl-t*	0.0000e+00e			
149	* cfzl-z*	0.0000e+00e			
150	* cfzl-r*	0.0000e+00e			
151	* cfzv-t*	0.0000e+00e			
152	* cfzv-z*	0.0000e+00e			
153	* cfzv-r*	0.0000e+00e			
154	*	lccfl			
155		0e			
156	* vol *	1.0000e+00e			
157	* fa-t *	1.0000e+00e			
158	* fa-z *	1.0000e+00e			
159	* fa-r *	1.0000e+00e			
160	* hd-t *	1.0000e+00e			
161	* hd-z *	5.3600e-02e			
162	* hd-r *	4.3000e-02e			
163	* alpn *	1.0000e+00e			
164	* vvn-t *	0.0000e+00e			
165	* vvn-z *	0.0000e+00e			
166	* vvn-r *	0.0000e+00e			
167	* vln-t *	0.0000e+00e			
168	* vln-z *	0.0000e+00e			
169	* vln-r *	0.0000e+00e			
170	* tvn *	3.7316e+02e			
171	* tln *	3.7316e+02e			
172	* pn *	1.0000e+05e			
173	* pan *	0.0000e+00e			
174	*				
175	* level	4			

```

176 *
177 * cfzl-t* 0.0000e+00e
178 * cfzl-z* 0.0000e+00e
179 * cfzl-r* 0.0000e+00e
180 * cfzv-t* 0.0000e+00e
181 * cfzv-z* 0.0000e+00e
182 * cfzv-r* 0.0000e+00e
183 * lccfl
184 * 0e
185 * vol * 1.0000e+00e
186 * fa-t * 1.0000e+00e
187 * fa-z * 1.0000e+00e
188 * fa-r * 0.0000e+00e
189 * hd-t * 1.0000e+00e
190 * hd-z * 5.3600e-02e
191 * hd-r * 4.3000e-02e
192 * alpn * 1.0000e+00e
193 * vvn-t * 0.0000e+00e
194 * vvn-z * 0.0000e+00e
195 * vvn-r * 0.0000e+00e
196 * vln-t * 0.0000e+00e
197 * vln-z * 0.0000e+00e
198 * vln-r * 0.0000e+00e
199 * tvn * 3.7316e+02e
200 * tln * 3.7316e+02e
201 * pn * 1.0000e+05e
202 * pan * 0.0000e+00e
203 *
204 * level 5
205 *
206 * cfzl-t* 0.0000e+00e
207 * cfzl-z* 1.0000e+00e
208 * cfzl-r* 0.0000e+00e
209 * cfzv-t* 0.0000e+00e
210 * cfzv-z* 1.0000e+00e
211 * cfzv-r* 0.0000e+00e
212 * lccfl
213 * 3e
214 * vol * 1.0000e+00e
215 * fa-t * 1.0000e+00e
216 * fa-z * 4.2350e-01e
217 * fa-r * 0.0000e+00e
218 * hd-t * 1.0000e+00e
219 * hd-z * 1.0500e-02e
220 * hd-r * 4.3000e-02e
221 * alpn * 1.0000e+00e
222 * vvn-t * 0.0000e+00e
223 * vvn-z * 0.0000e+00e
224 * vvn-r * 0.0000e+00e
225 * vln-t * 0.0000e+00e
226 * vln-z * 0.0000e+00e
227 * vln-r * 0.0000e+00e
228 * tvn * 3.7316e+02e
229 * tln * 3.7316e+02e
230 * pn * 1.0000e+05e
231 * pan * 0.0000e+00e
232 *
233 * level 6
234 *
235 * cfzl-t* 0.0000e+00e
236 * cfzl-z* 0.0000e+00e
237 * cfzl-r* 0.0000e+00e
238 * cfzv-t* 0.0000e+00e
239 * cfzv-z* 0.0000e+00e
240 * cfzv-r* 0.0000e+00e
241 * lccfl
242 * 0e
243 * vol * 1.0000e+00e
244 * fa-t * 1.0000e+00e
245 * fa-z * 1.0000e+00e
246 * fa-r * 0.0000e+00e
247 * hd-t * 1.0000e+00e
248 * hd-z * 5.3600e-02e
249 * hd-r * 4.3000e-02e
250 * alpn * 1.0000e+00e
251 * vvn-t * 0.0000e+00e
252 * vvn-z * 0.0000e+00e
253 * vvn-r * 0.0000e+00e
254 * vln-t * 0.0000e+00e
255 * vln-z * 0.0000e+00e
256 * vln-r * 0.0000e+00e
257 * tvn * 3.7316e+02e
258 * tln * 3.7316e+02e
259 * pn * 1.0000e+05e
260 * pan * 0.0000e+00e
261 *
262 * level 7
263 *
264 * cfzl-t* 0.0000e+00e
265 * cfzl-z* 0.0000e+00e
266 * cfzl-r* 0.0000e+00e
267 * cfzv-t* 0.0000e+00e

```



```

268 * cfzv-z*      0.0000e+00e
269 * cfzv-r*      0.0000e+00e
270 *          lccfl
271 *          0e
272 * vol *        1.0000e+00e
273 * fa-t *        1.0000e+00e
274 * fa-z *        1.0000e+00e
275 * fa-r *        0.0000e+00e
276 * hd-t *        1.0000e+00e
277 * hd-z *        5.3600e-02e
278 * hd-r *        4.3000e-02e
279 * alpn *        0.0000e+00e
280 * vvn-t *        0.0000e+00e
281 * vvn-z *        0.0000e+00e
282 * vvn-r *        0.0000e+00e
283 * vln-t *        0.0000e+00e
284 * vln-z *        0.0000e+00e
285 * vln-r *        0.0000e+00e
286 * tvn *        3.7316e+02e
287 * tln *        3.7316e+02e
288 * pn *         1.0000e+05e
289 * pan *        0.0000e+00e
290 *
291 * level 8
292 *
293 * cfzl-t*      0.0000e+00e
294 * cfzl-z*      0.0000e+00e
295 * cfzl-r*      0.0000e+00e
296 * cfzv-t*      0.0000e+00e
297 * cfzv-z*      0.0000e+00e
298 * cfzv-r*      0.0000e+00e
299 *          lccfl
300 *          0e
301 * vol *        1.0000e+00e
302 * fa-t *        1.0000e+00e
303 * fa-z *        1.0000e+00e
304 * fa-r *        1.0000e+00e
305 * hd-t *        1.0000e+00e
306 * hd-z *        5.3600e-02e
307 * hd-r *        4.3000e-02e
308 * alpn *        0.0000e+00e
309 * vvn-t *        0.0000e+00e
310 * vvn-z *        0.0000e+00e
311 * vvn-r *        0.0000e+00e
312 * vln-t *        0.0000e+00e
313 * vln-z *        0.0000e+00e
314 * vln-r *        0.0000e+00e
315 * tvn *        3.7316e+02e
316 * tln *        3.7316e+02e
317 * pn *         1.0000e+05e
318 * pan *        0.0000e+00e
319 *
320 * level 9
321 *
322 * cfzl-t*      0.0000e+00e
323 * cfzl-z*      0.0000e+00e
324 * cfzl-r*      0.0000e+00e
325 * cfzv-t*      0.0000e+00e
326 * cfzv-z*      0.0000e+00e
327 * cfzv-r*      0.0000e+00e
328 *          lccfl
329 *          0e
330 * vol *        1.0000e+00e
331 * fa-t *        1.0000e+00e
332 * fa-z *        1.0000e+00e
333 * fa-r *        1.0000e+00e
334 * hd-t *        1.0000e+00e
335 * hd-z *        5.3600e-02e
336 * hd-r *        4.3000e-02e
337 * alpn *        0.0000e+00e
338 * vvn-t *        0.0000e+00e
339 * vvn-z *        0.0000e+00e
340 * vvn-r *        0.0000e+00e
341 * vln-t *        0.0000e+00e
342 * vln-z *        0.0000e+00e
343 * vln-r *        0.0000e+00e
344 * tvn *        3.7316e+02e
345 * tln *        3.7316e+02e
346 * pn *         1.0000e+05e
347 * pan *        0.0000e+00e
348 *
349 * level 10
350 *
351 * cfzl-t*      0.0000e+00e
352 * cfzl-z*      0.0000e+00e
353 * cfzl-r*      0.0000e+00e
354 * cfzv-t*      0.0000e+00e
355 * cfzv-z*      0.0000e+00e
356 * cfzv-r*      0.0000e+00e
357 *          lccfl
358 *          0e
359 * vol *        1.0000e+00e

```

```

360 * fa-t * 1.0000e+00e
361 * fa-z * 1.0000e+00e
362 * fa-r * 1.0000e+00e
363 * hd-t * 1.0000e+00e
364 * hd-z * 5.3600e-02e
365 * hd-r * 4.3000e-02e
366 * alpn * 1.0000e+00e
367 * vvn-t * 0.0000e+00e
368 * vvn-z * 0.0000e+00e
369 * vvn-r * 0.0000e+00e
370 * vln-t * 0.0000e+00e
371 * vln-z * 0.0000e+00e
372 * vln-r * 0.0000e+00e
373 * tvn * 3.7316e+02e
374 * tln * 3.7316e+02e
375 * pn * 1.0000e+05e
376 * pan * 0.0000e+00e
377 *
378 * level 11
379 *
380 * cfzl-t* 0.0000e+00e
381 * cfzl-z* 0.0000e+00e
382 * cfzl-r* 0.0000e+00e
383 * cfzv-t* 0.0000e+00e
384 * cfzv-z* 0.0000e+00e
385 * cfzv-r* 0.0000e+00e
386 * lccfl
387 * 0e
388 * vol * 1.0000e+00e
389 * fa-t * 1.0000e+00e
390 * fa-z * 1.0000e+00e
391 * fa-r * 1.0000e+00e
392 * hd-t * 1.0000e+00e
393 * hd-z * 5.3600e-02e
394 * hd-r * 4.3000e-02e
395 * alpn * 1.0000e+00e
396 * vvn-t * 0.0000e+00e
397 * vvn-z * 0.0000e+00e
398 * vvn-r * 0.0000e+00e
399 * vln-t * 0.0000e+00e
400 * vln-z * 0.0000e+00e
401 * vln-r * 0.0000e+00e
402 * tvn * 3.7316e+02e
403 * tln * 3.7316e+02e
404 * pn * 1.0000e+05e
405 * pan * 0.0000e+00e
406 *
407 ***** type num id ctitle
408 pipe 5 5 $$ steam injection pipe
409 * ncells nodes jun1 jun2 epsw
410 * 1 0 1 2 0.0000e+00
411 * ichf iconc iacc ipow
412 * 1 0 0 0
413 * radin th hout1 houtv tout1
414 * 1.9100e-01 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
415 * toutv
416 * 3.0000e+02
417 *
418 * dx * 1.0000e+00e
419 * vol * 1.0130e-03e
420 * fa * f 1.0130e-03e
421 * fric * f 0.0000e+00e
422 * grav * f 0.0000e+00e
423 * hd * f 3.6000e-02e
424 * nff * f -1e
425 * lccfl
426 * 0 0 e
427 * alp * 1.0000e+00e
428 * vl * f 0.0000e+00e
429 * vv * f 0.0000e+00e
430 * tl * 3.7316e+02e
431 * tv * 3.7316e+02e
432 * p * 1.0000e+05e
433 * pa * 0.0000e+00e
434 *
435 ***** type num id ctitle
436 pipe 6 6 $$ ecc water inj. pipe
437 * ncells nodes jun1 jun2 epsw
438 * 1 0 3 4 0.0000e+00
439 * ichf iconc iacc ipow
440 * 1 0 0 0
441 * radin th hout1 houtv tout1
442 * 1.9100e-01 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
443 * toutv
444 * 3.0000e+02
445 *
446 * dx * 1.0000e+00e
447 * vol * 1.1500e-04e
448 * fa * f 1.1500e-04e
449 * fric * f 0.0000e+00e
450 * grav * 0.0 -1.0 e
451 * hd * f 1.2000e-02e

```

```

452 * nff * f -1e
453 * lccfl
454 0 0 e
455 * alp * 0.0000e+00e
456 * vl * f 0.0000e+00e
457 * vv * f 0.0000e+00e
458 * tl * 3.7316e+02e
459 * tv * 3.7316e+02e
460 * p * 1.0000e+05e
461 * pa * 0.0000e+00e
462 *
463 ***** type num id ctitle
464 pipe 7 7 $7$ outlet pipe
465 * ncells nodes jun1 jun2 epsw
466 * 1 0 5 6 0.0000e+00
467 * ichf iconc iacc ipow
468 * 1 0 0 0
469 * radin th hout1 houtv tout1
470 * 1.9100e-01 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
471 * toutv
472 * 3.0000e+02
473 *
474 * dx * 5.0000e+00e
475 * vol * 5.0000e-01e
476 * fa * f 1.0000e-01e
477 * fric * f 0.0000e+00e
478 * grav * f 0.0000e+00e
479 * hd * f 1.0000e+00e
480 * nff * f -1e
481 * lccfl
482 0 0 e
483 * alp * 0.0000e+00e
484 * vl * f 0.0000e+00e
485 * vv * f 0.0000e+00e
486 * tl * 3.7316e+02e
487 * tv * 3.7316e+02e
488 * p * 1.0000e+05e
489 * pa * 0.0000e+00e
490 *
491 ***** type num id ctitle
492 pipe 8 8 $8$ pipe at bottom
493 * ncells nodes jun1 jun2 epsw
494 * 1 0 9 7 0.0000e+00
495 * ichf iconc iacc ipow
496 * 1 0 0 0
497 * radin th hout1 houtv tout1
498 * 1.9100e-01 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
499 * toutv
500 * 3.0000e+02
501 *
502 * dx * 1.0000e+01e
503 * vol * 0.0306735 e
504 * fa * f 0.00306735e
505 * fric * f 0.0000e+00e
506 * grav * f 0.0000e+00e
507 * hd * f 0.0600e+00e
508 * nff * f -1e
509 * lccfl
510 0 0 e
511 * alp * 0.0000e+00e
512 * vl * f 0.0000e+00e
513 * vv * f 0.0000e+00e
514 * tl * 3.7316e+02e
515 * tv * 3.7316e+02e
516 * p * 1.0000e+05e
517 * pa * 0.0000e+00e
518 *
519 ***** type num id ctitle
520 pipe 9 9 $9$ pipe at top
521 * ncells nodes jun1 jun2 epsw
522 * 1 0 8 10 0.0000e+00
523 * ichf iconc iacc ipow
524 * 1 0 0 0
525 * radin th hout1 houtv tout1
526 * 1.9100e-01 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
527 * toutv
528 * 3.0000e+02
529 *
530 * dx * 1.0000e-01e
531 * vol * 0.000306735 e
532 * fa * f 0.000306735e
533 * fric * f 0.0000e+00e
534 * grav * f 0.0000e+00e
535 * hd * f 0.0600e+00e
536 * nff * f -1e
537 * lccfl
538 0 0 e
539 * alp * 1.0000e+00e
540 * vl * f 0.0000e+00e
541 * vv * f 0.0000e+00e
542 * tl * 3.7316e+02e
543 * tv * 3.7316e+02e

```

```

544 * p * 1.0000e+05e
545 * pa * 0.0000e+00e
546 *
547 ***** type num id ctitle
548 break 4 4 $4$ water-steam outlet break
549 * jun1 ibty isat ioff
550 * 6 0 3 0
551 * dxin volin alpin tin pin
552 * 5.0000e+00 5.0000e-01 1.0000e+00 3.7316e+02 1.0000e+05
553 * pain concin rfm x poff belv
554 * 0.0000e+00 0.0000e+00 1.0000e+05 0.0000e+00 0.0000e+00
555 *
556 ***** type num id ctitle
557 break 10 10 $10$ steam outlet break at the top
558 * jun1 ibty isat ioff
559 * 10 0 3 0
560 * dxin volin alpin tin pin
561 * 5.0000e+00 5.0000e-01 1.0000e+00 3.7316e+02 1.0000e+05
562 * pain concin rfm x poff belv
563 * 0.0000e+00 0.0000e+00 1.0000e+05 0.0000e+00 0.0000e+00
564 *
565 ***** type num id ctitle
566 fill 3 3 $3$ ecc injection fill
567 * jun1 ifty ioff
568 * 4 5 0
569 * iftr ifsv nftb nfsv nfrf
570 * 0 1 4 0 0
571 * twtold rfm x concin felv
572 * 0.0000e+00 1.0000e+05 0.0000e+00 0.0000e+00
573 * dxin volin alpin vlin tlin
574 * 1.0000e+00 1.1500e-04 0.0000e+00 0.0000e+00 3.7316e+02
575 * pin pain flowin vvin tvin
576 * 1.0000e+05 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
577 * vmscl vvscl
578 * 2.0000e+00 0.0000e+00
579 *
580 * vmtb * r02 0.0000e+00 2.0000e+00 0.0000e+00 3.0000e+00 0.1788000
581 * vmtb * 5.0000e+01 0.5000000 e
582 *
583 ***** type num id ctitle
584 fill 2 2 $2$ steam injection fill
585 * jun1 ifty ioff
586 * 2 5 0
587 * iftr ifsv nftb nfsv nfrf
588 * 0 1 4 0 0
589 * twtold rfm x concin felv
590 * 0.0000e+00 1.0000e+05 0.0000e+00 0.0000e+00
591 * dxin volin alpin vlin tlin
592 * 1.0000e+00 1.0130e-03 1.0000e+00 0.0000e+00 3.7316e+02
593 * pin pain flowin vvin tvin
594 * 1.0000e+05 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
595 * vmscl vvscl
596 * 0.2500e+00 0.0000e+00
597 *
598 * vmtb * r02 0.0000e+00 5.0000e-01 0.0240000 5.0000e+00 0.0240000
599 * vmtb * 4.00e+01 0.117600 e
600 *
601 ***** type num id ctitle
602 fill 11 11 $11$ zero fill at the bottom
603 * jun1 ifty ioff
604 * 9 2 0
605 * twtold rfm x concin felv
606 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
607 * dxin volin alpin vlin tlin
608 * 1.0000e+00 1.0130e-03 0.0000e+00 0.0000e+00 3.7316e+02
609 * pin pain flowin vvin tvin
610 * 1.0000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.7316e+02
611 end
612 *
613 *****
614 * time-step data *
615 *****
616 *
617 * dtmin dtmax tend rtwfp
618 * 1.0000e-06 0.005 5.0000e+01 1.0000e+00
619 * edint gfint dmpint sedint
620 * 2.5000e+01 1.0000e-01 2.5000e+01 2.5000e+01
621 *
622 *****
623 * time-step data *
624 *****
625 *
626 * endflag
627 * -1.0000e-06

```

APPENDIX C

CONDENSATION PROBLEMS INPUT LISTINGS

This appendix contains the input listings for the condensation problems of Section 4.2 as follows:

<u>Problem</u>	<u>Page</u>
Akimoto mist-flow condensation	C-2
Akimoto plug-flow condensation	C-5
Akimoto transitional-flow condensation	C-9

AKIMOTO MIST-FLOW CONDENSATION INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *      numtcr      ieos      inopt      nmat
8 *      1          0          1          0
9 Akimoto mist condensation experiment: mg=40, mli=330, Tin=323K
10 *
11 * This test problem is prepared from the paper by Akimoto and Kowawa
12 * and Aoki , 'Analysis of Direct Contact Condensation of Flowing Steam
13 * onto Injected Water with Multifluid Model of Two-Phase Flow,'
14 * Journal of Nuclear Science and Technology, 20 (12) pp. 1006-1022
15 * December 1983. In this paper there is a differential pressure and
16 * liquid film temperature data as a function of horizontal distance
17 * for mg=40 kg/m2s, ml=330 kg/m2s and Tin=323K. This input LISTING
18 * simulates this test with TRAC-PF1/MOD2 and prepared by Cetin Unal
19 * April, 23 1992.
20 *
21 *****
22 * namelist data *
23 *****
24 *
25 &inopts
26   iadded=10, ikfac=1,
27 &end
28 *
29 *      dstep      timet
30 *      0          0.0000e+00
31 *      stdyst      transi      ncomp      njun      ipak
32 *      0          1          6          5          1
33 *      epso      epss
34 *      1.0000e-03  1.0000e-04
35 *      oitmax      sitmax      isolut      ncontr      nccfl
36 *      10          10          0          0          0
37 *      ntsv      ntcfb      ntcf      ntrp      ntcp
38 *      8          8          0          0          0
39 *
40 *****
41 * component-number data *
42 *****
43 *
44 * iorder*      13      14      15      16      17
45 * iorder*      18e
46 *
47 *****
48 * control-parameter data *
49 *****
50 *
51 * signal variables
52 *
53 * idsv isvn ilcn icn1 icn2      * problem time
54 * 100  0    0    0    0      * vap specific heat (Cpv)
55 * 101  85  14  4    0      * liq specific heat (Cpl)
56 * 102  86  14  4    0      * latent heat (hfg)
57 * 103  87  14  4    0      * Z-face vap mass flow (mv)
58 * 104  29  14  4    0      * Z-face liq mass flow (ml)
59 * 105  32  14  4    0      * saturation temperature
60 * 106  83  14  4    0      * liq temperature
61 * 107  23  14  4    0
62 *
63 * control blocks
64 *
65 * idcb      icbn      icb1      icb2      icb3
66 *      cbgain      cbmin      cbmax      cbcon1      cbcon2
67 -----
68 * A=Flow area [m^2]
69 * -100      9 *const*      0      0      0
70 *      1.0      0.0      1.0      1.0E-03      0.0
71 *
72 * dT=Tsats-Tl subcooling [K]
73 * -200      54 *subtr*      106      107      0
74 *      0.0      0.0      0.0      0.0      0.0
75 *
76 * Cpl x dT [J/kg]
77 * -300      39 *mult*      102      -200      0
78 *      0.0      0.0      0.0      0.0      0.0
79 *
80 * ml x Cpl x dT [J/s]
81 * -400      39 *mult*      105      -300      0
82 *      0.0      0.0      0.0      0.0      0.0
83 *
84 * abs(hfg) [J/kg]
85 * -500      1 *abs*      103      0      0
86 *      1.0      1.0E-03      1.0E+20      0.0      0.0
87 *

```

```

88 * ml x Cpl x dT / abs(hfg) [kg/s]
89 -600 14 *div* -400 -500 0 0.0
90 0.0 0.0 0.0 0.0 0.0
91 *
92 * ml x Cpl x dT / abs(hfg) / A [kg/s/m^2]
93 -700 14 *div* -600 -100 0 0.0
94 0.0 0.0 0.0 0.0 0.0
95 *
96 * mv / A [kg/s/m^2]
97 -800 14 *div* 104 -100 0 0.0
98 0.0 0.0 0.0 0.0 0.0
99 *
100 *****
101 * component data *
102 *****
103 *
104 ***** type num id ctitle
105 break 17 17 steam break
106 * jun1 ibty isat ioff
107 17 0 3 0
108 * dxin volin alpin tin pin
109 1.0000e+00 1.2560e-01 1.0000e+00 3.7315e+02 1.0000e+05
110 * pain concin rbmx poff belv
111 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
112 *
113 ***** type num id ctitle
114 tee 18 18 outlet tank
115 * jcell nodes ichf cost epsw
116 3 0 0 0.0000e+00 1.0000e-06
117 * iconc1 ncell1 jun1 jun2 ipow1
118 0 5 16 17 0
119 * radin1 th1 hout11 houtv1 tout11
120 4.0000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
121 * toutv1
122 3.0000e+02
123 * iconc2 ncell2 jun3 ipow2
124 0 1 14 0
125 * radin2 th2 hout12 houtv2 tout12
126 1.4300e-02 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
127 * toutv2
128 3.0000e+02
129 *
130 * dx * f 1.0000e+00e
131 * vol * f 1.2560e-01e
132 * fa * f 1.2560e-01e
133 * fric * f 1.0000e-04e
134 * grav * f 1.0000e+00e
135 * hd * f 4.0000e-01e
136 * nff * f 1e
137 * alp * f 1.0000e+00e
138 * vl * f 0.0000e+00e
139 * vv * f 0.0000e+00e
140 * tl * f 3.7300e+02e
141 * tv * f 3.7300e+02e
142 * p * f 1.0000e+05e
143 * pa * f 0.0000e+00e
144 *
145 * dx * 2.2140e-01e
146 * vol * 2.2100e-04e
147 * fa * f 1.0000e-03e
148 * fric * f 1.0000e-04e
149 * grav * f 0.0000e+00e
150 * hd * f 2.8570e-02e
151 * nff * f 1e
152 * alp * 1.0000e+00e
153 * vl * f 0.0000e+00e
154 * vv * f 0.0000e+00e
155 * tl * 3.7300e+02e
156 * tv * 3.7300e+02e
157 * p * 1.0000e+05e
158 * pa * 0.0000e+00e
159 *
160 ***** type num id ctitle
161 tee 14 14 test section
162 * jcell nodes ichf cost epsw
163 4 0 0 0.0000e+00 1.0000e-06
164 * iconc1 ncell1 jun1 jun2 ipow1
165 0 13 13 14 0
166 * radin1 th1 hout11 houtv1 tout11
167 1.4300e-02 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
168 * toutv1
169 3.0000e+02
170 * iconc2 ncell2 jun3 ipow2
171 0 1 15 0
172 * radin2 th2 hout12 houtv2 tout12
173 5.0000e-03 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
174 * toutv2
175 3.0000e+02
176 *
177 * dx * 6.7500e-01r02 4.0000e-01r03 5.0000e-02 1.5000e-01 1.2500e-01
178 * dx * r02 2.0000e-01 4.0000e-01 6.0000e-01 3.5000e-01e
179 * vol * 6.7500e-04r02 4.0000e-04r03 5.0000e-05 1.5000e-04 1.2500e-04

```

```

180 * vol * r02 2.0000e-04 4.0000e-04 6.0000e-04 3.5000e-04e
181 * fa * f 1.0000e-03e
182 * fric * f 1.0000e-04e
183 * grav * f 0.0000e+00e
184 * hd * f 2.8570e-02e
185 * nff * f 1e
186 * alp * f 1.0000e+00e
187 * vl * f 0.0000e+00e
188 * vv * f 0.0000e+00e
189 * tl * f 3.7315e+02e
190 * tv * f 3.7315e+02e
191 * p * f 1.0000e+05e
192 * pa * f 0.0000e+00e
193 *
194 * dx * 1.0000e-01e
195 * vol * 7.8540e-06e
196 * fa * f 7.8540e-05e
197 * fric * f 1.0000e-05e
198 * grav * f 1.0000e+00e
199 * hd * f 1.0000e-02e
200 * nff * f 1e
201 * alp * 1.0000e+00e
202 * vl * f 0.0000e+00e
203 * vv * f 0.0000e+00e
204 * tl * 3.7315e+02e
205 * tv * 3.7315e+02e
206 * p * 1.0000e+05e
207 * pa * 0.0000e+00e
208 *
209 ***** type num id ctitle
210 fill 16 16
211 * jun1 ifty ioff
212 * 16 1 0
213 * twtold rfm xv concin felv
214 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
215 * dxin volin alpin vlin tlin
216 * 1.0000e+00 1.2560e-01 0.0000e+00 0.0000e+00 3.0000e+02
217 * pin pain flowin vvin tvin
218 * 1.0000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0000e+02
219 *
220 ***** type num id ctitle
221 fill 15 15 ecc inj.
222 * jun1 ifty ioff
223 * 15 5 0
224 * iftr ifsv nftb nfv nfrf
225 * 0 100 3 0 0
226 * twtold rfm xm concin felv
227 * 0.0000e+00 1.0000e+05 0.0000e+00 0.0000e+00
228 * dxin volin alpin vlin tlin
229 * 1.0000e-01 7.8540e-06 0.0000e+00 0.0000e+00 3.2300e+02
230 * pin pain flowin vvin tvin
231 * 1.0000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.2300e+02
232 * vmscl vvscl
233 * 1.0000e-03 1.0000e-03
234 *
235 * vmtbm * r02 0.0000e+00 5.0000e+00 0.0000e+00 2.0000e+01 3.3000e+02
236 * vmtbm * e
237 *
238 ***** type num id ctitle
239 fill 13 13 steam inj.
240 * jun1 ifty ioff
241 * 13 5 0
242 * iftr ifsv nftb nfv nfrf
243 * 0 100 2 0 0
244 * twtold rfm xm concin felv
245 * 0.0000e+00 1.0000e+04 0.0000e+00 0.0000e+00
246 * dxin volin alpin vlin tlin
247 * 6.7500e-01 6.7500e-04 1.0000e+00 0.0000e+00 3.7315e+02
248 * pin pain flowin vvin tvin
249 * 1.0010e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.7315e+02
250 * vmscl vvscl
251 * 1.0000e-03 1.0000e-03
252 *
253 * vmtbm * r02 0.0000e+00 1.0000e+00 4.0000e+01e
254 *
255 end
256 *
257 *****
258 * time-step data *
259 *****
260 *
261 * dtmin dtmax tend rtwfp powerc
262 * 1.0000e-06 1.0000e-01 1.5000e+02 1.0000e+01 0.0000e+00
263 * edint gfint dmpint sedint
264 * 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01
265 *
266 -1.0
270 *

```


AKIMOTO PLUG-FLOW CONDENSATION INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numtcr          ieos          inopt          nmat
8 *          1              0              1              0
9 Akimoto plug condensation experiment, mg=20, mli=600, Tin=323K
10 *
11 * This test problem is prepared from the paper by Akimoto and Kowawa
12 * and Aoki , 'Analysis of Direct Contact Condensation of Flowing Steam
13 * onto Injected Water with Multifluid Model of Two-Phase Flow,'
14 * Journal of Nuclear Science and Technology, 20 (12) pp. 1006-1022
15 * December 1983. In this paper there is a differential pressure and
16 * liquid film temperature data as a function of horizontal distance
17 * for mg=40 kg/m2s, ml=330 kg/m2s and Tin=323K. This input LISTING
18 * simulates this test with TRAC-PP1/MD2 and prepared by Cetin Unal
19 * April, 23 1992.
20 *
21 *
22 *****
23 * namelist data *
24 *****
25 *
26 &inopts
27 iadded=20, ikfac=1,
28 &end
29 *
30 *          dstep          timet
31 *          0              0.0000E+00
32 *          stdyst          transi          ncomp          njun          ipak
33 *          0              1              6              5              1
34 *          epso            epss
35 *          1.0000E-03      1.0000E-04
36 *          oitmax          sitmax          isolut          ncontr          nccfl
37 *          10             10             0              0              0
38 *          ntsv            ntcbl          ntrp            ntcp
39 *          8              8              0              0              0
40 *
41 *****
42 * component-number data *
43 *****
44 *
45 * iorder*          13          14          15          16          17
46 * iorder*          18e
47 *
48 *****
49 * control-parameter data *
50 *****
51 *
52 * signal variables
53 *
54 * idsv isvn ilcn icn1 icn2
55 * 100 0 0 0 0 * problem time
56 * 101 85 14 4 0 * vap specific heat (Cpv)
57 * 102 86 14 4 0 * liq specific heat (Cpl)
58 * 103 87 14 4 0 * latent heat (hfg)
59 * 104 29 14 4 0 * Z-face vap mass flow (mv)
60 * 105 32 14 4 0 * Z-face liq mass flow (ml)
61 * 106 83 14 4 0 * saturation temperature
62 * 107 23 14 4 0 * liq temperature
63 *
64 * control blocks
65 *
66 * idcb          icbn          icb1          icb2          icb3
67 *          cbgain          cbmin          cbmax          cbcon1          cbcon2
68 * -----
69 * A=Flow area [m^2]
70 * -100 1.0 9 *const* 0 1.0 0 1.0E-03 0 0.0
71 *
72 *
73 * dT=Tsats-Tl subcooling [K]
74 * -200 0.0 54 *subtr* 106 107 0
75 *
76 *
77 * Cpl x dT [J/kg]
78 * -300 0.0 39 *mult* 102 107 0
79 *
80 *
81 * ml x Cpl x dT [J/s]
82 * -400 0.0 39 *mult* 105 107 0
83 *
84 *
85 * abs (hfg) [J/kg]
86 * -500 1.0 1 *abs* 103 0 0
87 *
88 * 1.0E-03 1.0E+20 0.0 0.0

```

```

88 *
89 * ml x Cpl x dT / abs(hfg) [kg/s]
90 -600 14 *div* -400 -500 0 0.0
91 0.0 0.0 0.0 0.0 0.0
92 *
93 * ml x Cpl x dT / abs(hfg) / A [kg/s/m^2]
94 -700 14 *div* -600 -100 0 0.0
95 0.0 0.0 0.0 0.0 0.0
96 *
97 * mv / A [kg/s/m^2]
98 -800 14 *div* 104 -100 0 0.0
99 0.0 0.0 0.0 0.0 0.0
100 *
101 *****
102 * component data *
103 *****
104 *
105 ***** type num id ctitle
106 break 17 17 steam break
107 * jun1 ibty isat ioff
108 17 0 3 0
109 * dxin volin alpin tin pin
110 1.0000E+00 1.2560E-01 1.0000E+00 3.7315E+02 1.0000E+05
111 * pain concin rlmx poff belv
112 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
113 *
114 ***** type num id ctitle
115 tee 18 18 outlet tank
116 * jcell nodes ichf cost epsw
117 3 0 0 0.0000E+00 1.0000E-06
118 * iconc1 ncell1 jun1 jun2 ipow1
119 0 5 16 17 0
120 * radin1 th1 hout11 houtv1 tout11
121 4.0000E-01 1.0000E-02 0.0000E+00 0.0000E+00 3.0000E+02
122 * toutv1
123 3.0000E+02
124 * iconc2 ncell2 jun3 ipow2
125 0 1 14 0
126 * radin2 th2 hout12 houtv2 tout12
127 1.4300E-02 1.0000E-02 0.0000E+00 0.0000E+00 3.0000E+02
128 * toutv2
129 3.0000E+02
130 *
131 * dx * f 1.0000E+00e
132 * vol * f 1.2560E-01e
133 * fa * f 1.2560E-01e
134 * fric * f 1.0000E-04e
135 * grav * f 1.0000E+00e
136 * hd * f 4.0000E-01e
137 * nff * f 1e
138 * alp * f 1.0000E+00e
139 * vl * f 0.0000E+00e
140 * vv * f 0.0000E+00e
141 * tl * f 3.7300E+02e
142 * tv * f 3.7300E+02e
143 * p * f 1.0000E+05e
144 * pa * f 0.0000E+00e
145 *
146 * dx * 2.2140E-01e
147 * vol * 2.2100E-04e
148 * fa * f 1.0000E-03e
149 * fric * f 1.0000E-04e
150 * grav * f 0.0000E+00e
151 * hd * f 2.8570E-02e
152 * nff * f 1e
153 * alp * 1.0000E+00e
154 * vl * f 0.0000E+00e
155 * vv * f 0.0000E+00e
156 * tl * 3.7300E+02e
157 * tv * 3.7300E+02e
158 * p * 1.0000E+05e
159 * pa * 0.0000E+00e
160 *
161 ***** type num id ctitle
162 tee 14 14 test section
163 * jcell nodes ichf cost epsw
164 4 0 0 0.0000E+00 1.0000E-06
165 * iconc1 ncell1 jun1 jun2 ipow1
166 0 13 13 14 0
167 * radin1 th1 hout11 houtv1 tout11
168 1.4300E-02 1.0000E-02 0.0000E+00 0.0000E+00 3.0000E+02
169 * toutv1
170 3.0000E+02
171 * iconc2 ncell2 jun3 ipow2
172 0 1 15 0
173 * radin2 th2 hout12 houtv2 tout12
174 5.0000E-03 1.0000E-02 0.0000E+00 0.0000E+00 3.0000E+02
175 * toutv2
176 3.0000E+02
177 *
178 * dx * 6.7500E-01r02 4.0000E-01r03 5.0000E-02 1.5000E-01 1.2500E-01
179 * dx * r02 2.0000E-01 4.0000E-01 6.0000E-01 3.5000E-01e

```

```

180 * vol * 6.7500E-04r02 4.0000E-04r03 5.0000E-05 1.5000E-04 1.2500E-04
181 * vol * r02 2.0000E-04 4.0000E-04 6.0000E-04 3.5000E-04e
182 * fa * f 1.0000E-03e
183 * fric * f 1.0000E-04e
184 * grav * f 0.0000E+00e
185 * hd * f 2.8570E-02e
186 * nff * f 1e
187 * alp * f 1.0000E+00e
188 * vl * f 0.0000E+00e
189 * vv * f 0.0000E+00e
190 * tl * f 3.7315E+02e
191 * tv * f 3.7315E+02e
192 * p * f 1.0000E+05e
193 * pa * f 0.0000E+00e
194 *
195 * dx * 1.0000E-01e
196 * vol * 7.8540E-06e
197 * fa * f 7.8540E-05e
198 * fric * f 1.0000E-05e
199 * grav * f 1.0000E+00e
200 * hd * f 1.0000E-02e
201 * nff * f 1e
202 * alp * f 1.0000E+00e
203 * vl * f 0.0000E+00e
204 * vv * f 0.0000E+00e
205 * tl * 3.7315E+02e
206 * tv * 3.7315E+02e
207 * p * 1.0000E+05e
208 * pa * 0.0000E+00e
209 *
210 ***** type num id ctitle
211 fill 16 16
212 * jun1 ifty ioff
213 16 1 0
214 * twtold rfmvx concin felv
215 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
216 * dxin volin alpin vlin tlin
217 1.0000E+00 1.2560E-01 0.0000E+00 0.0000E+00 3.0000E+02
218 * pin pain flowin vvinn tvin
219 1.0000E+05 0.0000E+00 0.0000E+00 0.0000E+00 3.0000E+02
220 *
221 ***** type num id ctitle
222 fill 15 15 ecc inj.
223 * jun1 ifty ioff
224 15 5 0
225 * iftr ifsv nftb nfv nfrf
226 0 100 3 0 0
227 * twtold rfmxm concin felv
228 0.0000E+00 1.0000E+05 0.0000E+00 0.0000E+00
229 * dxin volin alpin vlin tlin
230 1.0000E-01 7.8540E-06 0.0000E+00 0.0000E+00 3.2300E+02
231 * pin pain flowin vvinn tvin
232 1.0000E+05 0.0000E+00 0.0000E+00 0.0000E+00 3.2300E+02
233 * vmscl vvscl
234 1.0000E-03 1.0000E-03
235 *
236 * vmtbm * r02 0.0000E+00 5.0000E+00 0.0000E+00 2.0000E+01 6.0000E+02
237 * vmtbm * e
238 *
239 ***** type num id ctitle
240 fill 13 13 steam inj.
241 * jun1 ifty ioff
242 13 5 0
243 * iftr ifsv nftb nfv nfrf
244 0 100 2 0 0
245 * twtold rfmxm concin felv
246 0.0000E+00 1.0000E+04 0.0000E+00 0.0000E+00
247 * dxin volin alpin vlin tlin
248 6.7500E-01 6.7500E-04 1.0000E+00 0.0000E+00 3.7315E+02
249 * pin pain flowin vvinn tvin
250 1.0010E+05 0.0000E+00 0.0000E+00 0.0000E+00 3.7315E+02
251 * vmscl vvscl
252 1.0000E-03 1.0000E-03
253 *
254 * vmtbm * r02 0.0000E+00 1.0000E+00 2.0000E+01e
255 *
256 end
257 *
258 *****
259 * time-step data *
260 *****
261 *
262 * dtmin dtmax tend rtwfp powerc
263 1.0000e-06 0.050 1.9000e+01 1.0000e+01 0.0000e+00
264 * edint gfint dmpint sedint
265 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01
266 *
267 * dtmin dtmax tend rtwfp powerc
268 1.0000e-06 0.001 2.5000e+01 1.0000e+01 0.0000e+00
269 * edint gfint dmpint sedint
270 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01
271 *

```


AKIMOTO TRANSITIONAL-FLOW CONDENSATION INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numtcr          ieos          inopt          nmat
8 *          1              0              1              0
9 Akimoto transitional condensation exp.: mg=stepped, ml=ramped, Tin=323k
10 * This test problem is prepared from the paper by Akimoto and Kowawa
11 * and Aoki, 'Analysis of Direct Contact Condensation of Flowing Steam
12 * onto Injected Water with Multifluid Model of Two-Phase Flow,'
13 * Journal of Nuclear Science and Technology, 20 (12) pp. 1006-1022
14 * December 1983. In this paper there is a differential pressure and
15 * liquid film temperature data as a function of horizontal distance.
16 * This input LISTING simulates this test with TRAC-PP1/MOD2 for varying
17 * steam and liquid injection flow rates defined as follows:
18 *
19 *   time      mv (kg/m2s)
20 *   0         20
21 *   20        20
22 * David A. Pimentel February 27, 1998.
23 *
24 *****
25 * namelist data *
26 *****
27 *
28 &inopts
29 iadded=20, ikfac=1
30 &end
31 *
32 *          dstep          timet
33 *          0              0.0000e+00
34 *          stdyst          transi          ncomp          njun          ipak
35 *          0              1              6              5              1
36 *          epso            epss
37 *          1.0000e-03      1.0000e-04
38 *          oitmax          sitmax          isolut          ncontr          nccfl
39 *          10             10             0              0              0
40 *          ntsv            ntcb          ntcf            ntrp            ntcp
41 *          6              10             0              0              0
42 *
43 *****
44 * component-number data *
45 *****
46 *
47 * iorder*          13          14          15          16          17
48 * iorder*          18e
49 *
50 *****
51 * control-parameter data *
52 *****
53 *
54 * signal variables
55 *
56 * idsv isvn ilcn icn1 icn2          * problem time
57 * 100  0    0    0    0          * liq specific heat (Cpl)
58 * 102  86  14  15  0          * latent heat (hfg)
59 * 103  87  14  15  0          * Z-face vap mass flow (mv)
60 * 104  29  14  4   0          * Z-face liq mass flow (ml)
61 * 105  32  14  15  0          * liq temperature
62 * 107  23  14  15  0
63 *
64 * control blocks
65 *
66 * idcb          icbn          icb1          icb2          icb3          cbcon2
67 *          cbgain          cbmin          cbmax          cbcon1
68 * -----
69 * Tsat(Pexit) [K] where Pexit=1.015bar
70 * -100          9 *const*          0          0          0          0.0
71 *          1.0          0.0          1.0E+03          3.733918e+02
72 *
73 * Av=Steam Flow area [m^2]
74 * -150          9 *const*          0          0          0          0.0
75 *          1.0          0.0          1.0          1.0E-03
76 *
77 * dT=Tsot(Pexit)-Tl [K]
78 * -200          54 *subtr*          -100          107          0          0.0
79 *          0.0          0.0          0.0          0.0
80 *
81 * Cpl x dT [J/kg]
82 * -300          39 *mult*          102          -200          0          0.0
83 *          0.0          0.0          0.0          0.0
84 *
85 * abs(ml) [kg/s]
86 * -350          1 *abs*          105          0          0          0.0
87 *          0.0          0.0          0.0          0.0

```

```

88 *
89 * ml x Cpl x dT [J/s]
90 -400 39 *mult* -350 0.0 -300 0.0 0 0.0
91 0.0 0.0 0.0 0.0 0.0 0.0
92 *
93 * abs(hfg) [J/kg]
94 -500 1 *abs* 103 0 0 0
95 1.0 1.0E-03 1.0E+20 0.0 0.0 0.0
96 *
97 * ml x Cpl x dT / abs(hfg) [kg/s]
98 -600 14 *div* -400 -500 0 0
99 0.0 0.0 0.0 0.0 0.0 0.0
100 *
101 * Mc,max = ml x Cpl x dT / abs(hfg) / Av [kg/s/m^2]
102 -700 14 *div* -600 -150 0 0
103 0.0 0.0 0.0 0.0 0.0 0.0
104 *
105 * Mv = mv / Av [kg/s/m^2]
106 -800 14 *div* 104 -150 0 0
107 0.0 0.0 0.0 0.0 0.0 0.0
108 *
109 *****
110 * component data *
111 *****
112 *
113 ***** type num id ctitle
114 break 17 17 steam break
115 * jun1 ibty isat iooff
116 17 0 3 0
117 * dxin volin alpin tin pin
118 1.0000e+00 1.2560e-01 1.0000e+00 3.7315e+02 1.0000e+05
119 * pain concin rbmx poff belv
120 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
121 *
122 ***** type num id ctitle
123 tee 18 18 outlet tank
124 * jcell nodes ichf cost epsw
125 3 0 0 0.0000e+00 1.0000e-06
126 * iconc1 ncell1 jun1 jun2 ipow1
127 0 5 16 17 0
128 * radin1 th1 hout11 houtv1 tout11
129 4.0000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
130 * toutv1
131 3.0000e+02
132 * iconc2 ncell2 jun3 ipow2
133 0 1 14 0
134 * radin2 th2 hout12 houtv2 tout12
135 1.4300e-02 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
136 * toutv2
137 3.0000e+02
138 *
139 * dx * f 1.0000e+00e
140 * vol * f 1.2560e-01e
141 * fa * f 1.2560e-01e
142 * fric * f 1.0000e-04e
143 * grav * f 1.0000e+00e
144 * hd * f 4.0000e-01e
145 * nff * f 1e
146 * alp * f 1.0000e+00e
147 * vl * f 0.0000e+00e
148 * vv * f 0.0000e+00e
149 * tl * f 3.7300e+02e
150 * tv * f 3.7300e+02e
151 * p * f 1.0000e+05e
152 * pa * f 0.0000e+00e
153 *
154 * dx * 2.2140e-01e
155 * vol * 2.2100e-04e
156 * fa * f 1.0000e-03e
157 * fric * f 1.0000e-04e
158 * grav * f 0.0000e+00e
159 * hd * f 2.8570e-02e
160 * nff * f 1e
161 * alp * 1.0000e+00e
162 * vl * f 0.0000e+00e
163 * vv * f 0.0000e+00e
164 * tl * 3.7300e+02e
165 * tv * 3.7300e+02e
166 * p * 1.0000e+05e
167 * pa * 0.0000e+00e
168 *
169 ***** type num id ctitle
170 tee 14 14 test section
171 * jcell nodes ichf cost epsw
172 4 0 0 0.0000e+00 1.0000e-06
173 * iconc1 ncell1 jun1 jun2 ipow1
174 0 13 13 14 0
175 * radin1 th1 hout11 houtv1 tout11
176 1.4300e-02 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
177 * toutv1
178 3.0000e+02
179 * iconc2 ncell2 jun3 ipow2

```

```

180          0          1          15          0
181 *      radin2      th2      houtl2      houtv2      toutl2
182      5.0000e-03      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
183 *      toutv2
184      3.0000e+02
185 *
186 * dx *      6.7500e-01r02      4.0000e-01r03      5.0000e-02      1.5000e-01      1.2500e-01
187 * dx * r02      2.0000e-01      4.0000e-01      6.0000e-01      3.5000e-01e
188 * vol *      6.7500e-04r02      4.0000e-04r03      5.0000e-05      1.5000e-04      1.2500e-04
189 * vol * r02      2.0000e-04      4.0000e-04      6.0000e-04      3.5000e-04e
190 * fa * f      1.0000e-03e
191 * fric * f      1.0000e-04e
192 * grav * f      0.0000e+00e
193 * hd * f      2.8570e-02e
194 * nff * f      1e
195 * alp * f      1.0000e+00e
196 * vl * f      0.0000e+00e
197 * vv * f      0.0000e+00e
198 * tl * f      3.7315e+02e
199 * tv * f      3.7315e+02e
200 * p * f      1.0000e+05e
201 * pa * f      0.0000e+00e
202 *
203 * dx *      1.0000e-01e
204 * vol *      7.8540e-06e
205 * fa * f      7.8540e-05e
206 * fric * f      1.0000e-05e
207 * grav * f      1.0000e+00e
208 * hd * f      1.0000e-02e
209 * nff * f      1e
210 * alp *      1.0000e+00e
211 * vl * f      0.0000e+00e
212 * vv * f      0.0000e+00e
213 * tl *      3.7315e+02e
214 * tv *      3.7315e+02e
215 * p *      1.0000e+05e
216 * pa *      0.0000e+00e
217 *
218 ***** type          num          id          ctitle
219 fill          16          16
220 *      junl          ifty          ioff
221          16          1
222 *      twtold          rfmvx          concin          felv
223          0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
224 *      dxin          volin          alpin          vlin          tlin
225          1.0000e+00      1.2560e-01      0.0000e+00      0.0000e+00      3.0000e+02
226 *      pin          pain          flowin          vvin          tvin
227          1.0000e+05      0.0000e+00      0.0000e+00      0.0000e+00      3.0000e+02
228 *
229 ***** type          num          id          ctitle
230 fill          15          15 ecc inj.
231 *      junl          ifty          ioff
232          15          5
233 *      iftr          ifsv          nftb          nfsv          nfrf
234          0          100          8          0          0
235 *      twtold          rfmxm          concin          felv
236          0.0000e+00      1.0000e+05      0.0000e+00      0.0000e+00
237 *      dxin          volin          alpin          vlin          tlin
238          1.0000e-01      7.8540e-06      0.0000e+00      0.0000e+00      3.2300e+02
239 *      pin          pain          flowin          vvin          tvin
240          1.0000e+05      0.0000e+00      0.0000e+00      0.0000e+00      3.2300e+02
241 *      vmscl          vvscl
242          1.0000e-03      1.0000e-03
243 *
244 * vmtbm *      0.0000e+00      0.0000e+00      4.0000e+01      4.7124e+02 s
245 * vmtbm *      4.0500e+01      0.0000e+00      5.0000e+01      0.0000e+00 s
246 * vmtbm *      9.0000e+01      1.0000e+03      9.0500e+01      0.0000e+00 s
247 * vmtbm *      1.0000e+02      0.0000e+00      1.4000e+02      1.6000e+03 e
248 *
249 ***** type          num          id          ctitle
250 fill          13          13 steam inj.
251 *      junl          ifty          ioff
252          13          5
253 *      iftr          ifsv          nftb          nfsv          nfrf
254          0          100          5          0          0
255 *      twtold          rfmxm          concin          felv
256          0.0000e+00      1.0000e+04      0.0000e+00      0.0000e+00
257 *      dxin          volin          alpin          vlin          tlin
258          6.7500e-01      6.7500e-04      1.0000e+00      0.0000e+00      3.7315e+02
259 *      pin          pain          flowin          vvin          tvin
260          1.0010e+05      0.0000e+00      0.0000e+00      0.0000e+00      3.7315e+02
261 *      vmscl          vvscl
262          1.0000e-03      1.0000e-03
263 *
264 * vmtbv *      4.5000e+01      2.0000e+01      4.5500e+01      4.0000e+01 s
265 * vmtbv *      9.5000e+01      4.0000e+01      9.5500e+01      6.0000e+01 s
266 * vmtbv *      1.4000e+02      6.0000e+01 e
267 *
268 end
269 *
270 *****
271 * time-step data *

```

```

272 *****
273 *
274 * dtmin 1.0000e-06 5.0000e-02 4.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
275 * edint 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
276 * dtmin 1.0000e-06 2.5000e-02 1.0000e+02 1.0000e+01 1.0000e+01 0.0000e+00
277 * edint 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
278 * dtmin 1.0000e-06 1.2500e-02 1.4000e+02 1.0000e+01 1.0000e+01 0.0000e+00
279 * edint 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
280 * dtmin 1.0000e-06 1.0000e-02 1.4000e+02 1.0000e+01 1.0000e+01 0.0000e+00
281 * edint 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
282 * dtmin 1.0000e-06 1.2500e-02 1.4000e+02 1.0000e+01 1.0000e+01 0.0000e+00
283 * edint 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
284 * dtmin 1.0000e-06 1.0000e-02 1.4000e+02 1.0000e+01 1.0000e+01 0.0000e+00
285 * edint 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
286 * dtmin 1.0000e-06 1.0000e-02 1.4000e+02 1.0000e+01 1.0000e+01 0.0000e+00
287 * edint 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
288 * dtmin 1.0000e-06 1.0000e-02 1.4000e+02 1.0000e+01 1.0000e+01 0.0000e+00
289 * edint 1.0000e+01 1.0000e-01 1.0000e+01 1.0000e+01 1.0000e+01 0.0000e+00
290 *

```


APPENDIX D

CRITICAL-FLOW TEST PROBLEMS INPUT LISTINGS

This appendix contains the input listings for the critical-flow test problems of Section 4.3 as follows:

<u>Problem</u>	<u>Page</u>
1. Marviken Test 4	D-2
2. Marviken Test 13	D-4
3. Marviken Test 20	D-6
4. Marviken Test 22	D-8
5. Marviken Test 24	D-10
6. Edwards Blowdown Test	D-12

MARVIKEN TEST 4 INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numctr          ieos          inopt          nmat
8 *          10              0              1              0
9 *--*TEST PROBLEM MARVIK , Time = 56.0
10 * marviken test 4 : critical flow noding, 2 cell nozzle. *
11 * This deck is an exact copy of the file located on Manjit Sahota's *
12 * directory: /091597/tracpfl/data/marviken/marviken4/data/trcinchok, *
13 * except for a.) these first 9 comment cards, *
14 *                b.) nff values were set = 1 on both pipes *
15 *                (they were previously = 2), *
16 *                c.) the minimum time step had to be decreased from the *
17 *                original value of 1.0x10(-2) to 1.0x10(-3). *
18 *
19 *                renodalized last 3 cells of pipe 3 so that throat
20 *                is upstream of pipe 3 outlet - j. steiner 9/26/97
21 *
22 *
23 *****
24 * namelist data *
25 *****
26 *
27 &inopts
28 icflow=2,
29 &end
30 *
31 *          dstep          timet
32 *          0              0.0000e+00
33 *          stdyst          transi          ncomp          njun          ipak
34 *          0              1              4              3              0
35 *          eps0            epss
36 *          1.0000e-03      1.0000e-02
37 *          oitmax          sitmax          isolut          ncontr          nccfl
38 *          30              80              0              0              0
39 *          ntsv            ntcb            ntcf            ntrp            ntcp
40 *          0              0              0              0              0
41 *
42 *****
43 * component-number data *
44 *****
45 *
46 * iorder*          1          2          3          4e
47 *
48 *****
49 * component data *
50 *****
51 *
52 ***** type          num          id          ctitle
53 fill          1          1          $1$ vessel top zero fill
54 *          jun1          ifty          ioff
55 *          1              1              0
56 *          twtold          rfmX          concin          felv
57 *          0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
58 *          dxin            volin          alpin          vlin          tlin
59 *          1.5500e+00      2.7391e+00      1.0000e+00      0.0000e+00      5.3560e+02
60 *          pin            pain          flowin          vvin          tvin
61 *          4.9400e+06      0.0000e+00      0.0000e+00      0.0000e+00      5.3560e+02
62 *
63 ***** type          num          id          ctitle
64 pipe          2          2          $2$ pressure vessel
65 *          ncells          nodes          jun1          jun2          epsw
66 *          15              0              1              2          0.0000e+00
67 *          ichf            iconc          iacc          ipow
68 *          1              0              0              0
69 *          radin          th            houtl          houtv          toutl
70 *          2.6100e+00      1.0000e-01      0.0000e+00      0.0000e+00      3.0000e+02
71 *          toutv
72 *          3.0000e+02
73 *
74 * dx          *          1.5500e+00      1.6000e+00      1.0000e+00r02      1.4000e+00r10      1.5000e+00
75 e
76 * vol          *          2.7391e+00      2.8274e+00      9.5118e+00r02      2.9005e+01r10      3.1076e+01
77 e
78 * fa          * r03      1.7671e+00r13      2.0718e+01e
79 * fric        * f          0.0000e+00e
80 * grav        * f          -1.0000e+00e
81 * hd          * r03      1.5000e+00r13      5.1360e+00e
82 * icflg       * f          0e
83 * nff         * r02          1r02          -1          1          -1r10          1
84 e
85 * alp         * r05      1.0000e+00r10      0.0000e+00e
86 * vl          * f          0.0000e+00e
87 * vv          * f          0.0000e+00e

```

```

88 * tl * r10 5.3620e+02 5.2300e+02 5.1000e+02r02 5.0600e+02 5.0100e+02
89 e
90 * tv * r10 5.3620e+02 5.2300e+02 5.1000e+02r02 5.0600e+02 5.0100e+02
91 e
92 * p * 4.9340e+06r03 4.9350e+06r02 4.9360e+06 4.9490e+06 4.9610e+06
93 * p * 4.9730e+06 4.9850e+06 4.9970e+06 5.0090e+06 5.0220e+06
94 * p * 5.0340e+06 5.0460e+06e
95 * pa * f 0.0000e+00e
96 *
97 ***** type num id ctitle
98 pipe 3 3 $3$ discharge pipe
99 * ncells nodes jun1 jun2 epsw
100 17 0 2 3 0.0000e+00
101 * ichf iconc iacc ipow
102 1 0 0 0
103 * radin th houtl houtv toutl
104 2.5500e-01 1.0000e-01 0.0000e+00 0.0000e+00 3.0000e+02
105 * toutv
106 3.0000e+02
107 *
108 * dx * 6.0000e-01r08 5.0000e-01 7.9000e-01 6.1000e-01 6.0000e-01
109 * dx * 5.6800e-01 5.0000e-01 .324 1.6 .226
110 e
111 * vol * 1.2104e+01 9.4300e+00 7.7925e+00 4.9886e+00 1.5474e+00
112 * vol * r04 2.2210e-01 3.5090e-01 2.8110e-01 2.8670e-01 2.6180e-01
113 * vol * 2.2210e-01 .188832 .320481 .065315e
114 * fa * 2.0718e+01 1.9635e+01 1.8096e+01 1.3203e+01 7.0686e+00
115 * fa * r06 4.4410e-01r02 4.7780e-01r02 4.4410e-01r02 .2035 .4094
116 e
117 * fric * r15 0.0000e+00 .00001r02 0.e
118 * grav * f -1.0000e+00e
119 * hd * 5.1360e+00 5.0000e+00 4.8000e+00 4.1000e+00 3.0000e+00
120 * hd * r06 7.5200e-01r02 7.8000e-01r02 7.5200e-01r02 .509 .722
121 e
122 * icflg * r16 0 1 0e
123 * nff * r04 1r02 -1r11 1 -1e
124 * alp * f 0.0000e+00e
125 * vl * f 0.0000e+00e
126 * vv * f 0.0000e+00e
127 * tl * r05 4.9900e+02 4.9800e+02r02 4.9700e+02 4.9600e+02 4.9500e+02
128 * tl * 4.9400e+02 4.9200e+02 4.8400e+02 4.7900e+02 4.7600e+02
129 * tl * r02 4.7500e+02e
130 * tv * r05 4.9900e+02 4.9800e+02r02 4.9700e+02 4.9600e+02 4.9500e+02
131 * tv * 4.9400e+02 4.9200e+02 4.8400e+02 4.7900e+02 4.7600e+02
132 * tv * r02 4.7500e+02e
133 * p * 5.0550e+06 5.0600e+06 5.0640e+06 5.0680e+06 5.0720e+06
134 * p * 5.0760e+06 5.0810e+06 5.0850e+06 5.0890e+06 5.0940e+06
135 * p * 5.1000e+06 5.1050e+06 5.1100e+06 5.1150e+06 5.1190e+06
136 * p * 5.1220e+06 5.1290e+06e
137 * pa * f 0.0000e+00e
138 *
139 ***** type num id ctitle
140 break 4 4 $4$ pressure boundary
141 * jun1 ibty isat ioff
142 3 0 0 0
143 * dxin volin alpin tin pin
144 0.0226 .065315 1.0000e+00 3.7300e+02 1.0170e+05
145 * pain concin rbmx poff belv
146 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
147 *
148 end
149 *
150 *****
151 * time-step data *
152 *****
153 *
154 * dtmin dtmax tend rtwfp
155 1.0000e-03 1.0000e+00 5.6000e+01 1.0000e+00
156 * edint gfint dmpint sedint
157 5.0000e+00 5.0000e-01 1.0000e+01 1.0000e+00
158 *
159 *****
160 * time-step data *
161 *****
162 *
163 * endflag
164 -1.0000e+00

```

MARVIKEN TEST 13 INPUT LISTING

```

1 free format
2 *
3 *      numtcr      ieos      inopt      nmat
4 *          5          0          1          0
5
6 marviken test 13
7
8 converted from PD2 to MOD2, 8/97, j. l. steiner
9 combined finely noded cells in discharge pipe 3
10 *
11 &inopts
12   icflow=2,
13 &end
14 *
15 *      dstep      timet
16 *          0          0.0
17 *
18 *      stdyst      transi      ncomp      njun      ipack
19 *          0          1          4          3          0
20 *
21 *      epso      epss
22 *      1.0e-03      1.0e-02
23 *
24 *      oitmax      sitmax      isolut      ncontr      nccfl
25 *          30          80          0          0          0
26 *
27 *      ntsv      ntcb      ntcf      ntrp      ntcp
28 *          0          0          0          0          1
29 *
30 * iorder      +      +      +      +      +
31 *          1          2          3          4e
32 *
33 *****
34 *                      component data                      *
35 *****
36 *
37 *                      num      id      ctitle
38 fill          jun1      ifty      ioff      $1$ vessel top zero fill
39 *          1          1          0
40 *
41 *
42 *      twtold      rfmx      concin      felv
43 *          0.          1.e+6      0.          0.
44 *
45 *      dxin      volin      alpin      vlin      tlin
46 *      1.550      2.7391      1.0          0.          538.3
47 *
48 *      pin      pain      flowin      vvin      tvin
49 *      5100000.      0.          0.          0.          538.3
50 *
51 *      type      num      id      ctitle
52 pipe          2          2      $2$ pressure vessel
53 *
54 *      ncells      nodes      jun1      jun2      epsw
55 *          15          0          1          2          0.
56 *
57 *      ichf      iconc      iacc      ipow
58 *          1          0          0          0
59 *
60 *      radin      th      hout1      houtv      tout1
61 *      2.61000e+00      1.00000e-01      0.          0.          3.00000e+02
62 *
63 *      toutv      powin      powoff      rpowmx      powscl
64 *      3.00000e+02      0.          0.          0.          1.
65 *
66 *      +      +      +      +      +
67 * dx * r 1 1.5500e+00r 1 1.6000e+00r 1 1.0000e+00r 1 1.4000e+00r 1 1.4800e+00
68 * dx * r 1 1.4200e+00r 9 1.5000e+00e
69 * vol * r 1 2.7391e+00r 1 2.8274e+00r 1 9.5118e+00r 1 2.9005e+01r 1 3.0662e+01
70 * vol * r 1 2.9419e+01r 9 3.1076e+01e
71 * fa * r 3 1.7671e+00r13 2.0718e+01e
72 *      +      +      +      +      +
73 * fric * r 2          0.r 2          .00001r12          0.e
74 * grav * f -1.0000e+00e
75 * hd * r 3 1.5000e+00r13 5.1360e+00e
76 * icflg * f          0e
77 * nff * f          1e
78 * alp * r 5 1.0000e+00r10 0.          e
79 * vl * f 0.          e
80 * vv * f 0.          e
81 * tl * r10 5.3830e+02r 1 5.3240e+02r 1 5.1860e+02r 1 5.0830e+02r 2 5.0710e+02e
82 * tv * r10 5.3830e+02r 1 5.3240e+02r 1 5.1860e+02r 1 5.0830e+02r 2 5.0710e+02e
83 * p * r 6 5.1000e+06r 1 5.1110e+06r 1 5.1230e+06r 1 5.1340e+06r 1 5.1460e+06
84 * p * r 1 5.1570e+06r 1 5.1690e+06r 1 5.1810e+06r 1 5.1930e+06r 1 5.2050e+06e
85 * pa * f          0.e
86 *
87 *      type      num      id      ctitle

```

```

88 pipe 3 3 $$$ discharge pipe
89 *
90 * ncells nodes jun1 jun2 epsw
91 * 13 0 2 3 0.
92 *
93 * ichf iconc iacc ipow
94 * 1 0 0 0
95 *
96 * radin th hout1 houtv tout1
97 * 1.00000e-01 1.00000e-01 0. 0. 3.00000e+02
98 *
99 * toutv powin powoff rpowmx powsci
100 * 3.00000e+02 0. 0. 0. 1.
101 *
102 * + + + + +
103 * dx * r 1 6.0000e-01r 4 5.0000e-01r 1 2.7900e+00r 1 6.1000e-01r 1 6.0000e-01
104 * dx * r 1 5.6800e-01r 2 5.0000e-01r 1 1.0000e-01r 1 5.9000e-01e
105 * vol * r 1 1.2104e+01r 1 9.4300e+00r 1 7.7925e+00r 1 4.9886e+00r 1 1.5474e+00
106 * vol * r 1 1.2393e+00r 1 2.8110e-01r 1 2.8670e-01r 1 2.6180e-01r 1 2.2210e-01
107 * vol * r 1 1.3430e-01r 1 5.1960e-03r 1 1.8539e-02e
108 * fa * r 1 2.0718e+01r 1 1.9635e+01r 1 1.8096e+01r 1 1.3203e+01r 1 7.0686e+00
109 * fa * r 2 4.4410e-01r 2 4.7780e-01r 2 4.4410e-01r 1 1.2570e-01r 2 3.1400e-02e
110 * fric * r 4 0. .00001 7.5200e-01r 5 0. r 2 .00001
111 * fric * r 1 0.e
112 * grav * f -1.0000e+00e
113 * hd * r 1 5.1360e+00r 1 5.0000e+00r 1 4.8000e+00r 1 4.1000e+00r 1 3.0000e+00
114 * hd * r 2 7.5200e-01r 2 7.8000e-01r 2 7.5200e-01r 1 4.0000e-01r 2 2.0000e-01e
115 * icflg * r13 0 1 e
116 * nff * r13 1 -1e
117 * alp * f 0. e
118 * vl * f 0. e
119 * vv * f 0. e
120 * tl * r 1 5.0620e+02r 1 5.0550e+02r 1 5.0480e+02r 1 5.0420e+02r 1 5.0150e+02
121 * tl * r 1 4.9308e+02r 1 4.7960e+02r 1 4.7040e+02r 1 4.6160e+02r 1 4.5350e+02
122 * tl * r 1 4.4590e+02r 2 4.4210e+02e
123 * tv * r 1 5.0620e+02r 1 5.0550e+02r 1 5.0480e+02r 1 5.0420e+02r 1 5.0150e+02
124 * tv * r 1 4.9308e+02r 1 4.7960e+02r 1 4.7040e+02r 1 4.6160e+02r 1 4.5350e+02
125 * tv * r 1 4.4590e+02r 2 4.4210e+02e
126 * p * r 1 5.2140e+06r 1 5.2180e+06r 1 5.2230e+06r 1 5.2270e+06r 1 5.2310e+06
127 * p * r 1 5.2434e+06r 1 5.2590e+06r 1 5.2640e+06r 1 5.2690e+06r 1 5.2740e+06
128 * p * r 1 5.2780e+06r 1 5.2808e+06r 1 5.2840e+06e
129 * pa * f 0.e
130 *
131 * type num id ctitle
132 break 4 4 $$$ pressure boundary
133 *
134 * jun1 ibty isat ioff
135 * 3 0 0 1
136 *
137 * dxin volin alpin tin pin
138 * .059 .018539 1.0 372.9 100400.
139 *
140 * pain concin rbmx poff belv
141 * 0. 0. 0. 0. 0.
142 *
143 end
144 *
145 *****
146 * time step data *
147 *****
148 *
149 * dtmin dtmax tend trwfp
150 * .00001 .040 152. 10.
151 *
152 * edint gfint dmpint sedint
153 * 20. .5 20. 1.e6
154 * -1.0

```

MARVIKEN TEST 20 INPUT LISTING

```

1 free format
2 *
3 *      numctr      ieos      inopt      nmat
4 *      5          0          1          0
5
6 marviken test 20
7
8 converted from PD2 to MOD2, 8/97, j. l. steiner
9 combined finely noded cells in discharge pipe 3
10 *
11 &inopts
12 icflow=2,
13 &end
14 *
15 *      dstep      timet
16 *      0          0.0
17 *
18 *      stdyst      transi      ncomp      njun      ipack
19 *      0          1          4          3          0
20 *
21 *      epso      epss
22 *      1.0e-03    1.0e-02
23 *
24 *      oitmax      sitmax      isolut      ncontr      nccfl
25 *      30          80          0          0          0
26 *
27 *      ntsv      ntcb      ntcf      ntrp      ntcp
28 *      0          0          0          0          1
29 *
30 * iorder      +      +      +      +
31 *      1          2          3          4e      +
32 *
33 *****
34 *      component data      *
35 *****
36 *
37 *      num      id      ctitle
38 fill      jun1      ifty      ioff      $1$ vessel top zero fill
39 *      1          1          0
40 *
41 *
42 *      twtold      rfmx      concin      felv
43 *      0          1.e+6      0.          0.
44 *
45 *      dxin      volin      alpin      vlin      tlin
46 *      1.550      2.7391      1.0          0.          537.18
47 *
48 *      pin      pain      flowin      vvin      tvin
49 *      4987000.      0.          0.          0.          537.18
50 *
51 *      type      num      id      ctitle
52 pipe      2          2      $2$ pressure vessel
53 *
54 *      ncells      nodes      jun1      jun2      epsw
55 *      38          0          1          2          0.
56 *
57 *      ichf      iconc      iacc      ipow
58 *      1          0          0          0
59 *
60 *      radin      th      hout1      houtv      tout1
61 *      2.56800e+00    1.00000e-01    0.          0.          3.00000e+02
62 *
63 *      toutv      powin      powoff      rpowmx      powscl
64 *      3.00000e+02    0.          0.          0.          1.
65 *
66 *      +      +      +      +      +
67 * dx * r 1 1.5500e+00r 1 1.6000e+00r 1 1.0000e+00r 1 7.6000e-01r 1 5.4000e-01
68 * dx * r 3 5.0000e-01r 1 5.2000e-01r 1 4.8000e-01r28 5.0000e-01e
69 * vol * r 1 2.7391e+00r 1 2.8274e+00r 1 9.5118e+00r 1 1.5745e+01r 1 1.1188e+01
70 * vol * r 3 1.0359e+01r 1 1.0773e+01r 1 9.9444e+00r28 1.0359e+01e
71 * fa * r 3 1.7671e+00r36 2.0718e+01e
72 *      +      +      +      +
73 * fric * r 2 0.r 2 .00001r35 0.e
74 * grav * f -1.0000e+00e
75 * hd * r 3 1.5000e+00r36 5.1360e+00e
76 * icflg * f 0e
77 * nff * f 1e
78 * alp * x10 1.r 1 .2r27 0.e
79 * vl * f 0.e
80 * vv * f 0.e
81 * tl * r 3 5.3710e+02r 1 5.3700e+02r 1 5.3690e+02r 1 5.3680e+02r 3 5.3670e+02
82 * tl * r 1 5.3660e+02r 1 5.3670e+02r 1 5.3690e+02r 1 5.3710e+02r 1 5.3730e+02
83 * tl * r 1 5.3720e+02r 1 5.3700e+02r 1 5.3690e+02r 1 5.3700e+02r 1 5.3710e+02
84 * tl * r 3 5.3730e+02r 1 5.3740e+02r 1 5.3750e+02r 1 5.3730e+02r 1 5.3720e+02
85 * tl * r 1 5.3710e+02r 2 5.3700e+02r 3 5.3690e+02r 2 5.3680e+02r 2 5.3720e+02
86 * tl * r 1 5.3660e+02r 1 5.3550e+02e
87 * tv * r 3 5.3710e+02r 1 5.3700e+02r 1 5.3690e+02r 1 5.3680e+02r 3 5.3670e+02

```

```

88 * tv * r 1 5.3660e+02r 1 5.3670e+02r 1 5.3690e+02r 1 5.3710e+02r 1 5.3730e+02
89 * tv * r 1 5.3720e+02r 1 5.3700e+02r 1 5.3690e+02r 1 5.3700e+02r 1 5.3710e+02
90 * tv * r 3 5.3730e+02r 1 5.3740e+02r 1 5.3750e+02r 1 5.3730e+02r 1 5.3720e+02
91 * tv * r 1 5.3710e+02r 2 5.3700e+02r 3 5.3690e+02r 2 5.3680e+02r 2 5.3720e+02
92 * tv * r 1 5.3660e+02r 1 5.3550e+02e
93 * p * r 1 4.9870e+06r 1 4.9935e+06r 1 5.0026e+06r 1 5.0087e+06r 1 5.0133e+06
94 * p * r 1 5.0169e+06r 1 5.0204e+06r 1 5.0239e+06r 1 5.0275e+06r 1 5.0310e+06
95 * p * r 1 5.0344e+06r 1 5.0379e+06r 1 5.0414e+06r 1 5.0449e+06r 1 5.0484e+06
96 * p * r 1 5.0519e+06r 1 5.0554e+06r 1 5.0589e+06r 1 5.0624e+06r 1 5.0659e+06
97 * p * r 1 5.0694e+06r 1 5.0729e+06r 1 5.0763e+06r 1 5.0798e+06r 1 5.0838e+06
98 * p * r 1 5.0868e+06r 1 5.0903e+06r 1 5.0938e+06r 1 5.0973e+06r 1 5.1008e+06
99 * p * r 1 5.1043e+06r 1 5.1078e+06r 1 5.1113e+06r 1 5.1126e+06r 1 5.1134e+06
100 * p * r 1 5.1141e+06r 1 5.1149e+06r 1 5.1157e+06e
101 * pa * f 0.e
102 *
103 * type num id ctitle
104 pipe 3 3 $3$ discharge pipe
105 *
106 * ncells nodes jun1 jun2 epsw
107 * 14 0 2 3 0.
108 *
109 * ichf iconc iacc ipow
110 * 1 0 0 0
111 *
112 * radin th houtl houtv toutl
113 * 1.00000e-01 1.00000e-01 0. 0. 3.00000e+02
114 *
115 * toutv powin powoff rpowmx pow scl
116 * 3.00000e+02 0. 0. 0. 1.
117 *
118 * + + + + + +
119 * dx * r 1 6.0000e-01r 1 4.0000e-01r 1 6.0000e-01r 2 5.0000e-01r 1 2.7900e+00
120 * dx * r 1 6.1000e-01r 1 6.0000e-01r 1 5.6800e-01r 2 5.0000e-01r 1 2.2500e+00
121 * dx * r 1 4.9100e-01r 1 2.3600e-01e
122 * vol * r 1 1.2104e+01r 1 7.5440e+00r 1 9.3509e+00r 1 4.9886e+00r 1 1.5474e+00
123 * vol * r 1 1.2393e+00r 1 2.8110e-01r 1 2.8670e-01r 1 2.6180e-01r 2 2.2210e-01
124 * vol * r 1 6.2852e-02r 1 9.9909e-02r 1 4.6569e-02e
125 * fa * r 1 2.0718e+01r 1 1.9635e+01r 1 1.8096e+01r 1 1.3203e+01r 1 7.0686e+00
126 * fa * r 2 4.4410e-01r 2 4.7780e-01r 2 4.4410e-01r 1 4.4410e-01r 2 2.0350e-01
127 * fa * r 1 1.9630e-01e
128 * + + + + + +
129 * fric * r 4 0.r 2 .00001r 9 0.e
130 * grav * f -1.0000e+00e
131 * hd * r 1 5.1360e+00r 1 5.0000e+00r 1 4.8000e+00r 1 4.1000e+00r 1 3.0000e+00
132 * hd * r 2 7.5200e-01r 2 7.8000e-01r 3 7.5200e-01r 2 5.0900e-01r 1 5.0000e-01e
133 * icflg * r14 0 1 e
134 * nff * r14 1 -1e
135 * alp * f 0. e
136 * vl * f 0. e
137 * vv * f 0. e
138 * + + + + + +
139 * tl * 533.3 532.4 532.2 530.6 523.6
140 * tl * 505.3 487.8 483.9 479.5 475.4
141 * tl * 464.8r 3 459.7e
142 * tv * 533.3 532.4 532.2 530.6 523.6
143 * tv * 505.3 487.8 483.9 479.5 475.4
144 * tv * 464.8r 3 459.7e
145 * p * 5.1165e+06 5.1173e+06 5.1180e+06 5.1189e+06 5.1197e+06
146 * p * 5.1254e+06 5.1394e+06 5.1451e+06 5.1505e+06 5.1555e+06
147 * p * 5.1602e+06 5.1637e+06 5.1670e+06 5.1702e+06e
148 * pa * f 0.e
149 *
150 * type num id ctitle
151 break 4 4 $4$ pressure boundary
152 *
153 * jun1 ibty isat ioff
154 * 3 0 0 1
155 *
156 * dxcin volin alpin tin pin
157 * 0.0236 .046569 1.0 373.25 101700.
158 *
159 * pain concin rbmx poff belv
160 * 0. 0. 0. 0. 0.
161 *
162 end
163 *
164 *****
165 * time step data *
166 *****
167 *
168 * dtmin dtmax tend trwfp
169 * .00001 .040 65. 10.
170 *
171 * edint gfint dmpint sedint
172 * 20. .5 20. 1.e6
173 * -1.0

```

MARVIKEN TEST 22 INPUT LISTING

```

1 free format
2 *
3 *      numctr      ieos      inopt      nmat
4 *      5          0          1          0
5
6 marviken test 22
7
8 converted from PD2 to MOD2, 9/97, j. l. steiner
9 combined finely noded cells in discharge pipe 3
10 *
11 &inopts
12 icflow=2,
13 &end
14 *
15 *      dstep      timet
16 *      0          0.0
17 *
18 *      stdyst      transi      ncomp      njun      ipack
19 *      0          1          4          3          0
20 *
21 *      epso      epss
22 *      1.0e-03    1.0e-02
23 *
24 *      oitmax      sitmax      isolut      ncontr      nccfl
25 *      30          80          0          0          0
26 *
27 *      ntsv      ntcb      ntcf      ntrp      ntcp
28 *      0          0          0          0          1
29 *
30 * iorder      +          +          +          +
31 *      1          2          3          4e
32 *
33 *****
34 *      component data      *
35 *****
36 *
37 *      num      id      ctitle
38 fill      1      1      $1$ vessel top zero fill
39 *      jun1      ifty      ioff
40 *      1          1          0
41 *
42 *      twtold      rfmx      concin      felv
43 *      0.          1.e+6      0.          0.
44 *
45 *      dxin      volin      alpin      vlin      tlin
46 *      1.550      2.7391      1.0          0.          536.18
47 *
48 *      pin      pain      flowin      vvvin      tvin
49 *      4930000.      0.          0.          0.          536.18
50 *
51 *      type      num      id      ctitle
52 pipe      2          2          $2$ pressure vessel
53 *
54 *      ncells      nodes      jun1      jun2      epsw
55 *      38          0          1          2          0.
56 *
57 *      ichf      iconc      iacc      ipow
58 *      1          0          0          0
59 *
60 *      radin      th      hout1      houtv      tout1
61 *      2.56800e+00      1.00000e-01      0.          0.          3.00000e+02
62 *
63 *      toutv      powin      powoff      rpowmx      powsc1
64 *      3.00000e+02      0.          0.          0.          1.
65 *
66 *      +          +          +          +          +
67 * dx * r 1 1.5500e+00r 1 1.6000e+00r 1 1.0000e+00r 1 7.6000e-01r 1 5.4000e-01
68 * dx * r 3 5.0000e-01r 1 5.2000e-01r 1 4.8000e-01r28 5.0000e-01e
69 * vol * r 1 2.7391e+00r 1 2.8274e+00r 1 9.5118e+00r 1 1.5745e+01r 1 1.1188e+01
70 * vol * r 3 1.0359e+01r 1 1.0773e+01r 1 9.9444e+00r28 1.0359e+01e
71 * fa * r 3 1.7671e+00r36 2.0718e+01e
72 *      +          +          +          +          +
73 * fric * r 2 0.r 2 .00001r35 0.e
74 * grav * f -1.0000e+00e
75 * hd * r 3 1.5000e+00r36 5.1360e+00e
76 * icflg * f 0e
77 * nff * f 1e
78 * alp * r 4 1.r34 0.e
79 * vl * f 0.e
80 * vv * f 0.e
81 * tl * r 9 5.3618e+02r 1 5.3048e+02r 1 5.1884e+02r 1 5.0696e+02r 1 4.9509e+02
82 * tl * r 1 4.8906e+02r 1 4.8887e+02r 1 4.8869e+02r 1 4.8861e+02r 1 4.8857e+02
83 * tl * r 1 4.8852e+02r 1 4.8847e+02r 1 4.8843e+02r 1 4.8838e+02r 1 4.8833e+02
84 * tl * r 1 4.8829e+02r 1 4.8824e+02r 1 4.8819e+02r 1 4.8815e+02r 1 4.8810e+02
85 * tl * r 1 4.8805e+02r 1 4.8801e+02r 1 4.8796e+02r 1 4.8791e+02r 1 4.8787e+02
86 * tl * r 1 4.8782e+02r 1 4.8777e+02r 1 4.8773e+02r 1 4.8768e+02r 1 4.8735e+02
87 * tv * r 9 5.3618e+02r 1 5.3048e+02r 1 5.1884e+02r 1 5.0696e+02r 1 4.9509e+02

```



```

88 * tv * r 1 4.8906e+02r 1 4.8887e+02r 1 4.8869e+02r 1 4.8861e+02r 1 4.8857e+02
89 * tv * r 1 4.8852e+02r 1 4.8847e+02r 1 4.8843e+02r 1 4.8838e+02r 1 4.8833e+02
90 * tv * r 1 4.8829e+02r 1 4.8824e+02r 1 4.8819e+02r 1 4.8815e+02r 1 4.8810e+02
91 * tv * r 1 4.8805e+02r 1 4.8801e+02r 1 4.8796e+02r 1 4.8791e+02r 1 4.8787e+02
92 * tv * r 1 4.8782e+02r 1 4.8777e+02r 1 4.8773e+02r 1 4.8768e+02r 1 4.8735e+02e
93 * p * r 4 4.9300e+06r 1 4.9312e+06r 1 4.9348e+06r 1 4.9384e+06r 1 4.9420e+06
94 * p * r 1 4.9458e+06r 1 4.9495e+06r 1 4.9533e+06r 1 4.9572e+06r 1 4.9613e+06
95 * p * r 1 4.9654e+06r 1 4.9695e+06r 1 4.9736e+06r 1 4.9778e+06r 1 4.9819e+06
96 * p * r 1 4.9861e+06r 1 4.9903e+06r 1 4.9944e+06r 1 4.9986e+06r 1 5.0028e+06
97 * p * r 1 5.0070e+06r 1 5.0112e+06r 1 5.0154e+06r 1 5.0196e+06r 1 5.0238e+06
98 * p * r 1 5.0280e+06r 1 5.0322e+06r 1 5.0364e+06r 1 5.0406e+06r 1 5.0448e+06
99 * p * r 1 5.0490e+06r 1 5.0532e+06r 1 5.0574e+06r 1 5.0616e+06r 1 5.0659e+06e
100 * pa * f 0.e
101 *
102 * type num id ctitle
103 pipe 3 3 $$$ discharge pipe
104 *
105 * ncells nodes jun1 jun2 epsw
106 14 0 2 3 0.
107 *
108 * ichf iconc iacc ipow
109 1 0 0 0
110 *
111 * radin th hout1 houtv tout1
112 1.00000e-01 1.00000e-01 0. 0. 3.00000e+02
113 *
114 * toutv powin powoff rpowmx pow scl
115 3.00000e+02 0. 0. 0. 1.
116 *
117 * + + + + +
118 * dx * r 1 6.0000e-01r 1 4.0000e-01r 1 6.0000e-01r 2 5.0000e-01r 1 2.7900e+00
119 * dx * r 1 6.1000e-01r 1 6.0000e-01r 1 5.6800e-01r 2 5.0000e-01r 1 2.2500e-01e
120 * dx * r 1 4.9100e-01r 1 2.3600e-01e
121 * vol * r 1 1.2104e+01r 1 7.5440e+00r 1 9.3509e+00r 1 4.9886e+00r 1 1.5474e+00
122 * vol * r 1 1.2393e+00r 1 2.8110e-01r 1 2.8670e-01r 1 2.6180e-01r 2 2.2210e-01
123 * vol * r 1 6.2852e-02r 1 9.9909e-02r 1 4.6569e-02e
124 * fa * r 1 2.0718e+01r 1 1.9635e+01r 1 1.8096e+01r 1 1.3203e+01r 1 7.0686e+00
125 * fa * r 2 4.4410e-01r 2 4.7780e-01r 2 4.4410e-01r 1 4.4410e-01r 2 2.0350e-01
126 * fa * r 1 1.9630e-01e
127 * + + + + +
128 * fric * r 4 0.r 2 .00001r 9 0.e
129 * grav * f -1.0000e+00e
130 * hd * r 1 5.1360e+00r 1 5.0000e+00r 1 4.8000e+00r 1 4.1000e+00r 1 3.0000e+00
131 * hd * r 2 7.5200e-01r 2 7.8000e-01r 3 7.5200e-01r 2 5.0900e-01r 1 5.0000e-01e
132 * icflg * r14 0 1 e
133 * nff * r14 1 -1e
134 * alp * f 0. e
135 * vl * f 0. e
136 * vv * f 0. e
137 * + + + + +
138 * tl * r 1 4.8649e+02r 1 4.8586e+02r 1 4.8535e+02r 1 4.8418e+02r 1 4.8129e+02
139 * tl * r 1 4.7176e+02r 1 4.5868e+02r 1 4.5439e+02r 1 4.5025e+02r 1 4.4647e+02
140 * tl * r 1 4.4292e+02r 3 4.4115e+02e
141 * tv * r 1 4.8649e+02r 1 4.8586e+02r 1 4.8535e+02r 1 4.8418e+02r 1 4.8129e+02
142 * tv * r 1 4.7176e+02r 1 4.5868e+02r 1 4.5439e+02r 1 4.5025e+02r 1 4.4647e+02
143 * tv * r 1 4.4292e+02r 3 4.4115e+02e
144 * p * 5.0705e+06 5.0747e+06 5.0789e+06 5.0836e+06 5.0879e+06
145 * p * 5.1007e+06 5.1168e+06 5.1221e+06 5.1273e+06 5.1320e+06
146 * p * 5.1365e+06 5.1398e+06 5.1430e+06 5.1460e+06e
147 * pa * f 0.e
148 *
149 * type num id ctitle
150 break 4 4 $$$ pressure boundary
151 *
152 * jun1 ibty isat iooff
153 3 0 0 1
154 *
155 * dxin volin alpin tin pin
156 0.0236 .046569 1.0 373.25 101700.
157 *
158 * pain concin rbnx poff belv
159 0. 0. 0. 0. 0.
160 *
161 end
162 *
163 *****
164 * time step data *
165 *****
166 *
167 * dtmin dtmax tend trwfp
168 .00001 .040 65. 10.
169 *
170 * edint gfint dmpint sedint
171 20. .5 20. 1.e6
172 -1.0

```

MARVIKEN TEST 24 INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numctr          ieos          inopt          nmat
8 *          15              0              1              0
9 * marviken test 24 : critical flow nodding, 2 cell nozzle. *
10 * This deck is an exact copy of the file located on Manjit Sahota's *
11 * directory: /091597/tracpf1/data/marviken/marviken24/data/trcinchok, *
12 * except for a.) these first 15 comment cards, *
13 *                b.) the INLAB option was used to add standard comments, *
14 *                c.) NFF values were set = 1 on both PIPES *
15 *                   (they were previously = 2), *
16 *                d.) FRICs were set = those from the fine mesh input case *
17 *                   (TINM24FM) on both PIPES for consistency *
18 *                   (they were previously all = 0), *
19 *                e.) the BREAK input was updated: variable IVDV was *
20 *                   deleted from Card 2, the DXIN was set to be 1/10th *
21 *                   that of the neighboring PIPE cell, and the VOLIN *
22 *                   was set equal to that of the neighboring PIPE cell *
23 *                   to model a flow area expansion of 10X. *
24 *
25 *****
26 * namelist data *
27 *****
28 *
29 &inopts
30 icflow=2,
31 &end
32 *
33 *          dstep          timet
34 *          0              0.0000e+00
35 *          stdyst          transi          ncomp          njun          ipak
36 *          0              1              4              3              0
37 *          epso            epss
38 *          1.0000e-03      1.0000e-02
39 *          oitmax          sitmax          isolut          ncontr          nccfl
40 *          30              80              0              0              0
41 *          ntsv            ntcb            ntcp            ntrp            ntcp
42 *          0              0              0              0              0
43 *
44 *****
45 * component-number data *
46 *****
47 *
48 * iorder*          1          2          3          4e
49 *
50 *****
51 * component data *
52 *****
53 *
54 ***** type          num          id          ctitle
55 fill          1          128
56 *          jun1          ifty          ioff
57 *          1              1              0
58 *          twtold          rfmX          concin          felv
59 *          0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
60 *          dxin            volin          alpin          vlin          tlin
61 *          1.5500e+00      2.7391e+00      1.0000e+00      0.0000e+00      5.3656e+02
62 *          pin            pain          flowin          vvin          tvin
63 *          4.9600e+06      0.0000e+00      0.0000e+00      0.0000e+00      5.3656e+02
64 *
65 ***** type          num          id          ctitle
66 pipe          2          128
67 *          ncells          nodes          jun1          jun2          epsw
68 *          15              0              1              2          0.0000e+00
69 *          ichf            iconc          iacc          ipow
70 *          1              0              0              0
71 *          radin          th            hout1          houtv          tout1
72 *          2.5680e+00      1.0000e-01      0.0000e+00      0.0000e+00      3.0000e+02
73 *          toutv
74 *          3.0000e+02
75 *
76 * dx *          1.5500e+00      1.6000e+00      1.0000e+00      5.2000e-01      1.9800e+00
77 * dx *          1.6000e+00      1.7000e+00r08      1.5000e+00e
78 * vol *          2.7391e+00      2.8274e+00      9.5118e+00      1.0773e+01      4.1021e+01
79 * vol *          3.3148e+01      3.5220e+01r08      3.1076e+01e
80 * fa * r03 1.7671e+00r13 2.0718e+01e
81 * fric * r15 4.0000e-02 0.0000e+00e
82 * grav * f -1.0000e+00e
83 * hd * r03 1.5000e+00r13 5.1360e+00e
84 * icflg * f 0e
85 * nff * f 1e
86 * alp * r04 1.0000e+00r11 0.0000e+00e
87 * vl * f 0.0000e+00e

```

```

88 * vv * f 0.0000e+00e
89 * tl * r05 5.3656e+02 5.3300e+02 5.0740e+02 5.0661e+02 5.0655e+02
90 * tl * * 5.0648e+02 5.0641e+02 5.0634e+02 5.0628e+02 5.0621e+02
91 * tl * * 5.0610e+02e
92 * tv * r05 5.3656e+02 5.3300e+02 5.0740e+02 5.0661e+02 5.0655e+02
93 * tv * * 5.0648e+02 5.0641e+02 5.0634e+02 5.0628e+02 5.0621e+02
94 * tv * * 5.0610e+02e
95 * p * r04 4.9600e+06 4.9604e+06 4.9755e+06 4.9892e+06 5.0027e+06
96 * p * * 5.0153e+06 5.0277e+06 5.0400e+06 5.0524e+06 5.0646e+06
97 * p * * 5.0769e+06 5.0892e+06e
98 * pa * f 0.0000e+00e
99 *
100 ***** type num id ctitle
101 pipe 3 128
102 * ncells nodes jun1 jun2 epsw
103 * 17 0 2 3 0.0000e+00
104 * ichf iconc iacc ipow
105 * 1 0 0 0
106 * radin th houtl houtv toutl
107 * 2.5000e-01 1.0000e-01 0.0000e+00 0.0000e+00 3.0000e+02
108 * toutv
109 * 3.0000e+02
110 *
111 * dx * 6.0000e-01 4.0000e-01 6.0000e-01r06 5.0000e-01 7.9000e-01
112 * dx * 6.1000e-01 6.0000e-01 5.6800e-01r02 5.0000e-01 2.2500e-01
113 * dx * 1.6600e-01e
114 * vol * 1.2104e+01 7.5440e+00 9.3509e+00 4.9886e+00 1.5474e+00
115 * vol * r04 2.2210e-01 3.5090e-01 2.8110e-01 2.8670e-01 2.6180e-01
116 * vol * r02 2.2210e-01 6.2762e-02 3.2594e-02e
117 * fa * 2.0718e+01 1.9635e+01 1.8096e+01 1.3203e+01 7.0686e+00
118 * fa * r06 4.4410e-01r02 4.7780e-01r03 4.4410e-01r02 1.9635e-01e
119 * fric * r 4 0.r 2 .00001r12 0.e
120 * grav * f -1.0000e+00e
121 * hd * 5.1360e+00 5.0000e+00 4.8000e+00 4.1000e+00 3.0000e+00
122 * hd * r06 7.5200e-01r02 7.8000e-01r03 7.5200e-01r02 5.0000e-01e
123 * icflg * r17 0 1 e
124 * nff * r17 1 -1e
125 * alp * f 0.0000e+00e
126 * vl * f 0.0000e+00e
127 * vv * f 0.0000e+00e
128 * tl * 5.0573e+02 5.0522e+02 5.0444e+02 5.0318e+02 5.0011e+02
129 * tl * 4.9701e+02 4.9382e+02 4.9037e+02 4.8692e+02 4.8246e+02
130 * tl * 4.7758e+02 4.7331e+02 4.6920e+02 4.6544e+02 4.6191e+02
131 * tl * r02 4.6015e+02e
132 * tv * 5.0573e+02 5.0522e+02 5.0444e+02 5.0318e+02 5.0011e+02
133 * tv * 4.9701e+02 4.9382e+02 4.9037e+02 4.8692e+02 4.8246e+02
134 * tv * 4.7758e+02 4.7331e+02 4.6920e+02 4.6544e+02 4.6191e+02
135 * tv * r02 4.6015e+02e
136 * p * 5.0978e+06 5.1019e+06 5.1060e+06 5.1105e+06 5.1146e+06
137 * p * 5.1187e+06 5.1229e+06 5.1270e+06 5.1312e+06 5.1367e+06
138 * p * 5.1426e+06 5.1478e+06 5.1528e+06 5.1574e+06 5.1618e+06
139 * p * 5.1650e+06 5.1667e+06e
140 * pa * f 0.0000e+00e
141 *
142 ***** type num id ctitle
143 break 4 128
144 * jun1 ibty isat ioff
145 * 3 0 0 0
146 * dbcin volin alpin tin pin
147 * 1.6600e-02 3.2594e-02 1.0000e+00 3.7325e+02 1.0170e+05
148 * pain concin rbmox poff belv
149 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
150 *
151 end
152 *
153 *****
154 * time-step data *
155 *****
156 *
157 * dtmin dtmax tend rtwfp
158 * 1.0000e-03 1.0000e+00 8.0000e+01 1.0000e+00
159 * edint gfint dmpint sedint
160 * 5.0000e+00 5.0000e-01 1.0000e+01 1.0000e+00
161 *
162 *****
163 * time-step data *
164 *****
165 *
166 * endflag
167 * -1.0000e+00

```

EDWARDS BLOWDOWN TEST INPUT LISTING

```

1 free format
2 *
3 *      numtcr      ieos      inopt      nmat
4 *      8          0          1          0
5
6 edwards blowdown experiment model no. 1
7
8 converted from PD2 to MOD2, 9/97, j. l. steiner
9 combined finely noded cells in original pipe 3
10 combined original pipe 2 and original pipe 3 into pipe 1 for mod 2 model
11 reversed order of cells in pipe 1 so flows will be positive
12
13 *
14 &inopts
15 icflow=2, iadded=20,
16 &end
17 *
18 *      dstep      timet
19 *      0          0.0
20 *
21 *      stdyst      transi      ncomp      njun      ipack
22 *      0          1          3          2          0
23 *
24 *      epso      epss
25 *      1.0e-04  1.0e-04
26 *
27 *      oitmax      sitmax      isolut      ncontr      nccfl
28 *      30         80          0          0          0
29 *
30 *      ntsv      ntcv      ntcf      ntrp      ntcp
31 *      0          0          0          0          1
32 *
33 * iorder      +          +          +          +
34 *      1          2          3e
35 *
36 *****
37 *      component data
38 *****
39 *
40 *      num      id      ctitle
41 fill      1      1      $1$ pipe end zero fill
42 *      jun1      ifty      ioff
43 *      1          1          0
44 *
45 *      twtold      rfmv      concin      felv
46 *      0.          1.e+6      0.          0.
47 *
48 *      dxin      volin      alpin      vlin      tlin
49 *      1.20500e-01  5.06000e-04      0.          0.          5.14800e+02
50 *
51 *      pin      pain      flowin      vvin      tvin
52 *      6.99610e+06      0.          0.          0.          5.14800e+02
53 *
54 *      type      num      id      ctitle
55 pipe      2          2      $2$ pressure vessel
56 *
57 *      ncells      nodes      jun1      jun2      epsw
58 *      37          0          1          2          1.0e-03
59 *
60 *      ichf      iconc      iacc      ipow
61 *      1          0          0          0
62 *
63 *      radin      th      houtl      houtv      toutl
64 *      2.56800e+00  1.00000e-01      0.          0.          3.00000e+02
65 *
66 *      toutv      powin      powoff      rpowmx      powscl
67 *      3.00000e+02      0.          0.          0.          1.
68 *
69 *      +          +          +          +          +          +
70 * dx * 0.158 0.11675 0.11675 0.11675 0.11675 s
71 * dx * 0.11675 0.11675 0.11104 0.11104 0.11104 s
72 * dx * 0.11104 0.11104 0.11063 0.11063 0.11063 s
73 * dx * 0.11063 0.11063 0.11435 0.11435 0.11435 s
74 * dx * 0.11435 0.11435 0.11435 0.11435 0.11435 s
75 * dx * 0.1068 0.1068 0.1068 0.1068 0.1068 s
76 * dx * 0.1068 0.1068 0.1068 0.068 0.068 s
77 * dx * 0.112 0.112 e
78 * vol * 6.6407e-04 4.9070e-04 4.9070e-04 4.9070e-04 4.9070e-04 s
79 * vol * 4.9070e-04 4.9070e-04 4.6670e-04 4.6670e-04 4.6670e-04 s
80 * vol * 4.6670e-04 4.6670e-04 4.6498e-04 4.6498e-04 4.6498e-04 s
81 * vol * 4.6498e-04 4.6498e-04 4.8061e-04 4.8061e-04 4.8061e-04 s
82 * vol * 4.8061e-04 4.8061e-04 4.8061e-04 4.8061e-04 4.8061e-04 s
83 * vol * 4.4888e-04 4.4888e-04 4.4888e-04 4.4888e-04 4.4888e-04 s
84 * vol * 4.4888e-04 4.4888e-04 4.4888e-04 2.8580e-04 2.8580e-04 s
85 * vol * 4.7074e-04 4.7074e-04 e
86 * fa * r37 4.2030e-03 3.6566e-03e
87 * fric * r37 0.          0.0 e

```

```

88 * grav * f 0.e
89 * hd * f 7.3152e-02e
90 * icflg * r37 0 1 e
91 * nff * r37 1 -1e
92 * alp * f 0.e
93 * vl * f 0. e
94 * vv * f 0. e
95 * + + + + +
96 * tl * 504.20 504.75 505.15 505.55 506.00 s
97 * tl * 506.50 506.85 506.90 506.50 506.15 s
98 * tl * 505.70 505.50 505.40 505.10 504.85 s
99 * tl * 504.55 504.30 504.20 504.20 504.45 s
100 * tl * 504.70 504.90 505.10 505.30 505.50 s
101 * tl * 505.50 504.30 503.30 502.10 501.10 s
102 * tl * 500.00 499.00 497.89 497.85 497.90 s
103 * tl * 498.00 498.10 e
104 * tv * 504.20 504.75 505.15 505.55 506.00 s
105 * tv * 506.50 506.85 506.90 506.50 506.15 s
106 * tv * 505.70 505.50 505.40 505.10 504.85 s
107 * tv * 504.55 504.30 504.20 504.20 504.45 s
108 * tv * 504.70 504.90 505.10 505.30 505.50 s
109 * tv * 505.50 504.30 503.30 502.10 501.10 s
110 * tv * 500.00 499.00 497.89 497.85 497.90 s
111 * tv * 498.00 498.10 e
112 * p * f 6.9961e+06e
113 * pa * f 0.e
114 *
115 * type num id ctitle
116 break 3 3 $$$ pressure boundary
117 *
118 * jun1 ibty isat ioff
119 * 2 0 0 1
120 *
121 * dxin volin alpin tin pin
122 * 0.01120 4.7074e-04 1. 373.15 1.013535e05
123 *
124 * pain concin rbmx poff belv
125 * 0. 0. 0. 0. 0.
126 *
127 end
128 *
129 *****
130 * time step data *
131 *****
132 *
133 * dtmin dtmax tend trwfp
134 * .00001 .010 .6 10.
135 *
136 * edint gfint dmpint sedint
137 * .2 .01 20. 1.e6
138 * -1.0

```

APPENDIX E

LEHIGH TEST 02/24/85-20 INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *      numtcr      ieos      inopt      nmat
8 *      6           0         1         0
9 lehigh rod bundle test - run 02/24/95-20
10 *****
11 LEHIGH UNIVERSITY ROD BUNDLE EXPERIMENT 11-level model
12 G=25.13 KG/M2S      SUBCOOLING=21 'C
13 *****
14
15 * corrected to run 20 by jim lime 1/26/98
16 * lehigh simplified by jim lime 1/3/98
17 * one time-edit set used
18 * levels 1 through 7 are same
19 * level 7, 8, and 9 are different
20 * levels 10 and 11 same as level 9
21 * repeat level 1 input used for levels 2-7
22 * repeat level 9 input used for levels 10 and 11
23 *
24 *****
25 * namelist data *
26 *****
27 *
28 &inopts
29 icflow=0, nhtstr=2 , ithd=1, nrslv=1, newrfd=3, iadded=20,
30 &end
31 *
32 *      dstep      timet
33 *      0          0.0000e+00
34 *      stdyst      transi      ncomp      njun      ipak
35 *      0           1           7           4           1
36 *      epso        epss
37 *      1.0000e-04  1.0000e-04
38 *      oitmax      sitmax      isolut      ncontr
39 *      10          10         0           0
40 *      ntsv        ntcb        ntrp        ntcp
41 *      1           0         0           1           0
42 *
43 *****
44 * component-number data *
45 *****
46 *
47 * iorder*      1      2      3      4      5 s
48 *              6      7e
49 *
50 *****
51 * control-parameter data *
52 *****
53 *
54 *
55 * signal variables
56 *      idsv      isvn      ilcn      icn1      icn2
57 *      11        0         0         0         0
58 *
59 * trips
60 *      ntse      ntct      ntsf      ntap      ntsd
61 *      0         0         0         0         0
62 *      idtp      isrt      iset      itst      idsg
63 *      301       2         0         1         11
64 *      setp(1)   setp(2)
65 *      0.0000e+00 0.0000e+00
66 *      dtsp(1)   dtsp(2)
67 *      0.0000e+00 0.0000e+00
68 *      ifsp(1)   ifsp(2)
69 *      0         0
70 *
71 *****
72 * component data *
73 *****
74 *
75 ***** type      num      id      ctitle
76 vessel          1         1 $1$ bundle
77 *      nasx      nrSX      ntsx      ncsr      ivssbf
78 *      11        1         1         2         0
79 *      idcu      idcl      idcr      icru      icrl
80 *      0         0         0         11        0
81 *      icrr      ilcsp      iucsp      iuhp      iconc
82 *      1         0         11        0         0
83 *      igeom      nvent      nvvtb      nsgrid
84 *      0         0         0         0 * 1 *

```

```

85 *          shelv          epsw
86          0.0000e+00      0.0000e+00
87 *z* 1.1000e-01 2.2000e-01 3.3000e-01 4.4000e-01 5.5000e-01s
88 *z* 6.5000e-01 7.5000e-01 9.0000e-01 1.0100e+00 1.1145e+00s
89 *z* 1.2190e+00e
90 * rad * 2.9500e-02e
91 * th * 6.2832e+00e
92 * funh * 0.1000e+00e
93 * nhsc * 6e
94 * zsgrid 0.762e
95 *          lisrl          lisrc          lisrf          ljuns
96          1          1          -2          1
97          11          1          2          2
98 *
99 * level 1
100 *
101 * cfzl-t* 0.0000e+00e
102 * cfzl-z* 0.0000e+00e
103 * cfzl-r* 0.0000e+00e
104 * cfzv-t* 0.0000e+00e
105 * cfzv-z* 0.0000e+00e
106 * cfzv-r* 0.0000e+00e
107 * vol * 4.6355e-01e
108 * fa-t * 0.0000e+00e
109 * fa-z * 4.6355e-01e
110 * fa-r * 0.0000e+00e
111 * hd-t * 0.0000e+00e
112 * hd-z * 1.1778e-02e
113 * hd-r * 0.0000e+00e
114 * alpn * 1.0000e+00e
115 * vvn-t * 0.0000e+00e
116 * vvn-z * 0.0000e+00e
117 * vvn-r * 0.0000e+00e
118 * vln-t * 0.0000e+00e
119 * vln-z * 0.0000e+00e
120 * vln-r * 0.0000e+00e
121 * tvn * 3.9300e+02e
122 * tln * 3.5200e+02e
123 * pn * 1.0130e+05e
124 * pan * 0.0000e+00e
125 *
126 * level 2
127 *
128 repeat level 1
129 *
130 * level 3
131 *
132 repeat level 1
133 *
134 * level 4
135 *
136 repeat level 1
137 *
138 * level 5
139 *
140 repeat level 1
141 *
142 * level 6
143 *
144 repeat level 1
145 *
146 * level 7
147 *
148 repeat level 1
149 *
150 * level 8
151 *
152 * cfzl-t* 0.0000e+00e
153 * cfzl-z* 0.0000e+00e
154 * cfzl-r* 0.0000e+00e
155 * cfzv-t* 0.0000e+00e
156 * cfzv-z* 0.0000e+00e
157 * cfzv-r* 0.0000e+00e
158 * vol * 4.3264e-01e
159 * fa-t * 0.0000e+00e
160 * fa-z * 3.7084e-01e
161 * fa-r * 0.0000e+00e
162 * hd-t * 0.0000e+00e
163 * hd-z * 9.4224e-03e
164 * hd-r * 0.0000e+00e
165 * alpn * 1.0000e+00e
166 * vvn-t * 0.0000e+00e
167 * vvn-z * 0.0000e+00e
168 * vvn-r * 0.0000e+00e
169 * vln-t * 0.0000e+00e
170 * vln-z * 0.0000e+00e
171 * vln-r * 0.0000e+00e
172 * tvn * 3.9300e+02e
173 * tln * 3.5200e+02e
174 * pn * 1.0130e+05e
175 * pan * 0.0000e+00e
176 *

```

```

177 * level 9
178 *
179 * cfzl-t* 0.0000e+00e
180 * cfzl-z* 0.0000e+00e
181 * cfzl-r* 0.0000e+00e
182 * cfzv-t* 0.0000e+00e
183 * cfzv-z* 0.0000e+00e
184 * cfzv-r* 0.0000e+00e
185 * vol * 4.6355e-01e
186 * fa-t * 0.0000e+00e
187 * fa-z * 4.6355e-01e
188 * fa-r * 0.0000e+00e
189 * hd-t * 0.0000e+00e
190 * hd-z * 1.1778e-02e
191 * hd-r * 0.0000e+00e
192 * alpn * 1.0000e+00e
193 * vvn-t * 0.0000e+00e
194 * vvn-z * 0.0000e+00e
195 * vvn-r * 0.0000e+00e
196 * vln-t * 0.0000e+00e
197 * vln-z * 0.0000e+00e
198 * vln-r * 0.0000e+00e
199 * tvn * 3.9300e+02e
200 * tln * 3.5200e+02e
201 * pn * 1.0130e+05e
202 * pan * 0.0000e+00e
203 *
204 * level 10
205 *
206 repeat level 9
207 *
208 * level 11
209 *
210 repeat level 9
211 *
212 ***** type num id ctitle
213 pipe 2 2 $2$ injection pipe
214 * ncells nodes jun1 jun2 epsw
215 * 1 0 3 1 0.0000e+00
216 * ichf iconc iacc ipow
217 * 1 0 0 0
218 * radin th hout1 houtv tout1
219 * 2.9500e-02 3.0000e-03 0.0000e+00 0.0000e+00 3.7300e+02
220 * toutv
221 * 3.7300e+02
222 *
223 * dx * 6.0000e-02e
224 * vol * 7.6002e-05e
225 * fa * f 1.2667e-03e
226 * fric * f 0.0000e+00e
227 * grav * f 1.0000e+00e
228 * hd * f 1.1778e-02e
229 * nff * f 1e
230 * alp * 1.0000e+00e
231 * vl * f 0.0000e+00e
232 * vv * f 0.0000e+00e
233 * tl * 3.5815e+02e
234 * tv * 3.7315e+02e
235 * p * 1.0130e+05e
236 * pa * 0.0000e+00e
237 *
238 ***** type num id ctitle
239 fill 3 3 $3$ inlet boundary
240 * jun1 ifty ioff
241 * 3 2 0
242 * twtold rfmxc concin felv
243 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
244 * dxin volin alpin vlin tlin
245 * 6.0000e-02 7.6002e-05 0.0000e+00 0.0000e+00 3.5200e+02
246 * pin pain flowin vvin tvin
247 * 1.0130e+05 0.0000e+00 3.1832e-02 0.0000e+00 3.7315e+02
248 *
249 ***** type num id ctitle
250 pipe 4 4 $4$ break pipe
251 * ncells nodes jun1 jun2 epsw
252 * 1 0 2 4 0.0
253 * ichf iconc iacc ipow
254 * 1 0 0 0
255 * radin th hout1 houtv tout1
256 * 2.9500e-02 3.0000e-03 0.0000e+00 0.0000e+00 3.7300e+02
257 * toutv
258 * 3.7300e+02
259 *
260 * dx * 2.0000e-01e
261 * vol * 2.5334e-04e
262 * fa * f 1.2667e-03e
263 * fric * f 0.0000e+00e
264 * grav * f 1.0000e+00e
265 * hd * f 1.1778e-02e
266 * nff * f 1e
267 * alp * 1.0000e+00e
268 * vl * f 0.0000e+00e

```



```

269 * vv * f 0.0000e+00e
270 * tl * 3.5815e+02e
271 * tv * 3.7315e+02e
272 * p * 1.0130e+05e
273 * pa * 0.0000e+00e
274 *
275 ***** type num id ctitle
276 break 5 5 $$$ pressure boundary
277 * junl ibty isat ioff
278 4 0 3 0
279 * dxin volin alpin tin pin
280 5.5880e-01 7.0783e-04 1.0000e+00 3.7300e+02 1.0130e+05
281 * pain concin rbmx poff belv
282 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
283 *
284 *****
285 ***** heat structure for heater rods*****
286 *****
287 * type num id ctitle
288 rod 6 6 $$$ fuel rod component
289 * ncrx ncrz
290 1 11
291 * nopowr nrldr modez liqlev iaxcnd
292 0 0 0 1 1
293 * idbci idbco hdri hdro
294 0 2 0.0000e+00 1.1778e-02
295 * nrods nodes irftr nzmaxirftr2
296 1 6 301 250 301
297 * dtxht(1) dtxht(2) dznht hgapo shelv
298 3.0000e+00 1.0000e+01 1.0000e-03 1.0000e+10 2.0000e-01
299 * irpwty ndgx ndhx nrts nhist
300 5 0 0 10000 0
301 * izpwtr izpwsv nzpwtb nzpwsv nzpwrfl
302 0 11 1 0 0
303 * nmwrx nfcil nfbpwt
304 0 0 0
305 * nzpwz nzpwi nfbpwt
306 12 -1 0
307 * react tneut rpwoff rrpwmk rpwscl
308 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 1.0000e+00
309 * rpowri zpwini zpwoff rzpwmk
310 1.0343e+04 0.0000e+00 0.0000e+00 0.0000e+00
311 * extsou pldr pdrat fucrac
312 0.0000e+00 0.0000e+00 1.3263e+00 0.0000e+00
313 * nhcomo
314 f 1e
315 * nhcelo
316 0s
317 1s
318 2s
319 3s
320 4s
321 5s
322 6s
323 7s
324 8s
325 9s
326 10s
327 11s
328 12e
329 * z * 0.0000e+00s
330 *z* 1.1000e-01 2.2000e-01 3.3000e-01 4.4000e-01 5.5000e-01s
331 *z* 6.5000e-01 7.5000e-01 9.0000e-01 1.0100e+00 1.1145e+00s
332 *z* 1.2190e+00e
333 * grav
334 f 1.0e
335 * rdx * 9.0000e+00e
336 * radrd * 0.0000e+00 1.6000e-03 2.4000e-03 2.8000e-03 4.5500e-03
337 * radrd * 4.7498e-03e
338 * matrd* 5 4 5 4 7e
339 * nfax * f 7e
340 * rftn* r06 9.2500e+02s
341 * rftn * r06 9.6515e+02s
342 * rftn * r06 9.9615e+02s
343 * rftn * r06 1.0132e+03s
344 * rftn * r06 1.0192e+03s
345 * rftn * r06 1.0202e+03s
346 * rftn * r06 1.0247e+03s
347 * rftn * r06 1.0162e+03s
348 * rftn * r06 1.0112e+03s
349 * rftn * r06 1.0146e+03s
350 * rftn * r06 1.0146e+03s
351 * rftn * r06 1.0146e+03e
352 * rdpwr * 1.0000e+00 0.0000e+00 1.0000e+00r03 0.0000e+00e
353 * cpowr * 1.0000e+00e
354 * zpwzt * 0.0000e+00s
355 *zpwzt* 1.1000e-01 2.2000e-01 3.3000e-01 4.4000e-01 5.5000e-01s
356 *zpwzt* 6.5000e-01 7.5000e-01 9.0000e-01 1.0100e+00 1.1145e+00s
357 *zpwzt* 1.2190e+00e
358 * zpwtb * f 1.0000e+00e
359 * fpuo2 * 0.0000e+00e
360 * ftd * 9.0000e-01e

```

```

361 * gmix * f 0.0000e+00e
362 * gmles * 0.0000e+00e
363 * pgapt * 0.0000e+00e
364 * plvol * 0.0000e+00e
365 * pslen * 0.0000e+00e
366 * clenn * 1.2190e+00e
367 * burn * f 1.0000e+00e
368 *
369 *****
370 ***** heat slab simulating shroud *****
371 *****
372 * type num id ctitle
373 slab 7 7 $7$ shroud
374 * ncrx ncrz
375 * 1 11
376 * nopowr nrldr modez liglev laxcnd
377 * 1 0 0 1 -1
378 * idbci idbco hdri hdro
379 * 2 1 5.9000e-02 6.3000e-02
380 * width ipatch
381 * 0.18526 0
382 * tli twi hli hvl
383 * 1193.0 1193.0 25.0 25.0
384 * nrods nodes irftr nzmax
385 * 1 2 0 200
386 * dtxht(1) dtxht(2) dznht hgapo shelv
387 * 3.0000e+00 1.0000e+01 1.0000e-03 1.0000e+10 2.0000e-01
388 * nhcomi
389 f le
390 * nhceli
391 * 0 1 2 3 4s
392 * 5 6 7 8 9s
393 * 10 11 12e
394 * z * 0.0000e+00s
395 *z* 1.1000e-01 2.2000e-01 3.3000e-01 4.4000e-01 5.5000e-01s
396 *z* 6.5000e-01 7.5000e-01 9.0000e-01 1.0100e+00 1.1145e+00s
397 *z* 1.2190e+00e
398 * grav
399 f 1.0e
400 * rdx
401 f 1.0e
402 * radrd
403 * 0.001 0.002e
404 * matrd
405 f 10e
406 * nfax
407 f 7e
408 * rftn *r02 740.0 r02 800.0 r02 838.0 r02 859.0 r02 873.0s
409 * rftn *r02 887.0 r02 900.0 r02 905.0 r02 905.0 r02 905.0s
410 * rftn *r02 900.0 r02 900.0e
411 *****
412 *
413 end
414 *
415 *****
416 * time-step data *
417 *****
418 *
419 * dtmin dtmax tend rtwfp
420 * 1.0000e-06 2.5000e-02 3.0000e+02 1.0000e+00
421 * edint gfint dmpint sedint
422 * 5.0000e+01 0.5000e+00 5.0000e+01 5.0000e+01
423 *
424 *****
425 * time-step data *
426 *****
427 *
428 * endflag
429 * -1.0000e-06

```

APPENDIX F

CODE-DATA COMPARISON FOR LEHIGH TEST 02/24/85-20 WITH NEWRFD=1

The calculation results for the reflood option newrfd=1, with and without grid spacers modeled, are presented in this appendix. The same set of plots that are presented in the main body of the report for the reflood option newrfd=3 are also presented for the reflood option newrfd=1. For reference purposes, the figure numbers for the two reflood options are listed below.

With Grid Spacers		Without Grid Spacers	
newrfd=1	newrfd=3	newrfd=1	newrfd=3
F-1	4.4-8	F-14	4.4-21
F-2	4.4-9	F-15	4.4-22
F-3	4.4-10	F-16	4.4-23
F-4	4.4-11	F-17	4.4-24
F-5	4.4-12	F-18	4.4-25
F-6	4.4-13	F-19	4.4-26
F-7	4.4-14	F-20	4.4-27
F-8	4.4-15	F-21	4.4-28
F-9	4.4-16	F-22	4.4-29
F-10	4.4-17	F-23	4.4-30
F-11	4.4-18	F-24	4.4-31
F-12	4.4-19	F-25	4.4-32
F-13	4.4-20	F-26	4.4-33

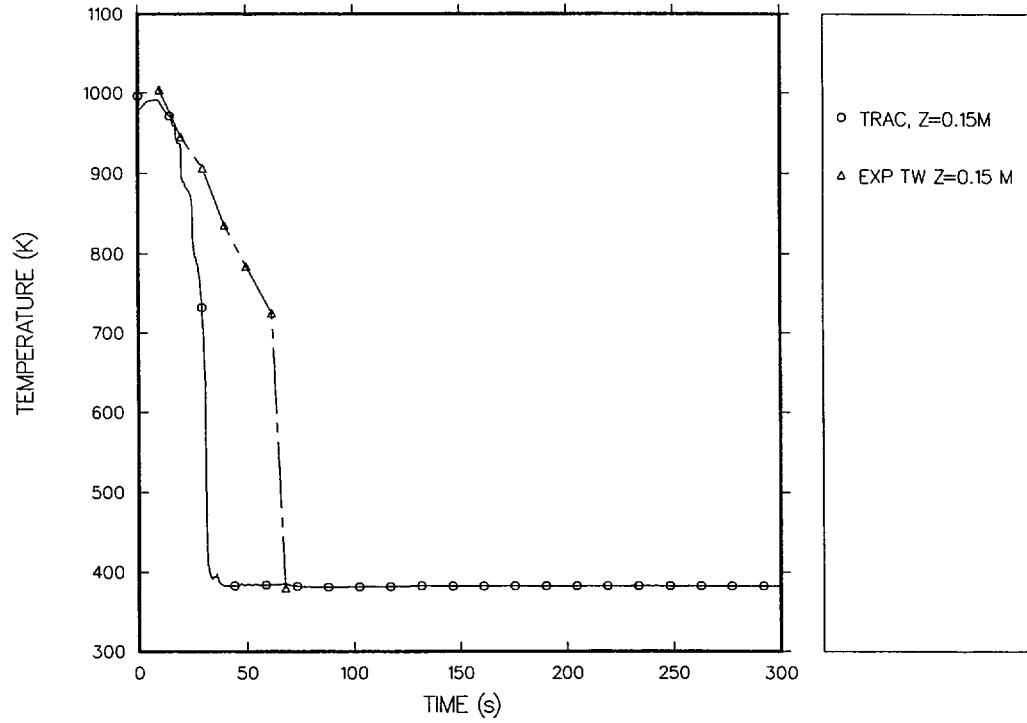


Fig. F-1. Predicted and measured wall temperature, 15-cm elevation.

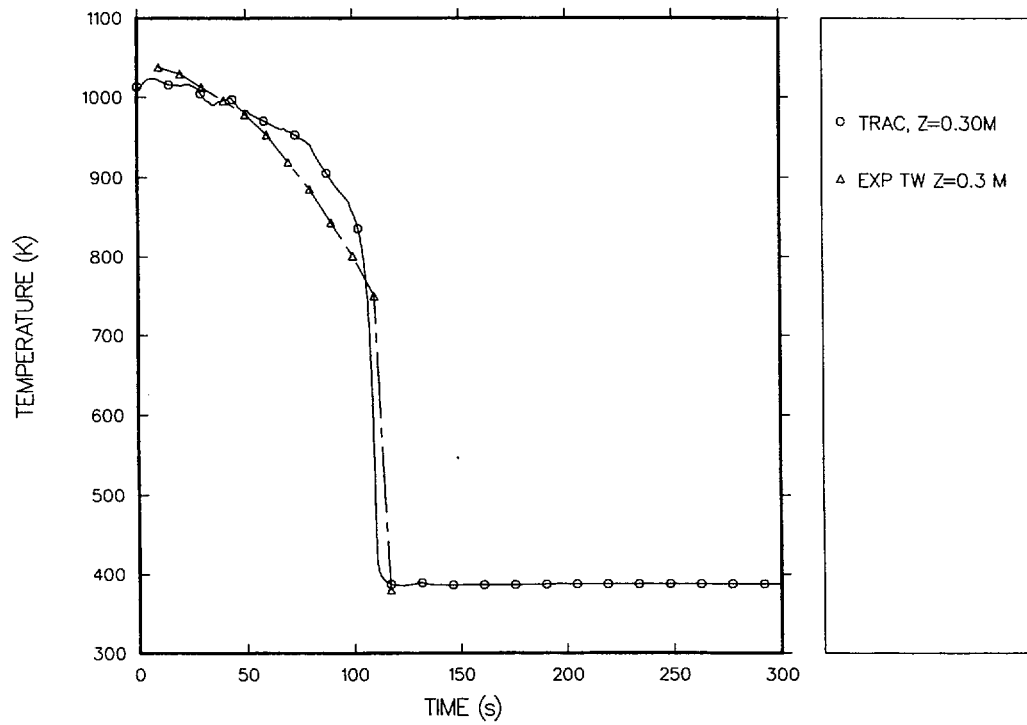


Fig. F-2. Predicted and measured wall temperature, 30-cm elevation.

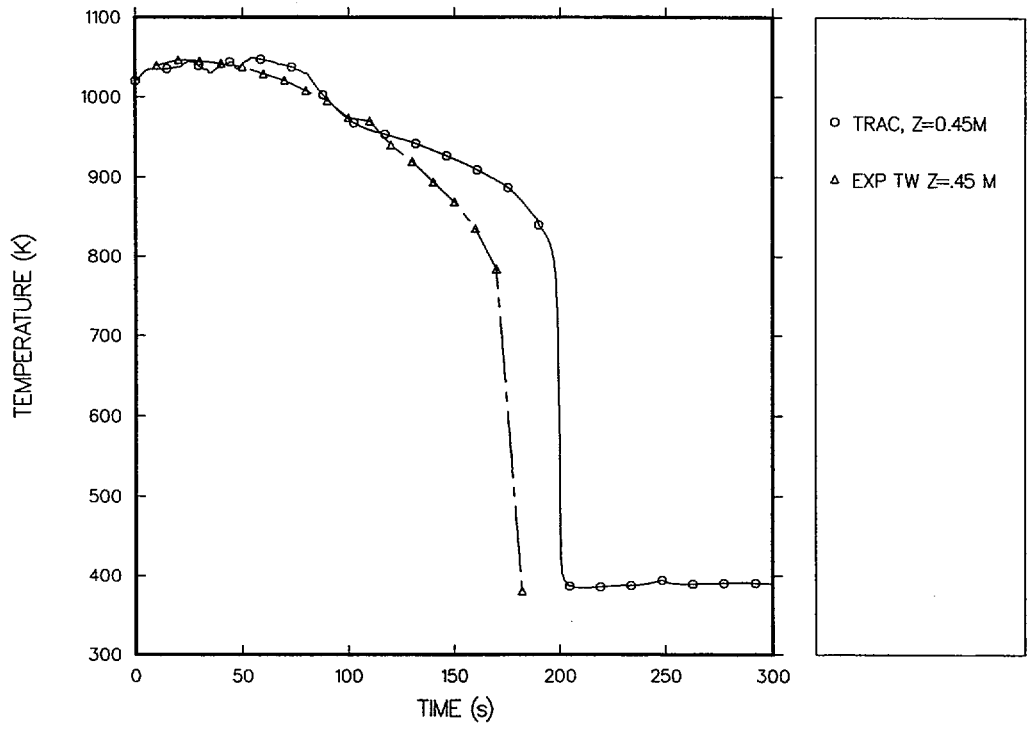


Fig. F-3. Predicted and measured wall temperature, 45-cm elevation.

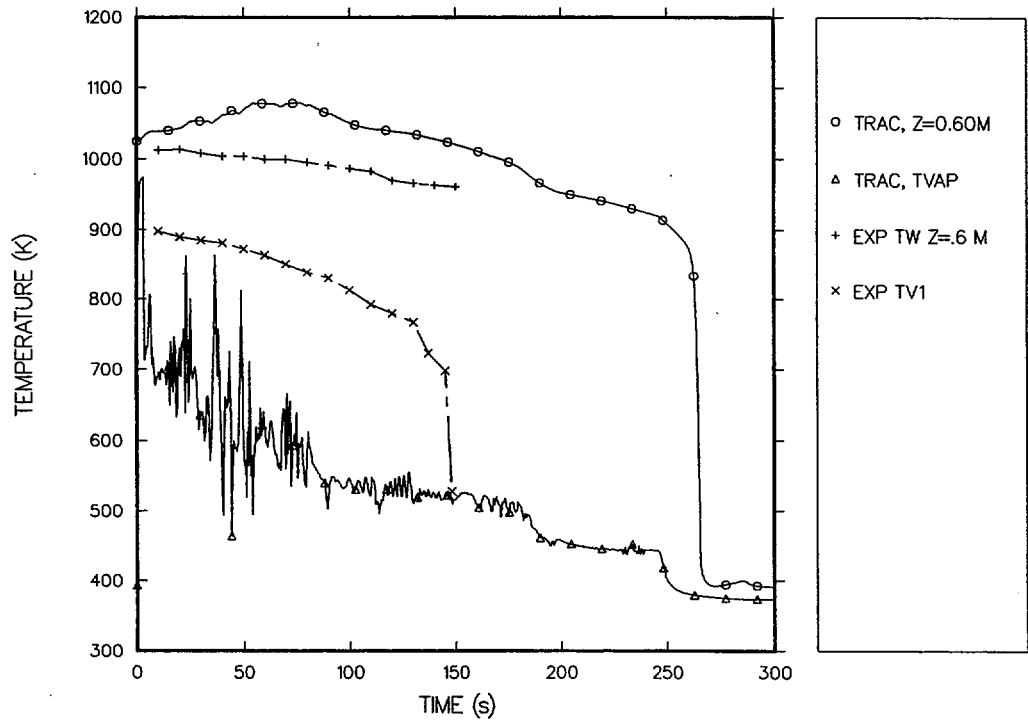


Fig. F-4. Predicted wall and vapor-temperature histories at 60 cm.

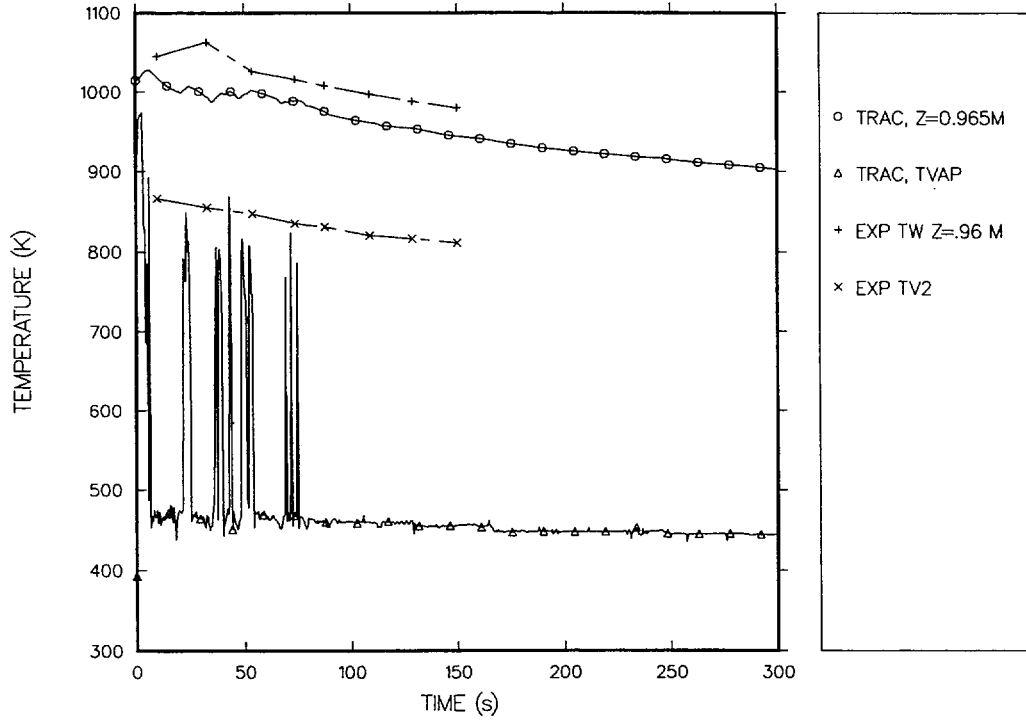


Fig. F-5. Predicted wall and vapor-temperature histories at 96 cm.

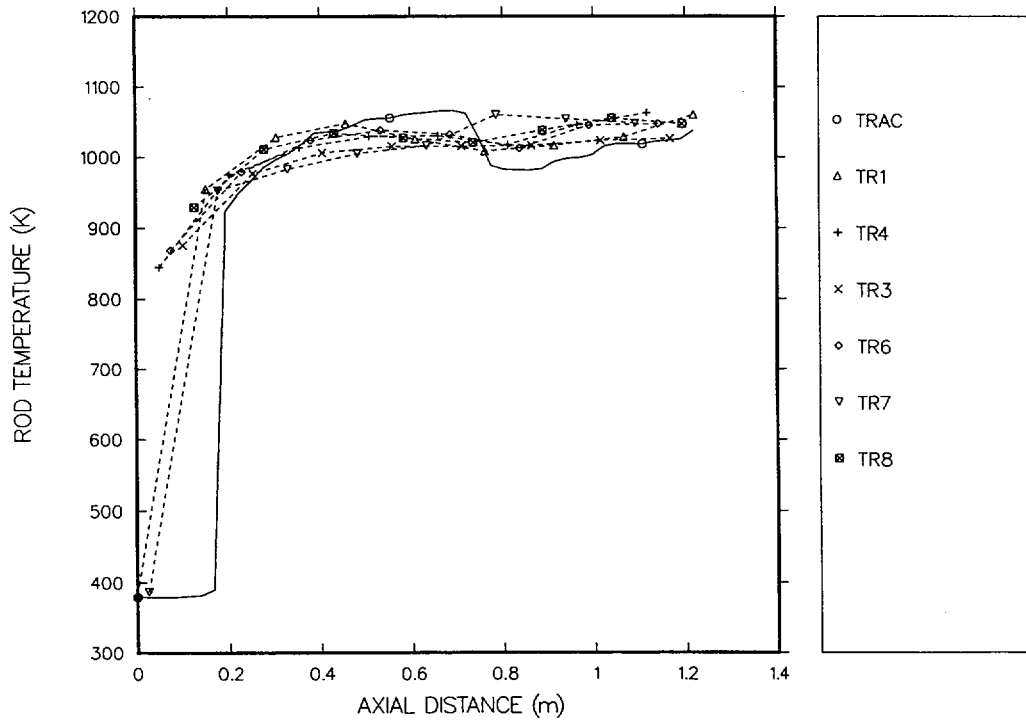


Fig. F-6. Comparison of predicted and measured axial temperatures at 40 s.

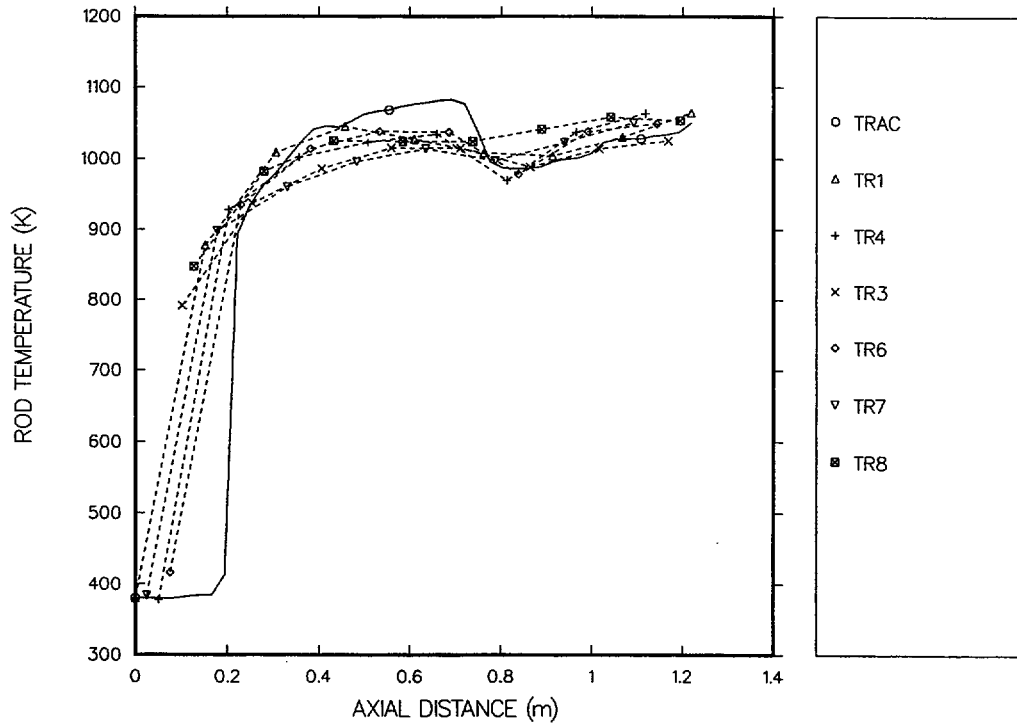


Fig. F-7. Comparison of predicted and measured axial temperatures at 53 s.

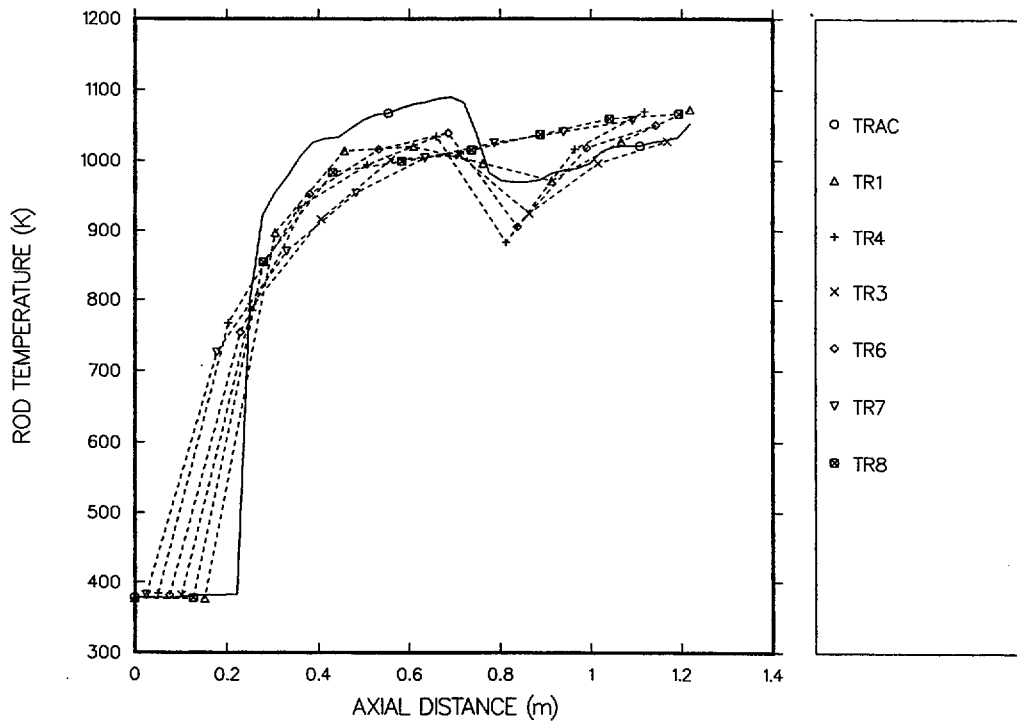


Fig. F-8. Comparison of predicted and measured axial temperatures at 74 s.

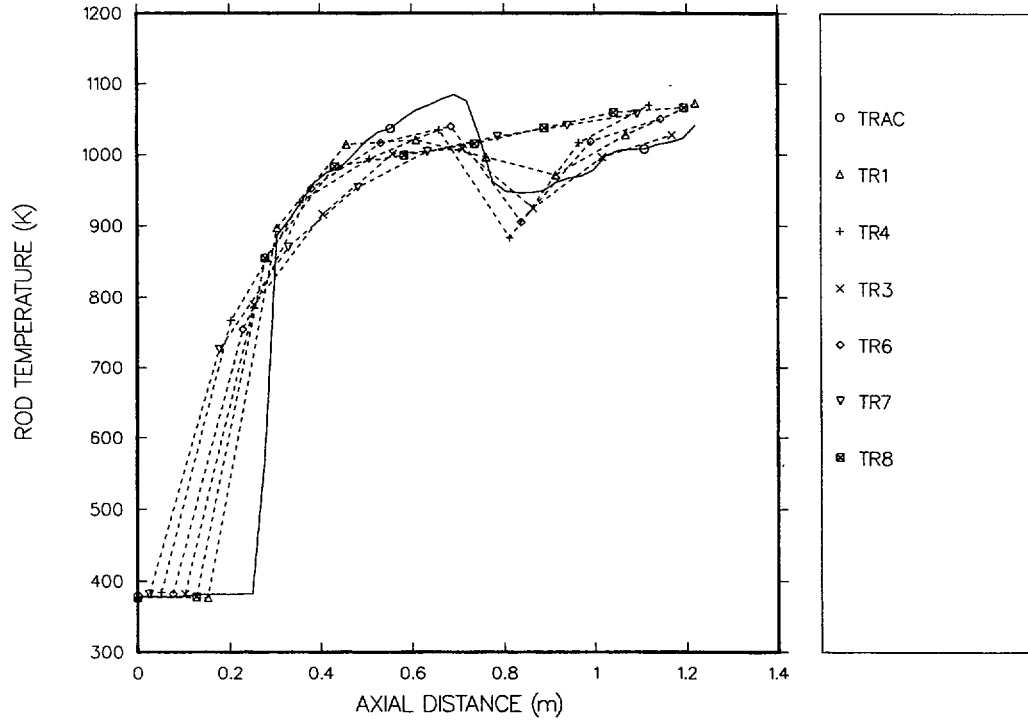


Fig. F-9. Comparison of predicted and measured axial temperatures at 94 s.

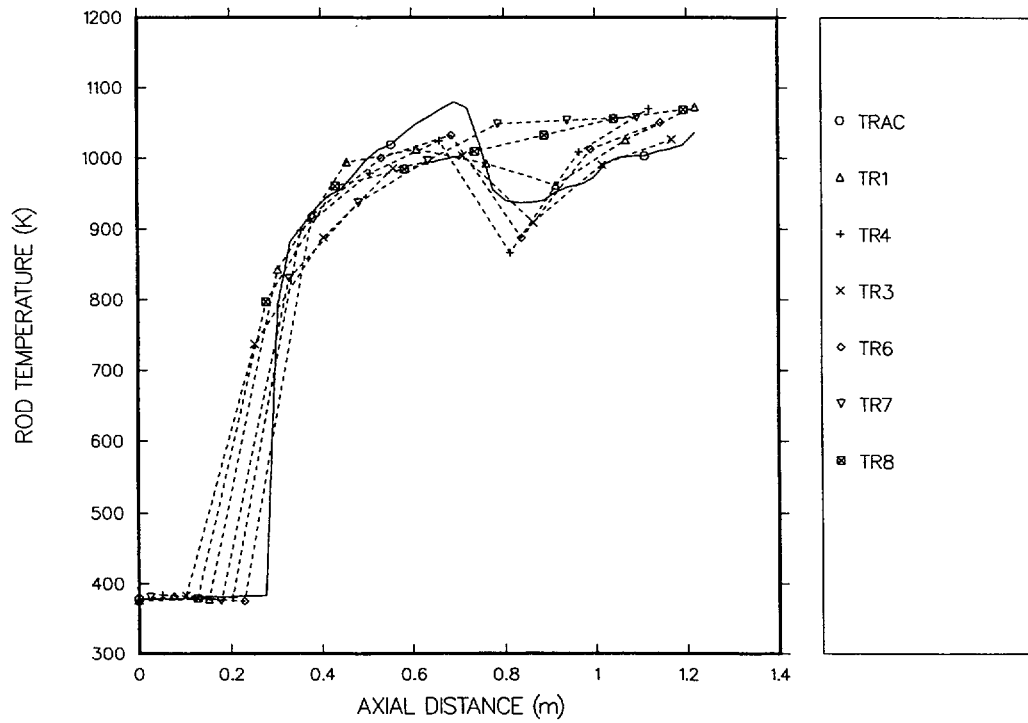


Fig. F-10. Comparison of predicted and measured axial temperatures at 108 s.

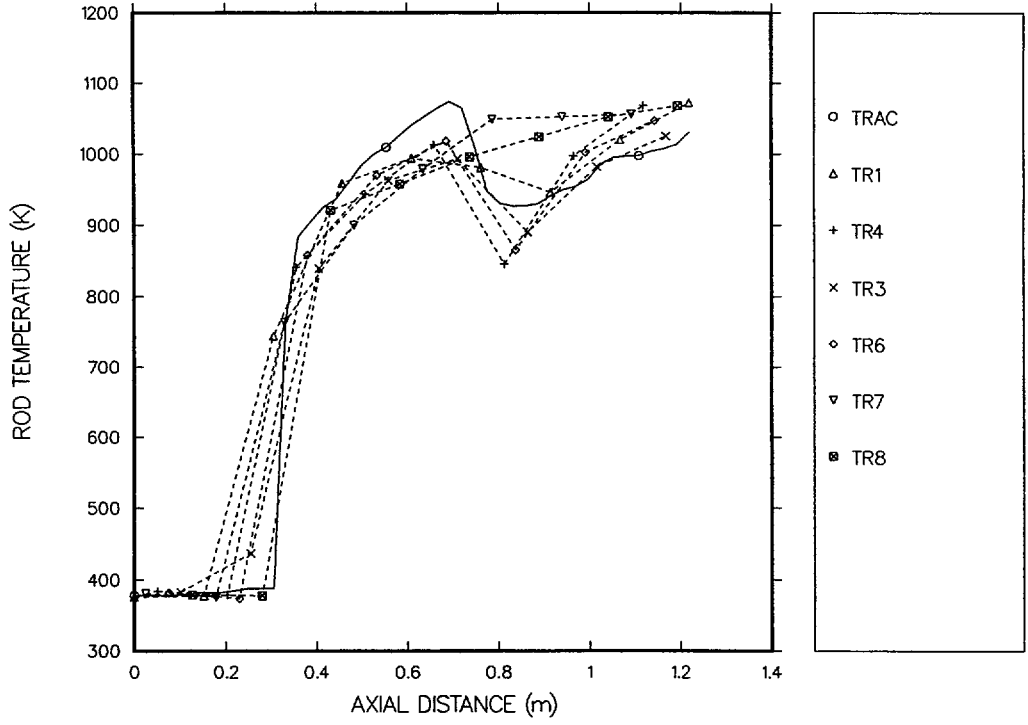


Fig. F-11. Comparison of predicted and measured axial temperatures at 129 s.

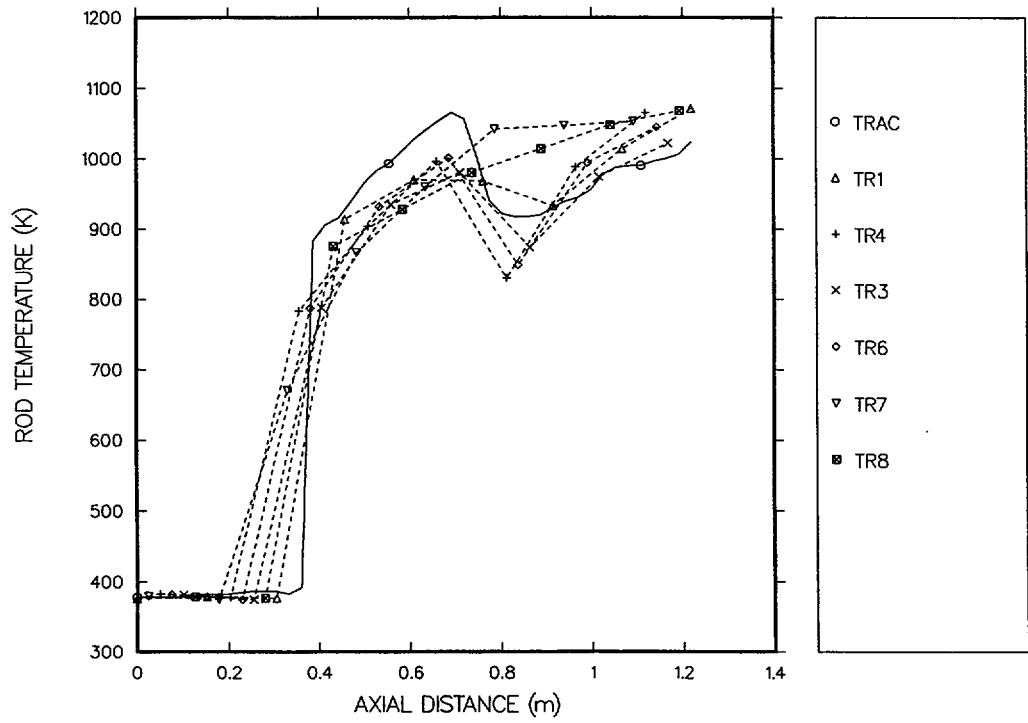


Fig. F-12. Comparison of predicted and measured axial temperatures at 149 s.

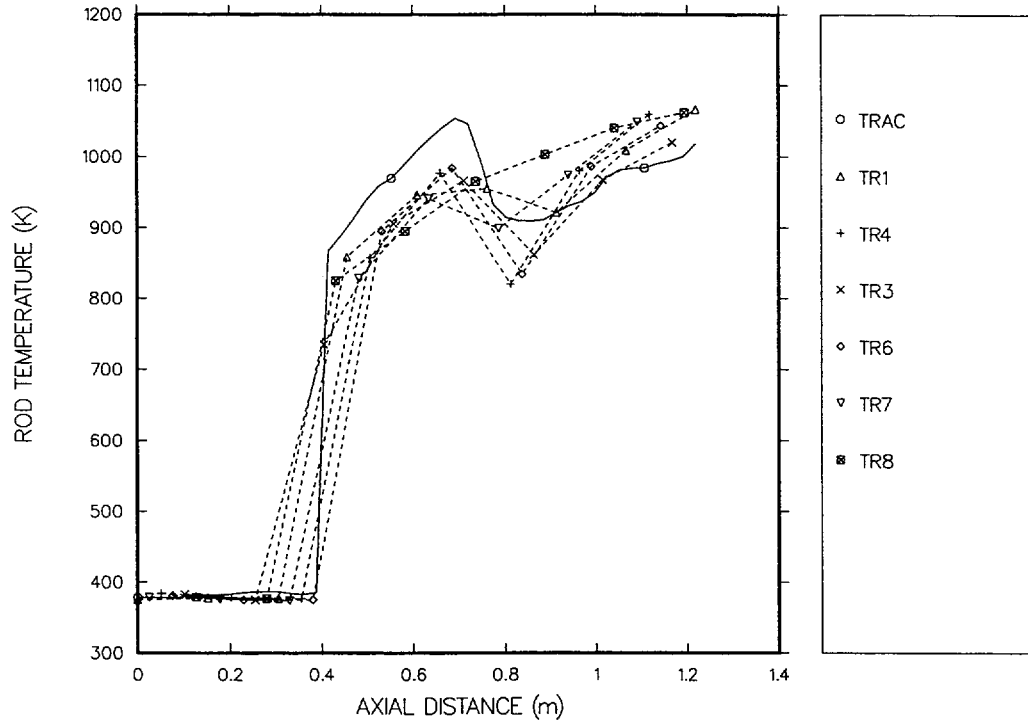


Fig. F-13. Comparison of predicted and measured axial temperatures at 170 s.

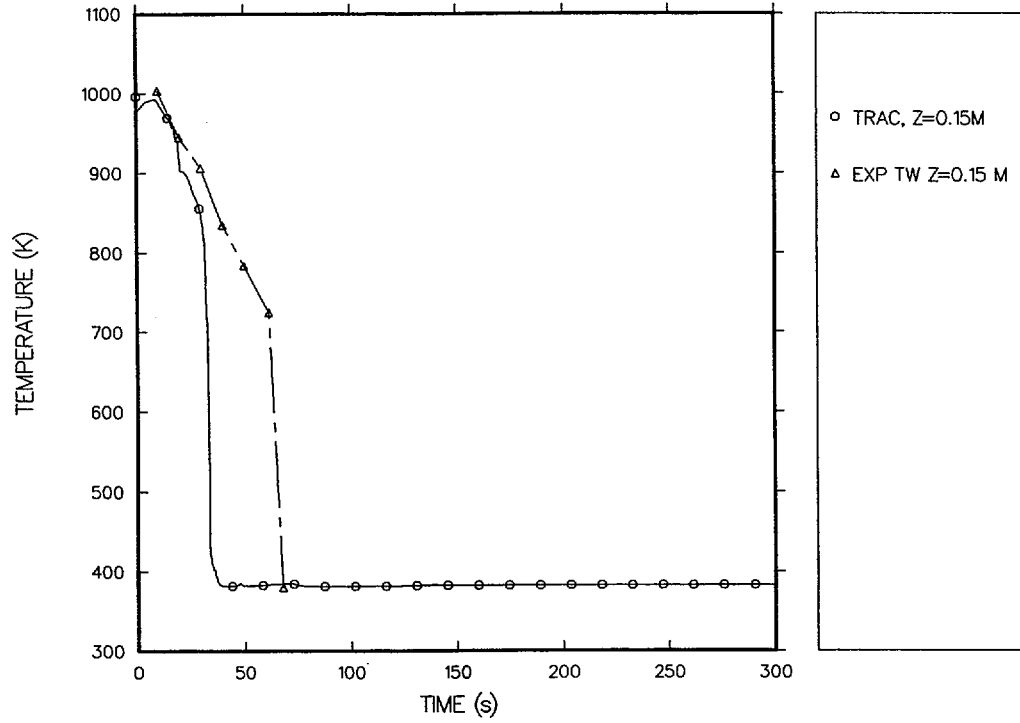


Fig. F-14. Predicted and measured wall temperature, 15-cm elevation (without grid spacer model).

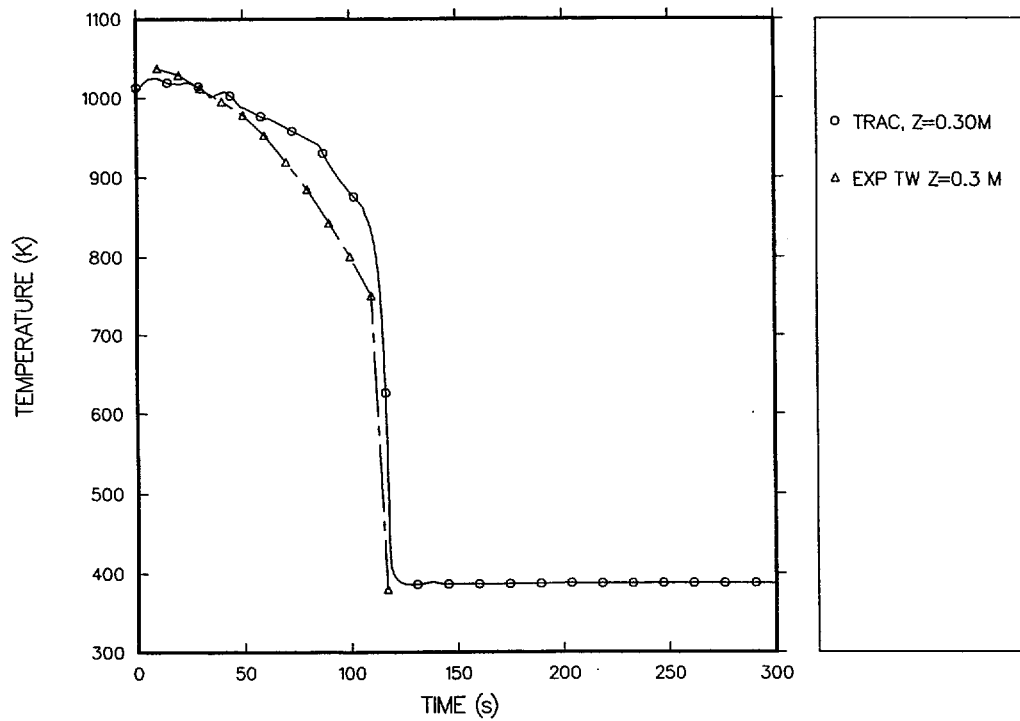


Fig. F-15. Predicted and measured wall temperature, 30-cm elevation (without grid spacer model).

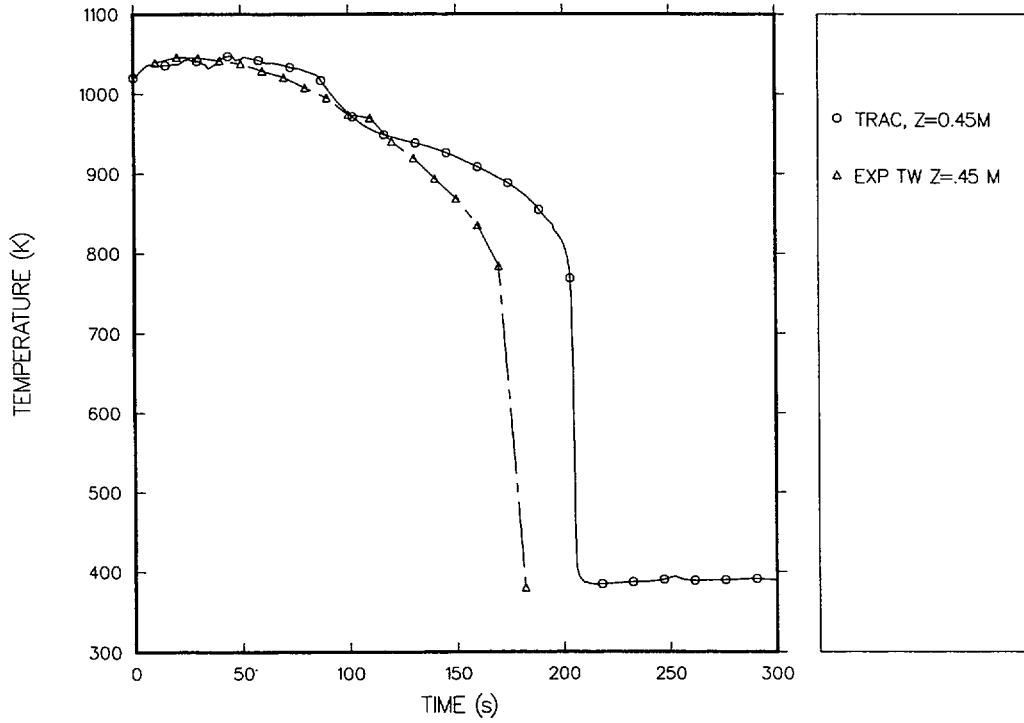


Fig. F-16. Predicted and measured wall temperature, 45-cm elevation (without grid spacer model).

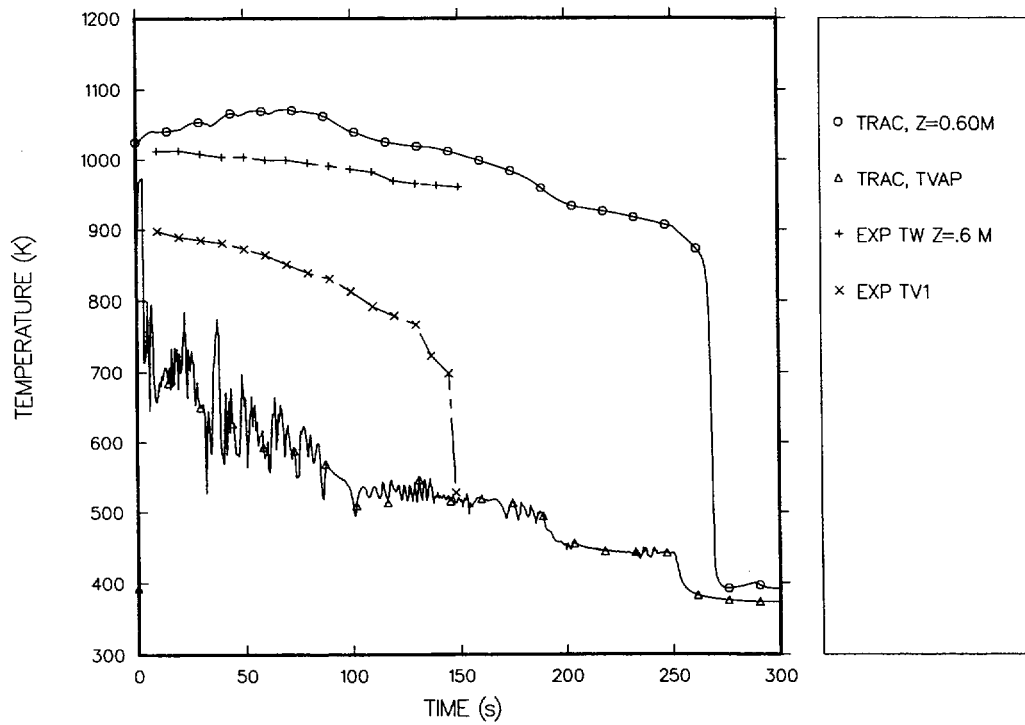


Fig. F-17. Predicted wall and vapor-temperature histories at 60 cm (without grid spacer model).

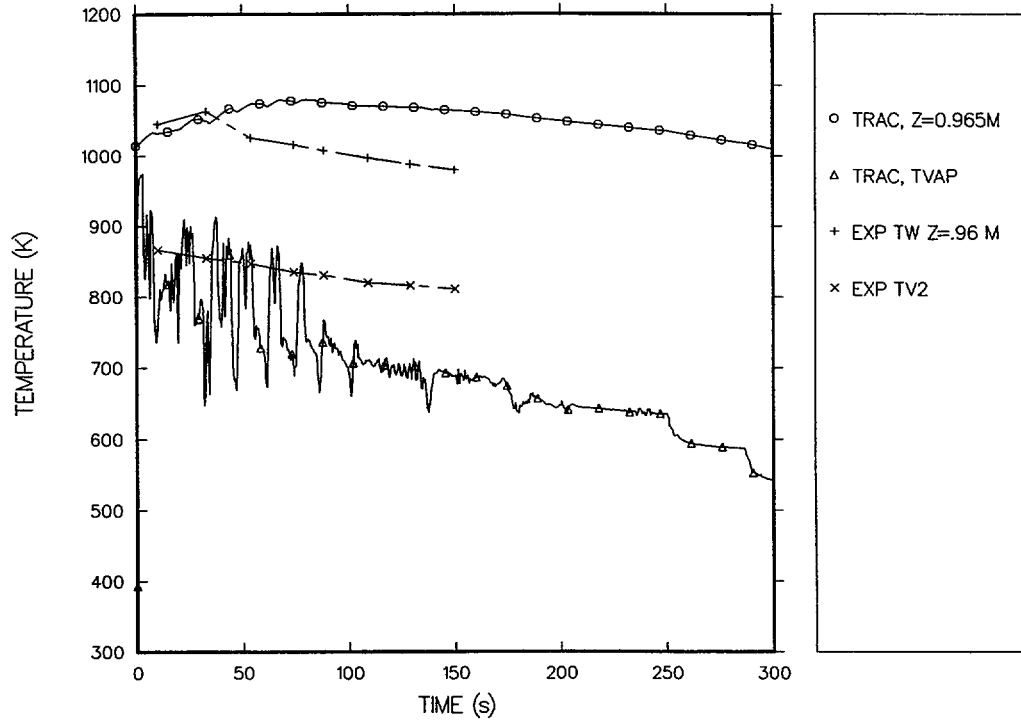


Fig. F-18. Predicted wall and vapor-temperature histories at 96 cm (without grid spacer model).

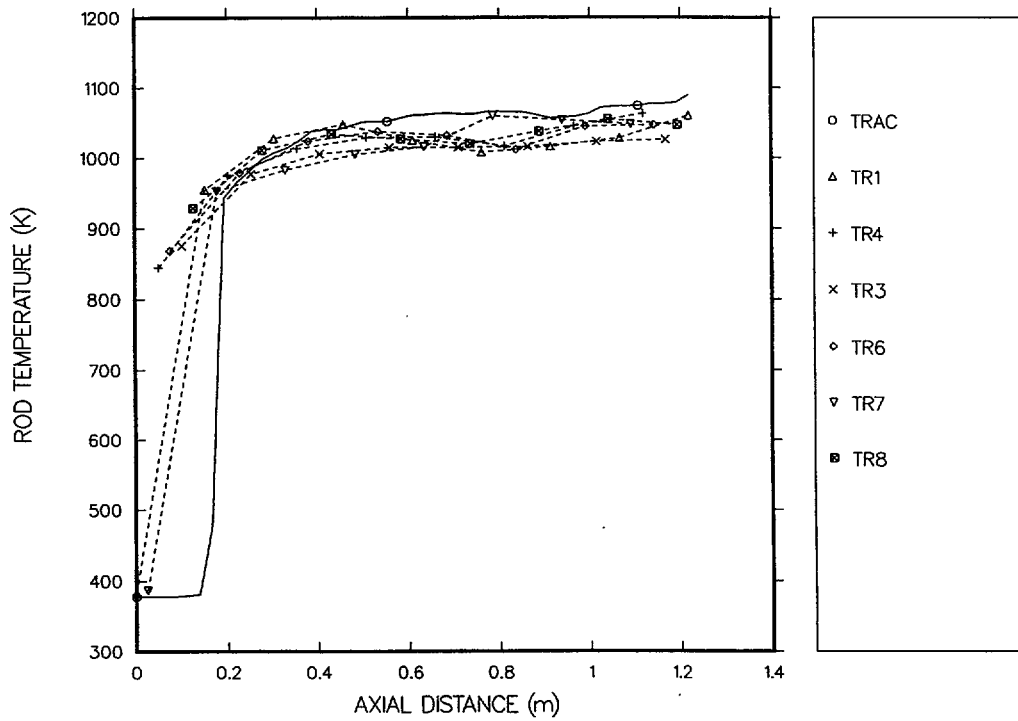


Fig. F-19. Comparison of predicted and measured axial temperatures at 40 s (without grid spacer model).

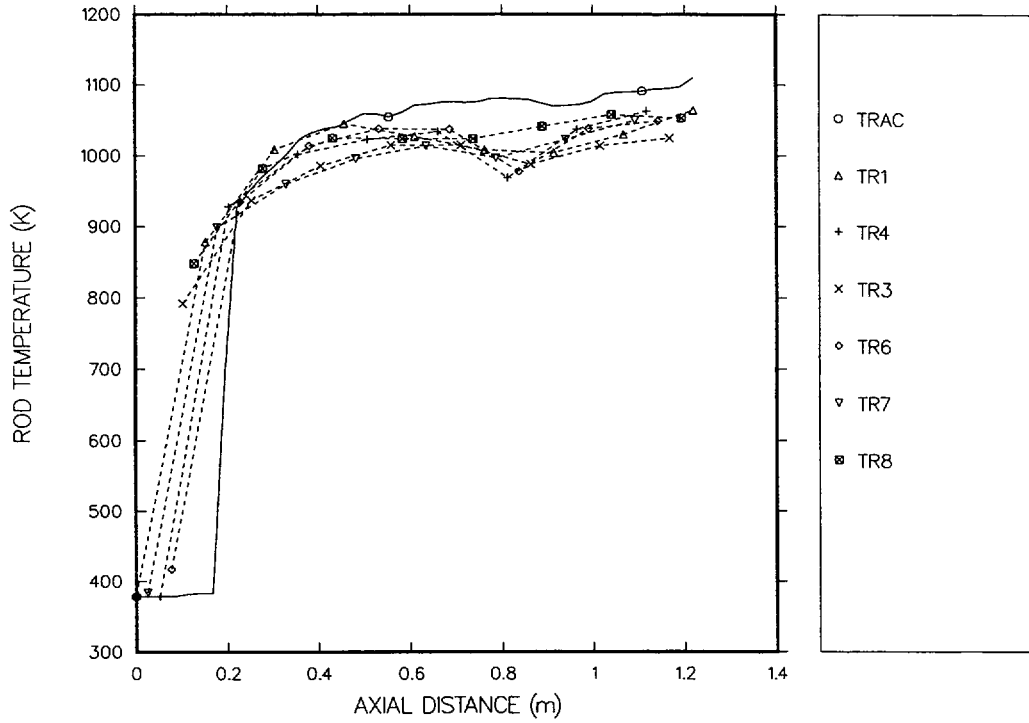


Fig. F-20. Comparison of predicted and measured axial temperatures at 53 s (without grid spacer model).

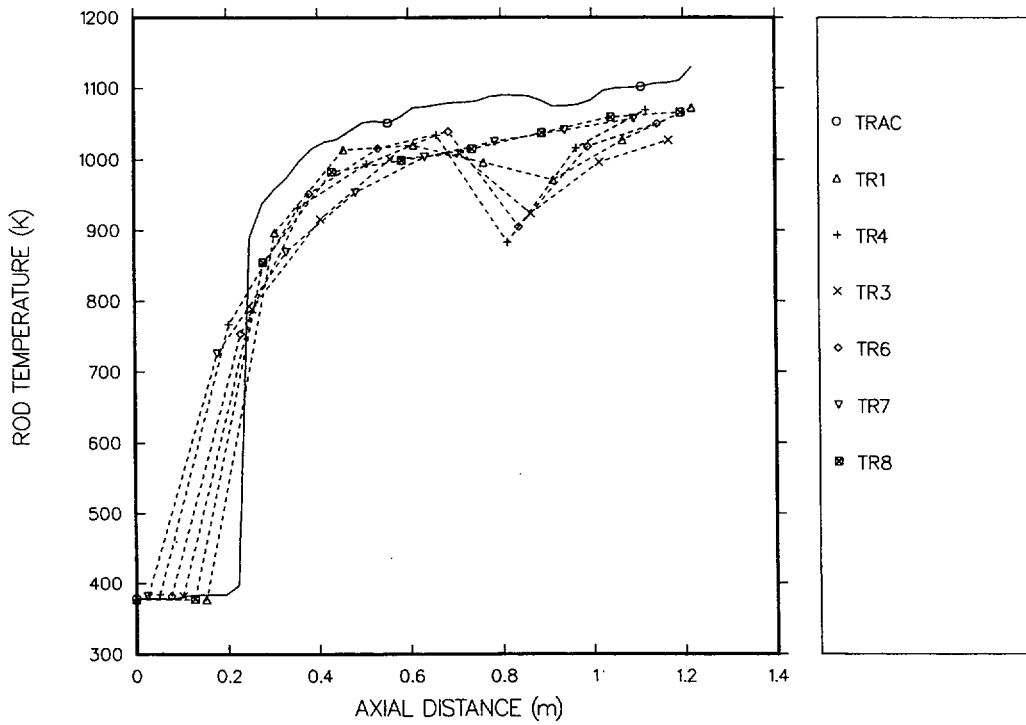


Fig. F-21. Comparison of predicted and measured axial temperatures at 74 s (without grid spacer model).

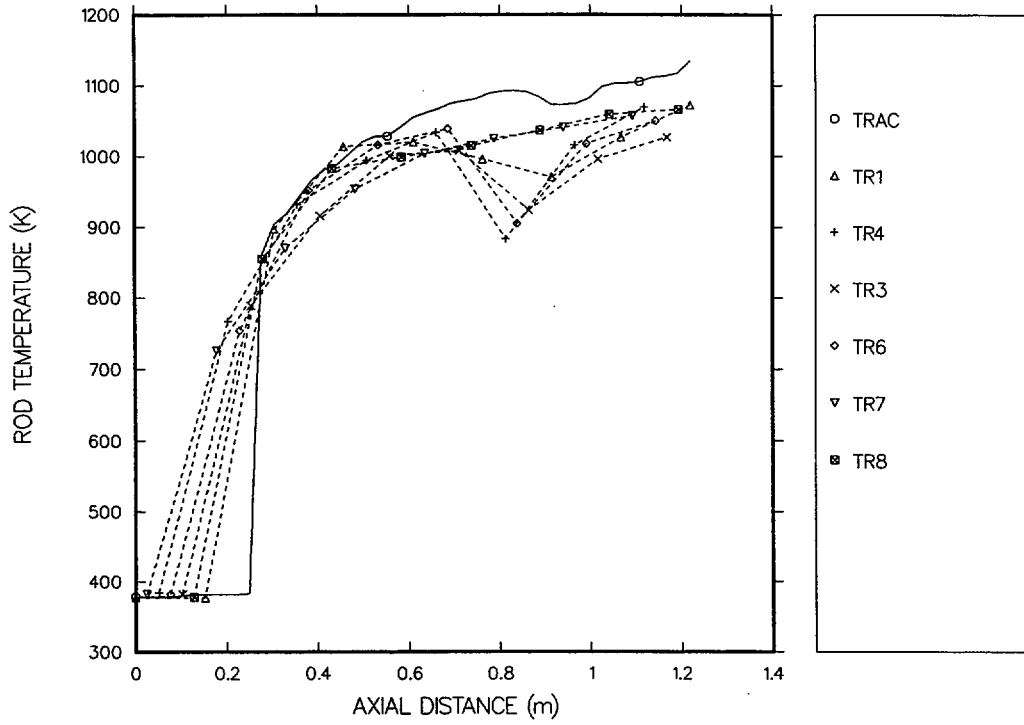


Fig. F-22. Comparison of predicted and measured axial temperatures at 94 s (without grid spacer model).

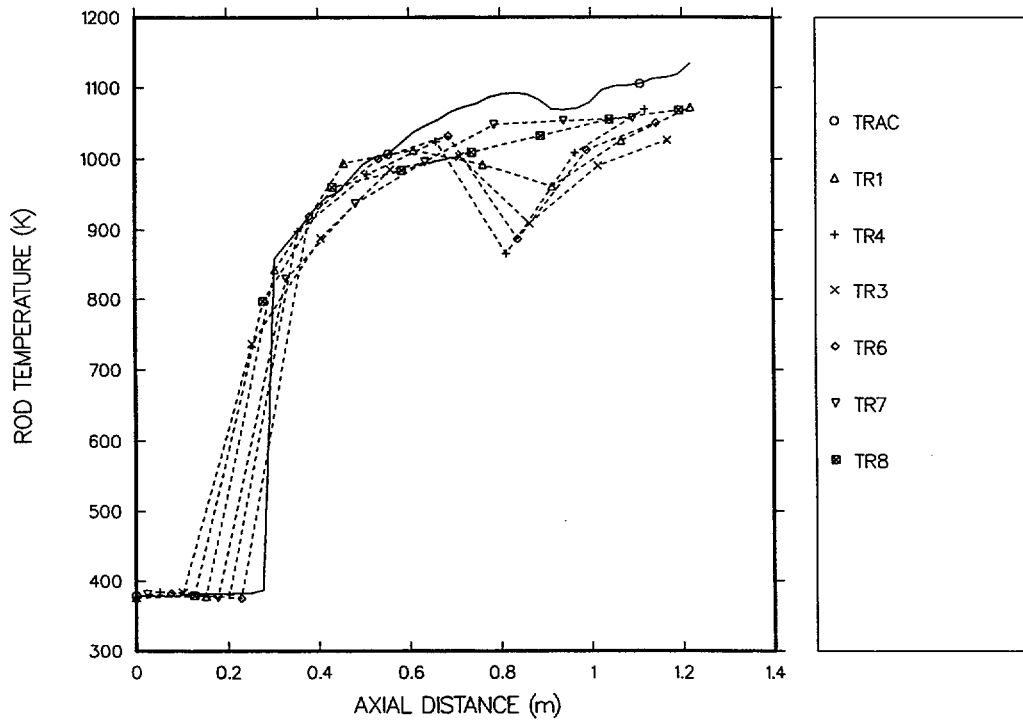


Fig. F-23. Comparison of predicted and measured axial temperatures at 108 s (without grid spacer model).

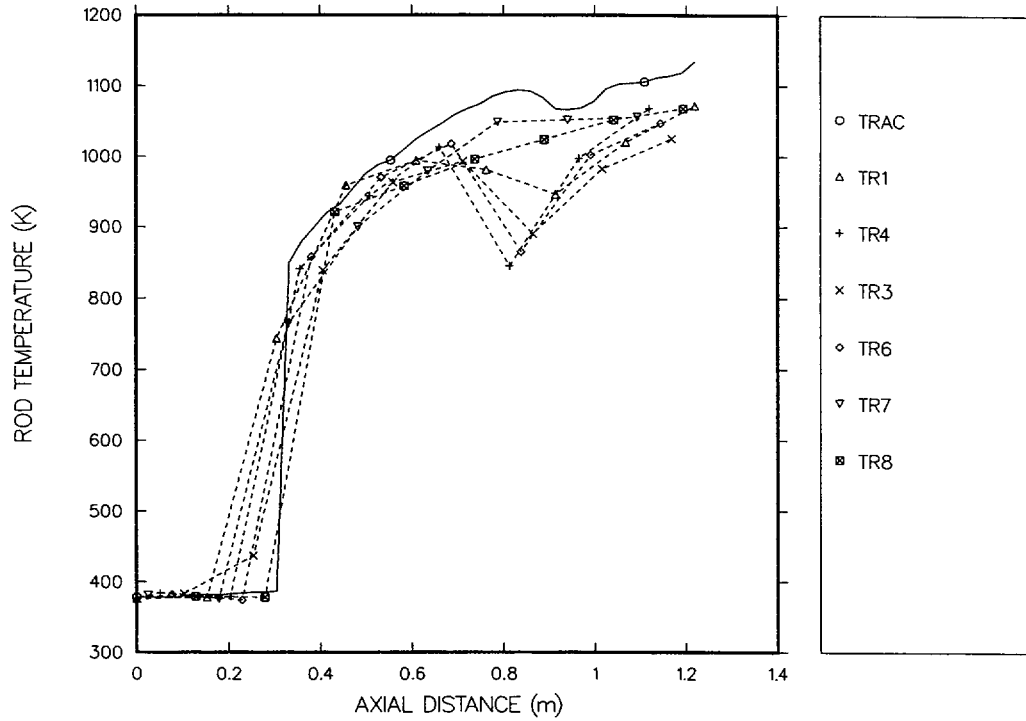


Fig. F-24. Comparison of predicted and measured axial temperatures at 129 s (without grid spacer model).

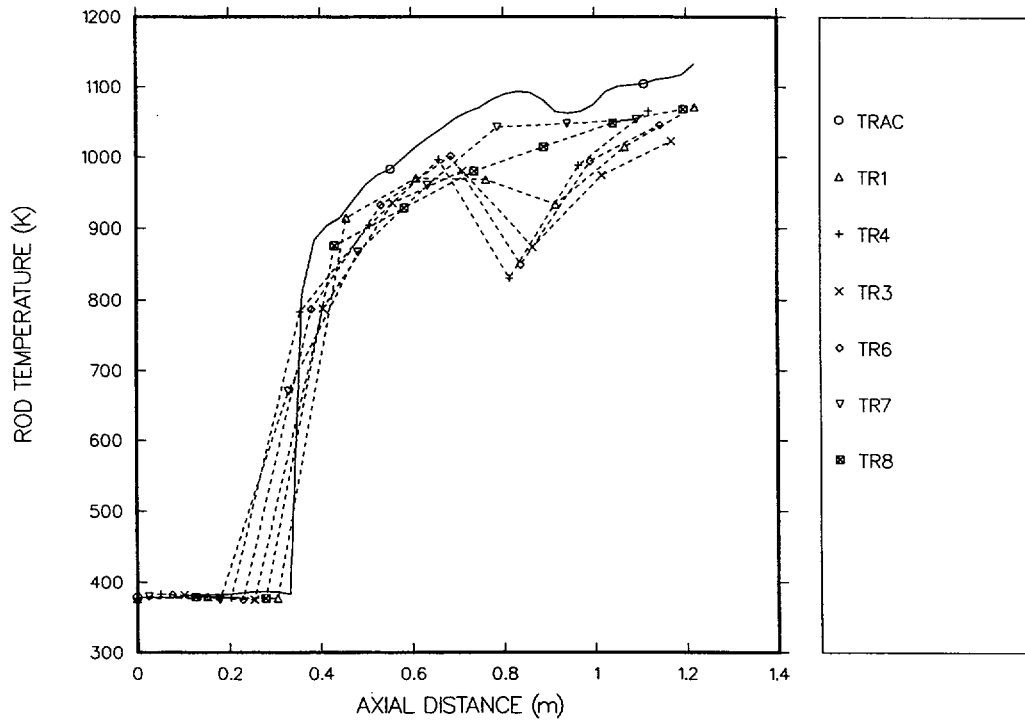


Fig. F-25. Comparison of predicted and measured axial temperatures at 149 s (without grid spacer model).

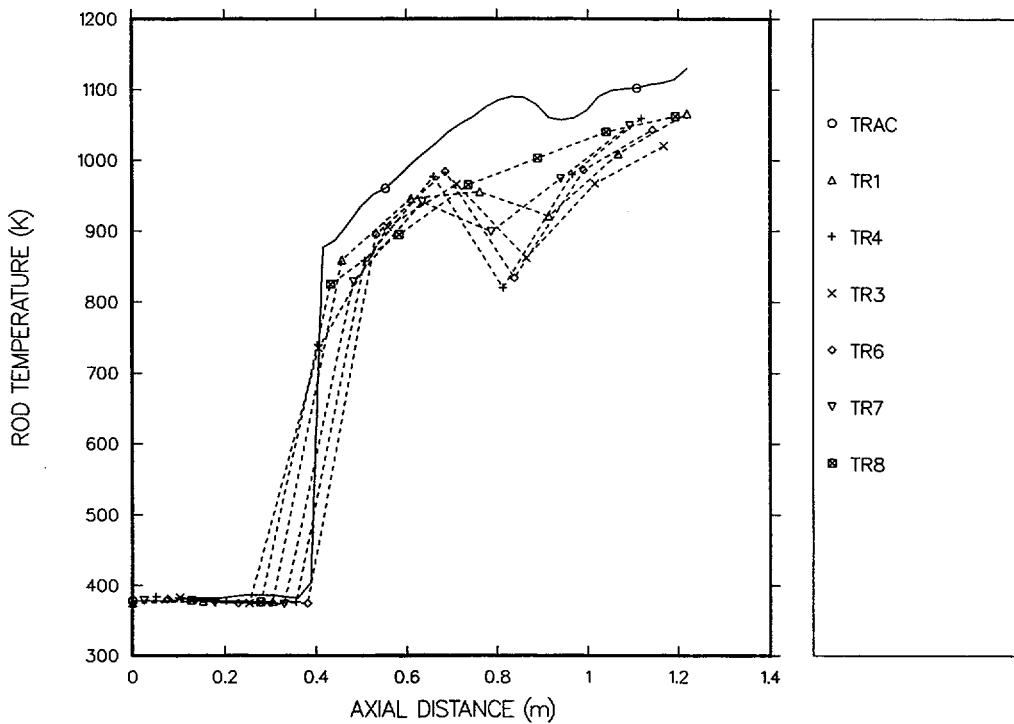


Fig. F-26. Comparison of predicted and measured axial temperatures at 170 s (without grid spacer model).

APPENDIX G

UPTF COLD-LEG TEST 8B INPUT LISTING

The corrected UPTF-8B input model requires a transient restart at 30 s to complete the calculation. The transient restart input listing starts on p. G-53.

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numtcr          ieos          inopt          nmat
8           8                0             1             0
9 Corrected UPTF Test 8B, By J. F. Lime, October 1999
10 The UPTF8B input model was corrected to model the vessel drain
11 mass flow more accurately. This was done by removing the vessel
12 drain valve and pressure boundary and replacing them with a
13 negative-flow Fill component that modeled the measured drain
14 mass flow. A slight adjustment in the downcomer volume fraction
15 was also made to match the measured downcomer liquid level at
16 initial conditions.
17 *
18 *****
19 ****  uptf test 8, phase b, part 1, run 111, post-test calculation  ****
20 *****
21 *
22 *          off
23 *          hl-ecc
24 *          #####
25 *          # fill #                loop 1
26 *          # 15 #
27 *          #####
28 *          15
29 *          #####          #####          #####
30 *          # tee #          # tee # # valve#
31 * 10# 10 #11          11# 11 #18# 19 #
32 *          #####          #####          #####
33 *          12          130
34 *          #####          #####          #####
35 *          # tee # # tee # # tee # # tee #
36 * 17# 14 #14# 13 #13# 12 #19# 18 #
37 *          #####          #####          #####
38 *          16          113          119
39 *          #####          #####          #####
40 *          # fill # # fill #          # fill #
41 *          # 16 # # 113 #          # 119 #
42 *          #####          #####          #####
43 *          cl-ecc          steam          controlled
44 *          off          off          drain
45 *
46 *
47 *          off closed porv
48 *          hl-ecc pressurizer
49 *          #####          #####
50 *          # fill # # fill #          loop 2
51 *          # 25 # # 228 #
52 *          #####          #####
53 *          25          228
54 *          #####          #####          #####
55 *          # tee # # tee # # tee # # valve#
56 * 20# 20 #227 27 #21# 21 #28# 29 #
57 *          #####          #####          #####
58 *          22          230
59 *          #####          #####          #####
60 *          # tee # # tee # # tee # # tee #
61 * 27# 24 #24# 23 #23# 22 #29# 28 #
62 *          #####          #####          #####
63 *          26          223          229
64 *          #####          #####          #####
65 *          # fill # # fill #          # fill #
66 *          # 26 # # 223 #          # 229 #
67 *          #####          #####          #####
68 *          cl-ecc          steam          controlled
69 *          on          off          drain
70 *
71 *
72 *          off
73 *          hl-ecc
74 *          #####
75 *          # fill #                loop 3
76 *          # 35 #
77 *          #####

```

```

78 *          35
79 * #####
80 * # tee # # tee # # valve#
81 * 30# 30 #31 31# 31 #38# 39 #
82 * #####
83 *          32          330
84 * #####
85 * # tee # # tee # # tee # # tee #
86 * 37# 34 #34# 33 #33# 32 #39# 38 #
87 * #####
88 *          36          333          339
89 * #####
90 * # fill # # fill # # fill #
91 * # 36 # # 333 # # 339 #
92 * #####
93 * cl-ecc steam controlled
94 * off off drain
95 *
96 *
97 * off
98 * hl-ecc drain
99 * #####
100 * # fill # # fill # loop 4
101 * # 45 # # 449 #
102 * #####
103 * 45 449 containment
104 * #####
105 * # tee # # tee # # valve# # break#
106 * 40# 40 #41# 41 #42# 42 #91# 91 #
107 * #####
108 *
109 * #####
110 * # valve# # tee # # tee # # break#
111 * 47# 46 #46# 47 #48# 48 #90# 90 #
112 * #####
113 * 479 49 containment
114 * #####
115 * # break# # valve# # fill #
116 * # 476 476# 477 # # 49 #
117 * #####
118 * drain drain
119 *
120 *
121 * #####
122 * # vessel 1 with (r=2, t=4, z=13) #
123 * # slab heat str 999 cells 1-4 levels 1-6 #
124 * # slab heat str 998 cells 5-8 levels 1-6 #10
125 * # slab heat str 997 cells 1-4 level 7 #
126 * # slab heat str 996 cells 1-4 level 8 #
127 * # slab heat str 995 cells 5-8 levels 7-8 #
128 * # slab heat str 994 cells 1-4 level 9 #
129 * # slab heat str 993 cells 1-4 level 10 #17
130 * # slab heat str 992 cells 5-8 levels 9-10 #
131 * # slab heat str 991 cells 1-2 level 11 #
132 * # slab heat str 990 cells 3-4 level 11 #
133 * # slab heat str 989 cells 5-6 level 11 #
134 * # slab heat str 988 cells 7-8 level 11 #20
135 * # slab heat str 987 cells 1-4 level 12 #
136 * # slab heat str 986 cells 5-8 level 12 #
137 * # slab heat str 985 cells 1-4 level 13 #
138 * # slab heat str 984 cells 5-8 level 13 #
139 * # core core #27
140 * # feedback feedback #
141 * # ##### #
142 * # fill # # fill # #
143 * # 701 # # 703 # #
144 * # ##### on #30
145 * # 701 steam 703 steam #
146 * # ##### #
147 * # tee # # fill # # tee # # fill # #
148 * # 501 #601 601 # # 503 #603 603 # #
149 * # ##### #37
150 * # 501 503 #
151 * # 502 504 #
152 * # ##### #
153 * # fill # # tee # # fill # # tee # #
154 * # 602 602# 502 # # 604 604# 504 # #40
155 * # ##### #
156 * # steam 702 steam 704 #
157 * # on ##### on #
158 * # fill # # fill # #
159 * # 702 # # 704 # #47
160 * # ##### #
161 * # feedback feedback #
162 * # core core #
163 * # ##### #
164 * # 101 104 102 103 #
165 * # ##### #
166 * # tee # # tee # #
167 * # 101# 102 # # 101 #103 #
168 * # ##### #
169 * # 106 105 #

```

```

170 *          #####
171 *          # tee #
172 *          106# 103 #
173 *          #####
174 *          107
175 *          #####
176 *          # fill #
177 *          # 107 #
178 *          #####
179 *          vessel drain
180 *
181 *
182 * *****
183 * namelist data *
184 * *****
185 *
186 &inopts
187 dtstrt=0.0001, iadded=10, icflow=2, imfr=3,
188 nfrcl=2, nfrcl=2, nfrcl=2, nhtstr=16, noair=1,
189 &end
190 *
191 *          dstep          timet
192 *          0          0.0000e+00
193 *          stdyst          transi          ncomp          njun          ipak
194 *          0          1          81          73          1
195 *          epso          epss
196 *          1.0000e-04          1.0000e-04
197 *          oitmax          sitmax          isolut          ncontr          nccfl
198 *          10          10          0          0          0
199 *          ntsv          ntcb          ntcf          ntrp          ntcp
200 *          28          38          252          20          1
201 *
202 * *****
203 * component-number data *
204 * *****
205 *
206 * iorder*          1          10          11          12          13
207 * iorder*          14          15          16          18          19
208 * iorder*          20          21          22          23          24
209 * iorder*          25          26          27          28          29
210 * iorder*          30          31          32          33          34
211 * iorder*          35          36          38          39          40
212 * iorder*          41          42          45          46          47
213 * iorder*          48          49          90          91          101
214 * iorder*          102          103          107          113 s
215 * iorder*          119          223          228          229          333
216 * iorder*          339          449          476          477          501
217 * iorder*          502          503          504          601          602
218 * iorder*          603          604          701          702          703
219 * iorder*          704          984          985          986          987
220 * iorder*          988          989          990          991          992
221 * iorder*          993          994          995          996          997
222 * iorder*          998          999e
223 *
224 * *****
225 * control-parameter data *
226 * *****
227 *
228 * signal variables
229 *
230 *          idsv          isvn          ilcn          icn1          icn2
231 *          100          0          0          0          0 * problem time
232 *          105          32          10          7          0 * liquid mass flow, hot leg loop 1
233 *          106          20          1          1001          4006 * core and lower plenum liquid level
234 *          107          20          1          5001          8009 * downcomer liquid level
235 *          119          27          12          8          0 * void fraction, separator-middle loop 1
236 *          205          32          27          3          0 * mass flow, pressurizer tee
237 *          229          27          22          8          0 * void fraction, separator-middle loop 2
238 *          305          32          30          7          0 * liquid mass flow, hot leg loop 2
239 *          339          27          32          8          0 * void fraction, separator-middle loop 3
240 *          479          27          47          3          0 * void fraction, bcl separator and kta pipe
241 *          489          27          48          18          0 * void fraction, bcl sep and cont pipe
242 *          501          29          501          4          0 * steam flow, core simulator tee cell 1
243 *          502          29          502          4          0 * steam flow, core simulator tee cell 2
244 *          503          29          503          4          0 * steam flow, core simulator tee cell 3
245 *          504          29          504          4          0 * steam flow, core simulator tee cell 4
246 *          701          32          1          1007          0 * void fraction, vessel level 7, cell 1
247 *          702          32          1          2007          0 * void fraction, vessel level 7, cell 2
248 *          703          32          1          3007          0 * void fraction, vessel level 7, cell 3
249 *          704          32          1          4007          0 * void fraction, vessel level 7, cell4
250 *          90          69          90          0          0 * component 90 total mass flow
251 *          91          69          91          0          0 * component 91 total mass flow
252 *          113          69          113          0          0 * component 113 total mass flow
253 *          223          69          223          0          0 * component 223 total mass flow
254 *          333          69          333          0          0 * component 333 total mass flow
255 *          601          69          601          0          0 * component 601 total mass flow
256 *          602          69          602          0          0 * component 602 total mass flow
257 *          603          69          603          0          0 * component 603 total mass flow
258 *          604          69          604          0          0 * component 604 total mass flow
259 *
260 * control blocks
261 *

```

262	*	idcb	icbn	icb1	icb2	icb3
263		-801	101	105	4	0
264	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
265		1.0000e+00	0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00
266	*					
267	*	cbftb *	-1.0000e+04r03	0.0000e+00	5.0000e+02	0.0000e+00
268	*	cbftb *	0.0000e+00e			1.0000e+04
269	*					
270	*	idcb	icbn	icb1	icb2	icb3
271		-802	101	205	4	0
272	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
273		1.0000e+00	0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00
274	*					
275	*	cbftb *	-1.0000e+04	5.0000e+00	0.0000e+00	5.0000e+00
276	*	cbftb *	3.0000e+01	1.0000e+04	3.0000e+01e	5.0000e+02
277	*					
278	*	idcb	icbn	icb1	icb2	icb3
279		-803	101	305	4	0
280	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
281		1.0000e+00	0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00
282	*					
283	*	cbftb *	-1.0000e+04r03	0.0000e+00	5.0000e+02	0.0000e+00
284	*	cbftb *	0.0000e+00e			1.0000e+04
285	*					
286	*	idcb	icbn	icb1	icb2	icb3
287		-901	100	-801	10	0
288	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
289		1.0000e+00	0.0000e+00	3.0000e+01	1.0000e+00	0.0000e+00
290	*					
291	*	idcb	icbn	icb1	icb2	icb3
292		-902	100	-802	10	0
293	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
294		1.0000e+00	0.0000e+00	3.0000e+01	1.0000e+00	0.0000e+00
295	*					
296	*	idcb	icbn	icb1	icb2	icb3
297		-903	100	-803	10	0
298	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
299		1.0000e+00	0.0000e+00	3.0000e+01	1.0000e+00	0.0000e+00
300	*					
301	*	idcb	icbn	icb1	icb2	icb3
302		-1001	23	501	0	0
303	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
304		2.3000e+06	0.0000e+00	1.0000e+09	1.0000e+00	0.0000e+00
305	*					
306	*	idcb	icbn	icb1	icb2	icb3
307		-1002	23	502	0	0
308	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
309		2.3000e+06	0.0000e+00	1.0000e+09	1.0000e+00	0.0000e+00
310	*					
311	*	idcb	icbn	icb1	icb2	icb3
312		-1003	23	503	0	0
313	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
314		2.3000e+06	0.0000e+00	1.0000e+09	1.0000e+00	0.0000e+00
315	*					
316	*	idcb	icbn	icb1	icb2	icb3
317		-1004	23	504	0	0
318	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
319		2.3000e+06	0.0000e+00	1.0000e+09	1.0000e+00	0.0000e+00
320	*					
321	*	idcb	icbn	icb1	icb2	icb3
322		-2001	56	100	0	0
323	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
324		0.0000e+00	0.0000e+00	1.0000e+09	0.0000e+00	0.0000e+00
325	*					
326	*	idcb	icbn	icb1	icb2	icb3
327		-2002	56	100	0	0
328	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
329		0.0000e+00	0.0000e+00	1.0000e+09	0.0000e+00	0.0000e+00
330	*					
331	*	idcb	icbn	icb1	icb2	icb3
332		-2003	56	100	0	0
333	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
334		0.0000e+00	0.0000e+00	1.0000e+09	0.0000e+00	0.0000e+00
335	*					
336	*	idcb	icbn	icb1	icb2	icb3
337		-2004	56	100	0	0
338	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
339		0.0000e+00	0.0000e+00	1.0000e+09	0.0000e+00	0.0000e+00
340	*					
341	*	idcb	icbn	icb1	icb2	icb3
342		-3001	56	-2001	0	0
343	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
344		1.0000e+00	0.0000e+00	1.0000e+09	6.3400e+08	0.0000e+00
345	*					
346	*	idcb	icbn	icb1	icb2	icb3
347		-3002	56	-2002	0	0
348	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
349		1.0000e+00	0.0000e+00	1.0000e+09	6.3400e+08	0.0000e+00
350	*					
351	*	idcb	icbn	icb1	icb2	icb3
352		-3003	56	-2003	0	0
353	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2

```

354 1.0000e+00 0.0000e+00 1.0000e+09 6.3400e+08 0.0000e+00
355 *
356 * idcb icbn icb1 icb2 icb3
357 * -3004 56 -2004 0 0
358 * cbgain cbxmin cbxmax cbcon1 cbcon2
359 1.0000e+00 0.0000e+00 1.0000e+09 6.3400e+08 0.0000e+00
360 *
361 * idcb icbn icb1 icb2 icb3
362 * -4001 54 -3001 -1001 0
363 * cbgain cbxmin cbxmax cbcon1 cbcon2
364 1.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
365 *
366 * idcb icbn icb1 icb2 icb3
367 * -4002 54 -3002 -1002 0
368 * cbgain cbxmin cbxmax cbcon1 cbcon2
369 1.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
370 *
371 * idcb icbn icb1 icb2 icb3
372 * -4003 54 -3003 -1003 0
373 * cbgain cbxmin cbxmax cbcon1 cbcon2
374 1.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
375 *
376 * idcb icbn icb1 icb2 icb3
377 * -4004 54 -3004 -1004 0
378 * cbgain cbxmin cbxmax cbcon1 cbcon2
379 1.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
380 *
381 * idcb icbn icb1 icb2 icb3
382 * -5001 101 701 4 0
383 * cbgain cbxmin cbxmax cbcon1 cbcon2
384 1.0000e+00 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
385 *
386 * cbftb * -9.6500e+02 1.0084e+02 -7.2375e+02 9.1675e+01 -4.8250e+02
387 * cbftb * 6.7550e+01 -2.4125e+02 0.0000e+00e
388 *
389 * idcb icbn icb1 icb2 icb3
390 * -5002 101 702 4 0
391 * cbgain cbxmin cbxmax cbcon1 cbcon2
392 1.0000e+00 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
393 *
394 * cbftb * -9.6500e+02 1.0084e+02 -7.2375e+02 9.1675e+01 -4.8250e+02
395 * cbftb * 6.7550e+01 -2.4125e+02 0.0000e+00e
396 *
397 * idcb icbn icb1 icb2 icb3
398 * -5003 101 703 4 0
399 * cbgain cbxmin cbxmax cbcon1 cbcon2
400 1.0000e+00 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
401 *
402 * cbftb * -9.6500e+02 1.0084e+02 -7.2375e+02 9.1675e+01 -4.8250e+02
403 * cbftb * 6.7550e+01 -2.4125e+02 0.0000e+00e
404 *
405 * idcb icbn icb1 icb2 icb3
406 * -5004 101 704 4 0
407 * cbgain cbxmin cbxmax cbcon1 cbcon2
408 1.0000e+00 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
409 *
410 * cbftb * -9.6500e+02 1.0084e+02 -7.2375e+02 9.1675e+01 -4.8250e+02
411 * cbftb * 6.7550e+01 -2.4125e+02 0.0000e+00e
412 *
413 * idcb icbn icb1 icb2 icb3
414 * -6001 101 -4001 4 0
415 * cbgain cbxmin cbxmax cbcon1 cbcon2
416 1.0000e+00 0.0000e+00 1.0000e+00 0.0000e+00 0.0000e+00
417 *
418 * cbftb * r02 0.0000e+00 1.2700e+08 6.1000e-01 2.5000e+08 8.2000e-01
419 * cbftb * 6.3400e+08 1.0000e+00e
420 *
421 * idcb icbn icb1 icb2 icb3
422 * -6002 101 -4002 4 0
423 * cbgain cbxmin cbxmax cbcon1 cbcon2
424 1.0000e+00 0.0000e+00 1.0000e+00 0.0000e+00 0.0000e+00
425 *
426 * cbftb * r02 0.0000e+00 1.2700e+08 6.1000e-01 2.5000e+08 8.2000e-01
427 * cbftb * 6.3400e+08 1.0000e+00e
428 *
429 * idcb icbn icb1 icb2 icb3
430 * -6003 101 -4003 4 0
431 * cbgain cbxmin cbxmax cbcon1 cbcon2
432 1.0000e+00 0.0000e+00 1.0000e+00 0.0000e+00 0.0000e+00
433 *
434 * cbftb * r02 0.0000e+00 1.2700e+08 6.1000e-01 2.5000e+08 8.2000e-01
435 * cbftb * 6.3400e+08 1.0000e+00e
436 *
437 * idcb icbn icb1 icb2 icb3
438 * -6004 101 -4004 4 0
439 * cbgain cbxmin cbxmax cbcon1 cbcon2
440 1.0000e+00 0.0000e+00 1.0000e+00 0.0000e+00 0.0000e+00
441 *
442 * cbftb * r02 0.0000e+00 1.2700e+08 6.1000e-01 2.5000e+08 8.2000e-01
443 * cbftb * 6.3400e+08 1.0000e+00e
444 *
445 * idcb icbn icb1 icb2 icb3

```

446	-7001	39	-6001	-5001	0
447	* cbgain	cbxmin	cbxmax	cbcon1	cbcon2
448	1.0000e+00	0.0000e+00	1.0000e+02	0.0000e+00	0.0000e+00
449	*				
450	* idcb	icbn	icb1	icb2	icb3
451	-7002	39	-6002	-5002	0
452	* cbgain	cbxmin	cbxmax	cbcon1	cbcon2
453	1.0000e+00	0.0000e+00	1.0000e+02	0.0000e+00	0.0000e+00
454	*				
455	* idcb	icbn	icb1	icb2	icb3
456	-7003	39	-6003	-5003	0
457	* cbgain	cbxmin	cbxmax	cbcon1	cbcon2
458	1.0000e+00	0.0000e+00	1.0000e+02	0.0000e+00	0.0000e+00
459	*				
460	* idcb	icbn	icb1	icb2	icb3
461	-7004	39	-6004	-5004	0
462	* cbgain	cbxmin	cbxmax	cbcon1	cbcon2
463	1.0000e+00	0.0000e+00	1.0000e+02	0.0000e+00	0.0000e+00
464	*				
465	* idcb	icbn	icb1	icb2	icb3
466	-8001	100	-7001	10	0
467	* cbgain	cbxmin	cbxmax	cbcon1	cbcon2
468	1.0000e+00	0.0000e+00	1.0000e+02	1.0000e+00	0.0000e+00
469	*				
470	* idcb	icbn	icb1	icb2	icb3
471	-8002	100	-7002	10	0
472	* cbgain	cbxmin	cbxmax	cbcon1	cbcon2
473	1.0000e+00	0.0000e+00	1.0000e+02	1.0000e+00	0.0000e+00
474	*				
475	* idcb	icbn	icb1	icb2	icb3
476	-8003	100	-7003	10	0
477	* cbgain	cbxmin	cbxmax	cbcon1	cbcon2
478	1.0000e+00	0.0000e+00	1.0000e+02	1.0000e+00	0.0000e+00
479	*				
480	* idcb	icbn	icb1	icb2	icb3
481	-8004	100	-7004	10	0
482	* cbgain	cbxmin	cbxmax	cbcon1	cbcon2
483	1.0000e+00	0.0000e+00	1.0000e+02	1.0000e+00	0.0000e+00
484	*				
485	* trips				
486	*				
487	* ntse	ntct	ntsf	ntdp	ntsd
488	0	4	0	1	0
489	*				
490	* idtp	isrt	iset	itst	idsg
491	90	2	0	1	100
492	* setp(1)	setp(2)			
493	-2.0000e-06	-1.0000e-06			
494	* dtsp(1)	dtsp(2)			
495	0.0000e+00	0.0000e+00			
496	* ifsp(1)	ifsp(2)			
497	0	0			
498	*				
499	* idtp	isrt	iset	itst	idsg
500	91	2	0	1	100
501	* setp(1)	setp(2)			
502	-2.0000e-06	-1.0000e-06			
503	* dtsp(1)	dtsp(2)			
504	0.0000e+00	0.0000e+00			
505	* ifsp(1)	ifsp(2)			
506	0	0			
507	*				
508	* idtp	isrt	iset	itst	idsg
509	115	2	0	1	100
510	* setp(1)	setp(2)			
511	-2.0000e-06	-1.0000e-06			
512	* dtsp(1)	dtsp(2)			
513	0.0000e+00	0.0000e+00			
514	* ifsp(1)	ifsp(2)			
515	0	0			
516	*				
517	* idtp	isrt	iset	itst	idsg
518	116	2	0	1	100
519	* setp(1)	setp(2)			
520	-2.0000e-06	-1.0000e-06			
521	* dtsp(1)	dtsp(2)			
522	0.0000e+00	0.0000e+00			
523	* ifsp(1)	ifsp(2)			
524	0	0			
525	*				
526	* idtp	isrt	iset	itst	idsg
527	117	2	0	1	100
528	* setp(1)	setp(2)			
529	-2.0000e-06	-1.0000e-06			
530	* dtsp(1)	dtsp(2)			
531	0.0000e+00	0.0000e+00			
532	* ifsp(1)	ifsp(2)			
533	0	0			
534	*				
535	* idtp	isrt	iset	itst	idsg
536	118	1	0	1	119
537	* setp(1)	setp(2)			

538	2.0000e-01	8.0000e-01			
539	* dtsp(1)	dtsp(2)			
540	0.0000e+00	0.0000e+00			
541	* ifsp(1)	ifsp(2)			
542	0	0			
543	*				
544	* idtp	isrt	iset	itst	idsg
545	119	2	0	3	-199
546	* setp(1)	setp(2)			
547	4.0000e-01	6.0000e-01			
548	* dtsp(1)	dtsp(2)			
549	0.0000e+00	0.0000e+00			
550	* ifsp(1)	ifsp(2)			
551	0	0			
552	*				
553	* idtp	isrt	iset	itst	idsg
554	220	2	0	1	100
555	* setp(1)	setp(2)			
556	-2.0000e-06	-1.0000e-06			
557	* dtsp(1)	dtsp(2)			
558	0.0000e+00	0.0000e+00			
559	* ifsp(1)	ifsp(2)			
560	0	0			
561	*				
562	* idtp	isrt	iset	itst	idsg
563	228	1	0	1	229
564	* setp(1)	setp(2)			
565	2.0000e-01	8.0000e-01			
566	* dtsp(1)	dtsp(2)			
567	0.0000e+00	0.0000e+00			
568	* ifsp(1)	ifsp(2)			
569	0	0			
570	*				
571	* idtp	isrt	iset	itst	idsg
572	229	2	0	3	-299
573	* setp(1)	setp(2)			
574	4.0000e-01	6.0000e-01			
575	* dtsp(1)	dtsp(2)			
576	0.0000e+00	0.0000e+00			
577	* ifsp(1)	ifsp(2)			
578	0	0			
579	*				
580	* idtp	isrt	iset	itst	idsg
581	338	1	0	1	339
582	* setp(1)	setp(2)			
583	2.0000e-01	8.0000e-01			
584	* dtsp(1)	dtsp(2)			
585	0.0000e+00	0.0000e+00			
586	* ifsp(1)	ifsp(2)			
587	0	0			
588	*				
589	* idtp	isrt	iset	itst	idsg
590	339	2	0	3	-399
591	* setp(1)	setp(2)			
592	4.0000e-01	6.0000e-01			
593	* dtsp(1)	dtsp(2)			
594	0.0000e+00	0.0000e+00			
595	* ifsp(1)	ifsp(2)			
596	0	0			
597	*				
598	* idtp	isrt	iset	itst	idsg
599	442	2	0	1	100
600	* setp(1)	setp(2)			
601	-2.0000e-06	-1.0000e-06			
602	* dtsp(1)	dtsp(2)			
603	0.0000e+00	0.0000e+00			
604	* ifsp(1)	ifsp(2)			
605	0	0			
606	*				
607	* idtp	isrt	iset	itst	idsg
608	446	2	0	1	100
609	* setp(1)	setp(2)			
610	-2.0000e-06	-1.0000e-06			
611	* dtsp(1)	dtsp(2)			
612	0.0000e+00	0.0000e+00			
613	* ifsp(1)	ifsp(2)			
614	0	0			
615	*				
616	* idtp	isrt	iset	itst	idsg
617	479	3	0	1	479
618	* setp(1)	setp(2)	setp(3)	setp(4)	
619	3.0000e-01	4.0000e-01	6.0000e-01	7.0000e-01	
620	* dtsp(1)	dtsp(2)	dtsp(3)	dtsp(4)	
621	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	
622	* ifsp(1)	ifsp(2)	ifsp(3)	ifsp(4)	
623	0	0	0	0	
624	*				
625	* idtp	isrt	iset	itst	idsg
626	489	1	0	1	489
627	* setp(1)	setp(2)			
628	2.0000e-01	8.0000e-01			
629	* dtsp(1)	dtsp(2)			

```

630 0.0000e+00 0.0000e+00
631 * ifsp(1) ifsp(2)
632 0 0
633 *
634 * idtp isrt iset itst idsg
635 499 2 0 3 -499
636 * setp(1) setp(2)
637 4.0000e-01 6.0000e-01
638 * dtsp(1) dtsp(2)
639 0.0000e+00 0.0000e+00
640 * ifsp(1) ifsp(2)
641 0 0
642 *
643 * idtp isrt iset itst idsg
644 600 2 0 1 100
645 * setp(1) setp(2)
646 -2.0000e-06 -1.0000e-06
647 * dtsp(1) dtsp(2)
648 0.0000e+00 0.0000e+00
649 * ifsp(1) ifsp(2)
650 0 0
651 *
652 * idtp isrt iset itst idsg
653 666 2 0 1 100
654 * setp(1) setp(2)
655 9.8000e+10 9.9000e+10
656 * dtsp(1) dtsp(2)
657 0.0000e+00 0.0000e+00
658 * ifsp(1) ifsp(2)
659 0 0
660 *
661 * idtp isrt iset itst idsg
662 999 2 0 1 106
663 * setp(1) setp(2)
664 5.9000e+00 6.0000e+00
665 * dtsp(1) dtsp(2)
666 0.0000e+00 0.0000e+00
667 * ifsp(1) ifsp(2)
668 0 0
669 *
670 * idtn intn
671 -199 2
672 * itn(1) itn(2)
673 117 118
674 *
675 * idtn intn
676 -299 2
677 * itn(1) itn(2)
678 117 228
679 *
680 * idtn intn
681 -399 2
682 * itn(1) itn(2)
683 117 338
684 *
685 * idtn intn
686 -499 2
687 * itn(1) itn(2)
688 117 489
689 *
690 * ndmp
691 1
692 * idmp(1)
693 -999
694 *
695 *****
696 * component data *
697 *****
698 *
699 * type num id ctitle
700 vessel 1 1 $1$ main vessel
701 * nasx nrsx ntsx ncsr ivssbf
702 13 2 4 16 0
703 * idcu idcl idcr icru icrl
704 12 2 1 0 0
705 * icrr ilcsp iucsp iuhp iconc
706 0 3 7 12 0
707 * igeom nvent nvvtb
708 0 0 0
709 * shelv epsw
710 0.0000e+00 0.0000e+00
711 *
712 * z * 2.0070e+00 2.4800e+00 2.9150e+00 4.3825e+00 5.8500e+00
713 * z * 6.7200e+00 7.4950e+00 7.7600e+00 8.0100e+00 8.7450e+00
714 * z * 9.4950e+00 1.0240e+01 1.3392e+01e
715 * rad * 2.1850e+00 2.4350e+00e
716 * th * 1.5708e+00 3.1416e+00 4.7124e+00 6.2832e+00e
717 *
718 * lisrl lisrc lisrf ljuns
719 11 2 3 40
720 11 6 3 47
721 11 1 3 10

```

722	11	4	3	20
723	11	3	3	30
724	11	5	3	17
725	11	8	3	27
726	11	7	3	37
727	6	1	3	501
728	6	2	3	502
729	6	3	3	503
730	6	4	3	504
731	1	1	-2	101
732	1	4	-2	102
733	1	3	-2	103
734	1	2	-2	104

```

* * level 1
* * cfzlj-t* f 0.0000e+00e
* * cfzlj-z* f -1.0000e-06e
* * cfzlj-r* f 0.0000e+00e
* * cfzlv-t* f 0.0000e+00e
* * cfzlv-z* f 0.0000e+00e
* * cfzlv-r* f 0.0000e+00e
* * vol r04 5.2510e-01r04 1.9870e-01e
* * fa-t * r04 3.7230e-01r04 2.0170e-01e
* * fa-z * r04 5.5950e-01r04 1.0000e+00e
* * fa-r * r04 2.6720e-01r04 0.0000e+00e
* * hd-t * r04 5.4000e-01r04 5.0000e-01e
* * hd-z * r04 9.5000e-01r04 5.0000e-01e
* * hd-r * r04 1.1107e+00r04 1.0000e-05e
* * alpn * f 0.0000e+00e
* * vvn-t * f 0.0000e+00e
* * vvn-z * f 0.0000e+00e
* * vvn-r * f 0.0000e+00e
* * vln-t * f 0.0000e+00e
* * vln-z * f 0.0000e+00e
* * vln-r * f 0.0000e+00e
* * tvn * f 3.9400e+02e
* * tln * f 3.9400e+02e
* * pn * f 4.0500e+05e
* * pan * f 0.0000e+00e

```

```

* * level 2
* * cfzlj-t* f 0.0000e+00e
* * cfzlj-z* f 0.0000e+00e
* * cfzlj-r* f 0.0000e+00e
* * cfzlv-t* f 0.0000e+00e
* * cfzlv-z* f 0.0000e+00e
* * cfzlv-r* f 0.0000e+00e
* * vol r04 6.9110e-01r04 1.0000e+00e
* * fa-t * r04 3.4900e-01r04 1.0000e+00e
* * fa-z * r04 3.8850e-01r04 1.0000e+00e
* * fa-r * r04 2.9190e-01r04 0.0000e+00e
* * hd-t * r04 7.1890e-01r04 1.0200e+00e
* * hd-z * r04 1.7000e-01r04 7.0000e-01e
* * hd-r * r04 1.3000e+00r04 1.0000e-05e
* * alpn * f 0.0000e+00e
* * vvn-t * f 0.0000e+00e
* * vvn-z * f 0.0000e+00e
* * vvn-r * f 0.0000e+00e
* * vln-t * f 0.0000e+00e
* * vln-z * f 0.0000e+00e
* * vln-r * f 0.0000e+00e
* * tvn * f 4.0300e+02e
* * tln * f 4.0300e+02e
* * pn * f 3.9500e+05e
* * pan * f 0.0000e+00e

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```

* * level 3
* * cfzlj-t* f 0.0000e+00e
* * cfzlj-z* r04 9.7350e-01r04 0.0000e+00e
* * cfzlj-r* f 0.0000e+00e
* * cfzlv-t* f 0.0000e+00e
* * cfzlv-z* r04 9.7350e-01r04 0.0000e+00e
* * cfzlv-r* f 0.0000e+00e
* * vol r04 5.0700e-01r04 1.0000e+00e
* * fa-t * r04 1.7270e-01r04 1.0000e+00e
* * fa-z * r04 1.2190e-01r04 1.0000e+00e
* * fa-r * f 0.0000e+00e
* * hd-t * r04 8.7000e-02r04 5.0000e-01e
* * hd-z * r04 1.1000e-01r04 5.0000e-01e
* * hd-r * f 1.0000e-05e
* * alpn * f 0.0000e+00e
* * vvn-t * f 0.0000e+00e
* * vvn-z * f 0.0000e+00e
* * vvn-r * f 0.0000e+00e
* * vln-t * f 0.0000e+00e
* * vln-z * f 0.0000e+00e
* * vln-r * f 0.0000e+00e
* * tvn * f 4.0700e+02e
* * tln * f 4.0700e+02e

```

```

814 * pn * f 3.9040e+05e
815 * pan * f 0.0000e+00e
816 *
817 * level 4
818 *
819 * cfzl-t* f 0.0000e+00e
820 * cfzl-z* f 0.0000e+00e
821 * cfzl-r* f 0.0000e+00e
822 * cfzv-t* f 0.0000e+00e
823 * cfzv-z* f 0.0000e+00e
824 * cfzv-r* f 0.0000e+00e
825 * vol * r04 5.5060e-01r04 1.0000e+00e
826 * fa-t * r04 1.3200e-01r04 1.0000e+00e
827 * fa-z * r04 4.3080e-01r04 1.0000e+00e
828 * fa-r * f 0.0000e+00e
829 * hd-t * r04 3.3190e-01r04 5.0000e-01e
830 * hd-z * r04 3.5070e-01r04 5.0000e-01e
831 * hd-r * f 1.0000e-05e
832 * alpn / f 1.2436e-01e
833 * alpn * r4 1.2436e-01 f 0.0 e
834 * vvn-t * f 0.0000e+00e
835 * vvn-z * f 0.0000e+00e
836 * vvn-r * f 0.0000e+00e
837 * vln-t * f 0.0000e+00e
838 * vln-z * f 0.0000e+00e
839 * vln-r * f 0.0000e+00e
840 * tvn * f 4.1300e+02e
841 * tln * f 4.1300e+02e
842 * pn * f 3.8171e+05e
843 * pan * f 0.0000e+00e
844 *
845 * level 5
846 *
847 * cfzl-t* f 0.0000e+00e
848 * cfzl-z* f 0.0000e+00e
849 * cfzl-r* f 0.0000e+00e
850 * cfzv-t* f 0.0000e+00e
851 * cfzv-z* f 0.0000e+00e
852 * cfzv-r* f 0.0000e+00e
853 * vol * r04 5.9380e-01r04 1.0000e+00e
854 * fa-t * r04 1.6470e-01r04 1.0000e+00e
855 * fa-z * r04 4.3080e-01r04 1.0000e+00e
856 * fa-r * f 0.0000e+00e
857 * hd-t * r04 3.4170e-01r04 5.0000e-01e
858 * hd-z * r04 3.5080e-01r04 5.0000e-01e
859 * hd-r * f 1.0000e-05e
860 * alpn / f 1.0000e+00e
861 * alpn * r4 1.0000e+00 f 0.88 e
862 * vvn-t * f 0.0000e+00e
863 * vvn-z * f 0.0000e+00e
864 * vvn-r * f 0.0000e+00e
865 * vln-t * f 0.0000e+00e
866 * vln-z * f 0.0000e+00e
867 * vln-r * f 0.0000e+00e
868 * tvn * f 4.1339e+02e
869 * tln * f 4.1339e+02e
870 * pn * f 3.7500e+05e
871 * pan * f 0.0000e+00e
872 *
873 * level 6
874 *
875 * cfzl-t* f 0.0000e+00e
876 * cfzl-z* f 0.0000e+00e
877 * cfzl-r* f 0.0000e+00e
878 * cfzv-t* f 0.0000e+00e
879 * cfzv-z* f 0.0000e+00e
880 * cfzv-r* f 0.0000e+00e
881 * vol * r04 6.5310e-01r04 1.0000e+00e
882 * fa-t * r04 0.0000e+00r04 1.0000e+00e
883 * fa-z * r04 3.6720e-01r04 1.0000e+00e
884 * fa-r * f 0.0000e+00e
885 * hd-t * r04 0.0000e+00r04 5.0000e-01e
886 * hd-z * r04 1.0751e+00r04 5.0000e-01e
887 * hd-r * f 0.0000e+00e
888 * alpn * f 1.0000e+00e
889 * vvn-t * f 0.0000e+00e
890 * vvn-z * f 0.0000e+00e
891 * vvn-r * f 0.0000e+00e
892 * vln-t * f 0.0000e+00e
893 * vln-z * f 0.0000e+00e
894 * vln-r * f 0.0000e+00e
895 * tvn * f 4.1339e+02e
896 * tln * f 4.1339e+02e
897 * pn * f 3.7500e+05e
898 * pan * f 0.0000e+00e
899 *
900 * level 7
901 *
902 * cfzl-t* r04 8.4366e-02r04 0.0000e+00e
903 * cfzl-z* f 0.0000e+00e
904 * cfzl-r* r04 2.3800e+00r04 0.0000e+00e
905 * cfzv-t* r04 8.4366e-02r04 0.0000e+00e

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906 * cfzv-z* f 0.0000e+00e
907 * cfzv-r* r04 2.3800e+00r04 0.0000e+00e
908 * vol * r04 5.3210e-01r04 1.0000e+00e
909 * fa-t * r04 4.1780e-01r04 1.0000e+00e
910 * fa-z * r04 2.5360e-01r04 1.0000e+00e
911 * fa-r * f 0.0000e+00e
912 * hd-t * r04 1.8000e-02r04 2.0000e-01e
913 * hd-z * r04 1.3400e-02r04 2.0000e-01e
914 * hd-r * f 0.0000e+00e
915 * alpn * f 1.0000e+00e
916 * vvn-t * f 0.0000e+00e
917 * vvn-z * f 0.0000e+00e
918 * vvn-r * f 0.0000e+00e
919 * vln-t * f 0.0000e+00e
920 * vln-z * f 0.0000e+00e
921 * vln-r * f 0.0000e+00e
922 * tvn * f 4.1339e+02e
923 * tln * f 4.1339e+02e
924 * pn * f 3.7500e+05e
925 * pan * f 0.0000e+00e
926 *
927 * level 8
928 *
929 * cfzl-t* f 0.0000e+00e
930 * cfzl-z* r04 3.6195e-01r04 0.0000e+00e
931 * cfzl-r* f 0.0000e+00e
932 * cfzv-t* f 0.0000e+00e
933 * cfzv-z* r04 3.6195e-01r04 0.0000e+00e
934 * cfzv-r* f 0.0000e+00e
935 * vol * r04 6.6870e-01r04 1.0000e+00e
936 * fa-t * r04 4.0110e-01r04 1.0000e+00e
937 * fa-z * r04 3.8380e-01r04 1.0000e+00e
938 * fa-r * f 0.0000e+00e
939 * hd-t * r04 6.5000e-02r04 1.5750e-01e
940 * hd-z * r04 7.6200e-02r04 2.6600e-01e
941 * hd-r * f 0.0000e+00e
942 * alpn * f 1.0000e+00e
943 * vvn-t * f 0.0000e+00e
944 * vvn-z * f 0.0000e+00e
945 * vvn-r * f 0.0000e+00e
946 * vln-t * f 0.0000e+00e
947 * vln-z * f 0.0000e+00e
948 * vln-r * f 0.0000e+00e
949 * tvn * f 4.1339e+02e
950 * tln * f 4.1339e+02e
951 * pn * f 3.7500e+05e
952 * pan * f 0.0000e+00e
953 *
954 * level 9
955 *
956 * cfzl-t* f 0.0000e+00e
957 * cfzl-z* f 0.0000e+00e
958 * cfzl-r* f 1.5399e-01 1.2400e-01 1.2400e-01 1.2400e-01r04 0.0000e+00
959 *
960 * cfzv-t* f 0.0000e+00e
961 * cfzv-z* f 0.0000e+00e
962 * cfzv-r* f 1.5399e-01 1.2400e-01 1.2400e-01 1.2400e-01r04 0.0000e+00
963 *
964 * vol * r04 7.4160e-01r04 1.0000e+00e
965 * fa-t * 4.0510e-01 4.0510e-01 5.0920e-01 5.0920e-01r04 1.0000e+00
966 *
967 * fa-z * r04 6.6420e-01r04 1.0000e+00e
968 * fa-r * f 0.0000e+00e
969 * hd-t * 6.0000e-02 7.3600e-02 7.3600e-02 7.3600e-02r04 2.5000e-01
970 *
971 * hd-z * r04 2.3990e-01r04 2.5000e-01e
972 * hd-r * 6.4700e-02 5.2100e-02 5.2100e-02 5.2100e-02r04 1.0000e-05
973 *
974 * alpn * f 1.0000e+00e
975 * vvn-t * f 0.0000e+00e
976 * vvn-z * f 0.0000e+00e
977 * vvn-r * f 0.0000e+00e
978 * vln-t * f 0.0000e+00e
979 * vln-z * f 0.0000e+00e
980 * vln-r * f 0.0000e+00e
981 * tvn * f 4.1339e+02e
982 * tln * f 4.1339e+02e
983 * pn * f 3.7500e+05e
984 * pan * f 0.0000e+00e
985 *
986 * level 10
987 *
988 * cfzl-t* f 0.0000e+00e
989 * cfzl-z* f 0.0000e+00e
990 * cfzl-r* r04 2.3800e-05r04 0.0000e+00e
991 * cfzv-t* f 0.0000e+00e
992 * cfzv-z* f 0.0000e+00e
993 * cfzv-r* r04 2.3800e-05r04 0.0000e+00e
994 * vol * r04 8.8100e-01r04 6.2670e-01e
995 * fa-t * r04 4.3710e-01r04 6.5240e-01e
996 * fa-z * r04 6.8570e-01r04 6.8310e-01e
997 * fa-r * f 0.0000e+00e

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998 * hd-t * r04 3.5870e-01r04 4.1460e-01e
999 * hd-z * r04 4.4010e-01r04 3.3920e-01e
1000 * hd-r * f 1.0000e-05e
1001 * alpn * f 1.0000e+00e
1002 * vvn-t * f 0.0000e+00e
1003 * vvn-z * f 0.0000e+00e
1004 * vvn-r * f 0.0000e+00e
1005 * vln-t * f 0.0000e+00e
1006 * vln-z * f 0.0000e+00e
1007 * vln-r * f 0.0000e+00e
1008 * tvn * f 4.1339e+02e
1009 * tln * f 4.1339e+02e
1010 * pn * f 3.7500e+05e
1011 * pan * f 0.0000e+00e
1012 *
1013 * level 11
1014 *
1015 * cfzl-t* f 0.0000e+00e
1016 * cfzl-z* f 0.0000e+00e
1017 * cfzl-r* r04 2.3800e-05r04 0.0000e+00e
1018 * cfzv-t* f 0.0000e+00e
1019 * cfzv-z* f 0.0000e+00e
1020 * cfzv-r* r04 2.3800e-05r04 0.0000e+00e
1021 * vol * r04 9.1919e-01r04 3.7130e-01e
1022 * fa-t * r04 4.3810e-01r04 3.7130e-01e
1023 * fa-z * r04 6.8750e-01r04 3.7130e-01e
1024 * fa-r * f 0.0000e+00e
1025 * hd-t * r04 3.5960e-01r04 3.6000e-01e
1026 * hd-z * r04 4.4010e-01r04 3.6544e-01e
1027 * hd-r * f 1.0000e-05e
1028 * alpn * f 1.0000e+00e
1029 * vvn-t * f 0.0000e+00e
1030 * vvn-z * f 0.0000e+00e
1031 * vvn-r * f 0.0000e+00e
1032 * vln-t * f 0.0000e+00e
1033 * vln-z * f 0.0000e+00e
1034 * vln-r * f 0.0000e+00e
1035 * tvn * f 4.1339e+02e
1036 * tln * f 4.1339e+02e
1037 * pn * f 3.7500e+05e
1038 * pan * f 0.0000e+00e
1039 *
1040 * level 12
1041 *
1042 * cfzl-t* f 0.0000e+00e
1043 * cfzl-z* f -1.0000e-06e
1044 * cfzl-r* r04 2.3800e-05r04 0.0000e+00e
1045 * cfzv-t* f 0.0000e+00e
1046 * cfzv-z* f 0.0000e+00e
1047 * cfzv-r* r04 2.3800e-05r04 0.0000e+00e
1048 * vol * r04 1.0446e+00r04 4.7520e-01e
1049 * fa-t * r04 4.5920e-01r04 4.6110e-01e
1050 * fa-z * r04 3.8500e-02r04 0.0000e+00e
1051 * fa-r * f 0.0000e+00e
1052 * hd-t * f 2.6510e-01e
1053 * hd-z * r04 1.0000e-05r04 4.0000e-04e
1054 * hd-r * f 1.0000e-05e
1055 * alpn * f 1.0000e+00e
1056 * vvn-t * f 0.0000e+00e
1057 * vvn-z * f 0.0000e+00e
1058 * vvn-r * f 0.0000e+00e
1059 * vln-t * f 0.0000e+00e
1060 * vln-z * f 0.0000e+00e
1061 * vln-r * f 0.0000e+00e
1062 * tvn * f 4.1339e+02e
1063 * tln * f 4.1339e+02e
1064 * pn * f 3.7500e+05e
1065 * pan * f 0.0000e+00e
1066 *
1067 * level 13
1068 *
1069 * cfzl-t* f 0.0000e+00e
1070 * cfzl-z* f 0.0000e+00e
1071 * cfzl-r* f 0.0000e+00e
1072 * cfzv-t* f 0.0000e+00e
1073 * cfzv-z* f 0.0000e+00e
1074 * cfzv-r* f 0.0000e+00e
1075 * vol * r04 4.9460e-01r04 2.0895e-01e
1076 * fa-t * r04 4.9460e-01r04 1.0000e-01e
1077 * fa-z * f 0.0000e+00e
1078 * fa-r * r04 2.5000e-01r04 0.0000e+00e
1079 * hd-t * r04 4.0860e-01r04 1.8620e-01e
1080 * hd-z * f 1.0000e-05e
1081 * hd-r * r04 1.0000e+00r04 1.0000e-05e
1082 * alpn * f 1.0000e+00e
1083 * vvn-t * f 0.0000e+00e
1084 * vvn-z * f 0.0000e+00e
1085 * vvn-r * f 0.0000e+00e
1086 * vln-t * f 0.0000e+00e
1087 * vln-z * f 0.0000e+00e
1088 * vln-r * f 0.0000e+00e
1089 * tvn * f 4.1339e+02e

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1090 * tln * f 4.1339e+02e
1091 * pn * f 3.7500e+05e
1092 * pan * f 0.0000e+00e
1093 *
1094 * type num id ctitle
1095 tee 101 101 $101$ vessel drain loops 2,3
1096 * jcell nodes ichf cost epsw
1097 * 4 4 0 0.0000e+00 0.0000e+00
1098 * iconcl ncell1 jun1 jun2 ipow1
1099 * 0 6 102 105 0
1100 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
1101 * 0 0 0 0 0
1102 * radin1 th1 hout11 houtv1 tout11
1103 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1104 * toutv1
1105 * 3.0000e+02
1106 * qpin1 qpoff1 rqpms1 qpscl1
1107 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1108 * iconc2 ncell2 jun3 ipow2
1109 * 0 2 103 0
1110 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
1111 * 0 0 0 0 0
1112 * radin2 th2 hout12 houtv2 tout12
1113 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1114 * toutv2
1115 * 3.0000e+02
1116 * qpin2 qpoff2 rqpms2 qpscl2
1117 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1118 *
1119 * dx * 3.9600e-01 1.7500e+00 4.1500e+00 2.6000e+00 4.4000e+00
1120 * dx * 1.2350e+01e
1121 * vol * 4.8000e-02 2.1230e-01 5.0340e-01 3.1540e-01 5.3370e-01
1122 * vol * 1.4981e+00e
1123 * fa * f 1.2130e-01e
1124 * fric * 0.0000e+00 8.8200e-03 3.2100e-03 2.8000e-03r02 0.0000e+00
1125 * fric * 1.0700e-03e
1126 * rvfric* 0.0000e+00 8.8200e-03 3.2100e-03 2.8000e-03r02 0.0000e+00
1127 * rvfric* 1.0700e-03e
1128 * grav * -1.0000e+00 -2.7310e-01 -9.3000e-03 -8.6000e-03 -1.0000e-02
1129 * grav * -9.2000e-03 -3.0280e-01e
1130 * hd * f 3.9300e-01e
1131 * icflg * f 0e
1132 * nff * -1r06 1e
1133 * alp * f 0.0000e+00e
1134 * vl * f 0.0000e+00e
1135 * vv * f 0.0000e+00e
1136 * tl * f 3.0800e+02e
1137 * tv * f 3.0800e+02e
1138 * p * f 4.1500e+05e
1139 * pa * f 0.0000e+00e
1140 * qppp * f 0.0000e+00e
1141 * matid * f 6e
1142 * tw * f 3.0800e+02e
1143 *
1144 * dx * 1.8500e+00 3.8300e-01e
1145 * vol * 2.2440e-01 4.6500e-02e
1146 * fa * f 1.2130e-01e
1147 * fric * 1.0000e-04 8.4700e-03 0.0000e+00e
1148 * rvfric* 1.0000e-04 8.4700e-03 0.0000e+00e
1149 * grav * 0.0000e+00 2.6890e-01 1.0000e+00e
1150 * hd * f 3.9300e-01e
1151 * icflg * f 0e
1152 * nff * r02 1 -1e
1153 * alp * f 0.0000e+00e
1154 * vl * f 0.0000e+00e
1155 * vv * f 0.0000e+00e
1156 * tl * f 3.0800e+02e
1157 * tv * f 3.0800e+02e
1158 * p * f 4.1500e+05e
1159 * pa * f 0.0000e+00e
1160 * qppp * f 0.0000e+00e
1161 * matid * f 6e
1162 * tw * f 3.0800e+02e
1163 *
1164 * type num id ctitle
1165 tee 102 102 $102$ vessel drain loops 1,4
1166 * jcell nodes ichf cost epsw
1167 * 3 4 0 0.0000e+00 0.0000e+00
1168 * iconcl ncell1 jun1 jun2 ipow1
1169 * 0 4 104 106 0
1170 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
1171 * 0 0 0 0 0
1172 * radin1 th1 hout11 houtv1 tout11
1173 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1174 * toutv1
1175 * 3.0000e+02
1176 * qpin1 qpoff1 rqpms1 qpscl1
1177 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1178 * iconc2 ncell2 jun3 ipow2
1179 * 0 2 101 0
1180 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
1181 * 0 0 0 0 0

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1182 *      radin2          th2          hout12          houtv2          tout12
1183 * 1.9650e-01          1.0000e-02          0.0000e+00          0.0000e+00          3.0000e+02
1184 *      toutv2
1185 * 3.0000e+02
1186 *      qpin2          qpoff2          rqpms2          qpscl2
1187 * 0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
1188 *
1189 * dx * 3.9600e-01 1.7500e+00 3.1500e+00 7.3500e+00e
1190 * vol * 4.8000e-02 2.1230e-01 2.8930e-01 8.9160e-01e
1191 * fa * f 1.2130e-01e
1192 * fric * 0.0000e+00 8.8200e-03 3.8600e-03 0.0000e+00 1.8000e-03
1193 * fric * e
1194 * rvfric* 0.0000e+00 8.8200e-03 3.8600e-03 0.0000e+00 1.8000e-03
1195 * rvfric* e
1196 * grav * -1.0000e+00 -1.9340e-01 -9.4000e-03 -9.5000e-03 -3.0640e-01
1197 * grav * e
1198 * hd * f 3.9300e-01e
1199 * icflg * f 0e
1200 * nff * -1r04 1e
1201 * alp * f 0.0000e+00e
1202 * vl * f 0.0000e+00e
1203 * vv * f 0.0000e+00e
1204 * tl * f 3.0800e+02e
1205 * tv * f 3.0800e+02e
1206 * p * f 4.1500e+05e
1207 * pa * f 0.0000e+00e
1208 * qppp * f 0.0000e+00e
1209 * matid * f 6e
1210 * tw * f 3.0800e+02e
1211 *
1212 * dx * 1.7500e+00 3.9100e-01e
1213 * vol * 2.1230e-01 4.7400e-02e
1214 * fa * f 1.2130e-01e
1215 * fric * 1.0000e-04 8.8400e-03 0.0000e+00e
1216 * rvfric* 1.0000e-04 8.8400e-03 0.0000e+00e
1217 * grav * 0.0000e+00 2.0320e-01 1.0000e+00e
1218 * hd * f 3.9300e-01e
1219 * icflg * f 0e
1220 * nff * r02 1 -1e
1221 * alp * f 0.0000e+00e
1222 * vl * f 0.0000e+00e
1223 * vv * f 0.0000e+00e
1224 * tl * f 3.0800e+02e
1225 * tv * f 3.0800e+02e
1226 * p * f 4.1500e+05e
1227 * pa * f 0.0000e+00e
1228 * qppp * f 0.0000e+00e
1229 * matid * f 6e
1230 * tw * f 3.0800e+02e
1231 *
1232 * type num id ctitle
1233 tee 103 103 $103$ vessel drain part2-to fill
1234 * jcell nodes ichf cost epsw
1235 * 2 4 0 5.0000e-01 0.0000e+00
1236 * iconcl ncell1 jun1 jun2 ipow1
1237 * 0 3 105 107 0
1238 * iqptr1 iqpsv1 ngptb1 ngpsv1 ngprf1
1239 * 0 0 0 0 0
1240 * radin1 th1 hout11 houtv1 tout11
1241 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1242 * toutv1
1243 * 3.0000e+02
1244 * qpin1 qpoff1 rqpms1 qpscl1
1245 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1246 * iconc2 ncell2 jun3 ipow2
1247 * 0 2 106 0
1248 * iqptr2 iqpsv2 ngptb2 ngpsv2 ngprf2
1249 * 0 0 0 0 0
1250 * radin2 th2 hout12 houtv2 tout12
1251 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1252 * toutv2
1253 * 3.0000e+02
1254 * qpin2 qpoff2 rqpms2 qpscl2
1255 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1256 *
1257 * dx * 5.3320e+00 2.4610e+00 2.5140e+00e
1258 * vol * 6.4680e-01 2.9850e-01 3.0490e-01e
1259 * fa * f 1.2130e-01e
1260 * fric * 1.0700e-03 3.8600e-03r02 0.0000e+00e
1261 * rvfric* 1.0700e-03 3.8600e-03r02 0.0000e+00e
1262 * grav * -3.0280e-01 -6.8040e-01 -1.8000e-03 0.0000e+00e
1263 * hd * f 3.9300e-01e
1264 * icflg * f 0e
1265 * nff * f 1e
1266 * alp * f 0.0000e+00e
1267 * vl * f 0.0000e+00e
1268 * vv * f 0.0000e+00e
1269 * tl * f 3.0800e+02e
1270 * tv * f 3.0800e+02e
1271 * p * f 4.1500e+05e
1272 * pa * f 0.0000e+00e
1273 * qppp * f 0.0000e+00e

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1274 * matid * f          6e
1275 * tw * f 3.0800e+02e
1276 *
1277 * dx * 2.5280e+00 3.1430e+00e
1278 * vol * 3.0660e-01 3.8120e-01e
1279 * fa * f 1.2130e-01e
1280 * fric * 1.9500e-03 8.5600e-04 1.8000e-03e
1281 * rvfric* 1.9500e-03 8.5600e-04 1.8000e-03e
1282 * grav * 4.3480e-01 9.3670e-01 3.0640e-01e
1283 * hd * f 3.9300e-01e
1284 * icflg * f 0e
1285 * nff * f 1e
1286 * alp * f 0.0000e+00e
1287 * vl * f 0.0000e+00e
1288 * vv * f 0.0000e+00e
1289 * tl * f 3.0800e+02e
1290 * tv * f 3.0800e+02e
1291 * p * f 4.1500e+05e
1292 * pa * f 0.0000e+00e
1293 * qppp * f 0.0000e+00e
1294 * matid * f 6e
1295 * tw * f 3.0800e+02e
1296 *
1297 * type num id ctitle
1298 fill 107 107 $107$ vessel drain
1299 * junl ifty ioff
1300 * 107 5 1
1301 * iftr ifsv nftb nfv nfrf
1302 * 0 100 395 0 0
1303 * twtold rfmk concin felv
1304 0.0000e+00 1.0000e+04 0.0000e+00 0.0000e+00
1305 * dbin volin alpin vlin tlin
1306 1.0000e+00 2.7160e+00 0.0000e+00 0.0000e+00 3.0800e+02
1307 * pin pain flowin vvin tvin
1308 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0800e+02
1309 * vmscl vvscl
1310 1.0000e+00 1.0000e+00
1311 *
1312 0.0 0.0 s
1313 1.3000E-02 2.4840E+00 s
1314 5.1300E-01 2.0340E+00 s
1315 1.0130E+00 2.9340E+00 s
1316 1.5130E+00 2.4840E+00 s
1317 2.0130E+00 1.1330E+00 s
1318 2.5130E+00 6.8280E-01 s
1319 3.0130E+00 -6.6810E-01 s
1320 3.5130E+00 -2.0190E+00 s
1321 4.0130E+00 -2.9190E+00 s
1322 4.5130E+00 -5.6200E+00 s
1323 5.0130E+00 -7.8720E+00 s
1324 5.5130E+00 -7.4220E+00 s
1325 6.0130E+00 -1.5750E+01 s
1326 6.5130E+00 -1.1600E+02 s
1327 7.0130E+00 -2.4540E+02 s
1328 7.5130E+00 -2.6150E+02 s
1329 8.0130E+00 -2.1810E+02 s
1330 8.5130E+00 -1.0610E+02 s
1331 9.0130E+00 -1.2360E+01 s
1332 9.5130E+00 -8.7230E+00 s
1333 1.0013E+01 -8.0200E+00 s
1334 1.0513E+01 -7.8820E+01 s
1335 1.1013E+01 -1.0770E+02 s
1336 1.1513E+01 -1.0630E+02 s
1337 1.2013E+01 -1.2500E+02 s
1338 1.2513E+01 -1.0880E+02 s
1339 1.3013E+01 -1.7560E+02 s
1340 1.3513E+01 -2.1520E+02 s
1341 1.4013E+01 -2.1920E+02 s
1342 1.4513E+01 -2.8050E+02 s
1343 1.5013E+01 -3.1740E+02 s
1344 1.5513E+01 -2.9540E+02 s
1345 1.6013E+01 -3.1230E+02 s
1346 1.6513E+01 -3.5110E+02 s
1347 1.7013E+01 -3.5940E+02 s
1348 1.7513E+01 -3.4440E+02 s
1349 1.8013E+01 -3.6710E+02 s
1350 1.8513E+01 -4.1890E+02 s
1351 1.9013E+01 -4.1210E+02 s
1352 1.9513E+01 -3.7560E+02 s
1353 2.0013E+01 -3.9100E+02 s
1354 2.0513E+01 -4.0360E+02 s
1355 2.1013E+01 -3.9100E+02 s
1356 2.1513E+01 -3.9300E+02 s
1357 2.2013E+01 -3.9510E+02 s
1358 2.2513E+01 -3.9340E+02 s
1359 2.3013E+01 -3.9590E+02 s
1360 2.3513E+01 -3.9900E+02 s
1361 2.4013E+01 -3.9860E+02 s
1362 2.4513E+01 -3.9750E+02 s
1363 2.5013E+01 -3.9660E+02 s
1364 2.5513E+01 -3.9740E+02 s
1365 2.6013E+01 -3.9570E+02 s

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1366	2.6513E+01	-3.9260E+02 s
1367	2.7013E+01	-3.9810E+02 s
1368	2.7513E+01	-4.0340E+02 s
1369	2.8013E+01	-4.0290E+02 s
1370	2.8513E+01	-3.9770E+02 s
1371	2.9013E+01	-3.9430E+02 s
1372	2.9513E+01	-3.9640E+02 s
1373	3.0013E+01	-3.9850E+02 s
1374	3.0513E+01	-3.9780E+02 s
1375	3.1013E+01	-3.9400E+02 s
1376	3.1513E+01	-3.9570E+02 s
1377	3.2013E+01	-4.0000E+02 s
1378	3.2513E+01	-4.0170E+02 s
1379	3.3013E+01	-4.0000E+02 s
1380	3.3513E+01	-3.9860E+02 s
1381	3.4013E+01	-3.9960E+02 s
1382	3.4513E+01	-4.0020E+02 s
1383	3.5013E+01	-3.9910E+02 s
1384	3.5513E+01	-3.9850E+02 s
1385	3.6013E+01	-3.9910E+02 s
1386	3.6513E+01	-3.9820E+02 s
1387	3.7013E+01	-4.0020E+02 s
1388	3.7513E+01	-4.0340E+02 s
1389	3.8013E+01	-4.0070E+02 s
1390	3.8513E+01	-3.9800E+02 s
1391	3.9013E+01	-3.9720E+02 s
1392	3.9513E+01	-3.9630E+02 s
1393	4.0013E+01	-3.9710E+02 s
1394	4.0513E+01	-3.9900E+02 s
1395	4.1013E+01	-3.9820E+02 s
1396	4.1513E+01	-3.9600E+02 s
1397	4.2013E+01	-3.9540E+02 s
1398	4.2513E+01	-3.9790E+02 s
1399	4.3013E+01	-4.0320E+02 s
1400	4.3513E+01	-4.0350E+02 s
1401	4.4013E+01	-4.0260E+02 s
1402	4.4513E+01	-4.0140E+02 s
1403	4.5013E+01	-3.9850E+02 s
1404	4.5513E+01	-3.9900E+02 s
1405	4.6013E+01	-4.0100E+02 s
1406	4.6513E+01	-4.0130E+02 s
1407	4.7013E+01	-4.0120E+02 s
1408	4.7513E+01	-3.9940E+02 s
1409	4.8013E+01	-3.9450E+02 s
1410	4.8513E+01	-3.9640E+02 s
1411	4.9013E+01	-4.0020E+02 s
1412	4.9513E+01	-4.0100E+02 s
1413	5.0013E+01	-4.0000E+02 s
1414	5.0513E+01	-3.9690E+02 s
1415	5.1013E+01	-3.9630E+02 s
1416	5.1513E+01	-3.9750E+02 s
1417	5.2013E+01	-3.9510E+02 s
1418	5.2513E+01	-3.9690E+02 s
1419	5.3013E+01	-4.0140E+02 s
1420	5.3513E+01	-4.0140E+02 s
1421	5.4013E+01	-4.0030E+02 s
1422	5.4513E+01	-3.9940E+02 s
1423	5.5013E+01	-3.9920E+02 s
1424	5.5513E+01	-3.9880E+02 s
1425	5.6013E+01	-3.9880E+02 s
1426	5.6513E+01	-3.9900E+02 s
1427	5.7013E+01	-3.9810E+02 s
1428	5.7513E+01	-3.9640E+02 s
1429	5.8013E+01	-3.9640E+02 s
1430	5.8513E+01	-3.9640E+02 s
1431	5.9013E+01	-3.9630E+02 s
1432	5.9513E+01	-3.9730E+02 s
1433	6.0013E+01	-3.9830E+02 s
1434	6.0513E+01	-3.9770E+02 s
1435	6.1013E+01	-3.9820E+02 s
1436	6.1513E+01	-3.9760E+02 s
1437	6.2013E+01	-3.9610E+02 s
1438	6.2513E+01	-3.9880E+02 s
1439	6.3013E+01	-4.0160E+02 s
1440	6.3513E+01	-4.0030E+02 s
1441	6.4013E+01	-3.9990E+02 s
1442	6.4513E+01	-3.9850E+02 s
1443	6.5013E+01	-3.9840E+02 s
1444	6.5513E+01	-4.0050E+02 s
1445	6.6013E+01	-4.0000E+02 s
1446	6.6513E+01	-4.0080E+02 s
1447	6.7013E+01	-4.0030E+02 s
1448	6.7513E+01	-3.9770E+02 s
1449	6.8013E+01	-3.9720E+02 s
1450	6.8513E+01	-3.9770E+02 s
1451	6.9013E+01	-4.0000E+02 s
1452	6.9513E+01	-4.0200E+02 s
1453	7.0013E+01	-4.0170E+02 s
1454	7.0513E+01	-3.9940E+02 s
1455	7.1013E+01	-3.9740E+02 s
1456	7.1513E+01	-4.0010E+02 s
1457	7.2013E+01	-4.0230E+02 s

1458	7.2513E+01	-4.0080E+02 s
1459	7.3013E+01	-4.0100E+02 s
1460	7.3513E+01	-4.0130E+02 s
1461	7.4013E+01	-4.0030E+02 s
1462	7.4513E+01	-3.9810E+02 s
1463	7.5013E+01	-3.9830E+02 s
1464	7.5513E+01	-4.0330E+02 s
1465	7.6013E+01	-4.0470E+02 s
1466	7.6513E+01	-4.0200E+02 s
1467	7.7010E+01	-3.9930E+02 s
1468	7.7510E+01	-3.9890E+02 s
1469	7.8010E+01	-4.0040E+02 s
1470	7.8510E+01	-4.0110E+02 s
1471	7.9010E+01	-4.0460E+02 s
1472	7.9510E+01	-4.0490E+02 s
1473	8.0010E+01	-3.9980E+02 s
1474	8.0510E+01	-3.9770E+02 s
1475	8.1010E+01	-3.9710E+02 s
1476	8.1510E+01	-3.9620E+02 s
1477	8.2010E+01	-3.9860E+02 s
1478	8.2510E+01	-4.0140E+02 s
1479	8.3010E+01	-4.0150E+02 s
1480	8.3510E+01	-3.9990E+02 s
1481	8.4010E+01	-3.9790E+02 s
1482	8.4510E+01	-3.9650E+02 s
1483	8.5010E+01	-3.9700E+02 s
1484	8.5510E+01	-3.9920E+02 s
1485	8.6010E+01	-4.0080E+02 s
1486	8.6510E+01	-4.0140E+02 s
1487	8.7010E+01	-3.9990E+02 s
1488	8.7510E+01	-4.0030E+02 s
1489	8.8010E+01	-4.0030E+02 s
1490	8.8510E+01	-3.9930E+02 s
1491	8.9010E+01	-3.9960E+02 s
1492	8.9510E+01	-4.0140E+02 s
1493	9.0010E+01	-4.0330E+02 s
1494	9.0510E+01	-4.0180E+02 s
1495	9.1010E+01	-4.0070E+02 s
1496	9.1510E+01	-3.9900E+02 s
1497	9.2010E+01	-3.9780E+02 s
1498	9.2510E+01	-3.9960E+02 s
1499	9.3010E+01	-4.0010E+02 s
1500	9.3510E+01	-4.0090E+02 s
1501	9.4010E+01	-4.0010E+02 s
1502	9.4510E+01	-3.9780E+02 s
1503	9.5010E+01	-3.9790E+02 s
1504	9.5510E+01	-3.9850E+02 s
1505	9.6010E+01	-4.0000E+02 s
1506	9.6510E+01	-4.0060E+02 s
1507	9.7010E+01	-4.0110E+02 s
1508	9.7510E+01	-4.0130E+02 s
1509	9.8010E+01	-3.9790E+02 s
1510	9.8510E+01	-3.9650E+02 s
1511	9.9010E+01	-3.9870E+02 s
1512	9.9510E+01	-4.0030E+02 s
1513	1.0001E+02	-4.0090E+02 s
1514	1.0051E+02	-4.0140E+02 s
1515	1.0101E+02	-4.0300E+02 s
1516	1.0151E+02	-4.0270E+02 s
1517	1.0201E+02	-4.0110E+02 s
1518	1.0251E+02	-4.0150E+02 s
1519	1.0301E+02	-4.0210E+02 s
1520	1.0351E+02	-4.0280E+02 s
1521	1.0401E+02	-4.0240E+02 s
1522	1.0451E+02	-4.0060E+02 s
1523	1.0501E+02	-3.9900E+02 s
1524	1.0551E+02	-3.9900E+02 s
1525	1.0601E+02	-4.0040E+02 s
1526	1.0651E+02	-4.0060E+02 s
1527	1.0701E+02	-3.9940E+02 s
1528	1.0751E+02	-3.9870E+02 s
1529	1.0801E+02	-3.9850E+02 s
1530	1.0851E+02	-3.9800E+02 s
1531	1.0901E+02	-3.9800E+02 s
1532	1.0951E+02	-3.9900E+02 s
1533	1.1001E+02	-4.0080E+02 s
1534	1.1051E+02	-4.0050E+02 s
1535	1.1101E+02	-4.0040E+02 s
1536	1.1151E+02	-4.0020E+02 s
1537	1.1201E+02	-4.0030E+02 s
1538	1.1251E+02	-4.0160E+02 s
1539	1.1301E+02	-4.0050E+02 s
1540	1.1351E+02	-4.0020E+02 s
1541	1.1401E+02	-4.0180E+02 s
1542	1.1451E+02	-4.0250E+02 s
1543	1.1501E+02	-4.0240E+02 s
1544	1.1551E+02	-4.0170E+02 s
1545	1.1601E+02	-4.0070E+02 s
1546	1.1651E+02	-4.0010E+02 s
1547	1.1701E+02	-4.0050E+02 s
1548	1.1751E+02	-3.9990E+02 s
1549	1.1801E+02	-3.9890E+02 s

1550	1.1851E+02	-4.0040E+02 s
1551	1.1901E+02	-4.0200E+02 s
1552	1.1951E+02	-3.9980E+02 s
1553	1.2001E+02	-3.9970E+02 s
1554	1.2051E+02	-4.0070E+02 s
1555	1.2101E+02	-3.9890E+02 s
1556	1.2151E+02	-3.9860E+02 s
1557	1.2201E+02	-3.9980E+02 s
1558	1.2251E+02	-3.9910E+02 s
1559	1.2301E+02	-3.9900E+02 s
1560	1.2351E+02	-3.9950E+02 s
1561	1.2401E+02	-3.9960E+02 s
1562	1.2451E+02	-4.0000E+02 s
1563	1.2501E+02	-4.0100E+02 s
1564	1.2551E+02	-4.0150E+02 s
1565	1.2601E+02	-4.0050E+02 s
1566	1.2651E+02	-3.9950E+02 s
1567	1.2701E+02	-3.9860E+02 s
1568	1.2751E+02	-3.9880E+02 s
1569	1.2801E+02	-3.9940E+02 s
1570	1.2851E+02	-3.9790E+02 s
1571	1.2901E+02	-3.9820E+02 s
1572	1.2951E+02	-3.9980E+02 s
1573	1.3001E+02	-3.9990E+02 s
1574	1.3051E+02	-3.9870E+02 s
1575	1.3101E+02	-3.9770E+02 s
1576	1.3151E+02	-3.9910E+02 s
1577	1.3201E+02	-3.9980E+02 s
1578	1.3251E+02	-3.9860E+02 s
1579	1.3301E+02	-3.9830E+02 s
1580	1.3351E+02	-3.9950E+02 s
1581	1.3401E+02	-3.9970E+02 s
1582	1.3451E+02	-3.9920E+02 s
1583	1.3501E+02	-3.9900E+02 s
1584	1.3551E+02	-3.9790E+02 s
1585	1.3601E+02	-3.9740E+02 s
1586	1.3651E+02	-3.9900E+02 s
1587	1.3701E+02	-4.0010E+02 s
1588	1.3751E+02	-3.9880E+02 s
1589	1.3801E+02	-3.9750E+02 s
1590	1.3851E+02	-3.9840E+02 s
1591	1.3901E+02	-3.9780E+02 s
1592	1.3951E+02	-3.9690E+02 s
1593	1.4001E+02	-3.9650E+02 s
1594	1.4051E+02	-3.9570E+02 s
1595	1.4101E+02	-3.9210E+02 s
1596	1.4151E+02	-3.8960E+02 s
1597	1.4201E+02	-3.8650E+02 s
1598	1.4251E+02	-3.8130E+02 s
1599	1.4301E+02	-3.7820E+02 s
1600	1.4351E+02	-3.6830E+02 s
1601	1.4401E+02	-3.5400E+02 s
1602	1.4451E+02	-3.4390E+02 s
1603	1.4501E+02	-3.3660E+02 s
1604	1.4551E+02	-3.2950E+02 s
1605	1.4601E+02	-3.2480E+02 s
1606	1.4651E+02	-3.1870E+02 s
1607	1.4701E+02	-3.1200E+02 s
1608	1.4751E+02	-3.0750E+02 s
1609	1.4801E+02	-2.9620E+02 s
1610	1.4851E+02	-2.8760E+02 s
1611	1.4901E+02	-2.7770E+02 s
1612	1.4951E+02	-2.6690E+02 s
1613	1.5001E+02	-2.4380E+02 s
1614	1.5051E+02	-2.1650E+02 s
1615	1.5101E+02	-2.0460E+02 s
1616	1.5151E+02	-2.0800E+02 s
1617	1.5201E+02	-2.0870E+02 s
1618	1.5251E+02	-2.0170E+02 s
1619	1.5301E+02	-1.9060E+02 s
1620	1.5351E+02	-1.9010E+02 s
1621	1.5401E+02	-1.7780E+02 s
1622	1.5451E+02	-1.5540E+02 s
1623	1.5501E+02	-1.5150E+02 s
1624	1.5551E+02	-1.5250E+02 s
1625	1.5601E+02	-1.4490E+02 s
1626	1.5651E+02	-1.4330E+02 s
1627	1.5701E+02	-1.4230E+02 s
1628	1.5751E+02	-1.3950E+02 s
1629	1.5801E+02	-1.3340E+02 s
1630	1.5851E+02	-1.1070E+02 s
1631	1.5901E+02	-1.0010E+02 s
1632	1.5951E+02	-1.0530E+02 s
1633	1.6001E+02	-1.2180E+02 s
1634	1.6051E+02	-1.4920E+02 s
1635	1.6101E+02	-1.6940E+02 s
1636	1.6151E+02	-1.7070E+02 s
1637	1.6201E+02	-1.6620E+02 s
1638	1.6251E+02	-1.5640E+02 s
1639	1.6301E+02	-1.1940E+02 s
1640	1.6351E+02	-1.0250E+02 s
1641	1.6401E+02	-1.1220E+02 s

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1642 1.6451E+02 -9.4710E+01 s
1643 1.6501E+02 -8.8850E+01 s
1644 1.6551E+02 -9.2030E+01 s
1645 1.6601E+02 -8.9080E+01 s
1646 1.6651E+02 -9.5790E+01 s
1647 1.6701E+02 -5.7960E+01 s
1648 1.6751E+02 -2.5190E+01 s
1649 1.6801E+02 -2.6340E+01 s
1650 1.6851E+02 -2.1970E+01 s
1651 1.6901E+02 -8.6020E+00 s
1652 1.6951E+02 -1.2540E+01 s
1653 1.7001E+02 -3.5460E+01 s
1654 1.7051E+02 -4.2470E+01 s
1655 1.7101E+02 -2.9630E+01 s
1656 1.7151E+02 -1.1250E+01 s
1657 1.7201E+02 1.2970E+00 s
1658 1.7251E+02 1.5550E+00 s
1659 1.7301E+02 -2.1380E-01 s
1660 1.7351E+02 -1.4540E+01 s
1661 1.7401E+02 -3.7860E+01 s
1662 1.7451E+02 -3.3790E+01 s
1663 1.7501E+02 -1.2930E+01 s
1664 1.7551E+02 -2.6720E+00 s
1665 1.7601E+02 1.1130E+00 s
1666 1.7651E+02 1.5560E+00 s
1667 1.7701E+02 -9.5760E+00 s
1668 1.7751E+02 -3.2680E+01 s
1669 1.7801E+02 -2.9860E+01 s
1670 1.7851E+02 -7.1940E+00 s
1671 1.7901E+02 6.7080E-01 s
1672 1.7951E+02 1.5560E+00 s
1673 1.8001E+02 1.5560E+00 s
1674 1.8051E+02 2.2850E-01 s
1675 1.8101E+02 -9.9850E+00 s
1676 1.8151E+02 -1.8840E+01 s
1677 1.8201E+02 -1.4220E+01 s
1678 1.8251E+02 -8.4630E+00 s
1679 1.8301E+02 -5.9650E+00 s
1680 1.8351E+02 -5.5230E+00 s
1681 1.8401E+02 -5.9650E+00 s
1682 1.8451E+02 -5.5230E+00 s
1683 1.8501E+02 -5.9660E+00 s
1684 1.8551E+02 -5.5240E+00 s
1685 1.8601E+02 -3.7540E+00 s
1686 1.8651E+02 -4.6390E+00 s
1687 1.8701E+02 -5.5240E+00 s
1688 1.8751E+02 -5.0820E+00 s
1689 1.8801E+02 -4.1970E+00 s
1690 1.8851E+02 -3.3120E+00 s
1691 1.8901E+02 -1.1470E+01 s
1692 1.8951E+02 -3.4750E+01 s
1693 1.9001E+02 -3.8210E+01 s
1694 1.9051E+02 -2.6320E+01 s
1695 1.9101E+02 -3.4840E+01 s
1696 1.9151E+02 -2.7810E+01 s
1697 1.9201E+02 -6.3590E+00 s
1698 1.9251E+02 -2.7250E+00 s
1699 1.9301E+02 -3.3350E+00 s
1700 1.9351E+02 -4.0380E+00 s
1701 1.9401E+02 -2.9840E+00 s
1702 1.9451E+02 6.7230E-01 s
1703 1.9501E+02 1.5590E+00 s
1704 1.9551E+02 2.0030E+00 s
1705 1.9601E+02 2.0030E+00 s
1706 1.9651E+02 1.5590E+00 e
1707 *
1708 * type num id ctitle
1709 tee 501 501 $501$ core simulator tee cell 1
1710 * jcell nodes ichf cost epsw
1711 * 3 0 0 1.0000e+00 0.0000e+00
1712 * iconc1 ncell1 jun1 jun2 ipow1
1713 * 0 4 701 501 0
1714 * radin1 th1 hout11 houtv1 tout11
1715 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1716 * toutv1
1717 * 3.0000e+02
1718 * iconc2 ncell2 jun3 ipow2
1719 * 0 2 601 0
1720 * radin2 th2 hout12 houtv2 tout12
1721 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1722 * toutv2
1723 * 3.0000e+02
1724 *
1725 * dx * f 9.0000e-01e
1726 * vol * f 1.2392e+00e
1727 * fa * f 1.3769e+00e
1728 * fric * f 0.0000e+00e
1729 * rvfric* f 1.0000e+15e
1730 * grav * f 0.0000e+00e
1731 * hd * f 5.0800e-01e
1732 * icflg * f 0e
1733 * nff * f 1e

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1734 * alp * f 1.0000e+00e
1735 * vl * f 0.0000e+00e
1736 * vv * f 0.0000e+00e
1737 * tl * f 4.1339e+02e
1738 * tv * f 4.1339e+02e
1739 * p * f 3.7500e+05e
1740 * pa * f 0.0000e+00e
1741 *
1742 * dx * f 9.0000e-01e
1743 * vol * f 1.2392e+00e
1744 * fa * f 1.3769e+00e
1745 * fric * f 1.0000e+15e
1746 * rvfric* 1.0000e-04r02 0.0000e+00e
1747 * grav * f 0.0000e+00e
1748 * hd * f 5.0800e-01e
1749 * icflg * f 0e
1750 * nff * f 1e
1751 * alp * f 1.0000e+00e
1752 * vl * f 0.0000e+00e
1753 * vv * f 0.0000e+00e
1754 * tl * f 4.1339e+02e
1755 * tv * f 4.1339e+02e
1756 * p * f 3.7500e+05e
1757 * pa * f 0.0000e+00e
1758 *
1759 * type num id ctitle
1760 tee 502 502 $502$ core simulator tee cell 2
1761 * jcell nodes ichf cost epsw
1762 * 3 0 0 1.0000e+00 0.0000e+00
1763 * iconc1 ncell1 jun1 jun2 ipow1
1764 * 0 4 702 502 0
1765 * radin1 th1 hout11 houtv1 tout11
1766 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1767 * toutv1
1768 * 3.0000e+02
1769 * iconc2 ncell2 jun3 ipow2
1770 * 0 2 602 0
1771 * radin2 th2 hout12 houtv2 tout12
1772 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1773 * toutv2
1774 * 3.0000e+02
1775 *
1776 * dx * f 9.0000e-01e
1777 * vol * f 1.2392e+00e
1778 * fa * f 1.3769e+00e
1779 * fric * f 0.0000e+00e
1780 * rvfric* f 1.0000e+15e
1781 * grav * f 0.0000e+00e
1782 * hd * f 5.0800e-01e
1783 * icflg * f 0e
1784 * nff * f 1e
1785 * alp * f 1.0000e+00e
1786 * vl * f 0.0000e+00e
1787 * vv * f 0.0000e+00e
1788 * tl * f 4.1339e+02e
1789 * tv * f 4.1339e+02e
1790 * p * f 3.7500e+05e
1791 * pa * f 0.0000e+00e
1792 *
1793 * dx * f 9.0000e-01e
1794 * vol * f 1.2392e+00e
1795 * fa * f 1.3769e+00e
1796 * fric * f 1.0000e+15e
1797 * rvfric* 1.0000e-04r02 0.0000e+00e
1798 * grav * f 0.0000e+00e
1799 * hd * f 5.0800e-01e
1800 * icflg * f 0e
1801 * nff * f 1e
1802 * alp * f 1.0000e+00e
1803 * vl * f 0.0000e+00e
1804 * vv * f 0.0000e+00e
1805 * tl * f 4.1339e+02e
1806 * tv * f 4.1339e+02e
1807 * p * f 3.7500e+05e
1808 * pa * f 0.0000e+00e
1809 *
1810 * type num id ctitle
1811 tee 503 503 $503$ core simulator tee cell 3
1812 * jcell nodes ichf cost epsw
1813 * 3 0 0 1.0000e+00 0.0000e+00
1814 * iconc1 ncell1 jun1 jun2 ipow1
1815 * 0 4 703 503 0
1816 * radin1 th1 hout11 houtv1 tout11
1817 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1818 * toutv1
1819 * 3.0000e+02
1820 * iconc2 ncell2 jun3 ipow2
1821 * 0 2 603 0
1822 * radin2 th2 hout12 houtv2 tout12
1823 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1824 * toutv2
1825 * 3.0000e+02

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1826 *
1827 * dx * f 9.0000e-01e
1828 * vol * f 1.2392e+00e
1829 * fa * f 1.3769e+00e
1830 * fric * f 0.0000e+00e
1831 * rvfric* f 1.0000e+15e
1832 * grav * f 0.0000e+00e
1833 * hd * f 5.0800e-01e
1834 * icflg * f 0e
1835 * nff * f 1e
1836 * alp * f 1.0000e+00e
1837 * vl * f 0.0000e+00e
1838 * vv * f 0.0000e+00e
1839 * tl * f 4.1339e+02e
1840 * tv * f 4.1339e+02e
1841 * p * f 3.7500e+05e
1842 * pa * f 0.0000e+00e
1843 *
1844 * dx * f 9.0000e-01e
1845 * vol * f 1.2392e+00e
1846 * fa * f 1.3769e+00e
1847 * fric * f 1.0000e+15e
1848 * rvfric* f 1.0000e-04r02 0.0000e+00e
1849 * grav * f 1.0000e+00e
1850 * hd * f 5.0800e-01e
1851 * icflg * f 0e
1852 * nff * f 1e
1853 * alp * f 1.0000e+00e
1854 * vl * f 0.0000e+00e
1855 * vv * f 0.0000e+00e
1856 * tl * f 4.1339e+02e
1857 * tv * f 4.1339e+02e
1858 * p * f 3.7500e+05e
1859 * pa * f 0.0000e+00e
1860 *
1861 * type num id ctitle
1862 tee 504 504 $504$ core-simulator tee cell 4
1863 * jcell nodes ichf cost epsw
1864 3 0 0 1.0000e+00 0.0000e+00
1865 * iconc1 ncell1 jun1 jun2 ipow1
1866 0 4 704 504 0
1867 * radin1 th1 hout11 houtv1 tout11
1868 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1869 * toutv1
1870 3.0000e+02
1871 * iconc2 ncell2 jun3 ipow2
1872 0 2 604 0
1873 * radin2 th2 hout12 houtv2 tout12
1874 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1875 * toutv2
1876 3.0000e+02
1877 *
1878 * dx * f 9.0000e-01e
1879 * vol * f 1.2392e+00e
1880 * fa * f 1.3769e+00e
1881 * fric * f 0.0000e+00e
1882 * rvfric* f 1.0000e+15e
1883 * grav * f 0.0000e+00e
1884 * hd * f 5.0800e-01e
1885 * icflg * f 0e
1886 * nff * f 1e
1887 * alp * f 1.0000e+00e
1888 * vl * f 0.0000e+00e
1889 * vv * f 0.0000e+00e
1890 * tl * f 4.1339e+02e
1891 * tv * f 4.1339e+02e
1892 * p * f 3.7500e+05e
1893 * pa * f 0.0000e+00e
1894 *
1895 * dx * f 9.0000e-01e
1896 * vol * f 1.2392e+00e
1897 * fa * f 1.3769e+00e
1898 * fric * f 1.0000e+15e
1899 * rvfric* f 1.0000e-04r02 0.0000e+00e
1900 * grav * f 0.0000e+00e
1901 * hd * f 5.0800e-01e
1902 * icflg * f 0e
1903 * nff * f 1e
1904 * alp * f 1.0000e+00e
1905 * vl * f 0.0000e+00e
1906 * vv * f 0.0000e+00e
1907 * tl * f 4.1339e+02e
1908 * tv * f 4.1339e+02e
1909 * p * f 3.7500e+05e
1910 * pa * f 0.0000e+00e
1911 *
1912 * type num id ctitle
1913 fill 601 601 $601$ base steam-water fill cell 1
1914 * jun1 ifty ioff
1915 601 8 0
1916 * iftr ifsv nftb nfsv nfrf
1917 600 100 -2 0 0

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1918 *      twtold      rfmX      concin      felv
1919 *      0.0000e+00  1.4413e+01  0.0000e+00  0.0000e+00
1920 *      dxin      volin      alpin      vlin      tlin
1921 *      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.6114e+02
1922 *      pin      pain      flowin      vvin      tvin
1923 *      1.2000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.6114e+02
1924 *      vmscl      vvscl
1925 *      1.0000e+00  1.0000e+00
1926 *
1927 * vmtb      core-simulator steam mass flow is on
1928 * vmtb * r02 0.0000e+00  2.0000e+00  2.8825e+01e
1929 *
1930 * type      num      id      ctitle
1931 fill      602      602 $602$ base steam-water fill cell 2
1932 *      jun1      ifty      ioff
1933 *      602      8      0
1934 *      iftr      ifsv      nftb      nfsv      nfrf
1935 *      600      100      -2      0      0
1936 *      twtold      rfmX      concin      felv
1937 *      0.0000e+00  1.4413e+01  0.0000e+00  0.0000e+00
1938 *      dxin      volin      alpin      vlin      tlin
1939 *      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.6114e+02
1940 *      pin      pain      flowin      vvin      tvin
1941 *      1.2000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.6114e+02
1942 *      vmscl      vvscl
1943 *      1.0000e+00  1.0000e+00
1944 *
1945 * vmtb      core-simulator steam mass flow is on
1946 * vmtb * r02 0.0000e+00  2.0000e+00  2.8825e+01e
1947 *
1948 * type      num      id      ctitle
1949 fill      603      603 $603$ base steam-water fill cell 3
1950 *      jun1      ifty      ioff
1951 *      603      8      0
1952 *      iftr      ifsv      nftb      nfsv      nfrf
1953 *      600      100      -2      0      0
1954 *      twtold      rfmX      concin      felv
1955 *      0.0000e+00  1.4413e+01  0.0000e+00  0.0000e+00
1956 *      dxin      volin      alpin      vlin      tlin
1957 *      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.6114e+02
1958 *      pin      pain      flowin      vvin      tvin
1959 *      1.2000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.6114e+02
1960 *      vmscl      vvscl
1961 *      1.0000e+00  1.0000e+00
1962 *
1963 * vmtb      core-simulator steam mass flow is on
1964 * vmtb * r02 0.0000e+00  2.0000e+00  2.8825e+01e
1965 *
1966 * type      num      id      ctitle
1967 fill      604      604 $604$ base steam-water fill cell 4
1968 *      jun1      ifty      ioff
1969 *      604      8      0
1970 *      iftr      ifsv      nftb      nfsv      nfrf
1971 *      600      100      -2      0      0
1972 *      twtold      rfmX      concin      felv
1973 *      0.0000e+00  1.4413e+01  0.0000e+00  0.0000e+00
1974 *      dxin      volin      alpin      vlin      tlin
1975 *      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.6114e+02
1976 *      pin      pain      flowin      vvin      tvin
1977 *      1.2000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.6114e+02
1978 *      vmscl      vvscl
1979 *      1.0000e+00  1.0000e+00
1980 *
1981 * vmtb      core-simulator steam mass flow is on
1982 * vmtb * r02 0.0000e+00  2.0000e+00  2.8825e+01e
1983 *
1984 * type      num      id      ctitle
1985 fill      701      701 $701$ core feedback fill cell 01
1986 *      jun1      ifty      ioff
1987 *      701      8      1
1988 *      iftr      ifsv      nftb      nfsv      nfrf
1989 *      666      -8001      0      0      0
1990 *      twtold      rfmX      concin      felv
1991 *      0.0000e+00  3.0000e+01  0.0000e+00  0.0000e+00
1992 *      dxin      volin      alpin      vlin      tlin
1993 *      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.6114e+02
1994 *      pin      pain      flowin      vvin      tvin
1995 *      1.2000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.6114e+02
1996 *
1997 * type      num      id      ctitle
1998 fill      702      702 $702$ core feedback fill cell 02
1999 *      jun1      ifty      ioff
2000 *      702      8      1
2001 *      iftr      ifsv      nftb      nfsv      nfrf
2002 *      666      -8002      0      0      0
2003 *      twtold      rfmX      concin      felv
2004 *      0.0000e+00  3.0000e+01  0.0000e+00  0.0000e+00
2005 *      dxin      volin      alpin      vlin      tlin
2006 *      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.6114e+02
2007 *      pin      pain      flowin      vvin      tvin
2008 *      1.2000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.6114e+02
2009 *

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2010 * type          num          id          ctitle
2011 fill          703          703 $703$ core feedback fill cell 03
2012 *            jun1          ifty          ioiff
2013 *            703           8            1
2014 *            iftr          ifsv          nftb          nfsv          nfrf
2015 *            666          -8003        0            0            0
2016 *            twtold        rfmix        concin        felv
2017 *            0.0000e+00    3.0000e+01  0.0000e+00  0.0000e+00
2018 *            dxin          volin        alpin         vlin          tlin
2019 *            9.0000e-01    2.6000e-01  1.0000e+00  0.0000e+00  4.6114e+02
2020 *            pin          pain         flowin        vvin          tvin
2021 *            1.2000e+06    0.0000e+00  0.0000e+00  0.0000e+00  4.6114e+02
2022 *
2023 * type          num          id          ctitle
2024 fill          704          704 $704$ core feedback fill cell 04
2025 *            jun1          ifty          ioiff
2026 *            704           8            1
2027 *            iftr          ifsv          nftb          nfsv          nfrf
2028 *            666          -8004        0            0            0
2029 *            twtold        rfmix        concin        felv
2030 *            0.0000e+00    3.0000e+01  0.0000e+00  0.0000e+00
2031 *            dxin          volin        alpin         vlin          tlin
2032 *            9.0000e-01    2.6000e-01  1.0000e+00  0.0000e+00  4.6114e+02
2033 *            pin          pain         flowin        vvin          tvin
2034 *            1.2000e+06    0.0000e+00  0.0000e+00  0.0000e+00  4.6114e+02
2035 *
2036 * type          num          id          ctitle
2037 tee           10          10 $10$ hot-leg loop 1
2038 *            jcell        nodes        ichf          cost          epsw
2039 *            4            4            1            -1.0000e+00  0.0000e+00
2040 *            iconcl       ncell1       jun1          jun2          ipow1
2041 *            0            9            10           11           0
2042 *            iqptr1       iqpsv1       nqptb1       nqpsv1       nqprf1
2043 *            0            0            0            0            0
2044 *            radin1       th1          hout1         houtv1       tout11
2045 *            3.7500e-01    1.0000e-02  0.0000e+00  0.0000e+00  3.0000e+02
2046 *            toutv1
2047 *            3.0000e+02
2048 *            qpin1        qppoff1      rqpms1       qpscl1
2049 *            0.0000e+00    0.0000e+00  0.0000e+00  0.0000e+00
2050 *            iconc2       ncell2       jun3          ipow2
2051 *            0            1            15           0            0
2052 *            iqptr2       iqpsv2       nqptb2       nqpsv2       nqprf2
2053 *            0            0            0            0            0
2054 *            radin2       th2          hout1         houtv2       tout12
2055 *            1.1000e-01    1.0000e-02  0.0000e+00  0.0000e+00  3.0000e+02
2056 *            toutv2
2057 *            3.0000e+02
2058 *            qpin2        qppoff2      rqpms2       qpscl2
2059 *            0.0000e+00    0.0000e+00  0.0000e+00  0.0000e+00
2060 *
2061 * dx          * r03 5.1070e-01r03 1.2867e+00  1.3370e+00  1.0420e+00  6.2600e-01
2062 e
2063 * vol        * r03 2.2560e-01r03 5.1130e-01  5.9070e-01  4.6030e-01  2.7660e-01
2064 e
2065 * fa          * r03 4.4179e-01r03 3.9740e-01r04 4.4179e-01e
2066 * fric        * r02 0.0000e+00r06 1.6000e-02r02 0.0000e+00e
2067 * rvfric*    * r02 0.0000e+00r06 1.6000e-02r02 0.0000e+00e
2068 * grav        * r07 0.0000e+00  1.8020e-01  5.6120e-01  6.8030e-01e
2069 * hd          * r03 7.5000e-01r03 6.3880e-01r04 7.5000e-01e
2070 * icflg      * r04 0            1r05 0e
2071 * nff        * -1r08 1            1e
2072 * alp        * f 1.0000e+00e
2073 * vl         * f 0.0000e+00e
2074 * vv         * f 0.0000e+00e
2075 * tl         * f 4.1339e+02e
2076 * tv         * f 4.1339e+02e
2077 * p          * f 3.7500e+05e
2078 * pa         * f 0.0000e+00e
2079 * qppp        * f 0.0000e+00e
2080 * matid      * f 6e
2081 * tw         * f 4.1339e+02e
2082 *
2083 * dx          * 5.0000e-01e
2084 * vol        * 2.0330e-02e
2085 * fa          * f 4.0660e-02e
2086 * fric        * 1.0000e-04  0.0000e+00e
2087 * rvfric*    * 1.0000e-04  0.0000e+00e
2088 * grav        * f 0.0000e+00e
2089 * hd          * f 2.0770e-01e
2090 * icflg      * f 0e
2091 * nff        * 1 -1e
2092 * alp        * 1.0000e+00e
2093 * vl         * f 0.0000e+00e
2094 * vv         * f 0.0000e+00e
2095 * tl         * 4.1339e+02e
2096 * tv         * 4.1339e+02e
2097 * p          * 3.7500e+05e
2098 * pa         * 0.0000e+00e
2099 * qppp        * f 0.0000e+00e
2100 * matid      * f 6e
2101 * tw         * f 4.1339e+02e

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2102 *
2103 * type          num          id          ctitle
2104 tee          11          11 $11$ separator-bottom loop 1
2105 *          jcell          nodes          ichf          cost          epsw
2106          1          4          1          0.0000e+00          0.0000e+00
2107 *          iconc1          ncell11          jun1          jun2          ipow1
2108          0          4          11          12          0
2109 *          iqptr1          iqpsv1          ngptb1          ngpsv1          ngprf1
2110          0          0          0          0          0
2111 *          radin1          th1          hout11          houtv1          tout11
2112          1.2500e+00          2.5000e-02          0.0000e+00          0.0000e+00          3.0000e+02
2113 *          toutv1
2114          3.0000e+02
2115 *          qpin1          qpoff1          rqpms1          qpscl1
2116          0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
2117 *          iconc2          ncell12          jun3          ipow2
2118          0          1          18          0
2119 *          iqptr2          iqpsv2          ngptb2          ngpsv2          ngprf2
2120          0          0          0          0          0
2121 *          radin2          th2          hout12          houtv2          tout12
2122          1.2500e+00          2.5000e-02          0.0000e+00          0.0000e+00          3.0000e+02
2123 *          toutv2
2124          3.0000e+02
2125 *          qpin2          qpoff2          rqpms2          qpscl2
2126          0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
2127 *
2128 * dx          *          9.5560e-01r02          3.2510e-01          4.2400e-01e
2129 * vol          *          2.5970e+00          1.5266e+00          1.5253e+00          2.5870e-01e
2130 * fa          *          4.4179e-01          4.5584e+00          4.7298e+00r02          6.1010e-01e
2131 * fric          * f          0.0000e+00e
2132 * rvfric          * f          0.0000e+00e
2133 * grav          *          6.8030e-01r04          1.0000e+00e
2134 * hd          *          7.5000e-01r02          2.3000e+00r02          1.5830e-01e
2135 * icflg          * f          0e
2136 * nff          * f          -1e
2137 * alp          * f          1.0000e+00e
2138 * vl          * f          0.0000e+00e
2139 * vv          * f          0.0000e+00e
2140 * tl          * f          4.1339e+02e
2141 * tv          * f          4.1339e+02e
2142 * p          * f          3.7500e+05e
2143 * pa          * f          0.0000e+00e
2144 * qppp          * f          0.0000e+00e
2145 * matid          * f          6e
2146 * tw          * f          4.1339e+02e
2147 *
2148 * dx          *          2.0000e-01e
2149 * vol          *          1.0700e-02e
2150 * fa          * f          5.3260e-02e
2151 * fric          *          1.0000e-04          0.0000e+00e
2152 * rvfric          *          1.0000e-04          0.0000e+00e
2153 * grav          *          0.0000e+00          -4.2200e-01e
2154 * hd          * f          2.6040e-01e
2155 * icflg          * f          0e
2156 * nff          * f          1e
2157 * alp          *          1.0000e+00e
2158 * vl          * f          0.0000e+00e
2159 * vv          * f          0.0000e+00e
2160 * tl          *          4.1339e+02e
2161 * tv          *          4.1339e+02e
2162 * p          *          3.7500e+05e
2163 * pa          *          0.0000e+00e
2164 * qppp          * f          0.0000e+00e
2165 * matid          * f          6e
2166 * tw          * f          4.1339e+02e
2167 *
2168 * type          num          id          ctitle
2169 tee          12          12 $12$ separator-middle loop 1
2170 *          jcell          nodes          ichf          cost          epsw
2171          4          4          1          1.0000e+00          0.0000e+00
2172 *          iconc1          ncell11          jun1          jun2          ipow1
2173          0          4          12          13          0
2174 *          iqptr1          iqpsv1          ngptb1          ngpsv1          ngprf1
2175          0          0          0          0          0
2176 *          radin1          th1          hout11          houtv1          tout11
2177          1.2500e+00          2.5000e-02          0.0000e+00          0.0000e+00          3.0000e+02
2178 *          toutv1
2179          3.0000e+02
2180 *          qpin1          qpoff1          rqpms1          qpscl1
2181          0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
2182 *          iconc2          ncell12          jun3          ipow2
2183          0          4          19          0
2184 *          iqptr2          iqpsv2          ngptb2          ngpsv2          ngprf2
2185          0          0          0          0          0
2186 *          radin2          th2          hout12          houtv2          tout12
2187          1.2500e+00          2.5000e-02          0.0000e+00          0.0000e+00          3.0000e+02
2188 *          toutv2
2189          3.0000e+02
2190 *          qpin2          qpoff2          rqpms2          qpscl2
2191          0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
2192 *
2193 * dx          *          1.8800e-01r02          7.1000e-01          2.0000e-01e

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2194 * vol * 1.5740e-01r02 7.5580e-01 2.1290e-01e
2195 * fa * 6.1010e-01r04 1.0645e+00e
2196 * fric * f 0.0000e+00e
2197 * rvfric* f 0.0000e+00e
2198 * grav * f 1.0000e+00e
2199 * hd * 1.5830e-01r04 2.0910e-01e
2200 * icflg * f 0e
2201 * nff * f -1e
2202 * alp * f 1.0000e+00e
2203 * vl * f 0.0000e+00e
2204 * vv * f 0.0000e+00e
2205 * tl * f 4.1339e+02e
2206 * tv * f 4.1339e+02e
2207 * p * f 3.7500e+05e
2208 * pa * f 0.0000e+00e
2209 * qppp * f 0.0000e+00e
2210 * matid * f 6e
2211 * tw * f 4.1339e+02e
2212 *
2213 * dx * r02 7.1000e-01 1.8800e-01 4.2400e-01e
2214 * vol * r02 2.4617e+00 7.0570e-01 1.7130e+00e
2215 * fa * r03 3.4673e+00r02 4.0401e+00e
2216 * fric * 1.0000e-04r04 0.0000e+00e
2217 * rvfric* 1.0000e-04r04 0.0000e+00e
2218 * grav * f -1.0000e+00e
2219 * hd * f 4.4000e-01e
2220 * icflg * f 0e
2221 * nff * r04 1 -1e
2222 * alp * f 1.0000e+00e
2223 * vl * f 0.0000e+00e
2224 * vv * f 0.0000e+00e
2225 * tl * f 4.1339e+02e
2226 * tv * f 4.1339e+02e
2227 * p * f 3.7500e+05e
2228 * pa * f 0.0000e+00e
2229 * qppp * f 0.0000e+00e
2230 * matid * f 6e
2231 * tw * f 4.1339e+02e
2232 *
2233 * type num id ctitle
2234 tee 13 13 $13$ separator-top loop 1
2235 * jcell nodes ichf cost epsw
2236 3 4 1 0.0000e+00 0.0000e+00
2237 * iconc1 ncell1 jun1 jun2 ipow1
2238 0 4 13 14 0
2239 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
2240 0 0 0 0 0
2241 * radin1 th1 hout11 houtv1 tout11
2242 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2243 * toutv1
2244 3.0000e+02
2245 * qpin1 qpoff1 rqpnc1 qpscl1
2246 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2247 * iconc2 ncell2 jun3 ipow2
2248 0 1 113 0
2249 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
2250 0 0 0 0 0
2251 * radin2 th2 hout12 houtv2 tout12
2252 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2253 * toutv2
2254 3.0000e+02
2255 * qpin2 qpoff2 rqpnc2 qpscl2
2256 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2257 *
2258 * dx * 2.0000e-01 2.8500e-01 4.0000e-01 8.1000e-01e
2259 * vol * 2.1290e-01 1.5732e+00 1.8919e+00 3.0974e+00e
2260 * fa * r02 1.0645e+00r02 4.7298e+00 4.4179e-01e
2261 * fric * f 0.0000e+00e
2262 * rvfric* f 0.0000e+00e
2263 * grav * f 1.0000e+00e
2264 * hd * r02 2.0910e-01r02 2.4540e+00 7.5000e-01e
2265 * icflg * f 0e
2266 * nff * f -1e
2267 * alp * f 1.0000e+00e
2268 * vl * f 0.0000e+00e
2269 * vv * f 0.0000e+00e
2270 * tl * f 4.1339e+02e
2271 * tv * f 4.1339e+02e
2272 * p * f 3.7500e+05e
2273 * pa * f 0.0000e+00e
2274 * qppp * f 0.0000e+00e
2275 * matid * f 6e
2276 * tw * f 4.1339e+02e
2277 *
2278 * dx * 1.0000e+00e
2279 * vol * 1.2600e-01e
2280 * fa * f 1.2600e-01e
2281 * fric * 1.0000e-04 0.0000e+00e
2282 * rvfric* 1.0000e-04 0.0000e+00e
2283 * grav * f 0.0000e+00e
2284 * hd * f 4.0000e-01e
2285 * icflg * f 0e

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2286 * nff * f 1e
2287 * alp * 1.0000e+00e
2288 * vl * f 0.0000e+00e
2289 * vv * f 0.0000e+00e
2290 * tl * 4.1339e+02e
2291 * tv * 4.1339e+02e
2292 * p * 3.7500e+05e
2293 * pa * 0.0000e+00e
2294 * qppp * f 0.0000e+00e
2295 * matid * f 6e
2296 * tw * f 4.1339e+02e
2297 *
2298 * type num id ctitle
2299 tee 14 14 $14$ loop-seal cold-leg loop 1
2300 * jcell nodes ichf cost epsw
2301 17 4 1 5.0000e-01 0.0000e+00
2302 * iconcl ncell1 jun1 jun2 ipow1
2303 0 21 14 17 0
2304 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
2305 0 0 0 0 0
2306 * radin1 th1 hout11 houtv1 tout11
2307 3.7500e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2308 * toutv1
2309 3.0000e+02
2310 * qpin1 qpoff1 rqpms1 qpscl1
2311 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2312 * iconc2 ncell2 jun3 ipow2
2313 0 1 16 0
2314 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
2315 0 0 0 0 0
2316 * radin2 th2 hout12 houtv2 tout12
2317 1.1000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2318 * toutv2
2319 3.0000e+02
2320 * qpin2 qpoff2 rqpms2 qpscl2
2321 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2322 *
2323 * dx * 1.2000e+00r02 1.9125e+00 1.2000e+00r03 2.3170e+00 1.5140e+00
2324 * dx * r02 1.6650e+00r02 1.0920e+00 6.5000e-01 6.0000e-01r02 1.4950e+00
2325 * dx * 1.5050e+00 1.9110e+00r02 1.6825e+00 7.1000e-01e
2326 * vol * 5.3010e-01r02 8.4490e-01 5.3010e-01r03 1.0236e+00 6.6890e-01
2327 * vol * r02 7.3560e-01r02 4.8240e-01 7.2000e-01 9.4800e-01r02 6.6048e-01
2328 * vol * 6.6489e-01 4.0247e-01r02 7.4331e-01 3.8058e-01e
2329 * fa * r12 4.4179e-01 0.0000e+00 6.8920e-01r07 4.4179e-01 6.3620e-01
2330 * fa * e
2331 * fric the pump simulator has a k factor of 18.0
2332 * fric fric=(k factor)xhd/(dx(12)+dx(13))=18.0x0.75/(1.0920+0.65)
2333 * fric * r12 0.0000e+00 7.7497e+00r09 0.0000e+00e
2334 * rvfric* r12 0.0000e+00 7.7497e+00r09 0.0000e+00e
2335 * grav * 1.0000e+00 2.3130e-01 0.0000e+00 -2.3130e-01r04-1.0000e+00
2336 * grav * -4.9350e-01 0.0000e+00 7.9780e-01 1.0000e+00 3.7200e-01
2337 * grav * -7.7520e-01 1.4110e-01r07 0.0000e+00e
2338 * hd * r21 7.5000e-01 9.0000e-01e
2339 * icflg * r12 0 1r09 0e
2340 * nff * r12 -1 1r09 -1e
2341 * alp * f 1.0000e+00e
2342 * vl * f 0.0000e+00e
2343 * vv * f 0.0000e+00e
2344 * tl * f 4.1339e+02e
2345 * tv * f 4.1339e+02e
2346 * p * f 3.7500e+05e
2347 * pa * f 0.0000e+00e
2348 * qppp * f 0.0000e+00e
2349 * matid * f 6e
2350 * tw * f 4.1339e+02e
2351 *
2352 * dx * 5.0000e-01e
2353 * vol * 1.7000e-02e
2354 * fa * f 3.8010e-02e
2355 * fric * 1.0000e-04 0.0000e+00e
2356 * rvfric* 1.0000e-04 0.0000e+00e
2357 * grav * f 5.0000e-01e
2358 * hd * f 2.2000e-01e
2359 * icflg * f 0e
2360 * nff * f 1e
2361 * alp * 1.0000e+00e
2362 * vl * f 0.0000e+00e
2363 * vv * f 0.0000e+00e
2364 * tl * 4.1339e+02e
2365 * tv * 4.1339e+02e
2366 * p * 3.7500e+05e
2367 * pa * 0.0000e+00e
2368 * qppp * f 0.0000e+00e
2369 * matid * f 6e
2370 * tw * f 4.1339e+02e
2371 *
2372 * type num id ctitle
2373 fill 15 15 $15$ hot-leg ecc loop 1
2374 * jun1 ifty ioff
2375 15 8 0
2376 * iftr ifsv nftb nfsv nfrf
2377 115 100 -4 0 0

```

```

2378 *          twtold          rfmix          concin          felv
2379 * 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
2380 *          dxin          volin          alpin          vlin          tlin
2381 * 3.3000e+00 1.3400e-01 0.0000e+00 0.0000e+00 3.1100e+02
2382 *          pin          pain          flowin          vvin          tvin
2383 * 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.1100e+02
2384 *          vmscl          vvscl
2385 * 1.0000e+00 1.0000e+00
2386 *
2387 * vmtb          loop 1 hot-leg ecc is off
2388 * vmtb * r02 0.0000e+00 5.0000e-01 0.0000e+00 2.0000e+00 0.0000e+00
2389 * vmtb * 1.2000e+01 0.0000e+00e
2390 *
2391 * type          num          id          ctitle
2392 fill          16          16 $16$ cold-leg ecc loop 1
2393 *          jun1          ifty          ioff
2394 *          16          8          0
2395 *          iftr          ifsv          nftb          nfsv          nfrf
2396 *          116          100          -4          0          0
2397 *          twtold          rfmix          concin          felv
2398 * 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
2399 *          dxin          volin          alpin          vlin          tlin
2400 * 3.3000e+00 1.2500e-01 0.0000e+00 0.0000e+00 3.1100e+02
2401 *          pin          pain          flowin          vvin          tvin
2402 * 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.1100e+02
2403 *          vmscl          vvscl
2404 * 1.0000e+00 1.0000e+00
2405 *
2406 * vmtb          loop 1 cold-leg ecc is off
2407 * vmtb * r02 0.0000e+00 5.0000e-01 0.0000e+00 2.0000e+00 0.0000e+00
2408 * vmtb * 1.2000e+01 0.0000e+00e
2409 *
2410 * type          num          id          ctitle
2411 tee          18          18 $18$ sep. drain tee loop 1
2412 *          jcell          nodes          ichf          cost          epsw
2413 *          5          4          1          0.0000e+00 0.0000e+00
2414 *          iconcl          ncell1          jun1          jun2          ipow1
2415 *          0          6          19          119          0
2416 *          iqptr1          iqpsv1          nqptb1          nqpsv1          nqprf1
2417 *          0          0          0          0          0
2418 *          radin1          th1          hout11          houtv1          tout11
2419 * 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2420 *          toutv1
2421 * 3.0000e+02
2422 *          qpin1          qpoff1          rqpms1          qpscl1
2423 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2424 *          iconc2          ncell2          jun3          ipow2
2425 *          0          1          130          0
2426 *          iqptr2          iqpsv2          nqptb2          nqpsv2          nqprf2
2427 *          0          0          0          0          0
2428 *          radin2          th2          hout12          houtv2          tout12
2429 * 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2430 *          toutv2
2431 * 3.0000e+02
2432 *          qpin2          qpoff2          rqpms2          qpscl2
2433 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2434 *
2435 * dx          *          9.0000e-01r02 9.2500e-01r03 4.9130e-01e
2436 * vol          *          2.8300e-02r02 2.9000e-02r03 9.6400e-02e
2437 * fa          *          4.0401e+00r02 3.1400e-02r04 1.9630e-01e
2438 * fric          * f          0.0000e+00e
2439 * rvfric          * f          0.0000e+00e
2440 * grav          *          -1.0000e+00 -3.3640e-01 0.0000e+00 -3.4700e-01r03-1.0000e+00
2441 * grav          * e
2442 * hd          *          4.4000e-01r02 2.0000e-01r04 5.0000e-01e
2443 * icflg          * f          0e
2444 * nff          *          -1r02          1          -1r03          1e
2445 * alp          * f          0.0000e+00e
2446 * vl          * f          0.0000e+00e
2447 * vv          * f          0.0000e+00e
2448 * tl          *          4.1500e+02 4.1000e+02 4.0500e+02 4.0000e+02 3.9500e+02e
2449 * tl          *          3.9000e+02e
2450 * tv          * f          4.1339e+02e
2451 * p          * f          3.7500e+05e
2452 * pa          * f          0.0000e+00e
2453 * qppp          * f          0.0000e+00e
2454 * matid          * f          6e
2455 * tw          * r04 4.1500e+02r04 4.1000e+02r04 4.0500e+02r04 4.0000e+02r04 3.9500e+02
2456 * tw          * r04 3.9000e+02e
2457 *
2458 * dx          *          5.0000e-01e
2459 * vol          *          2.6600e-02e
2460 * fa          * f          5.3260e-02e
2461 * fric          *          1.0000e-04 0.0000e+00e
2462 * rvfric          *          1.0000e-04 0.0000e+00e
2463 * grav          * f          0.0000e+00e
2464 * hd          * f          2.6040e-01e
2465 * icflg          * f          0e
2466 * nff          * f          1e
2467 * alp          *          0.0000e+00e
2468 * vl          * f          0.0000e+00e
2469 * vv          * f          0.0000e+00e

```

```

2470 * tl * 4.0000e+02e
2471 * tv * 4.1339e+02e
2472 * p * 3.7500e+05e
2473 * pa * 0.0000e+00e
2474 * qppp * f 0.0000e+00e
2475 * matid * f 6e
2476 * tw * f 4.0000e+02e
2477 *
2478 * type num id ctitle
2479 valve 19 19 $19$ separator drain valve
2480 * ncells nodes jun1 jun2 epsw
2481 * 2 4 130 18 0.0000e+00
2482 * ichf iconc ivty ivps nvth2
2483 * 1 0 1 2 0
2484 * ivtr ivsv nvtbl nvsv nvrfr
2485 * 0 100 2 0 0
2486 * iqp3tr iqp3sv nqp3tb nqp3sv nqp3rf
2487 * 0 0 0 0 0
2488 * ivtrov ivtyov
2489 * 0 0
2490 * rvmx rvov fminov fmaxov
2491 * 1.0000e+10 0.0000e+00 0.0000e+00 1.0000e+00
2492 * radin th hout1 houtv toutl
2493 * 1.5000e-02 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
2494 * toutv avlve hvlve favlve xpos
2495 * 3.0000e+02 3.1400e-02 2.0000e-01 0.0000e+00 0.0000e+00
2496 * qp3in qp3off rqp3mx qp3scl
2497 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2498 *
2499 * dx * 5.0000e-01 1.0000e+00e
2500 * vol * 2.6600e-02 5.3260e-02e
2501 * fa * f 5.3260e-02e
2502 * fric * 0.0000e+00 1.9440e+00 0.0000e+00e
2503 * rvfric * 0.0000e+00 1.9440e+00 0.0000e+00e
2504 * grav * r02 0.0000e+00 4.2200e-01e
2505 * hd * f 2.6040e-01e
2506 * icflg * f 0e
2507 * nff * f 1e
2508 * alp * 0.0000e+00 1.0000e+00e
2509 * vl * f 0.0000e+00e
2510 * vv * f 0.0000e+00e
2511 * tl * 4.0500e+02 4.1339e+02e
2512 * tv * f 4.1339e+02e
2513 * p * f 3.7500e+05e
2514 * pa * f 0.0000e+00e
2515 * qppp * f 0.0000e+00e
2516 * matid * f 6e
2517 * tw * r04 4.0500e+02r04 4.1339e+02e
2518 *
2519 * vtbl * r02 0.0000e+00 2.0200e+02 0.0000e+00e
2520 *
2521 * type num id ctitle
2522 fill 113 113 $113$ steam supply loop 1
2523 * jun1 ifty ioff
2524 * 113 5 0
2525 * iftr ifsv nftb nfsv nfrf
2526 * 0 100 -2 0 0
2527 * twtold rfmxc concin felv
2528 * 0.0000e+00 7.5000e+00 0.0000e+00 0.0000e+00
2529 * dxin volin alpin vlin tlin
2530 * 1.0000e+00 1.2600e-01 1.0000e+00 0.0000e+00 4.6114e+02
2531 * pin pain flowin vvin tvin
2532 * 1.2000e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.6114e+02
2533 * vmscl vvscl
2534 * 1.0000e+00 1.0000e+00
2535 *
2536 * vmtb sg-simulator steam mass flow is off during phase b
2537 * vmtb * r02 0.0000e+00 2.0000e+00 0.0000e+00e
2538 *
2539 * type num id ctitle
2540 fill 119 119 $119$ separator drain fill loop 1
2541 * jun1 ifty ioff
2542 * 119 8 1
2543 * iftr ifsv nftb nfsv nfrf
2544 * 119 100 -2 0 0
2545 * twtold rfmxc concin felv
2546 * 0.0000e+00 2.0000e+01 0.0000e+00 0.0000e+00
2547 * dxin volin alpin vlin tlin
2548 * 4.9130e-01 9.6400e-02 0.0000e+00 0.0000e+00 3.0800e+02
2549 * pin pain flowin vvin tvin
2550 * 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0800e+02
2551 * vmscl vvscl
2552 * -1.0000e+00 1.0000e+00
2553 *
2554 * vmtb * r02 0.0000e+00 5.0000e+00 1.0000e+02e
2555 *
2556 * type num id ctitle
2557 tee 20 20 $20$ hot-leg loop 2
2558 * jcell nodes ichf cost epsw
2559 * 4 4 1 -1.0000e+00 0.0000e+00
2560 * iconcl ncell1 jun1 jun2 ipowl
2561 * 0 5 20 227 0

```

```

2562 *      iqptr1      iqpsv1      nqptb1      nqpsv1      nqprf1
2563      0            0            0            0            0
2564 *      radin1      th1            hout11      houtv1      tout11
2565 *      3.7500e-01  1.0000e-02  0.0000e+00  0.0000e+00  3.0000e+02
2566 *      toutv1
2567 *      3.0000e+02
2568 *      qpin1      qpoff1      rqpms1      qpscl1
2569 *      0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
2570 *      iconc2      ncell2      jun3      ipow2
2571 *      0            1            25          0
2572 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
2573 *      0            0            0            0            0
2574 *      radin2      th2            hout12      houtv2      tout12
2575 *      1.1000e-01  1.0000e-02  0.0000e+00  0.0000e+00  3.0000e+02
2576 *      toutv2
2577 *      3.0000e+02
2578 *      qpin2      qpoff2      rqpms2      qpscl2
2579 *      0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
2580 *
2581 * dx * r03 5.1070e-01r02 1.2867e+00e
2582 * vol * r03 2.2560e-01r02 5.1130e-01e
2583 * fa * r03 4.4179e-01r03 3.9740e-01e
2584 * fric * r02 0.0000e+00r04 1.6000e-02e
2585 * rvfric* r02 0.0000e+00r04 1.6000e-02e
2586 * grav * f 0.0000e+00e
2587 * hd * r03 7.5000e-01r03 6.3880e-01e
2588 * icflg * r03 0 1r02 0e
2589 * nff * -1r05 1e
2590 * alp * f 1.0000e+00e
2591 * vl * f 0.0000e+00e
2592 * vv * f 0.0000e+00e
2593 * tl * f 4.1339e+02e
2594 * tv * f 4.1339e+02e
2595 * p * f 3.7500e+05e
2596 * pa * f 0.0000e+00e
2597 * qppp * f 0.0000e+00e
2598 * matid * f 6e
2599 * tw * f 4.1339e+02e
2600 *
2601 * dx * 5.0000e-01e
2602 * vol * 2.0330e-02e
2603 * fa * f 4.0660e-02e
2604 * fric * 1.0000e-04 0.0000e+00e
2605 * rvfric* 1.0000e-04 0.0000e+00e
2606 * grav * f 0.0000e+00e
2607 * hd * f 2.0770e-01e
2608 * icflg * f 0e
2609 * nff * f 1e
2610 * alp * 1.0000e+00e
2611 * vl * f 0.0000e+00e
2612 * vv * f 0.0000e+00e
2613 * tl * 4.1339e+02e
2614 * tv * 4.1339e+02e
2615 * p * 3.7500e+05e
2616 * pa * 0.0000e+00e
2617 * qppp * f 0.0000e+00e
2618 * matid * f 6e
2619 * tw * f 4.1339e+02e
2620 *
2621 * type num id ctitle
2622 tee 21 21 $21$ separator-bottom loop 2
2623 * jcell nodes ichf cost epsw
2624 * 1 4 1 0.0000e+00 0.0000e+00
2625 * iconcl1 ncell1 jun1 jun2 ipow1
2626 * 0 4 21 22 0
2627 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
2628 * 0 0 0 0 0
2629 * radin1 th1 hout11 houtv1 tout11
2630 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2631 * toutv1
2632 * 3.0000e+02
2633 * qpin1 qpoff1 rqpms1 qpscl1
2634 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2635 * iconc2 ncell2 jun3 ipow2
2636 * 0 1 28 0
2637 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
2638 * 0 0 0 0 0
2639 * radin2 th2 hout12 houtv2 tout12
2640 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2641 * toutv2
2642 * 3.0000e+02
2643 * qpin2 qpoff2 rqpms2 qpscl2
2644 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2645 *
2646 * dx * 9.5560e-01r02 3.2510e-01 4.2400e-01e
2647 * vol * 2.5970e+00 1.5266e+00 1.5253e+00 2.5870e-01e
2648 * fa * 4.4179e-01 4.5584e+00 4.7298e+00r02 6.1010e-01e
2649 * fric * f 0.0000e+00e
2650 * rvfric* f 0.0000e+00e
2651 * grav * 6.8030e-01r04 1.0000e+00e
2652 * hd * 7.5000e-01r02 2.3000e+00r02 1.5830e-01e
2653 * icflg * f 0e

```

```

2654 * nff * f -1e
2655 * alp * f 1.0000e+00e
2656 * vl * f 0.0000e+00e
2657 * vv * f 0.0000e+00e
2658 * tl * f 4.1339e+02e
2659 * tv * f 4.1339e+02e
2660 * p * f 3.7500e+05e
2661 * pa * f 0.0000e+00e
2662 * qppp * f 0.0000e+00e
2663 * matid * f 6e
2664 * tw * f 4.1339e+02e
2665 *
2666 * dx * 2.0000e-01e
2667 * vol * 1.0700e-02e
2668 * fa * f 5.3260e-02e
2669 * fric * 1.0000e-04 0.0000e+00e
2670 * rvfric* 1.0000e-04 0.0000e+00e
2671 * grav * 0.0000e+00 -4.2200e-01e
2672 * hd * f 2.6040e-01e
2673 * icflg * f 0e
2674 * nff * f 1e
2675 * alp * 1.0000e+00e
2676 * vl * f 0.0000e+00e
2677 * vv * f 0.0000e+00e
2678 * tl * 4.1339e+02e
2679 * tv * 4.1339e+02e
2680 * p * 3.7500e+05e
2681 * pa * 0.0000e+00e
2682 * qppp * f 0.0000e+00e
2683 * matid * f 6e
2684 * tw * f 4.1339e+02e
2685 *
2686 * type num id ctitle
2687 tee 22 22 $22$ separator-middle loop 2
2688 * jcell nodes ichf cost epsw
2689 4 4 1 1.0000e+00 0.0000e+00
2690 * iconcl ncell1 jun1 jun2 ipow1
2691 0 4 22 23 0
2692 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
2693 0 0 0 0 0
2694 * radin1 th1 hout11 houtv1 tout11
2695 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2696 * toutv1
2697 3.0000e+02
2698 * qpoff1 rqpax1 qpscl1
2699 0.0000e+00 0.0000e+00 0.0000e+00
2700 * iconc2 ncell2 jun3 ipow2
2701 0 4 29 0
2702 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
2703 0 0 0 0 0
2704 * radin2 th2 hout12 houtv2 tout12
2705 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2706 * toutv2
2707 3.0000e+02
2708 * qpoff2 rqpax2 qpscl2
2709 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2710 *
2711 * dx * 1.8800e-01r02 7.1000e-01 2.0000e-01e
2712 * vol * 1.5740e-01r02 7.5580e-01 2.1290e-01e
2713 * fa * 6.1010e-01r04 1.0645e+00e
2714 * fric * f 0.0000e+00e
2715 * rvfric* f 0.0000e+00e
2716 * grav * f 1.0000e+00e
2717 * hd * 1.5830e-01r04 2.0910e-01e
2718 * icflg * f 0e
2719 * nff * f -1e
2720 * alp * f 1.0000e+00e
2721 * vl * f 0.0000e+00e
2722 * vv * f 0.0000e+00e
2723 * tl * f 4.1339e+02e
2724 * tv * f 4.1339e+02e
2725 * p * f 3.7500e+05e
2726 * pa * f 0.0000e+00e
2727 * qppp * f 0.0000e+00e
2728 * matid * f 6e
2729 * tw * f 4.1339e+02e
2730 *
2731 * dx * r02 7.1000e-01 1.8800e-01 4.2400e-01e
2732 * vol * r02 2.4617e+00 7.0570e-01 1.7130e+00e
2733 * fa * r03 3.4673e+00r02 4.0401e+00e
2734 * fric * 1.0000e-04r04 0.0000e+00e
2735 * rvfric* 1.0000e-04r04 0.0000e+00e
2736 * grav * f -1.0000e+00e
2737 * hd * f 4.4000e-01e
2738 * icflg * f 0e
2739 * nff * r04 1 -1e
2740 * alp * f 1.0000e+00e
2741 * vl * f 0.0000e+00e
2742 * vv * f 0.0000e+00e
2743 * tl * f 4.1339e+02e
2744 * tv * f 4.1339e+02e
2745 * p * f 3.7500e+05e

```



```

2746 * pa * f 0.0000e+00e
2747 * qppp * f 0.0000e+00e
2748 * matid * f 6e
2749 * tw * f 4.1339e+02e
2750 *
2751 * type num id ctitle
2752 tee 23 23 $23$ separator-top loop 2
2753 * jcell nodes ichf cost epsw
2754 * 3 4 1 0.0000e+00 0.0000e+00
2755 * iconc1 ncell1 jun1 jun2 ipow1
2756 * 0 4 23 24 0
2757 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
2758 * 0 0 0 0 0
2759 * radin1 th1 hout11 houtv1 tout11
2760 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2761 * toutv1
2762 * 3.0000e+02
2763 * qpin1 qpoff1 rqpms1 qpscl1
2764 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2765 * iconc2 ncell2 jun3 ipow2
2766 * 0 1 223 0
2767 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
2768 * 0 0 0 0 0
2769 * radin2 th2 hout12 houtv2 tout12
2770 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2771 * toutv2
2772 * 3.0000e+02
2773 * qpin2 qpoff2 rqpms2 qpscl2
2774 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2775 *
2776 * dx * 2.0000e-01 2.8500e-01 4.0000e-01 8.1000e-01e
2777 * vol * 2.1290e-01 1.5732e+00 1.8919e+00 3.0974e+00e
2778 * fa * r02 1.0645e+00r02 4.7298e+00 4.4179e-01e
2779 * fric * f 0.0000e+00e
2780 * rvfric * f 0.0000e+00e
2781 * grav * f 1.0000e+00e
2782 * hd * r02 2.0910e-01r02 2.4540e+00 7.5000e-01e
2783 * icflg * f 0e
2784 * nff * f -1e
2785 * alp * f 1.0000e+00e
2786 * vl * f 0.0000e+00e
2787 * vv * f 0.0000e+00e
2788 * tl * f 4.1339e+02e
2789 * tv * f 4.1339e+02e
2790 * p * f 3.7500e+05e
2791 * pa * f 0.0000e+00e
2792 * qppp * f 0.0000e+00e
2793 * matid * f 6e
2794 * tw * f 4.1339e+02e
2795 *
2796 * dx * 1.0000e+00e
2797 * vol * 1.2600e-01e
2798 * fa * f 1.2600e-01e
2799 * fric * 1.0000e-04 0.0000e+00e
2800 * rvfric * 1.0000e-04 0.0000e+00e
2801 * grav * f 0.0000e+00e
2802 * hd * f 4.0000e-01e
2803 * icflg * f 0e
2804 * nff * f 1e
2805 * alp * f 1.0000e+00e
2806 * vl * f 0.0000e+00e
2807 * vv * f 0.0000e+00e
2808 * tl * 4.1339e+02e
2809 * tv * 4.1339e+02e
2810 * p * 3.7500e+05e
2811 * pa * 0.0000e+00e
2812 * qppp * f 0.0000e+00e
2813 * matid * f 6e
2814 * tw * f 4.1339e+02e
2815 *
2816 * type num id ctitle
2817 tee 24 24 $24$ loop-seal cold-leg loop 2
2818 * jcell nodes ichf cost epsw
2819 * 17 4 1 5.0000e-01 0.0000e+00
2820 * iconc1 ncell1 jun1 jun2 ipow1
2821 * 0 21 24 27 0
2822 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
2823 * 0 0 0 0 0
2824 * radin1 th1 hout11 houtv1 tout11
2825 * 3.7500e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2826 * toutv1
2827 * 3.0000e+02
2828 * qpin1 qpoff1 rqpms1 qpscl1
2829 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2830 * iconc2 ncell2 jun3 ipow2
2831 * 0 1 26 0
2832 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
2833 * 0 0 0 0 0
2834 * radin2 th2 hout12 houtv2 tout12
2835 * 1.1000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2836 * toutv2
2837 * 3.0000e+02

```

```

2838 *          qpin2          qpoff2          rqpms2          qpscl2
2839 * 0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
2840 *
2841 * dx * 1.2000e+00r02 1.9125e+00 1.2000e+00r03 2.3170e+00 1.5140e+00
2842 * dx * r02 1.6650e+00r02 1.0920e+00 6.5000e-01 6.0000e-01r02 1.4950e+00
2843 * dx * 1.5050e+00 1.9110e+00r02 1.6825e+00 7.1000e-01e
2844 * vol * 5.3010e-01r02 8.4490e-01 5.3010e-01r03 1.0236e+00 6.6890e-01
2845 * vol * r02 7.3560e-01r02 4.8240e-01 7.2000e-01 9.4800e-01r02 6.6048e-01
2846 * vol * 6.6489e-01 4.0247e-01r02 7.4331e-01 3.8058e-01e
2847 * fa * r13 4.4179e-01 6.8920e-01r07 4.4179e-01 6.3620e-01e
2848 * fric the phase b pump simulator has a k factor of 18.0
2849 * fric fric=(k factor)>hd/(dx(12)+dx(13))=18.0x0.75/(1.0920+0.65)
2850 * fric * r12 0.0000e+00 7.7497e+00r09 0.0000e+00e
2851 * rvfric* r12 0.0000e+00 7.7497e+00r09 0.0000e+00e
2852 * grav * 1.0000e+00 2.3130e-01 0.0000e+00 -2.3130e-01r04 -1.0000e+00
2853 * grav * -4.9350e-01 0.0000e+00 7.9780e-01 1.0000e+00 3.7200e-01
2854 * grav * -7.7520e-01 1.4110e-01r07 0.0000e+00e
2855 * hd * r21 7.5000e-01 9.0000e-01e
2856 * icflg * r12 0 1r09 0e
2857 * nff * r12 -1 1r09 -1e
2858 * alp * f 1.0000e+00e
2859 * vl * f 0.0000e+00e
2860 * vv * f 0.0000e+00e
2861 * tl * f 4.1339e+02e
2862 * tv * f 4.1339e+02e
2863 * p * f 3.7500e+05e
2864 * pa * f 0.0000e+00e
2865 * qppp * f 0.0000e+00e
2866 * matid * f 6e
2867 * tw * f 4.1339e+02e
2868 *
2869 * dx * 5.0000e-01e
2870 * vol * 1.7000e-02e
2871 * fa * f 3.8010e-02e
2872 * fric * 1.0000e-04 0.0000e+00e
2873 * rvfric* 1.0000e-04 0.0000e+00e
2874 * grav * f 5.0000e-01e
2875 * hd * f 2.2000e-01e
2876 * icflg * f 0e
2877 * nff * f 1e
2878 * alp * 1.0000e+00e
2879 * vl * f 0.0000e+00e
2880 * vv * f 0.0000e+00e
2881 * tl * 4.1339e+02e
2882 * tv * 4.1339e+02e
2883 * p * 3.7500e+05e
2884 * pa * 0.0000e+00e
2885 * qppp * f 0.0000e+00e
2886 * matid * f 6e
2887 * tw * f 4.1339e+02e
2888 *
2889 * type num id ctitle
2890 fill 25 25 $25$ hot-leg ecc loop 2
2891 * jun1 ifty ioff
2892 * 25 8 0
2893 * iftr ifsv nftb nfsv nfrf
2894 * 115 100 -7 0 0
2895 * twtold rfmX concin felv
2896 * 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
2897 * dxin volin alpin vlin tlin
2898 * 3.3000e+00 1.3400e-01 0.0000e+00 0.0000e+00 3.1100e+02
2899 * pin pain flowin vvin tvin
2900 * 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.1100e+02
2901 * vmscl vvscl
2902 * 1.0000e+00 1.0000e+00
2903 *
2904 * vmtb loop 2 hot-leg ecc is off
2905 * vmtb * r02 0.0000e+00 1.4000e+01 0.0000e+00 1.8000e+01 0.0000e+00
2906 * vmtb * 2.9000e+01 0.0000e+00 5.0000e+01 0.0000e+00 1.0000e+02
2907 * vmtb * 0.0000e+00 1.5000e+02 0.0000e+00e
2908 *
2909 * type num id ctitle
2910 fill 26 26 $26$ cold-leg ecc loop 2
2911 * jun1 ifty ioff
2912 * 26 8 0
2913 * iftr ifsv nftb nfsv nfrf
2914 * 116 100 -15 0 0
2915 * twtold rfmX concin felv
2916 * 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
2917 * dxin volin alpin vlin tlin
2918 * 3.3000e+00 1.2500e-01 0.0000e+00 0.0000e+00 3.1100e+02
2919 * pin pain flowin vvin tvin
2920 * 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.1100e+02
2921 * vmscl vvscl
2922 * 1.0000e+00 1.0000e+00
2923 *
2924 * vmtb loop 2 cold-leg ecc is on at 4.0 s
2925 * vmtb * r02 0.0000e+00 4.0000e+00 0.0000e+00 8.0000e+00 6.0000e+02
2926 * vmtb * 3.8000e+01 6.0000e+02 3.9000e+01 4.0000e+02 6.8000e+01
2927 * vmtb * 4.0000e+02 6.9000e+01 2.5000e+02 9.8000e+01 2.5000e+02
2928 * vmtb * 9.9000e+01 2.0000e+02 1.2800e+02 2.0000e+02 1.2900e+02
2929 * vmtb * 1.5000e+02 1.5800e+02 1.5000e+02 1.5900e+02 8.0000e+01

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2930 * vmtb *      1.8800e+02   8.0000e+01   1.8900e+02   0.0000e+00e
2931 *
2932 * type          num          id          ctitle
2933 tee          27 $27$ pressurizer tee
2934 *          jcell          nodes          ichf          cost          epsw
2935 *          2              4              1          0.0000e+00   0.0000e+00
2936 *          iconcl          ncell1          jun1          jun2          ipow1
2937 *          0              4              227         21           0
2938 *          iqptr1          iqpsv1          nqptb1          nqpsv1          nqprf1
2939 *          0              0              0           0           0
2940 *          radin1          th1           hout11          houtv1          tout11
2941 *          3.7500e-01   1.0000e-02   0.0000e+00   0.0000e+00   3.0000e+02
2942 *          toutv1
2943 *          3.0000e+02
2944 *          qpin1          qpoff1          rqpms1          qpscl1
2945 *          0.0000e+00   0.0000e+00   0.0000e+00   0.0000e+00
2946 *          iconc2          ncell2          jun3          ipow2
2947 *          0              2              228         0           0
2948 *          iqptr2          iqpsv2          nqptb2          nqpsv2          nqprf2
2949 *          0              0              0           0           0
2950 *          radin2          th2           hout12          houtv2          tout12
2951 *          2.6000e-01   1.0000e-02   0.0000e+00   0.0000e+00   3.0000e+02
2952 *          toutv2
2953 *          3.0000e+02
2954 *          qpin2          qpoff2          rqpms2          qpscl2
2955 *          0.0000e+00   0.0000e+00   0.0000e+00   0.0000e+00
2956 *
2957 * dx *          1.2867e+00   1.3370e+00   1.0420e+00   6.2600e-01e
2958 * vol *        5.1130e-01   5.9070e-01   4.6030e-01   2.7660e-01e
2959 * fa *        3.9740e-01r04 4.4179e-01e
2960 * fric * r03 1.6000e-02r02 0.0000e+00e
2961 * rvfric* r03 1.6000e-02r02 0.0000e+00e
2962 * grav * r02 0.0000e+00   1.8020e-01   5.6120e-01   6.8030e-01e
2963 * hd * r02 6.3880e-01r03 7.5000e-01e
2964 * icflg * f          0e
2965 * nff * r04 1          -1e
2966 * alp * f          1.0000e+00e
2967 * vl * f          0.0000e+00e
2968 * vv * f          0.0000e+00e
2969 * tl * f          4.1339e+02e
2970 * tv * f          4.1339e+02e
2971 * p * f          3.7500e+05e
2972 * pa * f          0.0000e+00e
2973 * qppp * f          0.0000e+00e
2974 * matid * f          6e
2975 * tw * f          4.1339e+02e
2976 *
2977 * dx *          5.6000e-01   7.1840e-01e
2978 * vol *        3.3390e-02   6.8330e-02e
2979 * fa *        1.0000e-04r02 9.1150e-02e
2980 * fric *        1.0000e-04   1.8200e-02   0.0000e+00e
2981 * rvfric* 1.0000e-04r02 0.0000e+00e
2982 * grav *        7.0050e-01   3.6217e-01   -9.7929e-01e
2983 * hd *        2.0000e-01r02 3.4800e-01e
2984 * icflg * f          0e
2985 * nff * f          1e
2986 * alp * f          1.0000e+00e
2987 * vl * f          0.0000e+00e
2988 * vv * f          0.0000e+00e
2989 * tl * f          4.1339e+02e
2990 * tv * f          4.1339e+02e
2991 * p * f          3.7500e+05e
2992 * pa * f          0.0000e+00e
2993 * qppp * f          0.0000e+00e
2994 * matid * f          6e
2995 * tw * f          4.1339e+02e
2996 *
2997 * type          num          id          ctitle
2998 tee          28 $28$ sep. drain tee loop 2
2999 *          jcell          nodes          ichf          cost          epsw
3000 *          5              4              1          0.0000e+00   0.0000e+00
3001 *          iconcl          ncell1          jun1          jun2          ipow1
3002 *          0              6              29         229         0
3003 *          iqptr1          iqpsv1          nqptb1          nqpsv1          nqprf1
3004 *          0              0              0           0           0
3005 *          radin1          th1           hout11          houtv1          tout11
3006 *          1.0000e-01   2.5000e-02   0.0000e+00   0.0000e+00   3.0000e+02
3007 *          toutv1
3008 *          3.0000e+02
3009 *          qpin1          qpoff1          rqpms1          qpscl1
3010 *          0.0000e+00   0.0000e+00   0.0000e+00   0.0000e+00
3011 *          iconc2          ncell2          jun3          ipow2
3012 *          0              1              230         0           0
3013 *          iqptr2          iqpsv2          nqptb2          nqpsv2          nqprf2
3014 *          0              0              0           0           0
3015 *          radin2          th2           hout12          houtv2          tout12
3016 *          1.0000e-01   2.5000e-02   0.0000e+00   0.0000e+00   3.0000e+02
3017 *          toutv2
3018 *          3.0000e+02
3019 *          qpin2          qpoff2          rqpms2          qpscl2
3020 *          0.0000e+00   0.0000e+00   0.0000e+00   0.0000e+00
3021 *

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3022 * dx * 9.0000e-01r02 9.2500e-01r03 4.9130e-01e
3023 * vol * 2.8300e-02r02 2.9000e-02r03 9.6400e-02e
3024 * fa * 4.0401e+00r02 3.1400e-02r04 1.9630e-01e
3025 * fric * f 0.0000e+00e
3026 * rvfric* f 0.0000e+00e
3027 * grav * f -1.0000e+00 -3.3640e-01 0.0000e+00 -3.4700e-01r03-1.0000e+00
3028 * grav * e
3029 * hd * e 4.4000e-01r02 2.0000e-01r04 5.0000e-01e
3030 * icflg * f 0e
3031 * nff * f -1r02 1 -1r03 1e
3032 * alp * f 0.0000e+00e
3033 * vl * f 0.0000e+00e
3034 * vv * f 0.0000e+00e
3035 * tl * 4.1500e+02 4.1000e+02 4.0500e+02 4.0000e+02 3.9500e+02e
3036 * tl * 3.9000e+02e
3037 * tv * f 4.1339e+02e
3038 * p * f 3.7500e+05e
3039 * pa * f 0.0000e+00e
3040 * qppp * f 0.0000e+00e
3041 * matid * f 6e
3042 * tw * r04 4.1500e+02r04 4.1000e+02r04 4.0500e+02r04 4.0000e+02r04 3.9500e+02
3043 * tw * r04 3.9000e+02e
3044 *
3045 * dx * 5.0000e-01e
3046 * vol * 2.6600e-02e
3047 * fa * f 5.3260e-02e
3048 * fric * 1.0000e-04 0.0000e+00e
3049 * rvfric* 1.0000e-04 0.0000e+00e
3050 * grav * f 0.0000e+00e
3051 * hd * f 2.6040e-01e
3052 * icflg * f 0e
3053 * nff * f 1e
3054 * alp * 0.0000e+00e
3055 * vl * f 0.0000e+00e
3056 * vv * f 0.0000e+00e
3057 * tl * 4.0000e+02e
3058 * tv * 4.1339e+02e
3059 * p * 3.7500e+05e
3060 * pa * 0.0000e+00e
3061 * qppp * f 0.0000e+00e
3062 * matid * f 6e
3063 * tw * f 4.0000e+02e
3064 *
3065 * type num id ctitle
3066 valve 29 $29$ separator drain valve
3067 * ncells nodes jun1 jun2 epsw
3068 2 4 230 28 0.0000e+00
3069 * ichf iconc ivty ivps nvtb2
3070 1 0 1 2 0
3071 * ivtr ivsv nvtb1 nvsv nvrfr
3072 0 100 2 0 0
3073 * iqp3tr iqp3sv nqp3tb nqp3sv nqp3rf
3074 0 0 0 0 0
3075 * ivtrov ivtyov
3076 0 0
3077 * rvmx rvov fminov fmaxov
3078 1.0000e+10 0.0000e+00 0.0000e+00 1.0000e+00
3079 * radin th houtl houtv toutl
3080 1.5000e-02 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
3081 * toutv avlve hvlve favlve xpos
3082 3.0000e+02 3.1400e-02 2.0000e-01 0.0000e+00 0.0000e+00
3083 * qp3in qp3off rqp3mx qp3scl
3084 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3085 *
3086 * dx * 5.0000e-01 1.0000e+00e
3087 * vol * 2.6600e-02 5.3260e-02e
3088 * fa * f 5.3260e-02e
3089 * fric * 0.0000e+00 1.9440e+00 0.0000e+00e
3090 * rvfric* 0.0000e+00 1.9440e+00 0.0000e+00e
3091 * grav * r02 0.0000e+00 4.2200e-01e
3092 * hd * f 2.6040e-01e
3093 * icflg * f 0e
3094 * nff * f 1e
3095 * alp * 0.0000e+00 1.0000e+00e
3096 * vl * f 0.0000e+00e
3097 * vv * f 0.0000e+00e
3098 * tl * 4.0500e+02 4.1339e+02e
3099 * tv * f 4.1339e+02e
3100 * p * f 3.7500e+05e
3101 * pa * f 0.0000e+00e
3102 * qppp * f 0.0000e+00e
3103 * matid * f 6e
3104 * tw * r04 4.0500e+02r04 4.1339e+02e
3105 *
3106 * vtb1 * r02 0.0000e+00 2.0200e+02 0.0000e+00e
3107 *
3108 * type num id ctitle
3109 fill 223 $223$ steam supply loop 2
3110 * jun1 ifty ioff
3111 223 5 0
3112 * iftr ifsv nftb nfsv nfrfr
3113 0 100 -2 0 0

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```

3114 *      twtold      rfm      concn      felv
3115 * 0.0000e+00      7.5000e+00      0.0000e+00      0.0000e+00
3116 *      dxin      volin      alpin      vlin      tlin
3117 * 1.0000e+00      1.2600e-01      1.0000e+00      0.0000e+00      4.6114e+02
3118 *      pin      pain      flowin      vvin      tvin
3119 * 1.2000e+06      0.0000e+00      0.0000e+00      0.0000e+00      4.6114e+02
3120 *      vmscl      vvscl
3121 * 1.0000e+00      1.0000e+00
3122 *
3123 * vmtb      sg-simulator steam mass flow is off during phase b
3124 * vmtb * r02 0.0000e+00      2.0000e+00      0.0000e+00e
3125 *
3126 * type      num      id      ctitle
3127 fill      228      228 $228$ pressurizer fill
3128 *      jun1      ifty      ioff
3129 *      228      8      0
3130 *      iftr      ifsv      nftb      nfsv      nfrf
3131 *      220      100      -2      0      0
3132 *      twtold      rfm      concn      felv
3133 * 0.0000e+00      1.0000e+10      0.0000e+00      0.0000e+00
3134 *      dxin      volin      alpin      vlin      tlin
3135 * 7.1840e-01      6.8330e-02      1.0000e+00      0.0000e+00      4.1339e+02
3136 *      pin      pain      flowin      vvin      tvin
3137 * 3.7500e+05      0.0000e+00      0.0000e+00      0.0000e+00      4.1339e+02
3138 *      vmscl      vvscl
3139 * 0.0000e+00      0.0000e+00
3140 *
3141 * vmtb * r02 0.0000e+00      1.0000e+02      0.0000e+00e
3142 *
3143 * type      num      id      ctitle
3144 fill      229      229 $229$ separator drain fill loop 2
3145 *      jun1      ifty      ioff
3146 *      229      8      1
3147 *      iftr      ifsv      nftb      nfsv      nfrf
3148 *      229      100      -2      0      0
3149 *      twtold      rfm      concn      felv
3150 * 0.0000e+00      2.0000e+01      0.0000e+00      0.0000e+00
3151 *      dxin      volin      alpin      vlin      tlin
3152 * 4.9130e-01      9.6400e-02      0.0000e+00      0.0000e+00      3.0800e+02
3153 *      pin      pain      flowin      vvin      tvin
3154 * 3.7500e+05      0.0000e+00      0.0000e+00      0.0000e+00      3.0800e+02
3155 *      vmscl      vvscl
3156 * -1.0000e+00      1.0000e+00
3157 *
3158 * vmtb * r02 0.0000e+00      5.0000e+00      1.0000e+02e
3159 *
3160 * type      num      id      ctitle
3161 tee      30      30 $30$ hot-leg loop 3
3162 *      jcell      nodes      ichf      cost      epsw
3163 *      4      4      1      -1.0000e+00      0.0000e+00
3164 *      iconc1      ncell1      jun1      jun2      ipow1
3165 *      0      9      30      31      0
3166 *      iqptr1      iqpsv1      nqptb1      nqpsv1      nqprf1
3167 *      0      0      0      0      0
3168 *      radin1      th1      hout11      houtv1      tout11
3169 * 3.7500e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3170 *      toutv1
3171 * 3.0000e+02
3172 *      qpin1      qpoff1      rqpms1      qpocl1
3173 * 0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3174 *      iconc2      ncell2      jun3      ipow2
3175 *      0      1      35      0
3176 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
3177 *      0      0      0      0      0
3178 *      radin2      th2      hout12      houtv2      tout12
3179 * 1.1000e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3180 *      toutv2
3181 * 3.0000e+02
3182 *      qpin2      qpoff2      rqpms2      qpocl2
3183 * 0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3184 *
3185 * dx * r03 5.1070e-01r03 1.2867e+00      1.3370e+00      1.0420e+00      6.2600e-01
3186 * dx * e
3187 * vol * r03 2.2560e-01r03 5.1130e-01      5.9070e-01      4.6030e-01      2.7660e-01
3188 * vol * e
3189 * fa * r03 4.4179e-01r03 3.9740e-01r04 4.4179e-01e
3190 * fric * r02 0.0000e+00r06 1.6000e-02r02 0.0000e+00e
3191 * rvfric * r02 0.0000e+00r06 1.6000e-02r02 0.0000e+00e
3192 * grav * r07 0.0000e+00      1.8020e-01      5.6120e-01      6.8030e-01e
3193 * hd * r03 7.5000e-01r03 6.3880e-01r04 7.5000e-01e
3194 * icflg * r04      0      1r05      0e
3195 * nff *      -1r08      1      -1e
3196 * alp * f 1.0000e+00e
3197 * vl * f 0.0000e+00e
3198 * vv * f 0.0000e+00e
3199 * tl * f 4.1339e+02e
3200 * tv * f 4.1339e+02e
3201 * p * f 3.7500e+05e
3202 * pa * f 0.0000e+00e
3203 * qppp * f 0.0000e+00e
3204 * matid * f 6e
3205 * tw * f 4.1339e+02e

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3206 *
3207 * dx * 5.0000e-01e
3208 * vol * 2.0330e-02e
3209 * fa * f 4.0660e-02e
3210 * fric * 1.0000e-04 0.0000e+00e
3211 * rvfric* 1.0000e-04 0.0000e+00e
3212 * grav * f 0.0000e+00e
3213 * hd * f 2.0770e-01e
3214 * icflg * f 0e
3215 * nff * f 1e
3216 * alp * 1.0000e+00e
3217 * vl * f 0.0000e+00e
3218 * vv * f 0.0000e+00e
3219 * tl * 4.1339e+02e
3220 * tv * 4.1339e+02e
3221 * p * 3.7500e+05e
3222 * pa * 0.0000e+00e
3223 * qppp * f 0.0000e+00e
3224 * matid * f 6e
3225 * tw * f 4.1339e+02e
3226 *
3227 * type num id ctitle
3228 tee 31 31 $31$ separator-bottom loop 3
3229 * jcell nodes ichf cost epsw
3230 * 1 4 1 0.0000e+00 0.0000e+00
3231 * iconc1 ncell1 jun1 jun2 ipow1
3232 * 0 4 31 32 0
3233 * iqptr1 iqpsv1 ngptb1 ngpsv1 ngprf1
3234 * 0 0 0 0 0
3235 * radin1 th1 hout11 houtv1 tout11
3236 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3237 * toutv1
3238 * 3.0000e+02
3239 * qpin1 qpoff1 rqpms1 qpscl1
3240 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3241 * iconc2 ncell2 jun3 ipow2
3242 * 0 1 38 0
3243 * iqptr2 iqpsv2 ngptb2 ngpsv2 ngprf2
3244 * 0 0 0 0 0
3245 * radin2 th2 hout12 houtv2 tout12
3246 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3247 * toutv2
3248 * 3.0000e+02
3249 * qpin2 qpoff2 rqpms2 qpscl2
3250 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3251 *
3252 * dx * 9.5560e-01r02 3.2510e-01 4.2400e-01e
3253 * vol * 2.5970e+00 1.5266e+00 1.5253e+00 2.5870e-01e
3254 * fa * 4.4179e-01 4.5584e+00 4.7298e+00r02 6.1010e-01e
3255 * fric * f 0.0000e+00e
3256 * rvfric* f 0.0000e+00e
3257 * grav * 6.8030e-01r04 1.0000e+00e
3258 * hd * 7.5000e-01r02 2.3000e+00r02 1.5830e-01e
3259 * icflg * f 0e
3260 * nff * f -1e
3261 * alp * f 1.0000e+00e
3262 * vl * f 0.0000e+00e
3263 * vv * f 0.0000e+00e
3264 * tl * f 4.1339e+02e
3265 * tv * f 4.1339e+02e
3266 * p * f 3.7500e+05e
3267 * pa * f 0.0000e+00e
3268 * qppp * f 0.0000e+00e
3269 * matid * f 6e
3270 * tw * f 4.1339e+02e
3271 *
3272 * dx * 2.0000e-01e
3273 * vol * 1.0700e-02e
3274 * fa * f 5.3260e-02e
3275 * fric * 1.0000e-04 0.0000e+00e
3276 * rvfric* 1.0000e-04 0.0000e+00e
3277 * grav * 0.0000e+00 -4.2200e-01e
3278 * hd * f 2.6040e-01e
3279 * icflg * f 0e
3280 * nff * f 1e
3281 * alp * 1.0000e+00e
3282 * vl * f 0.0000e+00e
3283 * vv * f 0.0000e+00e
3284 * tl * 4.1339e+02e
3285 * tv * 4.1339e+02e
3286 * p * 3.7500e+05e
3287 * pa * 0.0000e+00e
3288 * qppp * f 0.0000e+00e
3289 * matid * f 6e
3290 * tw * f 4.1339e+02e
3291 *
3292 * type num id ctitle
3293 tee 32 32 $32$ separator-middle loop 3
3294 * jcell nodes ichf cost epsw
3295 * 4 4 1 1.0000e+00 0.0000e+00
3296 * iconc1 ncell1 jun1 jun2 ipow1
3297 * 0 4 32 33 0

```

```

3298 *      iqptr1      iqpsv1      nqptb1      nqpsv1      nqprf1
3299          0          0          0          0          0
3300 *      radin1      th1      hout11      houtv1      tout11
3301      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3302 *      toutv1
3303      3.0000e+02
3304 *      qpin1      qpoff1      rqpms1      qpscl1
3305      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3306 *      iconc2      ncell2      jun3      ipow2
3307          0          4          39          0
3308 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
3309          0          0          0          0          0
3310 *      radin2      th2      hout12      houtv2      tout12
3311      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3312 *      toutv2
3313      3.0000e+02
3314 *      qpin2      qpoff2      rqpms2      qpscl2
3315      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3316 *
3317 * dx *      1.8800e-01r02 7.1000e-01      2.0000e-01e
3318 * vol *      1.5740e-01r02 7.5580e-01      2.1290e-01e
3319 * fa *      6.1010e-01r04 1.0645e+00e
3320 * fric * f      0.0000e+00e
3321 * rvfric* f      0.0000e+00e
3322 * grav * f      1.0000e+00e
3323 * hd *      1.5830e-01r04 2.0910e-01e
3324 * icflg * f      0e
3325 * nff * f      -1e
3326 * alp * f      1.0000e+00e
3327 * vl * f      0.0000e+00e
3328 * vv * f      0.0000e+00e
3329 * tl * f      4.1339e+02e
3330 * tv * f      4.1339e+02e
3331 * p * f      3.7500e+05e
3332 * pa * f      0.0000e+00e
3333 * qppp * f      0.0000e+00e
3334 * matid * f      6e
3335 * tw * f      4.1339e+02e
3336 *
3337 * dx * r02 7.1000e-01      1.8800e-01      4.2400e-01e
3338 * vol * r02 2.4617e+00      7.0570e-01      1.7130e+00e
3339 * fa * r03 3.4673e+00r02 4.0401e+00e
3340 * fric *      1.0000e-04r04 0.0000e+00e
3341 * rvfric*      1.0000e-04r04 0.0000e+00e
3342 * grav * f      -1.0000e+00e
3343 * hd * f      4.4000e-01e
3344 * icflg * f      0e
3345 * nff * r04      1      -1e
3346 * alp * f      1.0000e+00e
3347 * vl * f      0.0000e+00e
3348 * vv * f      0.0000e+00e
3349 * tl * f      4.1339e+02e
3350 * tv * f      4.1339e+02e
3351 * p * f      3.7500e+05e
3352 * pa * f      0.0000e+00e
3353 * qppp * f      0.0000e+00e
3354 * matid * f      6e
3355 * tw * f      4.1339e+02e
3356 *
3357 * type      num      id      cttitle
3358 tee      33      33 $33$ separator-top loop 3
3359 *      jcell      nodes      ichf      cost      epsw
3360          3          4          1      0.0000e+00      0.0000e+00
3361 *      iconc1      ncell1      jun1      jun2      ipow1
3362          0          4          33          34          0
3363 *      iqptr1      iqpsv1      nqptb1      nqpsv1      nqprf1
3364          0          0          0          0          0
3365 *      radin1      th1      hout11      houtv1      tout11
3366      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3367 *      toutv1
3368      3.0000e+02
3369 *      qpin1      qpoff1      rqpms1      qpscl1
3370      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3371 *      iconc2      ncell2      jun3      ipow2
3372          0          1          333          0
3373 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
3374          0          0          0          0          0
3375 *      radin2      th2      hout12      houtv2      tout12
3376      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3377 *      toutv2
3378      3.0000e+02
3379 *      qpin2      qpoff2      rqpms2      qpscl2
3380      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3381 *
3382 * dx *      2.0000e-01      2.8500e-01      4.0000e-01      8.1000e-01e
3383 * vol *      2.1290e-01      1.5732e+00      1.8919e+00      3.0974e+00e
3384 * fa * r02 1.0645e+00r02 4.7298e+00      4.4179e-01e
3385 * fric * f      0.0000e+00e
3386 * rvfric* f      0.0000e+00e
3387 * grav * f      1.0000e+00e
3388 * hd * r02 2.0910e-01r02 2.4540e+00      7.5000e-01e
3389 * icflg * f      0e

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3390 * nff * f -1e
3391 * alp * f 1.0000e+00e
3392 * vl * f 0.0000e+00e
3393 * vv * f 0.0000e+00e
3394 * tl * f 4.1339e+02e
3395 * tv * f 4.1339e+02e
3396 * p * f 3.7500e+05e
3397 * pa * f 0.0000e+00e
3398 * qppp * f 0.0000e+00e
3399 * matid * f 6e
3400 * tw * f 4.1339e+02e
3401 *
3402 * dx * 1.0000e+00e
3403 * vol * 1.2600e-01e
3404 * fa * f 1.2600e-01e
3405 * fric * 1.0000e-04 0.0000e+00e
3406 * rvfric* 1.0000e-04 0.0000e+00e
3407 * grav * f 0.0000e+00e
3408 * hd * f 4.0000e-01e
3409 * icflg * f 0e
3410 * nff * f 1e
3411 * alp * 1.0000e+00e
3412 * vl * f 0.0000e+00e
3413 * vv * f 0.0000e+00e
3414 * tl * 4.1339e+02e
3415 * tv * 4.1339e+02e
3416 * p * 3.7500e+05e
3417 * pa * 0.0000e+00e
3418 * qppp * f 0.0000e+00e
3419 * matid * f 6e
3420 * tw * f 4.1339e+02e
3421 *
3422 * type num id ctitle
3423 tee 34 34 $34$ loop-seal cold-leg loop 3
3424 * jcell nodes ichf cost epsw
3425 17 4 1 5.0000e-01 0.0000e+00
3426 * iconc1 ncell1 jun1 jun2 ipow1
3427 0 21 34 37 0
3428 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
3429 0 0 0 0 0
3430 * radin1 th1 hout11 houtv1 tout11
3431 3.7500e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3432 * toutv1
3433 3.0000e+02
3434 * qpini qpoff1 rqpax1 qpscl1
3435 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3436 * iconc2 ncell2 jun3 ipow2
3437 0 1 36 0
3438 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
3439 0 0 0 0 0
3440 * radin2 th2 hout12 houtv2 tout12
3441 1.1000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3442 * toutv2
3443 3.0000e+02
3444 * qpini qpoff2 rqpax2 qpscl2
3445 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3446 *
3447 * dx * 1.2000e+00r02 1.9125e+00 1.2000e+00r03 2.3170e+00 1.5140e+00
3448 * dx * r02 1.6650e+00r02 1.0920e+00 6.5000e-01 6.0000e-01r02 1.4950e+00
3449 * dx * 1.5050e+00 1.9110e+00r02 1.6825e+00 7.1000e-01e
3450 * vol * 5.3010e-01r02 8.4490e-01 5.3010e-01r03 1.0236e+00 6.6890e-01
3451 * vol * r02 7.3560e-01r02 4.8240e-01 7.2000e-01 9.4800e-01r02 6.6048e-01
3452 * vol * 6.6489e-01 4.0247e-01r02 7.4331e-01 3.8058e-01e
3453 * fa * r13 4.4179e-01 6.8920e-01r07 4.4179e-01 6.3620e-01e
3454 * fric the pump simulator has a k factor of 18.0
3455 * fric fric=(k factor)*xhd/(dx(12)+dx(13))=18.0x0.75/(1.0920+0.65)
3456 * fric * r12 0.0000e+00 7.7497e+00r09 0.0000e+00e
3457 * rvfric* r12 0.0000e+00 7.7497e+00r09 0.0000e+00e
3458 * grav * 1.0000e+00 2.3130e-01 0.0000e+00 -2.3130e-01r04-1.0000e+00
3459 * grav * -4.9350e-01 0.0000e+00 7.9780e-01 1.0000e+00 3.7200e-01
3460 * grav * -7.7520e-01 1.4110e-01r07 0.0000e+00e
3461 * hd * r21 7.5000e-01 9.0000e-01e
3462 * icflg * r12 0 1r09 0e
3463 * nff * r12 -1 1r09 -1e
3464 * alp * f 1.0000e+00e
3465 * vl * f 0.0000e+00e
3466 * vv * f 0.0000e+00e
3467 * tl * f 4.1339e+02e
3468 * tv * f 4.1339e+02e
3469 * p * f 3.7500e+05e
3470 * pa * f 0.0000e+00e
3471 * qppp * f 0.0000e+00e
3472 * matid * f 6e
3473 * tw * f 4.1339e+02e
3474 *
3475 * dx * 5.0000e-01e
3476 * vol * 1.7000e-02e
3477 * fa * f 3.8010e-02e
3478 * fric * 1.0000e-04 0.0000e+00e
3479 * rvfric* 1.0000e-04 0.0000e+00e
3480 * grav * f 5.0000e-01e
3481 * hd * f 2.2000e-01e

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3482 * icflg * f 0e
3483 * nff * f 1e
3484 * alp * f 1.0000e+00e
3485 * vl * f 0.0000e+00e
3486 * vv * f 0.0000e+00e
3487 * tl * f 4.1339e+02e
3488 * tv * f 4.1339e+02e
3489 * p * f 3.7500e+05e
3490 * pa * f 0.0000e+00e
3491 * qppp * f 0.0000e+00e
3492 * matid * f 6e
3493 * tw * f 4.1339e+02e
3494 *
3495 * type num id ctitle
3496 fill 35 35 $35$ hot-leg ecc loop 3
3497 * jun1 ifty ioff
3498 35 8 0
3499 * iftr ifsv nftb nfsv nfrf
3500 115 100 -4 0 0
3501 * twtold rfmx concin felv
3502 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
3503 * dxin volin alpin vlin tlin
3504 3.3000e+00 1.3400e-01 0.0000e+00 0.0000e+00 3.1100e+02
3505 * pin pain flowin vvin tvin
3506 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.1100e+02
3507 * vmscl vvscl
3508 1.0000e+00 1.0000e+00
3509 *
3510 * vmtb loop 3 hot-leg ecc is off
3511 * vmtb * r02 0.0000e+00 5.0000e-01 0.0000e+00 2.0000e+00 0.0000e+00
3512 * vmtb * 1.2000e+01 0.0000e+00e
3513 *
3514 * type num id ctitle
3515 fill 36 36 $36$ cold-leg ecc loop 3
3516 * jun1 ifty ioff
3517 36 8 0
3518 * iftr ifsv nftb nfsv nfrf
3519 116 100 -4 0 0
3520 * twtold rfmx concin felv
3521 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
3522 * dxin volin alpin vlin tlin
3523 3.3000e+00 1.2500e-01 0.0000e+00 0.0000e+00 3.1100e+02
3524 * pin pain flowin vvin tvin
3525 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.1100e+02
3526 * vmscl vvscl
3527 1.0000e+00 1.0000e+00
3528 *
3529 * vmtb loop 3 cold-leg ecc is off
3530 * vmtb * r02 0.0000e+00 5.0000e-01 0.0000e+00 2.0000e+00 0.0000e+00
3531 * vmtb * 1.2000e+01 0.0000e+00e
3532 *
3533 * type num id ctitle
3534 tee 38 38 $38$ sep. drain tee loop 3
3535 * jcell nodes ichf cost epsw
3536 5 4 1 0.0000e+00 0.0000e+00
3537 * iconc1 ncell1 jun1 jun2 ipow1
3538 0 6 39 339 0
3539 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
3540 0 0 0 0 0
3541 * radin1 th1 hout11 houtv1 tout11
3542 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3543 * toutv1
3544 3.0000e+02
3545 * qpin1 qpoff1 rqpax1 qpscl1
3546 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3547 * iconc2 ncell2 jun3 ipow2
3548 0 1 330 0
3549 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
3550 0 0 0 0 0
3551 * radin2 th2 hout12 houtv2 tout12
3552 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3553 * toutv2
3554 3.0000e+02
3555 * qpin2 qpoff2 rqpax2 qpscl2
3556 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3557 *
3558 * dx * 9.0000e-01r02 9.2500e-01r03 4.9130e-01e
3559 * vol * 2.8300e-02r02 2.9000e-02r03 9.6400e-02e
3560 * fa * 4.0401e+00r02 3.1400e-02r04 1.9630e-01e
3561 * fric * f 0.0000e+00e
3562 * rvfric * f 0.0000e+00e
3563 * grav * -1.0000e+00 -3.3640e-01 0.0000e+00 -3.4700e-01r03-1.0000e+00
3564 * grav * e
3565 * hd * 4.4000e-01r02 2.0000e-01r04 5.0000e-01e
3566 * icflg * f 0e
3567 * nff * -1r02 1 -1r03 1e
3568 * alp * f 0.0000e+00e
3569 * vl * f 0.0000e+00e
3570 * vv * f 0.0000e+00e
3571 * tl * 4.1500e+02 4.1000e+02 4.0500e+02 4.0000e+02 3.9500e+02e
3572 * t1 * 3.9000e+02e
3573 * tv * f 4.1339e+02e

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3574 * p * f 3.7500e+05e
3575 * pa * f 0.0000e+00e
3576 * qppp * f 0.0000e+00e
3577 * matid * f 6e
3578 * tw * r04 4.1500e+02r04 4.1000e+02r04 4.0500e+02r04 4.0000e+02r04 3.9500e+02
3579 * tw * r04 3.9000e+02e
3580 *
3581 * dx * 5.0000e-01e
3582 * vol * 2.6600e-02e
3583 * fa * f 5.3260e-02e
3584 * fric * 1.0000e-04 0.0000e+00e
3585 * rvfric* 1.0000e-04 0.0000e+00e
3586 * grav * f 0.0000e+00e
3587 * hd * f 2.6040e-01e
3588 * icflg * f 0e
3589 * nff * f 1e
3590 * alp * 0.0000e+00e
3591 * vl * f 0.0000e+00e
3592 * vv * f 0.0000e+00e
3593 * tl * 4.0000e+02e
3594 * tv * 4.1339e+02e
3595 * p * 3.7500e+05e
3596 * pa * 0.0000e+00e
3597 * qppp * f 0.0000e+00e
3598 * matid * f 6e
3599 * tw * f 4.0000e+02e
3600 *
3601 * type num id ctitle
3602 valve 39 39 $39$ separator drain valve
3603 * ncells nodes jun1 jun2 epsw
3604 2 4 330 38 0.0000e+00
3605 * ichf iconc ivty ivps nvtb2
3606 1 0 1 2 0
3607 * ivtr ivsv nvtb1 nvsv nvrfr
3608 0 100 2 0 0
3609 * iq3tr iq3sv nqp3tb nqp3sv nqp3rf
3610 0 0 0 0 0
3611 * ivtrov ivtyov
3612 0 0
3613 * rvmx rvov fminov fmaxov
3614 1.0000e+10 0.0000e+00 0.0000e+00 1.0000e+00
3615 * radin th hout1 houtv tout1
3616 1.5000e-02 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
3617 * toutv avlve hvlve favlve xpos
3618 3.0000e+02 3.1400e-02 2.0000e-01 0.0000e+00 0.0000e+00
3619 * qp3in qp3off rqp3mx qp3scl
3620 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3621 *
3622 * dx * 5.0000e-01 1.0000e+00e
3623 * vol * 2.6600e-02 5.3260e-02e
3624 * fa * f 5.3260e-02e
3625 * fric * 0.0000e+00 1.9440e+00 0.0000e+00e
3626 * rvfric* 0.0000e+00 1.9440e+00 0.0000e+00e
3627 * grav * r02 0.0000e+00 4.2200e-01e
3628 * hd * f 2.6040e-01e
3629 * icflg * f 0e
3630 * nff * f 1e
3631 * alp * 0.0000e+00 1.0000e+00e
3632 * vl * f 0.0000e+00e
3633 * vv * f 0.0000e+00e
3634 * tl * 4.0500e+02 4.1339e+02e
3635 * tv * f 4.1339e+02e
3636 * p * f 3.7500e+05e
3637 * pa * f 0.0000e+00e
3638 * qppp * f 0.0000e+00e
3639 * matid * f 6e
3640 * tw * r04 4.0000e+02r04 4.1339e+02e
3641 *
3642 * vtbl * r02 0.0000e+00 2.0200e+02 0.0000e+00e
3643 *
3644 * type num id ctitle
3645 fill 333 333 $333$ steam supply loop 3
3646 * jun1 ifty ioff
3647 333 5 0
3648 * iftr ifsv nftb nfvsv nfrf
3649 0 100 -2 0 0
3650 * twtold rfmxc concin felv
3651 0.0000e+00 7.5000e+00 0.0000e+00 0.0000e+00
3652 * dxin volin alpin vlin tlin
3653 1.0000e+00 1.2600e-01 1.0000e+00 0.0000e+00 4.6114e+02
3654 * pin pain flowin vvin tvin
3655 1.2000e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.6114e+02
3656 * vmscl vvscl
3657 1.0000e+00 1.0000e+00
3658 *
3659 * vmtb sg-simulator steam mass flow is off during phase b
3660 * vmtb * r02 0.0000e+00 2.0000e+00 0.0000e+00e
3661 *
3662 * type num id ctitle
3663 fill 339 339 $339$ separator drain fill loop 3
3664 * jun1 ifty ioff
3665 339 8 1

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```

3666 *      iftr      ifsv      nftb      nfsv      nfrf
3667      339      100      -2      0      0
3668 *      twtold      rfmw      concin      felv
3669      0.0000e+00      2.0000e+01      0.0000e+00      0.0000e+00
3670 *      dxin      volin      alpin      vlin      tlin
3671      4.9130e-01      9.6400e-02      0.0000e+00      0.0000e+00      3.0800e+02
3672 *      pin      pain      flowin      vvin      tvin
3673      3.7500e+05      0.0000e+00      0.0000e+00      0.0000e+00      3.0800e+02
3674 *      vmscl      vvscl
3675      -1.0000e+00      1.0000e+00
3676 *
3677 * vmtb * r02 0.0000e+00      5.0000e+00      1.0000e+02e
3678 *
3679 * type      num      id      ctitle
3680 tee      40      40 $40$ bhl pipe
3681 *      jcell      nodes      ichf      cost      epsw
3682      4      4      1      -1.0000e+00      0.0000e+00
3683 *      iconcl      ncell1      jun1      jun2      ipow1
3684      0      8      40      41      0
3685 *      iqptr1      iqpsv1      nqptb1      nqpsv1      nqprf1
3686      0      0      0      0      0
3687 *      radin1      th1      hout11      houtv1      tout11
3688      3.7500e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3689 *      toutv1
3690      3.0000e+02
3691 *      qpin1      qpoff1      rqpwx1      qpscl1
3692      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3693 *      iconc2      ncell2      jun3      ipow2
3694      0      1      45      0
3695 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
3696      0      0      0      0      0
3697 *      radin2      th2      hout12      houtv2      tout12
3698      1.1000e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3699 *      toutv2
3700      3.0000e+02
3701 *      qpin2      qpoff2      rqpwx2      qpscl2
3702      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3703 *
3704 * dx * r03 5.1070e-01r02 1.8718e+00      2.1350e+00      9.8170e-01      6.3960e-01
3705 * dx * e
3706 * vol * r03 2.2560e-01r02 7.3200e-01      9.4320e-01      4.3370e-01      2.8260e-01
3707 * vol * e
3708 * fa * r03 4.4179e-01r02 3.9130e-01r04 4.4179e-01e
3709 * fric * r02 0.0000e+00r05 1.6000e-02r02 0.0000e+00e
3710 * rvfric* r02 0.0000e+00r05 1.6000e-02r02 0.0000e+00e
3711 * grav * r07 0.0000e+00      7.7600e-01      7.6600e-01e
3712 * hd * r03 7.5000e-01r02 6.3290e-01r04 7.5000e-01e
3713 * icflg * r03      0      1r05      0e
3714 * nff *      -1r07      1      -1e
3715 * alp * f 1.0000e+00e
3716 * vl * f 0.0000e+00e
3717 * vv * f 0.0000e+00e
3718 * tl * f 4.1339e+02e
3719 * tv * f 4.1339e+02e
3720 * p * f 3.7500e+05e
3721 * pa * f 0.0000e+00e
3722 * qppp * f 0.0000e+00e
3723 * matid * f 6e
3724 * tw * f 4.1339e+02e
3725 *
3726 * dx * 5.0000e-01e
3727 * vol * 2.0330e-02e
3728 * fa * f 4.0660e-02e
3729 * fric * 1.0000e-04      0.0000e+00e
3730 * rvfric* 1.0000e-04      0.0000e+00e
3731 * grav * f 0.0000e+00e
3732 * hd * f 2.0770e-01e
3733 * icflg * f 0e
3734 * nff * f 1e
3735 * alp * 1.0000e+00e
3736 * vl * f 0.0000e+00e
3737 * vv * f 0.0000e+00e
3738 * tl * 4.1339e+02e
3739 * tv * 4.1339e+02e
3740 * p * 3.7500e+05e
3741 * pa * 0.0000e+00e
3742 * qppp * f 0.0000e+00e
3743 * matid * f 6e
3744 * tw * f 4.1339e+02e
3745 *
3746 * type      num      id      ctitle
3747 tee      41      41 $41$ bhl separator
3748 *      jcell      nodes      ichf      cost      epsw
3749      8      4      1      1.0000e+00      0.0000e+00
3750 *      iconcl      ncell1      jun1      jun2      ipow1
3751      0      11      41      42      0
3752 *      iqptr1      iqpsv1      nqptb1      nqpsv1      nqprf1
3753      0      0      0      0      0
3754 *      radin1      th1      hout11      houtv1      tout11
3755      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3756 *      toutv1
3757      3.0000e+02

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3758 *      qpin1      qpoff1      rqpwx1      qpscl1
3759 * 0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
3760 *      iconc2      ncell2      jun3      ipow2
3761 *      0          7          449      0
3762 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
3763 *      0          0          0          0          0
3764 *      radin2      th2      hout12      houtv2      tout12
3765 * 1.2500e+00  2.5000e-02  0.0000e+00  0.0000e+00  3.0000e+02
3766 *      toutv2
3767 * 3.0000e+02
3768 *      qpin2      qpoff2      rqpwx2      qpscl2
3769 * 0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
3770 *
3771 * dx * 9.5560e-01  2.8140e-01  2.0200e-01  4.2400e-01  1.8800e-01
3772 * dx * r02 7.1000e-01  6.0500e-01  2.0000e-01  3.4600e-01  7.9100e-01
3773 * dx * e
3774 * vol * 2.5970e+00  1.3300e+00  9.4770e-01  3.6700e-01  2.2300e-01
3775 * vol * r02 7.3560e-01  6.4400e-01  9.4600e-01  1.6365e+00  2.7340e+00
3776 * vol * e
3777 * fa * 4.4179e-01  4.5584e+00  4.7298e+00r02 8.6600e-01  1.1112e+00
3778 * fa * 1.0361e+00  1.0503e+00  1.5110e+00s
3779 * fa * r02 4.7298e+00  4.4179e-01e
3780 * fric * f 0.0000e+00e
3781 * rvfric* f 0.0000e+00e
3782 * grav * 7.6600e-01r11 1.0000e+00e
3783 * hd * 7.5000e-01r02 2.3000e+00r02 1.5830e-01r04 2.0910e-01r03 7.5000e-01
3784 * hd * e
3785 * icflg * f 0e
3786 * nff * f -1e
3787 * alp * f 1.0000e+00e
3788 * vl * f 0.0000e+00e
3789 * vv * f 0.0000e+00e
3790 * tl * f 4.1339e+02e
3791 * tv * f 4.1339e+02e
3792 * p * f 3.7500e+05e
3793 * pa * f 0.0000e+00e
3794 * qppp * f 0.0000e+00e
3795 * matid * f 6e
3796 * tw * f 4.1339e+02e
3797 *
3798 * dx * r02 7.1000e-01  1.8800e-01  4.2400e-01  9.0000e-01  1.8500e+00
3799 * dx * 1.4740e+00e
3800 * vol * r02 2.3590e+00  7.0100e-01  1.7550e+00  2.8300e-02  5.8000e-02
3801 * vol * 2.8920e-01e
3802 * fa * r03 3.3230e+00r02 4.1380e+00r02 3.1400e-02  1.9630e-01e
3803 * fric * 1.0000e-04r07 0.0000e+00e
3804 * rvfric* 1.0000e-04r07 0.0000e+00e
3805 * grav * r05-1.0000e+00 -2.2300e-01 -4.4300e-01 -1.0000e+00e
3806 * hd * r04 3.1800e-01r03 2.0000e-01  4.0000e-01e
3807 * icflg * f 0e
3808 * nff * r04 1r04 -1e
3809 * alp * r04 1.0000e+00r03 0.0000e+00e
3810 * vl * f 0.0000e+00e
3811 * vv * f 0.0000e+00e
3812 * tl * r04 4.1339e+02r03 3.0800e+02e
3813 * tv * r04 4.1339e+02r03 3.0800e+02e
3814 * p * f 3.7500e+05e
3815 * pa * f 0.0000e+00e
3816 * qppp * f 0.0000e+00e
3817 * matid * f 6e
3818 * tw * r16 4.1339e+02r12 3.0800e+02e
3819 *
3820 * type      num      id      ctitle
3821 valve      42      42 $42$ bhl valve
3822 *      ncells      nodes      jun1      jun2      epsw
3823 *      12          0          42      91      0.0000e+00
3824 *      ichf      iconc      ivty      ivps      nvtb2
3825 *      0          0          4          7          0
3826 *      ivtr      ivsv      nvtb1      nvsv      nvrf
3827 *      442      100      -2          0          0
3828 *      ivtrov      ivtyov
3829 *      0          0
3830 *      rvmx      rvov      fminov      fmaxov
3831 * 1.0000e+10  0.0000e+00  0.0000e+00  1.0000e+00
3832 *      radin      th      hout1      houtv      tout1
3833 * 3.7500e-01  5.0000e-03  0.0000e+00  0.0000e+00  3.0000e+02
3834 *      toutv      avlve      hvlve      favlve      xpos
3835 * 3.0000e+02  4.4179e-01  7.5000e-01  1.0000e+00  1.0000e+00
3836 *
3837 * dx * 1.0800e+00  3.8250e+00  1.2250e+00  5.0770e+00  3.1480e+00
3838 * dx * 4.1810e+00  1.4000e+00  1.3400e+00  8.3000e+00r02 1.3585e+01
3839 * dx * 4.3300e+00e
3840 * vol * 4.7710e-01  1.6898e+00  5.4130e-01  2.2429e+00  1.3907e+00
3841 * vol * 1.8471e+00  6.1850e-01  1.7786e+00  1.1017e+01r02 1.8032e+01
3842 * vol * 5.7473e+00e
3843 * fa * r04 4.4179e-01  1.3250e-01r02 4.4179e-01r06 1.3273e+00e
3844 * fric * throttle plate k factor is 18.2 for a flow area of 0.44179 m2
3845 * fric * for a flow area of 0.1325 m2, that k factor is 1.6371
3846 * fric * fric=(k factor)xhd/(dx(4)+dx(5))=1.6371x0.75/(5.077+3.148)
3847 * fric * 0.0000e+00  2.5920e-02  2.5150e-02  0.0000e+00  1.4928e-01
3848 * fric * 1.6880e-02r02 0.0000e+00  2.0230e-02  8.9100e-03  0.0000e+00
3849 * fric * 1.0880e-02  0.0000e+00e

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3850 * rvfric*      0.0000e+00  2.5920e-02  2.5150e-02  0.0000e+00  1.4928e-01
3851 * rvfric*      1.6880e-02r02 0.0000e+00  2.0230e-02  8.9100e-03  0.0000e+00
3852 * rvfric*      1.0880e-02  0.0000e+00e
3853 * grav*        1.0000e+00  2.2020e-01  -2.4250e-01r02-1.0000e+00  -4.2950e-01
3854 * grav* r02 0.0000e+00  8.6100e-01  3.7930e-01  0.0000e+00  -2.4170e-01
3855 * grav*        -1.0000e+00e
3856 * hd* r07 7.5000e-01r06 1.3000e+00e
3857 * icflg* r04 0 1 0 1r06 0
3858 * icflg* e
3859 * nff* -1r06 1r06 -1e
3860 * alp* f 1.0000e+00e
3861 * vl* f 0.0000e+00e
3862 * vv* f 0.0000e+00e
3863 * tl* f 4.1339e+02e
3864 * tv* f 4.1339e+02e
3865 * p* f 3.7500e+05e
3866 * pa* f 0.0000e+00e
3867 *
3868 * vtbl* 0.0000e+00  1.0000e+00  2.0200e+02  1.0000e+00e
3869 *
3870 * type num id ctitle
3871 fill 45 45 $45$ bhl ecc
3872 * jun1 ifty ioff
3873 45 8 0
3874 * iftr ifsv nftb nfvsv nfrf
3875 115 100 -4 0 0
3876 * twtold rfmv concin felv
3877 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
3878 * dxin volin alpin vlin tlin
3879 3.3000e+00 1.3400e-01 0.0000e+00 0.0000e+00 3.1100e+02
3880 * pin pain flowin vvin tvin
3881 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.1100e+02
3882 * vmscl vvscl
3883 1.0000e+00 1.0000e+00
3884 *
3885 * vmtb broken-loop 4 hot-leg ecc is off
3886 * vmtb* r02 0.0000e+00 5.0000e-01 0.0000e+00 2.0000e+00 0.0000e+00
3887 * vmtb* 1.2000e+01 0.0000e+00e
3888 *
3889 * type num id ctitle
3890 valve 46 46 $46$ bcl pipe and valve
3891 * ncells nodes jun1 jun2 epsw
3892 6 4 47 46 0.0000e+00
3893 * ichf iconc ivty ivps nvtb2
3894 1 0 4 6 0
3895 * ivtr ivsv nvtb1 nvsv nvrf
3896 446 100 -2 0 0
3897 * iq3tr iq3sv nqp3tb nqp3sv nqp3rf
3898 0 0 0 0 0
3899 * ivtrov ivtyov
3900 0 0
3901 * rvmx rvov fminov fmaxov
3902 1.0000e+10 0.0000e+00 0.0000e+00 1.0000e+00
3903 * radin th houtl houtv toutl
3904 3.7500e-01 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
3905 * toutv avlve hvlve favlve xpos
3906 3.0000e+02 4.4179e-01 7.5000e-01 1.0000e+00 1.0000e+00
3907 * qp3in qp3off rqp3mx qp3scl
3908 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3909 *
3910 * dx* 6.7000e-01r02 1.5475e+00r02 1.7580e+00 1.9450e+00e
3911 * vol* 3.6110e-01r02 6.8370e-01 2.2867e+00 7.7670e-01 4.4180e-01
3912 * vol* e
3913 * fa* 6.3620e-01r06 4.4179e-01e
3914 * fric* f 0.0000e+00e
3915 * rvfric* f 0.0000e+00e
3916 * grav* f 0.0000e+00e
3917 * hd* 9.0000e-01r06 7.5000e-01e
3918 * icflg* r05 0 1 0e
3919 * nff* r03 1r02 -1 1 -1e
3920 * alp* f 1.0000e+00e
3921 * vl* f 0.0000e+00e
3922 * vv* f 0.0000e+00e
3923 * tl* f 4.1339e+02e
3924 * tv* f 4.1339e+02e
3925 * p* f 3.7500e+05e
3926 * pa* f 0.0000e+00e
3927 * qppp* f 0.0000e+00e
3928 * matid* f 6e
3929 * tw* f 4.1339e+02e
3930 * vtbl* 0.0000e+00 1.0000e+00 2.0200e+02 1.0000e+00e
3931 *
3932 * type num id ctitle
3933 tee 47 47 $47$ bcl separator and kta pipe
3934 * jcell nodes ichf cost epsw
3935 2 0 0 1.0000e+00 0.0000e+00
3936 * iconcl ncell1 jun1 jun2 ipow1
3937 0 12 48 479 0
3938 * radinl th1 houtl1 houtv1 toutl1
3939 1.2500e+00 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
3940 * toutv1
3941 3.0000e+02

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3942 *      iconc2      ncell2      jun3      ipow2
3943      0          1          46          0
3944 *      radin2      th2      hout12      houtv2      tout12
3945      6.5000e-01    6.0000e-03    0.0000e+00    0.0000e+00    3.0000e+02
3946 *      toutv2
3947      3.0000e+02
3948 *
3949 * dx *      1.5010e+00    1.3000e+00    2.2990e+00    5.5040e+00    2.8920e+00
3950 * dx *      7.6720e+00    1.4850e+01    2.2750e+01    3.5850e+00    2.3070e+00
3951 * dx *      2.9910e+00    1.6000e+00e
3952 * vol *      7.0800e-01    6.7752e+00    1.0918e+01    4.3228e+00    2.2714e+00
3953 * vol *      1.7693e+01    1.1663e+01    1.7688e+01    2.8156e+00    1.8119e+00
3954 * vol *      2.3491e+00    1.2566e+00e
3955 * fa *      1.0825e+00r02    5.2117e+00r10    7.8540e-01e
3956 * fric * f      0.0000e+00e
3957 * rvfric* f      0.0000e+00e
3958 * grav * r04-1.0000e+00    -8.2780e-01    -5.6880e-02r03    0.0000e+00    -3.8340e-01
3959 * grav *      -9.9090e-01    -6.5150e-01    0.0000e+00e
3960 * hd *      1.5830e-01r02    2.5760e+00r10    1.0000e+00e
3961 * icflg * f      0e
3962 * nff * r02      -1          1          -1          1r02          -1
3963 * nff * r06      1e
3964 * alp * r02    1.0000e+00    5.0000e-01r09    0.0000e+00e
3965 * vl * f      0.0000e+00e
3966 * vv * f      0.0000e+00e
3967 * tl * r03    4.1339e+02r09    3.0800e+02e
3968 * tv * f      4.1339e+02e
3969 * p * f      3.7500e+05e
3970 * pa * f      0.0000e+00e
3971 *
3972 * dx *      8.0000e-01e
3973 * vol *      6.7586e-01e
3974 * fa *      1.3270e+00    4.4180e-01e
3975 * fric *      1.0000e-04    0.0000e+00e
3976 * rvfric*      1.0000e-04    0.0000e+00e
3977 * grav * f      0.0000e+00e
3978 * hd *      3.1000e+00    7.5000e-01e
3979 * icflg * f      0e
3980 * nff *      1          -1e
3981 * alp *      1.0000e+00e
3982 * vl * f      0.0000e+00e
3983 * vv * f      0.0000e+00e
3984 * tl *      4.1339e+02e
3985 * tv *      4.1339e+02e
3986 * p *      3.7500e+05e
3987 * pa *      0.0000e+00e
3988 *
3989 * type      num      id      ctitle
3990 tee      48      48 $48$ bcl sep and cont pipe
3991 *      jcell      nodes      ichf      cost      epsw
3992      5          0          0          1.0000e+00    0.0000e+00
3993 *      iconc1      ncell1      jun1      jun2      ipow1
3994      0          14         48          90          0
3995 *      radin1      th1      hout11      houtv1      tout11
3996      1.2500e+00    6.0000e-03    0.0000e+00    0.0000e+00    3.0000e+02
3997 *      toutv1
3998      3.0000e+02
3999 *      iconc2      ncell2      jun3      ipow2
4000      0          7          49          0
4001 *      radin2      th2      hout12      houtv2      tout12
4002      6.5000e-01    6.0000e-03    0.0000e+00    0.0000e+00    3.0000e+02
4003 *      toutv2
4004      3.0000e+02
4005 *
4006 * dx *      4.2400e-01    1.8800e-01r02    7.1000e-01    4.0000e-01r02    9.1600e-01
4007 * dx *      8.3600e-01    3.1000e+00    6.4280e+00    8.3470e+00    1.4850e+01
4008 * dx *      1.1350e+01    8.4420e+00e
4009 * vol *      4.5900e-01    2.7130e-01r02    1.3410e+00    7.5550e-01r02    4.7739e+00
4010 * vol *      2.6543e+00    4.1137e+00    8.5300e+00    1.1076e+01    1.9706e+01
4011 * vol *      1.5061e+01    1.1203e+01e
4012 * fa * r02    1.0825e+00r04    1.8887e+00r02    5.1754e+00r07    1.3273e+00e
4013 * fric * f      0.0000e+00e
4014 * rvfric* f      0.0000e+00e
4015 * grav * r09    1.0000e+00    3.2540e-01r03    0.0000e+00    -4.3960e-01    -1.0000e+00
4016 * grav * e
4017 * hd * r02    1.5830e-01r04    2.0910e-01r02    2.5760e+00r07    1.3000e+00e
4018 * icflg * f      0e
4019 * nff * f      -1e
4020 * alp * f      1.0000e+00e
4021 * vl * f      0.0000e+00e
4022 * vv * f      0.0000e+00e
4023 * tl * f      4.1339e+02e
4024 * tv * f      4.1339e+02e
4025 * p * f      3.7500e+05e
4026 * pa * f      0.0000e+00e
4027 *
4028 * dx * r02    7.1000e-01    1.8800e-01    4.2400e-01    8.0500e-01    1.7000e+00
4029 * dx *      1.3000e+00e
4030 * vol * r02    2.1100e+00    6.5470e-01    1.6928e+00    5.1600e-02    1.1015e-01
4031 * vol *      2.4310e-01e
4032 * fa * r03    2.9719e+00    3.9925e+00r03    6.4790e-02    1.8700e-01e
4033 * fric *      1.0000e-04r07    0.0000e+00e

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4034 * rvfric* 1.0000e-04r07 0.0000e+00e
4035 * grav * r05-1.0000e+00 -3.2140e-01 -4.3330e-01 -1.0000e+00e
4036 * hd * r04 4.7230e-01r03 2.0310e-01 4.8800e-01e
4037 * icflg * f 0e
4038 * nff * r04 1 -1 1 -1 1
4039 * nff * e
4040 * alp * r04 1.0000e+00r03 0.0000e+00e
4041 * vl * f 0.0000e+00e
4042 * vv * f 0.0000e+00e
4043 * tl * r04 4.1339e+02r03 3.0800e+02e
4044 * tv * r04 4.1339e+02r03 3.0800e+02e
4045 * p * f 3.7500e+05e
4046 * pa * f 0.0000e+00e
4047 *
4048 * type num id ctitle
4049 fill 49 49 $49$ bcl separator drain
4050 * jun1 ifty ioff
4051 * 49 8 1
4052 * iftr ifsv nftb nfsv nfrf
4053 * 499 100 -2 0 0
4054 * twtold rfmv concin felv
4055 * 0.0000e+00 2.0000e+01 0.0000e+00 0.0000e+00
4056 * dxin volin alpin vlin tlin
4057 * 1.0000e+00 2.7160e+00 0.0000e+00 0.0000e+00 3.0800e+02
4058 * pin pain flowin vvin tvin
4059 * 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0800e+02
4060 * vmscl vvscl
4061 * -1.0000e+00 1.0000e+00
4062 *
4063 * vmtb * r02 0.0000e+00 5.0000e+00 1.0000e+02e
4064 *
4065 * type num id ctitle
4066 break 90 90 $90$ bcl containment break
4067 * jun1 ibty isat ioff
4068 * 90 2 0 0
4069 * ibtr ibsv nftb nbsv nbrf
4070 * 90 100 -6 0 0
4071 * dxin volin alpin tin pin
4072 * 5.0000e-01 2.5000e+01 1.0000e+00 4.1339e+02 3.7500e+05
4073 * pain concin rfmv poff belv
4074 * 0.0000e+00 0.0000e+00 1.0000e+10 3.7500e+05 0.0000e+00
4075 * pscl tlscl tvscl pascl conscl
4076 * 1.0000e+00 1.0000e+00 1.0000e+00 1.0000e+00 1.0000e+00
4077 *
4078 * ptb * 0.0000e+00 3.7500e+05 1.0000e+00 3.7500e+05s
4079 * ptb * 3.0000e+00 4.0500e+05 9.0000e+00 3.9000e+05s
4080 * ptb * 6.5000e+01 3.9000e+05 2.0200e+02 4.0000e+05e
4081 * tltb * 0.0000e+00 4.1339e+02 1.0000e+00 4.1339e+02s
4082 * tltb * 3.0000e+00 4.1612e+02 9.0000e+00 4.1477e+02s
4083 * tltb * 6.5000e+01 4.1477e+02 2.0200e+02 4.1568e+02e
4084 *
4085 * type num id ctitle
4086 break 91 91 $91$ bhl containment break
4087 * jun1 ibty isat ioff
4088 * 91 2 0 0
4089 * ibtr ibsv nftb nbsv nbrf
4090 * 91 100 -6 0 0
4091 * dxin volin alpin tin pin
4092 * 5.0000e-01 2.5000e+01 1.0000e+00 4.1339e+02 3.7500e+05
4093 * pain concin rfmv poff belv
4094 * 0.0000e+00 0.0000e+00 1.0000e+10 3.7500e+05 0.0000e+00
4095 * pscl tlscl tvscl pascl conscl
4096 * 1.0000e+00 1.0000e+00 1.0000e+00 1.0000e+00 1.0000e+00
4097 *
4098 * ptb * 0.0000e+00 3.7500e+05 1.0000e+00 3.7500e+05s
4099 * ptb * 3.0000e+00 4.0500e+05 9.0000e+00 3.9000e+05s
4100 * ptb * 6.5000e+01 3.9000e+05 2.0200e+02 4.0000e+05e
4101 * tltb * 0.0000e+00 4.1339e+02 1.0000e+00 4.1339e+02s
4102 * tltb * 3.0000e+00 4.1612e+02 9.0000e+00 4.1477e+02s
4103 * tltb * 6.5000e+01 4.1477e+02 2.0200e+02 4.1568e+02e
4104 *
4105 * type num id ctitle
4106 fill 449 449 $449$ bhl separator drain
4107 * jun1 ifty ioff
4108 * 449 8 1
4109 * iftr ifsv nftb nfsv nfrf
4110 * 666 100 -2 0 0
4111 * twtold rfmv concin felv
4112 * 0.0000e+00 2.0000e+01 0.0000e+00 0.0000e+00
4113 * dxin volin alpin vlin tlin
4114 * 1.4740e+00 2.8920e-01 0.0000e+00 0.0000e+00 3.0800e+02
4115 * pin pain flowin vvin tvin
4116 * 3.7500e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0800e+02
4117 * vmscl vvscl
4118 * -1.0000e+00 1.0000e+00
4119 *
4120 * vmtb * r02 0.0000e+00 5.0000e+00 1.0000e+02e
4121 *
4122 * type num id ctitle
4123 break 476 476 $476$ bcl sep drain pressure bc
4124 * jun1 ibty isat ioff
4125 * 476 1 3 0

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4126 *      ibtr      ibsv      nbtb      nbsv      nbrf
4127      91      100      -2      0      0
4128 *      dxin      volin      alpin      tin      pin
4129      2.5000e-01      1.9640e-01      0.0000e+00      3.0800e+02      2.0000e+05
4130 *      pain      concin      rbmx      poff      belv
4131      0.0000e+00      0.0000e+00      1.0000e+10      2.0000e+05      0.0000e+00
4132 *      pscl      tpscl      tvscl      pascl      conscl
4133      1.0000e+00      1.0000e+00      1.0000e+00      1.0000e+00      1.0000e+00
4134 *
4135 * ptb *      0.0000e+00      2.0000e+05      2.0200e+02      2.0000e+05e
4136 *
4137 * type      num      id      ctitle
4138 valve      477      477 $477$ bcl sep primary drain valve
4139 *      ncells      nodes      jun1      jun2      epsw
4140      2      4      479      476      0.0000e+00
4141 *      ichf      iconc      ivty      ivps      nvth2
4142      1      0      4      2      0
4143 *      ivtr      ivsv      nvtb1      nvsv      nvrf
4144      479      100      -2      0      0
4145 *      iqp3tr      iqp3sv      nqp3tb      nqp3sv      nqp3rf
4146      0      0      0      0      0
4147 *      ivtrov      ivtyov
4148      0      0
4149 *      rvmx      rvov      fminov      fmaxov
4150      2.0000e-01      0.0000e+00      0.0000e+00      1.0000e+00
4151 *      radin      th      hout1      houtv      tout1
4152      3.7500e-01      5.0000e-03      0.0000e+00      0.0000e+00      3.0000e+02
4153 *      toutv      avlve      hv1ve      fav1ve      xpos
4154      3.0000e+02      7.8540e-01      1.0000e+00      0.0000e+00      0.0000e+00
4155 *      qp3in      qp3off      rqp3mx      qp3scl
4156      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
4157 *
4158 * dx * f      2.5000e-01e
4159 * vol * f      1.9640e-01e
4160 * fa * f      7.8540e-01e
4161 * fric *      0.0000e+00      4.5000e+01      0.0000e+00e
4162 * rvfric*      0.0000e+00      4.5000e+01      0.0000e+00e
4163 * grav * f      0.0000e+00e
4164 * hd * f      1.0000e+00e
4165 * icflg *      0      1      0e
4166 * nff * f      1e
4167 * alp * f      0.0000e+00e
4168 * vl * f      0.0000e+00e
4169 * vv * f      0.0000e+00e
4170 * tl * f      3.0800e+02e
4171 * tv * f      3.0800e+02e
4172 * p *      3.7500e+05      2.0000e+05e
4173 * pa * f      0.0000e+00e
4174 * qppp * f      0.0000e+00e
4175 * matid * f      6e
4176 * tw * f      3.0800e+02e
4177 *
4178 * vtbl * r02 0.0000e+00      5.0000e+00      1.0000e+00e
4179 *
4180 * type      num      id      ctitle
4181 slab      999      999 $999$ level 1-6 cell 1-4
4182 *      ncrx      ncrz      ittc      iext
4183      4      6      0      0
4184 *      nopowr      nrldr      modez      liqlev      iaxcnd
4185      1      1      1      0      0
4186 *      idbci      idbco      hdri      hdro
4187      0      2      0.0000e+00      0.0000e+00
4188 *      width      ipatch
4189      1.0000e+00      0
4190 *      nrods      nodes      irftr      nzmax      irftr2
4191      4      5      0      13      0
4192 *      dtxht(1)      dtxht(2)      dznht      hgapo      shelv
4193      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00      0.0000e+00
4194 *
4195 * nhcomo* f      1e
4196 * nhcelo*      0      1      2      3      4
4197 * nhcelo*      5      6      7e
4198 * dz *      1.7040e+01      2.7700e+00      1.5120e+01      2.7940e+01      2.8250e+01
4199 * dz *      3.6910e+01e
4200 * grav * f      1.0000e+00e
4201 * idrod *      1      2      3      4e
4202 * rdx * f      1.0000e+00e
4203 * radrd *      0.0000e+00      1.5000e-02      2.5000e-02      2.7000e-02      3.0000e-02
4204 * radrd * e
4205 * matrd * f      6e
4206 * nfax * f      1e
4207 * rftn * r05 3.8600e+02r05 4.0100e+02r05 4.0500e+02r05 4.1000e+02r15 4.1339e+02
4208 * rftn * e
4209 * rftn * r05 3.8600e+02r05 4.0100e+02r05 4.0500e+02r05 4.1000e+02r15 4.1339e+02
4210 * rftn * e
4211 * rftn * r05 3.8600e+02r05 4.0100e+02r05 4.0500e+02r05 4.1000e+02r15 4.1339e+02
4212 * rftn * e
4213 * rftn * r05 3.8600e+02r05 4.0100e+02r05 4.0500e+02r05 4.1000e+02r15 4.1339e+02
4214 * rftn * e
4215 *
4216 * type      num      id      ctitle
4217 slab      998      998 $998$ level 1-6 cell 5-8

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4218 *      ncrx      ncrz      ittc      iext
4219      4          6          0          0
4220 *      nopowr    nridr      modez      liqlev      iaxcnd
4221      1          1          1          0          0
4222 *      idbci      idbco      hdri      hdro
4223      0          2      0.0000e+00  0.0000e+00
4224 *      width      ipatch
4225      1.0000e+00  0
4226 *      nrods      nodes      irftr      nzmax      irftr2
4227      4          5          0          13          0
4228 *      dtxht(1)  dtxht(2)  dznht      hgapo      shelv
4229      3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00  0.0000e+00
4230 *
4231 * nhcomo* f      1e
4232 * nhcelo*      0          1          2          3          4
4233 * nhcelo*      5          6          7e
4234 * dz *      2.2400e+00  4.1300e+00  2.5400e+00r02  9.8900e+00  7.2000e+00
4235 * dz * e
4236 * grav * f      1.0000e+00e
4237 * idrod *      5          6          7          8e
4238 * rdx * f      1.0000e+00e
4239 * radrd *      0.0000e+00  2.5000e-02  4.0000e-02  4.7000e-02  5.0000e-02
4240 * radrd * e
4241 * matrd * f      6e
4242 * nfax * f      1e
4243 * rftn * r05 3.8600e+02r05 4.0100e+02r05 4.0500e+02r05 4.1000e+02r15 4.1339e+02
4244 * rftn * e
4245 * rftn * r05 3.8600e+02r05 4.0100e+02r05 4.0500e+02r05 4.1000e+02r15 4.1339e+02
4246 * rftn * e
4247 * rftn * r05 3.8600e+02r05 4.0100e+02r05 4.0500e+02r05 4.1000e+02r15 4.1339e+02
4248 * rftn * e
4249 * rftn * r05 3.8600e+02r05 4.0100e+02r05 4.0500e+02r05 4.1000e+02r15 4.1339e+02
4250 * rftn * e
4251 *
4252 * type      num      id      ctitle
4253 slab      997      997 $997$ level 7 cell 1-4
4254 *      ncrx      ncrz      ittc      iext
4255      4          1          0          0
4256 *      nopowr    nridr      modez      liqlev      iaxcnd
4257      1          1          1          0          0
4258 *      idbci      idbco      hdri      hdro
4259      0          2      0.0000e+00  0.0000e+00
4260 *      width      ipatch
4261      1.0000e+00  0
4262 *      nrods      nodes      irftr      nzmax      irftr2
4263      4          5          0          3          0
4264 *      dtxht(1)  dtxht(2)  dznht      hgapo      shelv
4265      3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00  0.0000e+00
4266 *
4267 * nhcomo* f      1e
4268 * nhcelo*      6          7          8e
4269 * dz *      8.6100e+01e
4270 * grav *      1.0000e+00e
4271 * idrod *      1          2          3          4e
4272 * rdx * f      1.0000e+00e
4273 * radrd *      0.0000e+00  5.5600e-03  8.8900e-03  1.0000e-02  1.1110e-02
4274 * radrd * e
4275 * matrd * f      6e
4276 * nfax * f      1e
4277 * rftn * f      4.1339e+02e
4278 * rftn * f      4.1339e+02e
4279 * rftn * f      4.1339e+02e
4280 * rftn * f      4.1339e+02e
4281 *
4282 * type      num      id      ctitle
4283 slab      996      996 $996$ level 8 cell 1-4
4284 *      ncrx      ncrz      ittc      iext
4285      4          1          0          0
4286 *      nopowr    nridr      modez      liqlev      iaxcnd
4287      1          1          1          0          0
4288 *      idbci      idbco      hdri      hdro
4289      0          2      0.0000e+00  0.0000e+00
4290 *      width      ipatch
4291      1.0000e+00  0
4292 *      nrods      nodes      irftr      nzmax      irftr2
4293      4          5          0          3          0
4294 *      dtxht(1)  dtxht(2)  dznht      hgapo      shelv
4295      3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00  0.0000e+00
4296 *
4297 * nhcomo* f      1e
4298 * nhcelo*      7          8          9e
4299 * dz *      5.5380e+01e
4300 * grav *      1.0000e+00e
4301 * idrod *      1          2          3          4e
4302 * rdx * f      1.0000e+00e
4303 * radrd *      0.0000e+00  7.9170e-03  1.2666e-02  1.4250e-02  1.5833e-02
4304 * radrd * e
4305 * matrd * f      6e
4306 * nfax * f      1e
4307 * rftn * f      4.1339e+02e
4308 * rftn * f      4.1339e+02e
4309 * rftn * f      4.1339e+02e

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4310 * rftn * f 4.1339e+02e
4311 *
4312 * type num id ctitle
4313 slab 995 995 $995$ level 7-8 cell 5-8
4314 * ncrx ncrz ittc iext
4315 * 4 2 0 0
4316 * nopowr nrldr modez liqlev iaxcnd
4317 * 1 1 1 0 0
4318 * idbci idbco hdri hdro
4319 * 0 2 0.0000e+00 0.0000e+00
4320 * width ipatch
4321 * 1.0000e+00 0
4322 * nrods nodes irftr nzmax irftr2
4323 * 4 5 0 5 0
4324 * dtxht(1) dtxht(2) dznht hgapo shelv
4325 * 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00 0.0000e+00
4326 *
4327 * nhcomo* f 1e
4328 * nhcelo* 6 7 8 9e
4329 * dz * 1.4700e+00 1.8800e+00e
4330 * grav * f 1.0000e+00e
4331 * idrod * 5 6 7 8e
4332 * rdx * f 1.0000e+00e
4333 * radrd * 0.0000e+00 4.6300e-02 7.4000e-02 8.3300e-02 9.2500e-02
4334 * radrd * e
4335 * matrdr * f 6e
4336 * nfax * f 1e
4337 * rftn * f 4.1339e+02e
4338 * rftn * f 4.1339e+02e
4339 * rftn * f 4.1339e+02e
4340 * rftn * f 4.1339e+02e
4341 *
4342 * type num id ctitle
4343 slab 994 994 $994$ level 9 cell 1-4
4344 * ncrx ncrz ittc iext
4345 * 4 1 0 0
4346 * nopowr nrldr modez liqlev iaxcnd
4347 * 1 1 1 0 0
4348 * idbci idbco hdri hdro
4349 * 0 2 0.0000e+00 0.0000e+00
4350 * width ipatch
4351 * 1.0000e+00 0
4352 * nrods nodes irftr nzmax irftr2
4353 * 4 5 0 3 0
4354 * dtxht(1) dtxht(2) dznht hgapo shelv
4355 * 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00 0.0000e+00
4356 *
4357 * nhcomo* f 1e
4358 * nhcelo* 8 9 10e
4359 * dz * 1.2860e+01e
4360 * grav * 1.0000e+00e
4361 * idrod * 1 2 3 4e
4362 * rdx * f 1.0000e+00e
4363 * radrd * 0.0000e+00 1.6710e-02 2.6730e-02 3.0070e-02 3.3410e-02
4364 * radrd * e
4365 * matrdr * f 6e
4366 * nfax * f 1e
4367 * rftn * f 4.1339e+02e
4368 * rftn * f 4.1339e+02e
4369 * rftn * f 4.1339e+02e
4370 * rftn * f 4.1339e+02e
4371 *
4372 * type num id ctitle
4373 slab 993 993 $993$ level 10 cell 1-4
4374 * ncrx ncrz ittc iext
4375 * 4 1 0 0
4376 * nopowr nrldr modez liqlev iaxcnd
4377 * 1 1 1 0 0
4378 * idbci idbco hdri hdro
4379 * 0 2 0.0000e+00 0.0000e+00
4380 * width ipatch
4381 * 1.0000e+00 0
4382 * nrods nodes irftr nzmax irftr2
4383 * 4 5 0 3 0
4384 * dtxht(1) dtxht(2) dznht hgapo shelv
4385 * 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00 0.0000e+00
4386 *
4387 * nhcomo* f 1e
4388 * nhcelo* 9 10 11e
4389 * dz * 1.3270e+01e
4390 * grav * 1.0000e+00e
4391 * idrod * 1 2 3 4e
4392 * rdx * f 1.0000e+00e
4393 * radrd * 0.0000e+00 1.1090e-02 1.7740e-02 1.9960e-02 2.2180e-02
4394 * radrd * e
4395 * matrdr * f 6e
4396 * nfax * f 1e
4397 * rftn * f 4.1339e+02e
4398 * rftn * f 4.1339e+02e
4399 * rftn * f 4.1339e+02e
4400 * rftn * f 4.1339e+02e
4401 *

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4402 * type          num          id          ctitle
4403 slab          992          992 $992$ level 9-10 cell 5-8
4404 *          ncrx          ncrz          ittc          iext
4405 *          4          2          0          0
4406 *          nopowr          nridr          modez          liqlev          iaxcnd
4407 *          1          1          1          0          0
4408 *          idbci          idbco          hdri          hdro
4409 *          0          2          0.0000e+00          0.0000e+00
4410 *          width          ipatch
4411 *          1.0000e+00          0
4412 *          nrods          nodes          irftr          nzmax          irftr2
4413 *          4          5          0          5          0
4414 *          dtxht(1)          dtxht(2)          dznht          hgapo          shelv
4415 *          3.0000e+00          1.0000e+01          0.0000e+00          0.0000e+00          0.0000e+00
4416 *
4417 * nhcomo* f          1e
4418 * nhcelo*          8          9          10          11e
4419 * dz *          1.8400e+00          5.2380e+00e
4420 * grav * f          1.0000e+00e
4421 * idrod *          5          6          7          8e
4422 * rdx * f          1.0000e+00e
4423 * radrd *          0.0000e+00          5.6300e-02          9.0000e-02          1.0130e-01          1.1250e-01
4424 * radrd * e
4425 * matrdr * f          6e
4426 * nfax * f          1e
4427 * rftn * f          4.1339e+02e
4428 * rftn * f          4.1339e+02e
4429 * rftn * f          4.1339e+02e
4430 * rftn * f          4.1339e+02e
4431 *
4432 * type          num          id          ctitle
4433 slab          991          991 $991$ level 11 cell 1-2
4434 *          ncrx          ncrz          ittc          iext
4435 *          2          1          0          0
4436 *          nopowr          nridr          modez          liqlev          iaxcnd
4437 *          1          1          1          0          0
4438 *          idbci          idbco          hdri          hdro
4439 *          0          2          0.0000e+00          0.0000e+00
4440 *          width          ipatch
4441 *          1.0000e+00          0
4442 *          nrods          nodes          irftr          nzmax          irftr2
4443 *          2          5          0          3          0
4444 *          dtxht(1)          dtxht(2)          dznht          hgapo          shelv
4445 *          3.0000e+00          1.0000e+01          0.0000e+00          0.0000e+00          0.0000e+00
4446 *
4447 * nhcomo* f          1e
4448 * nhcelo*          10          11          12e
4449 * dz *          1.3430e+01e
4450 * grav *          1.0000e+00e
4451 * idrod *          1          2e
4452 * rdx * f          1.0000e+00e
4453 * radrd *          0.0000e+00          1.1090e-02          1.7740e-02          1.9960e-02          2.2175e-02
4454 * radrd * e
4455 * matrdr * f          6e
4456 * nfax * f          1e
4457 * rftn * f          4.1339e+02e
4458 * rftn * f          4.1339e+02e
4459 *
4460 * type          num          id          ctitle
4461 slab          990          990 $990$ level 11 cell 3-4
4462 *          ncrx          ncrz          ittc          iext
4463 *          2          1          0          0
4464 *          nopowr          nridr          modez          liqlev          iaxcnd
4465 *          1          1          1          0          0
4466 *          idbci          idbco          hdri          hdro
4467 *          0          2          0.0000e+00          0.0000e+00
4468 *          width          ipatch
4469 *          1.0000e+00          0
4470 *          nrods          nodes          irftr          nzmax          irftr2
4471 *          2          5          0          3          0
4472 *          dtxht(1)          dtxht(2)          dznht          hgapo          shelv
4473 *          3.0000e+00          1.0000e+01          0.0000e+00          0.0000e+00          0.0000e+00
4474 *
4475 * nhcomo* f          1e
4476 * nhcelo*          10          11          12e
4477 * dz *          1.3430e+01e
4478 * grav *          1.0000e+00e
4479 * idrod *          3          4e
4480 * rdx * f          1.0000e+00e
4481 * radrd *          0.0000e+00          9.4100e-03          1.5050e-02          1.6930e-02          1.8810e-02
4482 * radrd * e
4483 * matrdr * f          6e
4484 * nfax * f          1e
4485 * rftn * f          4.1339e+02e
4486 * rftn * f          4.1339e+02e
4487 *
4488 * type          num          id          ctitle
4489 slab          989          989 $989$ level 11 cell 5-6
4490 *          ncrx          ncrz          ittc          iext
4491 *          2          1          0          0
4492 *          nopowr          nridr          modez          liqlev          iaxcnd
4493 *          1          1          1          0          0

```

```

4494 *      idbci      idbco      hdri      hdro
4495 *          0          2      0.0000e+00      0.0000e+00
4496 *      width      ipatch
4497 *      1.0000e+00      0
4498 *      nrods      nodes      irftr      nzmax      irftr2
4499 *          2          5          0          3          0
4500 *      dtxht(1)      dtxht(2)      dznht      hgapo      shelv
4501 *      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00      0.0000e+00
4502 *
4503 * nhcomo* f          1e
4504 * nhcelo*          10          11          12e
4505 * dz *          3.6100e+00e
4506 * grav *          1.0000e+00e
4507 * idrod *          5          6e
4508 * rdx * f          1.0000e+00e
4509 * radrd *          0.0000e+00      6.3000e-02      1.0080e-01      1.1340e-01      1.2100e-01
4510 * radrd * e
4511 * matr * f          6e
4512 * nfax *          1e
4513 * rftn * f          4.1339e+02e
4514 * rftn * f          4.1339e+02e
4515 *
4516 * type          num          id          ctitle
4517 slab          988          988 $988$ level 11 cell 7-8
4518 *      ncrx          ncrz          ittc          iext
4519 *          2          1          0          0
4520 *      nopowr          nridr          modez          liqlev          iaxcnd
4521 *          1          1          1          0          0
4522 *      idbci          idbco          hdri          hdro
4523 *          0          2      0.0000e+00      0.0000e+00
4524 *      width      ipatch
4525 *      1.0000e+00      0
4526 *      nrods      nodes      irftr      nzmax      irftr2
4527 *          2          5          0          3          0
4528 *      dtxht(1)      dtxht(2)      dznht      hgapo      shelv
4529 *      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00      0.0000e+00
4530 *
4531 * nhcomo* f          1e
4532 * nhcelo*          10          11          12e
4533 * dz *          3.6100e+00e
4534 * grav *          1.0000e+00e
4535 * idrod *          7          8e
4536 * rdx * f          1.0000e+00e
4537 * radrd *          0.0000e+00      6.3000e-02      1.0080e-01      1.1340e-01      1.2600e-01
4538 * radrd * e
4539 * matr * f          6e
4540 * nfax *          1e
4541 * rftn * f          4.1339e+02e
4542 * rftn * f          4.1339e+02e
4543 *
4544 * type          num          id          ctitle
4545 slab          987          987 $987$ level 12 cell 1-4
4546 *      ncrx          ncrz          ittc          iext
4547 *          4          1          0          0
4548 *      nopowr          nridr          modez          liqlev          iaxcnd
4549 *          1          1          1          0          0
4550 *      idbci          idbco          hdri          hdro
4551 *          0          2      0.0000e+00      0.0000e+00
4552 *      width      ipatch
4553 *      1.0000e+00      0
4554 *      nrods      nodes      irftr      nzmax      irftr2
4555 *          4          5          0          3          0
4556 *      dtxht(1)      dtxht(2)      dznht      hgapo      shelv
4557 *      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00      0.0000e+00
4558 *
4559 * nhcomo* f          1e
4560 * nhcelo*          11          12          13e
4561 * dz *          2.4510e+01e
4562 * grav *          1.0000e+00e
4563 * idrod *          1          2          3          4e
4564 * rdx * f          1.0000e+00e
4565 * radrd *          0.0000e+00      1.7860e-02      2.8580e-02      3.2150e-02      3.5722e-02
4566 * radrd * e
4567 * matr * f          6e
4568 * nfax *          1e
4569 * rftn * f          4.1339e+02e
4570 * rftn * f          4.1339e+02e
4571 * rftn * f          4.1339e+02e
4572 * rftn * f          4.1339e+02e
4573 *
4574 * type          num          id          ctitle
4575 slab          986          986 $986$ level 12 cell 5-8
4576 *      ncrx          ncrz          ittc          iext
4577 *          4          1          0          0
4578 *      nopowr          nridr          modez          liqlev          iaxcnd
4579 *          1          1          1          0          0
4580 *      idbci          idbco          hdri          hdro
4581 *          0          2      0.0000e+00      0.0000e+00
4582 *      width      ipatch
4583 *      1.0000e+00      0
4584 *      nrods      nodes      irftr      nzmax      irftr2
4585 *          4          5          0          3          0

```

```

4586 *      dtxht(1)      dtxht(2)      dznht      hgapo      shelv
4587 *      3.0000e+00    1.0000e+01    0.0000e+00    0.0000e+00    0.0000e+00
4588 *
4589 * nhcomo* f          1e
4590 * nhcelo*          11          12          13e
4591 * dz *          5.3300e+00e
4592 * grav *          1.0000e+00e
4593 * idrod *          5          6          7          8e
4594 * rdx * f          1.0000e+00e
4595 * radrd *          0.0000e+00    5.6300e-02    9.0000e-02    1.0800e-01    1.2000e-01
4596 * radrd * e
4597 * matrdr * f          6e
4598 * nfax *          1e
4599 * rftn * f          4.1339e+02e
4600 * rftn * f          4.1339e+02e
4601 * rftn * f          4.1339e+02e
4602 * rftn * f          4.1339e+02e
4603 *
4604 * type      num      id      ctitle
4605 slab      985      985 $985$ level 13 cell 1-4
4606 *      ncrx      ncrz      ittc      iext
4607 *      4          1          0          0
4608 *      nopowr      nrldr      modez      liqlev      iaxcnd
4609 *      1          1          1          0          0
4610 *      idbci      idbco      hdri      hdro
4611 *      0          2          0.0000e+00    0.0000e+00
4612 *      width      ipatch
4613 *      1.0000e+00    0
4614 *      nrods      nodes      irftr      nzmax      irftr2
4615 *      4          5          0          3          0
4616 *      dtxht(1)    dtxht(2)    dznht      hgapo      shelv
4617 *      3.0000e+00    1.0000e+01    0.0000e+00    0.0000e+00    0.0000e+00
4618 *
4619 * nhcomo* f          1e
4620 * nhcelo*          12          13          14e
4621 * dz *          7.2070e+01e
4622 * grav *          1.0000e+00e
4623 * idrod *          1          2          3          4e
4624 * rdx * f          1.0000e+00e
4625 * radrd *          0.0000e+00    3.2298e-02    5.1667e-02    5.8136e-02    6.4596e-02
4626 * radrd * e
4627 * matrdr * f          6e
4628 * nfax *          1e
4629 * rftn * f          4.1339e+02e
4630 * rftn * f          4.1339e+02e
4631 * rftn * f          4.1339e+02e
4632 * rftn * f          4.1339e+02e
4633 *
4634 * type      num      id      ctitle
4635 slab      984      984 $984$ level 13 cell 5-8
4636 *      ncrx      ncrz      ittc      iext
4637 *      4          1          0          0
4638 *      nopowr      nrldr      modez      liqlev      iaxcnd
4639 *      1          1          1          0          0
4640 *      idbci      idbco      hdri      hdro
4641 *      0          2          0.0000e+00    0.0000e+00
4642 *      width      ipatch
4643 *      1.0000e+00    0
4644 *      nrods      nodes      irftr      nzmax      irftr2
4645 *      4          5          0          3          0
4646 *      dtxht(1)    dtxht(2)    dznht      hgapo      shelv
4647 *      3.0000e+00    1.0000e+01    0.0000e+00    0.0000e+00    0.0000e+00
4648 *
4649 * nhcomo* f          1e
4650 * nhcelo*          12          13          14e
4651 * dz *          9.1800e+00e
4652 * grav *          1.0000e+00e
4653 * idrod *          5          6          7          8e
4654 * rdx * f          1.0000e+00e
4655 * radrd *          0.0000e+00    6.5000e-02    1.0400e-01    1.1700e-01    1.3000e-01
4656 * radrd * e
4657 * matrdr * f          6e
4658 * nfax *          1e
4659 * rftn * f          4.1339e+02e
4660 * rftn * f          4.1339e+02e
4661 * rftn * f          4.1339e+02e
4662 * rftn * f          4.1339e+02e
4663 *
4664 end
4665 *
4666 *****
4667 * time-step data *
4668 *****
4669 *
4670 *      dtmin      dtmax      tend      rtwfp
4671 *      1.0000e-07    2.5000e-02    10.000e+00    1.0000e+00
4672 *      edint      g fint      dmpint      sedint
4673 *      1.0000e+01    5.0000e-01    1.0000e+01    1.0000e+01
4674 *
4675 *      dtmin      dtmax      tend      rtwfp
4676 *      1.0000e-07    5.0000e-03    2.0000e+01    1.0000e+00
4677 *      edint      g fint      dmpint      sedint

```

4678	*	1.0000e+01	5.0000e-01	1.0000e+01	1.0000e+01
4679	*	dtmin	dtmax	tend	rtwfp
4680	*	1.0000e-07	2.5000e-02	5.7000e+01	1.0000e+00
4681	*	edint	gfint	dmpint	sedint
4682	*	1.0000e+01	5.0000e-01	1.0000e+01	1.0000e+01
4683	*	dtmin	dtmax	tend	rtwfp
4684	*	1.0000e-07	0.5000e-02	2.0200e+02	1.0000e+00
4685	*	edint	gfint	dmpint	sedint
4686	*	2.5000e+01	5.0000e-01	2.5000e+01	2.5000e+01
4687	*	endflag			
4688	*	-1.0000e+00			
4689	*				
4690	*				
4691	*				

UPTF COLD-LEG TEST 8B TRANSIENT-RESTART INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *      numtcr      ieos      inopt      rmat
8 *          8          0          1          0
9 Corrected UPTF Test 8B, By J. F. Lime, October 1999
10 The UPTF8B input model was corrected to model the vessel drain
11 mass flow more accurately. This was done by removing the vessel
12 drain valve and pressure boundary and replacing them with a
13 negative-flow Fill component that modeled the measured drain
14 mass flow. A slight adjustment in the downcomer volume fraction
15 was also made to match the measured downcomer liquid level at
16 initial conditions.
17 *
18 *****
19 ****  uptf test 8, phase b, part 1, run 111, post-test calculation  ****
20 *****
21 *
22 *
23 *      off
24 *      hl-ecc
25 *      #####
26 *      # fill #                loop 1
27 *      # 15 #
28 *      #####
29 *      15
30 *      #####          #####          #####
31 *      # tee #                # tee # # valve#
32 *      10# 10 #11          11# 11 #18# 19 #
33 *      #####          #####          #####
34 *      # tee #                # tee # # tee #
35 *      17# 14 #14# 13 #13# 12 #19# 18 #
36 *      #####          #####          #####
37 *      # tee #                # tee # # tee #
38 *      16          113          119
39 *      #####          #####          #####
40 *      # fill #                # fill #
41 *      # 16 #                # 113 #
42 *      #####          #####          #####
43 *      # 16 #                # 113 #
44 *      # 16 #                # 119 #
45 *      # 16 #                # 113 #
46 *      # 16 #                # 119 #
47 *      # 16 #                # 113 #
48 *      # 16 #                # 119 #
49 *      # 16 #                # 113 #
50 *      # 16 #                # 119 #
51 *      # 16 #                # 113 #
52 *      # 16 #                # 119 #
53 *      # 16 #                # 113 #
54 *      # 16 #                # 119 #
55 *      # 16 #                # 113 #
56 *      # 16 #                # 119 #
57 *      # 16 #                # 113 #
58 *      # 16 #                # 119 #
59 *      # 16 #                # 113 #
60 *      # 16 #                # 119 #
61 *      # 16 #                # 113 #
62 *      # 16 #                # 119 #
63 *      # 16 #                # 113 #
64 *      # 16 #                # 119 #
65 *      # 16 #                # 113 #
66 *      # 16 #                # 119 #
67 *      # 16 #                # 113 #
68 *      # 16 #                # 119 #
69 *      # 16 #                # 113 #
70 *      # 16 #                # 119 #
71 *      # 16 #                # 113 #
72 *      # 16 #                # 119 #
73 *      # 16 #                # 113 #
74 *      # 16 #                # 119 #
75 *      # 16 #                # 113 #
76 *      # 16 #                # 119 #
77 *      # 16 #                # 113 #
78 *      # 16 #                # 119 #
79 *      # 16 #                # 113 #
80 *      # 16 #                # 119 #
81 *      # 16 #                # 113 #
82 *      # 16 #                # 119 #
83 *      # 16 #                # 113 #
84 *      # 16 #                # 119 #
85 *      # 16 #                # 113 #
86 *      # 16 #                # 119 #
87 *      # 16 #                # 113 #

```

```

88 * #####
89 *      36      333      339
90 * #####
91 * # fill # # fill # # fill #
92 * # 36 # # 333 # # 339 #
93 * #####
94 * cl-ecc      steam      controlled
95 * off        off        drain
96 *
97 *
98 *
99 *      off
100 *      hl-ecc      drain
101 * #####
102 * # fill # # fill #      loop 4
103 * # 45 # # 449 #
104 * #####
105 *      45      449      containment
106 * #####
107 * # tee # # tee # # valve# # break#
108 * 40# 40 #41# 41 #42# 42 #91# 91 #
109 * #####
110 * #####
111 * # valve# # tee # # tee # # break#
112 * 47# 46 #46# 47 #48# 48 #90# 90 #
113 * #####
114 *      479      49      containment
115 * #####
116 * # break# # valve# # fill #
117 * # 476 476# 477 # # 49 #
118 * #####
119 * drain      drain
120 *
121 *
122 * #####
123 * # vessel 1 with (r=2, t=4, z=13) #
124 * # slab heat str 999 cells 1-4 levels 1-6 #
125 * # slab heat str 998 cells 5-8 levels 1-6 #10
126 * # slab heat str 997 cells 1-4 level 7 #
127 * # slab heat str 996 cells 1-4 level 8 #
128 * # slab heat str 995 cells 5-8 levels 7-8 #
129 * # slab heat str 994 cells 1-4 level 9 #
130 * # slab heat str 993 cells 1-4 level 10 #17
131 * # slab heat str 992 cells 5-8 levels 9-10 #
132 * # slab heat str 991 cells 1-2 level 11 #
133 * # slab heat str 990 cells 3-4 level 11 #
134 * # slab heat str 989 cells 5-6 level 11 #
135 * # slab heat str 988 cells 7-8 level 11 #20
136 * # slab heat str 987 cells 1-4 level 12 #
137 * # slab heat str 986 cells 5-8 level 12 #
138 * # slab heat str 985 cells 1-4 level 13 #
139 * # slab heat str 984 cells 5-8 level 13 #
140 * # core core #27
141 * # feedback feedback #
142 * ##### #
143 * # fill # # fill # #
144 * # # 701 # # 703 # #
145 * # ##### on ##### on #30
146 * # 701 steam 703 steam #
147 * # ##### #
148 * # tee # # fill # # tee # # fill # #
149 * # 501 #601 601 # # 503 #603 603 # #
150 * # ##### #37
151 * # 501 503 #
152 * # 502 504 #
153 * # ##### #
154 * # fill # # tee # # fill # # tee # #
155 * # 602 602# 502 # # 604 604# 504 # #40
156 * # ##### #
157 * # steam 702 steam 704 #
158 * # on ##### on ##### #
159 * # fill # # fill # #
160 * # # 702 # # 704 # #47
161 * # ##### #
162 * # feedback feedback #
163 * # core core #
164 * # ##### #
165 * # 101 104 102 103 #
166 * # ##### #
167 * # tee # # tee # #
168 * # 101# 102 # # 101 #103 #
169 * # ##### #
170 * # 106 105 #
171 * # ##### #
172 * # tee # #
173 * # 106# 103 #
174 * # ##### #
175 * # 107 #
176 * # ##### #
177 * # fill # #
178 * # 107 # #
179 * # ##### #

```



```

180 *                vessel drain
181 *
182 *
183 *****
184 * namelist data *
185 *****
186 *
187 &inopts
188 dtstrt=0.0001, iadded=10, icflow=2 , imfr=3 ,
189 nfrcl=2 , nfr3=1 , nhtstr=16, noair=1,
190 &end
191 *
192 *         dstep          timet
193         5585          30.017200
194 *         stdyst          transi          ncomp          njun          ipak
195         0              1              81              73              1
196 *         epso            epps
197         1.0000e-04      1.0000e-04
198 *         oitmax          sitmax          isolut          ncontr          nccfl
199         10              10              0              0              0
200 *         ntsv            ntcbl          ntcfl          ntrp          ntcp
201         28              38              252             20              1
202 *
203 *****
204 * component-number data *
205 *****
206 *
207 * iorder*           1           10           11           12           13
208 * iorder*           14          15           16           18           19
209 * iorder*           20          21           22           23           24
210 * iorder*           25          26           27           28           29
211 * iorder*           30          31           32           33           34
212 * iorder*           35          36           38           39           40
213 * iorder*           41          42           45           46           47
214 * iorder*           48          49           90           91           101
215 * iorder*           102         103          107          113 s
216 * iorder*           119         223          228          229          333
217 * iorder*           339         449          476          477          501
218 * iorder*           502         503          504          601          602
219 * iorder*           603         604          701          702          703
220 * iorder*           704         984          985          986          987
221 * iorder*           988         989          990          991          992
222 * iorder*           993         994          995          996          997
223 * iorder*           998         999e
224 *
225 *****
226 * control-parameter data *
227 *****
228 *
229 * signal variables
230 0
231 *
232 * control blocks
233 *
234 0
235 *
236 * trips
237 *
238 *         ntse          ntct          ntsf          ntqp          ntsd
239         0              5              4              1              0
240 *
241 *         idtp          isrt          iset          itst          idsg
242 0 0 0 0 0
243 *
244 *         ndmp
245         1
246 *         idmp(1)
247         -999
248 *
249 *****
250 * component data *
251 *****
252 *
253 *
254 end
255 *
256 *****
257 * time-step data *
258 *****
259 *
260 *         dtmin          dtmax          tend          rtwfp
261         1.0000e-07      2.5000e-02      5.7000e+01      1.0000e+00
262 *         edint          gfind          dmpint          sedint
263         1.0000e+01      5.0000e-01      1.0000e+01      1.0000e+01
264 *
265 *         dtmin          dtmax          tend          rtwfp
266         1.0000e-07      0.5000e-02      2.0200e+02      1.0000e+00
267 *         edint          gfind          dmpint          sedint
268         2.5000e+01      5.0000e-01      2.5000e+01      2.5000e+01
269 *
270 *         endflag
271         -1.0000e+00

```

APPENDIX H

UPTF DOWNCOMER TEST 6 INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numtcr          ieos          inopt          rmat
8 *              15              0              1              0
9 uptf downcomer test 6, run 133
10 bnl modified the deck on april 14,1988 for test 6 run131
11 uptf posttest no. 10b      february 2, 1988:brent boyack
12 used deck no. 1.2,revision from 1.0 based on:
13 minutes of frg mtg nov,84, vessel mods to lp and dc from plank
14 pump simulator volumes per hertlein, base steam per hertlein
15 valve 477 and break added to bcl primary drain
16 added the decay heat to control blks,changed hfg to 2.133e06
17 -----New comments, Norm Schnurr, 1/18/90 -----
18 This input deck was obtained from Henry Stumpf. It is a simulation of
19 UPTF Test 6 - Run 133 and was run with TRAC-PP1/MOD1 Vers. 14.3. I ran
20 it through GOCRVT3 to produce an input deck for MOD2, Vers. 4.8. It
21 was also necessary to change a few flow areas in the vessel and in some
22 TEES to satisfy restrictions imposed by newer versions of TRAC.
23 **** This is a revision of UPTF133* for 8 azimuthal sections - 1/13/90
24 *
25 *****
26 * namelist data *
27 *****
28 *
29 &inopts
30   icflow=2,nfrc1=2,nfrc3=1,iadded=10,nhtstr=39,nlt=22,noair=0,
31   iblaus=1,imfr=3,
32 &end
33 *
34 *          dstep          timet
35 *              0          0.0000e+00
36 *          stdyst          transi          ncomp          njun          ipak
37 *              0              1          141          110          1
38 *          epso          epss
39 * 1.0000e-04  1.0000e-04
40 *          oitmax          sitmax          isolut          ncontr
41 *              10              10              0              0
42 *          ntsv          ntcb          ntcf          ntrp          ntcp
43 *              22              39          252          31          0
44 *
45 *****
46 * component-number data *
47 *****
48 *
49 * iorder*          1          10          11          12          13
50 * iorder*          14          15          16          18          19
51 * iorder*          20          21          22          23          24
52 * iorder*          25          26          27          28          29
53 * iorder*          30          31          32          33          34
54 * iorder*          35          36          38          39          40
55 * iorder*          41          42          45          46          90
56 * iorder*          91          101          102          103          107
57 * iorder*          113          119          160          161          223
58 * iorder*          228          229          260          261          333
59 * iorder*          339          360          361          449          501
60 * iorder*          502          503          504          505          506
61 * iorder*          507          508          509          510          511
62 * iorder*          512          513          514          515          516
63 * iorder*          601          602          603          604          605
64 * iorder*          606          607          608          609          610
65 * iorder*          611          612          613          614          615
66 * iorder*          616          621          622          623          624
67 * iorder*          625          626          627          628          629
68 * iorder*          630          631          632          633          634
69 * iorder*          635          636s
70 * iorder*          999  991  983 s
71 * iorder*          975  967  959 s
72 * iorder*          951  943  935 s
73 * iorder*          927  919  911 s
74 * iorder*          903  895  887 s
75 * iorder*          879  871  863 s
76 * iorder*          855  847  839 s
77 * iorder*          831  823  815 s
78 * iorder*          807  799  791 s
79 * iorder*          783  775  767 s
80 * iorder*          759  751  743 s
81 * iorder*          735  727  719 s
82 * iorder*          711  703  695 e
83 *

```

```

84 *****
85 * control-parameter data *
86 *****
87 *
88 *
89 * signal variables
90 *      idsv      isvn      ilcn      icn1      icn2
91      100         0         0         0         0
92      107         27        101        1         0
93      601         21         1         1010        0
94      480         21         91         1         0
95      99          21         24         21         0
96      701         32         1         1007        0
97      501         29         501        4         0
98      702         32         1         2007        0
99      502         29         502        4         0
100     703         32         1         3007        0
101     503         29         503        4         0
102     704         32         1         4007        0
103     504         29         504        4         0
104     105         32         10         6         0
105     119         27         12         9         0
106     205         32         20         6         0
107     229         27         22         9         0
108     305         32         30         6         0
109     339         27         32         9         0
110     449         27         41         16         0
111     49          27         18         1         0
112     469         27         46         1         0
113 *
114 * control blocks
115 *      idcb      icbn      icb1      icb2      icb3
116     -8001       100      -7001       10         0
117 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
118     1.0000e+00  0.0000e+00  1.0000e+02  1.0000e+00  0.0000e+00
119 *      idcb      icbn      icb1      icb2      icb3
120     -7001       39       -6001      -5001        0
121 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
122     1.0000e+00  0.0000e+00  1.0000e+02  0.0000e+00  0.0000e+00
123 *      idcb      icbn      icb1      icb2      icb3
124     -5001       101       701         4         0
125 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
126     1.0000e+00  0.0000e+00  1.0000e+02  0.0000e+00  0.0000e+00
127 *
128 * cbftb *      -9.6500e+02  1.0084e+02  -7.2375e+02  9.1675e+01  -4.8250e+02
129 * cbftb *      6.7550e+01  -2.4125e+02  0.0000e+00e
130 *
131 *      idcb      icbn      icb1      icb2      icb3
132     -6001       101      -4001        4         0
133 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
134     1.0000e+00  0.0000e+00  1.0000e+00  0.0000e+00  0.0000e+00
135 *
136 * cbftb * r02 0.0000e+00  1.2700e+08  6.1000e-01  2.5000e+08  8.2000e-01
137 * cbftb *      6.3400e+08  1.0000e+00e
138 *
139 *      idcb      icbn      icb1      icb2      icb3
140     -4001       54      -3001      -1001        0
141 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
142     1.0000e+00  0.0000e+00  1.0000e+09  0.0000e+00  0.0000e+00
143 *      idcb      icbn      icb1      icb2      icb3
144     -3001       56      -2001        0         0
145 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
146     1.0000e+00  0.0000e+00  1.0000e+09  6.3400e+08  0.0000e+00
147 *      idcb      icbn      icb1      icb2      icb3
148     -2001       56         100        0         0
149 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
150     0.0000e+00  0.0000e+00  1.0000e+09  0.0000e+00  0.0000e+00
151 *      idcb      icbn      icb1      icb2      icb3
152     -1001       23         501        0         0
153 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
154     2.3000e+06  0.0000e+00  1.0000e+09  1.0000e+00  0.0000e+00
155 *      idcb      icbn      icb1      icb2      icb3
156     -8002       100      -7002        10         0
157 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
158     1.0000e+00  0.0000e+00  1.0000e+02  1.0000e+00  0.0000e+00
159 *      idcb      icbn      icb1      icb2      icb3
160     -7002       39      -6002      -5002        0
161 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
162     1.0000e+00  0.0000e+00  1.0000e+02  0.0000e+00  0.0000e+00
163 *      idcb      icbn      icb1      icb2      icb3
164     -5002       101       702         4         0
165 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
166     1.0000e+00  0.0000e+00  1.0000e+02  0.0000e+00  0.0000e+00
167 *
168 * cbftb *      -9.6500e+02  1.0084e+02  -7.2375e+02  9.1675e+01  -4.8250e+02
169 * cbftb *      6.7550e+01  -2.4125e+02  0.0000e+00e
170 *
171 *      idcb      icbn      icb1      icb2      icb3
172     -6002       101      -4002        4         0
173 *      cbgain     cbxmin     cbxmax     cbcon1     cbcon2
174     1.0000e+00  0.0000e+00  1.0000e+00  0.0000e+00  0.0000e+00
175 *

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176 * cbftb * r02 0.0000e+00 1.2700e+08 6.1000e-01 2.5000e+08 8.2000e-01
177 * cbftb * 6.3400e+08 1.0000e+00e
178 *
179 * idcb icbn icb1 icb2 icb3
180 * -4002 54 -3002 -1002 0
181 * cbgain cbxmin cbxmax cbcon1 cbcon2
182 * 1.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
183 * idcb icbn icb1 icb2 icb3
184 * -3002 56 -2002 0 0
185 * cbgain cbxmin cbxmax cbcon1 cbcon2
186 * 1.0000e+00 0.0000e+00 1.0000e+09 6.3400e+08 0.0000e+00
187 * idcb icbn icb1 icb2 icb3
188 * -2002 56 100 0 0
189 * cbgain cbxmin cbxmax cbcon1 cbcon2
190 * 0.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
191 * idcb icbn icb1 icb2 icb3
192 * -1002 23 502 0 0
193 * cbgain cbxmin cbxmax cbcon1 cbcon2
194 * 2.3000e+06 0.0000e+00 1.0000e+09 1.0000e+00 0.0000e+00
195 * idcb icbn icb1 icb2 icb3
196 * -8003 100 -7003 10 0
197 * cbgain cbxmin cbxmax cbcon1 cbcon2
198 * 1.0000e+00 0.0000e+00 1.0000e+02 1.0000e+00 0.0000e+00
199 * idcb icbn icb1 icb2 icb3
200 * -7003 39 -6003 -5003 0
201 * cbgain cbxmin cbxmax cbcon1 cbcon2
202 * 1.0000e+00 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
203 * idcb icbn icb1 icb2 icb3
204 * -5003 101 703 4 0
205 * cbgain cbxmin cbxmax cbcon1 cbcon2
206 * 1.0000e+00 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
207 *
208 * cbftb * -9.6500e+02 1.0084e+02 -7.2375e+02 9.1675e+01 -4.8250e+02
209 * cbftb * 6.7550e+01 -2.4125e+02 0.0000e+00e
210 *
211 * idcb icbn icb1 icb2 icb3
212 * -6003 101 -4003 4 0
213 * cbgain cbxmin cbxmax cbcon1 cbcon2
214 * 1.0000e+00 0.0000e+00 1.0000e+00 0.0000e+00 0.0000e+00
215 *
216 * cbftb * r02 0.0000e+00 1.2700e+08 6.1000e-01 2.5000e+08 8.2000e-01
217 * cbftb * 6.3400e+08 1.0000e+00e
218 *
219 * idcb icbn icb1 icb2 icb3
220 * -4003 54 -3003 -1003 0
221 * cbgain cbxmin cbxmax cbcon1 cbcon2
222 * 1.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
223 * idcb icbn icb1 icb2 icb3
224 * -3003 56 -2003 0 0
225 * cbgain cbxmin cbxmax cbcon1 cbcon2
226 * 1.0000e+00 0.0000e+00 1.0000e+09 6.3400e+08 0.0000e+00
227 * idcb icbn icb1 icb2 icb3
228 * -2003 56 100 0 0
229 * cbgain cbxmin cbxmax cbcon1 cbcon2
230 * 0.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
231 * idcb icbn icb1 icb2 icb3
232 * -1003 23 503 0 0
233 * cbgain cbxmin cbxmax cbcon1 cbcon2
234 * 2.3000e+06 0.0000e+00 1.0000e+09 1.0000e+00 0.0000e+00
235 * idcb icbn icb1 icb2 icb3
236 * -8004 100 -7004 10 0
237 * cbgain cbxmin cbxmax cbcon1 cbcon2
238 * 1.0000e+00 0.0000e+00 1.0000e+02 1.0000e+00 0.0000e+00
239 * idcb icbn icb1 icb2 icb3
240 * -7004 39 -6004 -5004 0
241 * cbgain cbxmin cbxmax cbcon1 cbcon2
242 * 1.0000e+00 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
243 * idcb icbn icb1 icb2 icb3
244 * -5004 101 704 4 0
245 * cbgain cbxmin cbxmax cbcon1 cbcon2
246 * 1.0000e+00 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
247 *
248 * cbftb * -9.6500e+02 1.0084e+02 -7.2375e+02 9.1675e+01 -4.8250e+02
249 * cbftb * 6.7550e+01 -2.4125e+02 0.0000e+00e
250 *
251 * idcb icbn icb1 icb2 icb3
252 * -6004 101 -4004 4 0
253 * cbgain cbxmin cbxmax cbcon1 cbcon2
254 * 1.0000e+00 0.0000e+00 1.0000e+00 0.0000e+00 0.0000e+00
255 *
256 * cbftb * r02 0.0000e+00 1.2700e+08 6.1000e-01 2.5000e+08 8.2000e-01
257 * cbftb * 6.3400e+08 1.0000e+00e
258 *
259 * idcb icbn icb1 icb2 icb3
260 * -4004 54 -3004 -1004 0
261 * cbgain cbxmin cbxmax cbcon1 cbcon2
262 * 1.0000e+00 0.0000e+00 1.0000e+09 0.0000e+00 0.0000e+00
263 * idcb icbn icb1 icb2 icb3
264 * -3004 56 -2004 0 0
265 * cbgain cbxmin cbxmax cbcon1 cbcon2
266 * 1.0000e+00 0.0000e+00 1.0000e+09 6.3400e+08 0.0000e+00
267 * idcb icbn icb1 icb2 icb3

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268		-2004	56	100	0	0
269	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
270		0.0000e+00	0.0000e+00	1.0000e+09	0.0000e+00	0.0000e+00
271	*	idcb	icbn	icb1	icb2	icb3
272		-1004	23	504	0	0
273	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
274		2.3000e+06	0.0000e+00	1.0000e+09	1.0000e+00	0.0000e+00
275	*	idcb	icbn	icb1	icb2	icb3
276		-801	101	105	4	0
277	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
278		0.0000e+00	0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00
279	*					
280	* cbftb *	-1.0000e+04r03	0.0000e+00	5.0000e+02	2.0000e+01	1.0000e+04
281	* cbftb *	2.0000e+01e				
282	*					
283	*	idcb	icbn	icb1	icb2	icb3
284		-901	100	-801	10	0
285	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
286		1.0000e+00	0.0000e+00	3.0000e+01	1.0000e+00	0.0000e+00
287	*	idcb	icbn	icb1	icb2	icb3
288		-802	101	205	4	0
289	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
290		0.0000e+00	0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00
291	*					
292	* cbftb *	-1.0000e+04r03	0.0000e+00	5.0000e+02	2.0000e+01	1.0000e+04
293	* cbftb *	2.0000e+01e				
294	*					
295	*	idcb	icbn	icb1	icb2	icb3
296		-902	100	-802	10	0
297	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
298		1.0000e+00	0.0000e+00	3.0000e+01	1.0000e+00	0.0000e+00
299	*	idcb	icbn	icb1	icb2	icb3
300		-803	101	305	4	0
301	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
302		0.0000e+00	0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00
303	*					
304	* cbftb *	-1.0000e+04r03	0.0000e+00	5.0000e+02	2.0000e+01	1.0000e+04
305	* cbftb *	2.0000e+01e				
306	*					
307	*	idcb	icbn	icb1	icb2	icb3
308		-903	100	-803	10	0
309	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
310		1.0000e+00	0.0000e+00	3.0000e+01	1.0000e+00	0.0000e+00
311	*	idcb	icbn	icb1	icb2	icb3
312		-601	44	601	480	0
313	*	cbgain	cbxmin	cbxmax	cbcon1	cbcon2
314		1.0000e+00	1.0000e+00	1.0000e+30	1.0000e+00	1.0000e+00
315	*					
316	* trips					
317	*	ntse	ntct	ntsf	ntdp	ntsd
318		0	7	0	1	0
319	*	idtp	isrt	iset	itst	idsg
320		701	4	0	1	100
321	*	setp(1)	setp(2)	setp(3)	setp(4)	
322		1.0000e+29	1.0000e+29	1.0000e+30	1.0000e+30	
323	*	dtsp(1)	dtsp(2)	dtsp(3)	dtsp(4)	
324		0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	
325	*	ifsp(1)	ifsp(2)	ifsp(3)	ifsp(4)	
326		0	0	0	0	
327	*	idtp	isrt	iset	itst	idsg
328		702	4	0	1	100
329	*	setp(1)	setp(2)	setp(3)	setp(4)	
330		1.0000e+29	1.0000e+29	1.0000e+30	1.0000e+30	
331	*	dtsp(1)	dtsp(2)	dtsp(3)	dtsp(4)	
332		0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	
333	*	ifsp(1)	ifsp(2)	ifsp(3)	ifsp(4)	
334		0	0	0	0	
335	*	idtp	isrt	iset	itst	idsg
336		703	4	0	1	100
337	*	setp(1)	setp(2)	setp(3)	setp(4)	
338		1.0000e+29	1.0000e+29	1.0000e+30	1.0000e+29	
339	*	dtsp(1)	dtsp(2)	dtsp(3)	dtsp(4)	
340		0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	
341	*	ifsp(1)	ifsp(2)	ifsp(3)	ifsp(4)	
342		0	0	0	0	
343	*	idtp	isrt	iset	itst	idsg
344		704	4	0	1	100
345	*	setp(1)	setp(2)	setp(3)	setp(4)	
346		1.0000e+29	1.0000e+29	1.0000e+30	1.0000e+30	
347	*	dtsp(1)	dtsp(2)	dtsp(3)	dtsp(4)	
348		0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	
349	*	ifsp(1)	ifsp(2)	ifsp(3)	ifsp(4)	
350		0	0	0	0	
351	*	idtp	isrt	iset	itst	idsg
352		600	2	0	1	100
353	*	setp(1)	setp(2)			
354		0.0000e+00	0.0000e+00			
355	*	dtsp(1)	dtsp(2)			
356		0.0000e+00	0.0000e+00			
357	*	ifsp(1)	ifsp(2)			
358		0	0			
359	*	idtp	isrt	iset	itst	idsg

360		90	2	0	1	100
361	*	setp(1)	setp(2)			
362		0.0000e+00	0.0000e+00			
363	*	dtsp(1)	dtsp(2)			
364		0.0000e+00	0.0000e+00			
365	*	ifsp(1)	ifsp(2)			
366		0	0			
367	*	idtp	isrt	iset	itst	idsg
368		91	2	0	1	100
369	*	setp(1)	setp(2)			
370		0.0000e+00	0.0000e+00			
371	*	dtsp(1)	dtsp(2)			
372		0.0000e+00	0.0000e+00			
373	*	ifsp(1)	ifsp(2)			
374		0	0			
375	*	idtp	isrt	iset	itst	idsg
376		106	1	0	1	107
377	*	setp(1)	setp(2)			
378		2.0000e-01	8.0000e-01			
379	*	dtsp(1)	dtsp(2)			
380		0.0000e+00	0.0000e+00			
381	*	ifsp(1)	ifsp(2)			
382		0	0			
383	*	idtp	isrt	iset	itst	idsg
384		105	2	0	1	100
385	*	setp(1)	setp(2)			
386		1.0000e+30	1.0000e+30			
387	*	dtsp(1)	dtsp(2)			
388		0.0000e+00	0.0000e+00			
389	*	ifsp(1)	ifsp(2)			
390		0	0			
391	*	idtp	isrt	iset	itst	idsg
392		107	2	0	3	-107
393	*	setp(1)	setp(2)			
394		5.0000e-01	5.0000e-01			
395	*	dtsp(1)	dtsp(2)			
396		0.0000e+00	0.0000e+00			
397	*	ifsp(1)	ifsp(2)			
398		0	0			
399	*	idtp	isrt	iset	itst	idsg
400		220	2	0	1	100
401	*	setp(1)	setp(2)			
402		1.0000e+30	1.0000e+30			
403	*	dtsp(1)	dtsp(2)			
404		0.0000e+00	0.0000e+00			
405	*	ifsp(1)	ifsp(2)			
406		0	0			
407	*	idtp	isrt	iset	itst	idsg
408		115	2	0	1	100
409	*	setp(1)	setp(2)			
410		1.0000e+30	1.0000e+30			
411	*	dtsp(1)	dtsp(2)			
412		0.0000e+00	0.0000e+00			
413	*	ifsp(1)	ifsp(2)			
414		0	0			
415	*	idtp	isrt	iset	itst	idsg
416		116	2	0	1	100
417	*	setp(1)	setp(2)			
418		3.0400e+01	3.0400e+01			
419	*	dtsp(1)	dtsp(2)			
420		0.0000e+00	0.0000e+00			
421	*	ifsp(1)	ifsp(2)			
422		0	0			
423	*	idtp	isrt	iset	itst	idsg
424		118	1	0	1	119
425	*	setp(1)	setp(2)			
426		2.0000e-01	8.0000e-01			
427	*	dtsp(1)	dtsp(2)			
428		0.0000e+00	0.0000e+00			
429	*	ifsp(1)	ifsp(2)			
430		0	0			
431	*	idtp	isrt	iset	itst	idsg
432		117	2	0	1	100
433	*	setp(1)	setp(2)			
434		1.0000e+30	1.0000e+30			
435	*	dtsp(1)	dtsp(2)			
436		0.0000e+00	0.0000e+00			
437	*	ifsp(1)	ifsp(2)			
438		0	0			
439	*	idtp	isrt	iset	itst	idsg
440		119	2	0	3	-199
441	*	setp(1)	setp(2)			
442		5.0000e-01	5.0000e-01			
443	*	dtsp(1)	dtsp(2)			
444		0.0000e+00	0.0000e+00			
445	*	ifsp(1)	ifsp(2)			
446		0	0			
447	*	idtp	isrt	iset	itst	idsg
448		228	1	0	1	229
449	*	setp(1)	setp(2)			
450		2.0000e-01	8.0000e-01			
451	*	dtsp(1)	dtsp(2)			

452	0.0000e+00	0.0000e+00			
453	* ifsp(1)	ifsp(2)			
454	0	0			
455	* idtp	isrt	iset	itst	idsg
456	229	2	0	3	-299
457	* setp(1)	setp(2)			
458	5.0000e-01	5.0000e-01			
459	* dtsp(1)	dtsp(2)			
460	0.0000e+00	0.0000e+00			
461	* ifsp(1)	ifsp(2)			
462	0	0			
463	* idtp	isrt	iset	itst	idsg
464	338	1	0	1	339
465	* setp(1)	setp(2)			
466	2.0000e-01	8.0000e-01			
467	* dtsp(1)	dtsp(2)			
468	0.0000e+00	0.0000e+00			
469	* ifsp(1)	ifsp(2)			
470	0	0			
471	* idtp	isrt	iset	itst	idsg
472	339	2	0	3	-399
473	* setp(1)	setp(2)			
474	5.0000e-01	5.0000e-01			
475	* dtsp(1)	dtsp(2)			
476	0.0000e+00	0.0000e+00			
477	* ifsp(1)	ifsp(2)			
478	0	0			
479	* idtp	isrt	iset	itst	idsg
480	666	2	0	1	100
481	* setp(1)	setp(2)			
482	9.9900e+10	9.9900e+10			
483	* dtsp(1)	dtsp(2)			
484	0.0000e+00	0.0000e+00			
485	* ifsp(1)	ifsp(2)			
486	0	0			
487	* idtp	isrt	iset	itst	idsg
488	999	1	0	1	100
489	* setp(1)	setp(2)			
490	1.0000e+30	1.0000e+30			
491	* dtsp(1)	dtsp(2)			
492	0.0000e+00	0.0000e+00			
493	* ifsp(1)	ifsp(2)			
494	0	0			
495	* idtp	isrt	iset	itst	idsg
496	449	1	0	1	100
497	* setp(1)	setp(2)			
498	1.0000e+30	1.0000e+30			
499	* dtsp(1)	dtsp(2)			
500	0.0000e+00	0.0000e+00			
501	* ifsp(1)	ifsp(2)			
502	0	0			
503	* idtp	isrt	iset	itst	idsg
504	442	2	0	1	100
505	* setp(1)	setp(2)			
506	1.0000e+30	1.0000e+30			
507	* dtsp(1)	dtsp(2)			
508	0.0000e+00	0.0000e+00			
509	* ifsp(1)	ifsp(2)			
510	0	0			
511	* idtp	isrt	iset	itst	idsg
512	49	2	0	1	100
513	* setp(1)	setp(2)			
514	0.0000e+00	0.0000e+00			
515	* dtsp(1)	dtsp(2)			
516	0.0000e+00	0.0000e+00			
517	* ifsp(1)	ifsp(2)			
518	0	0			
519	* idtp	isrt	iset	itst	idsg
520	498	2	0	3	-498
521	* setp(1)	setp(2)			
522	5.0000e-01	5.0000e-01			
523	* dtsp(1)	dtsp(2)			
524	0.0000e+00	0.0000e+00			
525	* ifsp(1)	ifsp(2)			
526	0	0			
527	* idtp	isrt	iset	itst	idsg
528	446	2	0	1	100
529	* setp(1)	setp(2)			
530	0.0000e+00	0.0000e+00			
531	* dtsp(1)	dtsp(2)			
532	0.0000e+00	0.0000e+00			
533	* ifsp(1)	ifsp(2)			
534	0	0			
535	* idtp	isrt	iset	itst	idsg
536	497	2	0	3	-497
537	* setp(1)	setp(2)			
538	5.0000e-01	5.0000e-01			
539	* dtsp(1)	dtsp(2)			
540	0.0000e+00	0.0000e+00			
541	* ifsp(1)	ifsp(2)			
542	0	0			
543	* idtp	isrt	iset	itst	idsg

```

544          479          2          0          1          100
545 *      setp(1)      setp(2)
546 0.0000e+00 0.0000e+00
547 *      dtsp(1)      dtsp(2)
548 0.0000e+00 0.0000e+00
549 *      ifsp(1)      ifsp(2)
550          0          0
551 *      idtp          isrt          iset          itst          idsg
552          601          1          0          1          100
553 *      setp(1)      setp(2)
554 2.0000e+05 2.0000e+05
555 *      dtsp(1)      dtsp(2)
556 0.0000e+00 0.0000e+00
557 *      ifsp(1)      ifsp(2)
558          0          0
559 *      idtp          isrt          iset          itst          idsg
560          499          2          0          3          -499
561 *      setp(1)      setp(2)
562 5.0000e-01 5.0000e-01
563 *      dtsp(1)      dtsp(2)
564 0.0000e+00 0.0000e+00
565 *      ifsp(1)      ifsp(2)
566          0          0
567 *      idtn          intn
568          -107          3
569 *      itn(1)          itn(2)          itn(3)
570          105          106          601
571 *      idtn          intn
572          -199          2
573 *      itn(1)          itn(2)
574          117          118
575 *      idtn          intn
576          -299          2
577 *      itn(1)          itn(2)
578          117          228
579 *      idtn          intn
580          -399          2
581 *      itn(1)          itn(2)
582          117          338
583 *      idtn          intn
584          -497          2
585 *      itn(1)          itn(2)
586          117          497
587 *      idtn          intn
588          -498          2
589 *      itn(1)          itn(2)
590          117          49
591 *      idtn          intn
592          -499          2
593 *      itn(1)          itn(2)
594          479          601
595 *      ndmp
596          1
597 *      idmp()
598          -999
599 *
600 *****
601 * component data *
602 *****
603 *
604 ***** type num id ctitle
605 vessel 1 $1$ main vessel
606 * nasx nrsx ntsx ncsr ivssbf
607 13 3 8 28 0
608 * idcu idcl idcr icru icrl
609 12 2 2 0 0
610 * icrr ilcsp iucsp iuhp iconc
611 2 3 7 12 0
612 * igeom nvent nvvtb
613 0 0 0
614 * shelv epsw
615 0.0000e+00 0.0000e+00
616 * z * 2.0070e+00 2.4800e+00 2.9150e+00 4.3825e+00 5.8500e+00
617 * z * 6.7200e+00 7.4950e+00 7.7600e+00 8.0100e+00 8.7450e+00
618 * z * 9.4950e+00 1.0240e+01 1.3392e+01e
619 * rad * 1.1680e+00 2.1850e+00 2.4350e+00e
620 * th * 0.7854e+00 1.5708e+00 2.3562e+00 3.1416e+00 3.9270e+00
621 * th * 4.7124e+00 5.4978e+00 6.2832e+00e
622 *
623 * lisrl lisrc lisrf ljuns
624 11 12 3 40
625 11 19 3 47
626 11 9 3 10
627 11 16 3 20
628 11 13 3 30
629 11 18 3 17
630 11 23 3 27
631 11 22 3 37
632 6 1 3 501
633 6 2 3 502
634 6 3 3 503
635 6 4 3 504

```


728 * vln-r * f 0.0000e+00e
729 * tvn * r16 4.3252e+02r08 4.0164e+02e
730 * tln * r16 4.3252e+02r08 4.0164e+02e
731 * pn * f 2.6000e+05e
732 * pan * f 0.0000e+00e
733 * level 4
734 * level 4
735 * cfzl-t* f 0.0000e+00e
736 * cfzl-z* f 0.0000e+00e
737 * cfzl-r* f 0.0000e+00e
738 * cfzl-t* f 0.0000e+00e
739 * cfzv-t* f 0.0000e+00e
740 * cfzv-z* f 0.0000e+00e
741 * cfzv-r* f 0.0000e+00e
742 * vol * r08 4.9240e-01r08 5.7387e-01r08 1.0000e+00e
743 * fa-t * r08 2.1000e-03r08 2.8124e-01r08 1.0000e+00e
744 * fa-z * r08 5.3919e-01r08 2.9844e-01r08 1.0000e+00e
745 * fa-r * r08 2.7000e-03r16 0.0000e+00e
746 * hd-t * r08 4.1820e-01r08 3.2270e-01r08 5.0000e-01e
747 * hd-z * r08 4.1820e-01r08 1.9770e-01r08 5.0000e-01e
748 * hd-r * r08 1.2000e+00r16 1.0000e-02e
749 * alpn * f 1.0000e+00e
750 * vvn-t * f 0.0000e+00e
751 * vvn-z * f 0.0000e+00e
752 * vvn-r * f 0.0000e+00e
753 * vln-t * f 0.0000e+00e
754 * vln-z * f 0.0000e+00e
755 * vln-r * f 0.0000e+00e
756 * tvn * r16 4.3252e+02r08 4.0164e+02e
757 * tln * r16 4.3252e+02r08 4.0164e+02e
758 * pn * f 2.6000e+05e
759 * pan * f 0.0000e+00e
760 * level 5
761 * level 5
762 * cfzl-t* f 0.0000e+00e
763 * cfzl-z* f 0.0000e+00e
764 * cfzl-r* f 0.0000e+00e
765 * cfzv-t* f 0.0000e+00e
766 * cfzv-z* f 0.0000e+00e
767 * cfzv-r* f 0.0000e+00e
768 * vol * r08 5.4560e-01r08 6.1310e-01r08 1.0000e+00e
769 * fa-t * r08 4.9400e-02r08 2.9750e-01r08 1.0000e+00e
770 * fa-z * r08 5.3919e-01r08 2.9844e-01r08 1.0000e+00e
771 * fa-r * r08 6.1900e-02r16 0.0000e+00e
772 * hd-t * r08 4.1820e-01r08 3.2270e-01r08 5.0000e-01e
773 * hd-z * r08 4.1820e-01r08 1.9772e-01r08 5.0000e-01e
774 * hd-r * r08 1.2000e+00r16 1.0000e-02e
775 * alpn * f 1.0000e+00e
776 * vvn-t * f 0.0000e+00e
777 * vvn-z * f 0.0000e+00e
778 * vvn-r * f 0.0000e+00e
779 * vln-t * f 0.0000e+00e
780 * vln-z * f 0.0000e+00e
781 * vln-r * f 0.0000e+00e
782 * tvn * r16 4.3252e+02r08 4.0164e+02e
783 * tln * r16 4.3252e+02r08 4.0164e+02e
784 * pn * f 2.6000e+05e
785 * pan * f 0.0000e+00e
786 * level 6
787 * level 6
788 * cfzl-t* f 0.0000e+00e
789 * cfzl-z* f 0.0000e+00e
790 * cfzl-r* f 0.0000e+00e
791 * cfzv-t* f 0.0000e+00e
792 * cfzv-z* f 0.0000e+00e
793 * cfzv-r* f 0.0000e+00e
794 * vol * r08 6.4670e-01r08 6.5560e-01r08 1.0000e+00e
795 * fa-t * r08 0.0000e+00r08 2.6780e-01r08 1.0000e+00e
796 * fa-z * r08 5.3919e-01r08 2.9844e-01r08 1.0000e+00e
797 * fa-r * f 0.0000e+00e
798 * hd-t * r08 1.2000e+00r08 6.6565e-01r08 5.0000e-01e
799 * hd-z * r08 1.2000e+00r08 9.5555e-01r08 5.0000e-01e
800 * hd-r * r08 1.2000e+00r16 1.0000e-03e
801 * alpn * f 1.0000e+00e
802 * vvn-t * f 0.0000e+00e
803 * vvn-z * f 0.0000e+00e
804 * vvn-r * f 0.0000e+00e
805 * vln-t * f 0.0000e+00e
806 * vln-z * f 0.0000e+00e
807 * vln-r * f 0.0000e+00e
808 * tvn * r16 4.3252e+02r08 4.0164e+02e
809 * tln * r16 4.3252e+02r08 4.0164e+02e
810 * pn * f 2.6000e+05e
811 * pan * f 0.0000e+00e
812 * level 7
813 * level 7
814 * level 7
815 * level 7
816 * level 7
817 * cfzl-t* r08 5.9830e-02r08 1.6403e-01r08 0.0000e+00e
818 * cfzl-z* r08 0.0000e+00r08 2.3202e+00r08 0.0000e+00e
819 * cfzl-r* r08 3.0381e-02r16 0.0000e+00e

820 * cfzv-t* r08 5.9830e-02r08 1.6403e-01r08 0.0000e+00e
821 * cfzv-z* r08 0.0000e+00r08 2.3202e-00r08 0.0000e+00e
822 * cfzv-r* r08 3.0381e-02r16 0.0000e+00e
823 * vol * r08 5.3924e-01r08 5.2927e-01r08 1.0000e+00e
824 * fa-t * r08 3.5265e-01r08 4.9256e-01r08 1.0000e+00e
825 * fa-z * r08 3.7000e-01r08 2.0470e-01r08 1.0000e+00e
826 * fa-r * r08 3.5265e-01r16 0.0000e+00e
827 * hd-t * r08 1.2765e-02r08 1.5786e-01r08 2.0000e-01e
828 * hd-z * r08 1.2850e-02r08 1.6840e-02r08 2.0000e-01e
829 * hd-r * r08 1.2765e-02r16 0.0000e+00e
830 * alpn * f 1.0000e+00e
831 * vvn-t * f 0.0000e+00e
832 * vvn-z * f 0.0000e+00e
833 * vvn-r * f 0.0000e+00e
834 * vln-t * f 0.0000e+00e
835 * vln-z * f 0.0000e+00e
836 * vln-r * f 0.0000e+00e
837 * tvn * r16 4.3252e+02r08 4.0164e+02e
838 * tln * r16 4.3252e+02r08 4.0164e+02e
839 * pn * f 2.6000e+05e
840 * pan * f 0.0000e+00e
841 * level 8
842 *
843 *
844 * cfzl-t* f 0.0000e+00e
845 * cfzl-z* r08 3.5693e-01r08 2.4443e-01r08 0.0000e+00e
846 * cfzl-r* f 0.0000e+00e
847 * cfzv-t* f 0.0000e+00e
848 * cfzv-z* r08 3.5693e-01r08 2.4443e-01r08 0.0000e+00e
849 * cfzv-r* f 0.0000e+00e
850 * vol * r08 6.9341e-01r08 6.5883e-01r08 1.0000e+00e
851 * fa-t * r08 3.3865e-01r08 3.5289e-01r08 1.0000e+00e
852 * fa-z * r08 4.8694e-01r08 2.6940e-01r08 1.0000e+00e
853 * fa-r * r08 3.4911e-01r16 0.0000e+00e
854 * hd-t * r08 5.6739e-02r08 1.1358e-01r08 1.5750e-01e
855 * hd-z * r08 7.5143e-02r08 8.7343e-02r08 2.6600e-01e
856 * hd-r * r08 5.6739e-02r16 0.0000e+00e
857 * alpn * f 1.0000e+00e
858 * vvn-t * f 0.0000e+00e
859 * vvn-z * f 0.0000e+00e
860 * vvn-r * f 0.0000e+00e
861 * vln-t * f 0.0000e+00e
862 * vln-z * f 0.0000e+00e
863 * vln-r * f 0.0000e+00e
864 * tvn * r16 4.3252e+02r08 4.0164e+02e
865 * tln * r16 4.3252e+02r08 4.0164e+02e
866 * pn * f 2.6000e+05e
867 * pan * f 0.0000e+00e
868 * level 9
869 *
870 *
871 * cfzl-t* f 0.0000e+00e
872 * cfzl-z* f 0.0000e+00e
873 * cfzl-r* r02 1.5406e-01r02 1.2401e-01r02 1.5406e-01r02 1.2401e-01r16 0.0000e+00
874 e
875 * cfzv-t* f 0.0000e+00e
876 * cfzv-z* f 0.0000e+00e
877 * cfzv-r* r02 1.5406e-01r02 1.2401e-01r02 1.5406e-01r02 1.2401e-01r16 0.0000e+00
878 e
879 * vol * r08 7.2799e-01r08 7.4698e-01r08 1.0000e+00e
880 * fa-t * r08 4.1725e-01r08 4.6742e-01r08 1.0000e+00e
881 * fa-z * r08 5.5572e-01r08 7.0769e-01r08 1.0000e+00e
882 * fa-r * r02 4.7105e-01r02 4.0590e-01r02 4.7105e-01r02 4.0590e-01r16 0.0000e+00
883 e
884 * hd-t * r08 5.7433e-02r08 1.5422e-01r08 2.5000e-01e
885 * hd-z * r08 2.3990e-01r16 2.5000e-01e
886 * hd-r * r02 6.4730e-02r02 5.2107e-02r02 6.4730e-02r02 5.2107e-02r16 0.0000e+00
887 e
888 * alpn * f 1.0000e+00e
889 * vvn-t * f 0.0000e+00e
890 * vvn-z * f 0.0000e+00e
891 * vvn-r * f 0.0000e+00e
892 * vln-t * f 0.0000e+00e
893 * vln-z * f 0.0000e+00e
894 * vln-r * f 0.0000e+00e
895 * tvn * r16 4.3252e+02r02 4.0078e+02r02 4.0355e+02r04 4.0078e+02e
896 * tln * r16 4.3252e+02r02 4.2340e+02r02 4.0355e+02r04 4.0078e+02e
897 * pn * f 2.6000e+05e
898 * pan * f 0.0000e+00e
899 * level 10
900 *
901 *
902 * cfzl-t* f 0.0000e+00e
903 * cfzl-z* f 0.0000e+00e
904 * cfzl-r* r08 4.3792e-01r16 0.0000e+00e
905 * cfzv-t* f 0.0000e+00e
906 * cfzv-z* f 0.0000e+00e
907 * cfzv-r* r08 4.3792e-01r16 0.0000e+00e
908 * vol * r08 9.1352e-01r08 8.6154e-01r08 6.2667e-01e
909 * fa-t * r08 4.0497e-01r08 5.0607e-01r02 6.2664e-01r02 6.2664e-01r02 6.2664e-01e
910 * fa-z * r02 6.2664e-01e
911 * fa-r * r08 5.8928e-01r08 7.2470e-01r08 6.2667e-01e

912 * fa-r * r08 3.9390e-01r16 0.0000e+00e
913 * hd-t * r08 3.4622e-01r08 5.3580e-01r02 4.2278e-01r02 4.0631e-01r02 4.2278e-01
914 * hd-t * r02 4.0631e-01e
915 * hd-z * r08 2.3990e-01r08 6.0541e-01r08 3.3917e-01e
916 * hd-r * r08 1.8400e-01r16 0.0000e+00e
917 * alpn * f 1.0000e+00e
918 * vvn-t * f 0.0000e+00e
919 * vvn-z * f 0.0000e+00e
920 * vvn-r * f 0.0000e+00e
921 * vln-t * f 0.0000e+00e
922 * vln-z * f 0.0000e+00e
923 * vln-r * f 0.0000e+00e
924 * tvn * r16 4.3252e+02r02 4.0078e+02r02 4.0355e+02r04 4.0078e+02e
925 * tln * r16 4.3252e+02r02 4.2340e+02r02 4.0355e+02r04 4.0078e+02e
926 * pn * f 2.6000e+05e
927 * pan * f 0.0000e+00e
928 * level 11
929 *
930 * cfzl-t* f 0.0000e+00e
931 * cfzl-z* f 0.0000e+00e
932 * cfzl-r* r08 4.3792e-01r16 0.0000e+00e
933 * cfzv-t* f 0.0000e+00e
934 * cfzv-z* f 0.0000e+00e
935 * cfzv-r* r08 4.3792e-01r16 0.0000e+00e
936 * vol * r08 9.7723e-01r08 9.0326e-01r08 3.7130e-01r02 3.7130e-01r02 3.7130e-01
937 * fa-t * r02 3.7130e-01e
938 * fa-z * r08 5.8928e-01r08 7.2470e-01r08 4.7520e-01e
939 * fa-r * r08 3.9390e-01r16 0.0000e+00e
940 * hd-t * r08 3.4622e-01r08 5.1200e-01r02 3.6000e-01r02 2.4000e-01r02 3.6000e-01
941 * hd-z * r02 2.4000e-01e
942 * hd-r * r08 2.3990e-01r08 6.1097e-01r08 3.8667e-01e
943 * alpn * f 1.0000e+00e
944 * vvn-t * f 0.0000e+00e
945 * vvn-z * f 0.0000e+00e
946 * vvn-r * f 0.0000e+00e
947 * vln-t * f 0.0000e+00e
948 * vln-z * f 0.0000e+00e
949 * vln-r * f 0.0000e+00e
950 * tvn * r16 4.3252e+02r02 4.2340e+02r08 4.2340e+02e
951 * tln * r16 4.3252e+02r08 4.2340e+02e
952 * pn * f 2.6000e+05e
953 * pan * f 0.0000e+00e
954 * level 12
955 *
956 * cfzl-t* f 0.0000e+00e
957 * cfzl-z* f -1.0000e-05e
958 * cfzl-r* r08 4.6298e-01r16 0.0000e+00e
959 * cfzv-t* f 0.0000e+00e
960 * cfzv-z* f 0.0000e+00e
961 * cfzv-r* r08 4.6298e-01r16 0.0000e+00e
962 * vol * r08 1.0681e+00r08 1.0242e+00r08 4.7523e-01e
963 * fa-t * r08 4.2520e-01r08 5.6026e-01r02 4.7548e-01r02 4.4663e-01r02 4.7548e-01
964 * fa-z * r08 6.3943e-02r08 2.8228e-02r08 1.3926e-03e
965 * fa-r * r08 4.2450e-01r16 0.0000e+00e
966 * hd-t * r08 2.5116e-01r08 3.0279e-01r02 2.7120e-01r02 2.5894e-01r02 2.7120e-01
967 * hd-z * r02 2.5894e-01e
968 * hd-r * r16 3.5763e-02r08 4.4300e-04e
969 * alpn * f 1.0000e+00e
970 * vvn-t * f 0.0000e+00e
971 * vvn-z * f 0.0000e+00e
972 * vvn-r * f 0.0000e+00e
973 * vln-t * f 0.0000e+00e
974 * vln-z * f 0.0000e+00e
975 * vln-r * f 0.0000e+00e
976 * tvn * r16 4.3252e+02r08 4.2340e+02e
977 * tln * r16 4.3252e+02r08 4.2340e+02e
978 * pn * f 2.6000e+05e
979 * pan * f 0.0000e+00e
980 * level 13
981 *
982 * cfzl-t* f 0.0000e+00e
983 * cfzl-z* f 0.0000e+00e
984 * cfzl-r* r08 6.2969e-01r08 4.0182e-01r08 1.0001e-01e
985 * cfzv-t* f 0.0000e+00e
986 * cfzv-z* f 0.0000e+00e
987 * cfzv-r* r08 6.2969e-01r08 4.0182e-01r08 1.0001e-01e
988 * vol * r08 7.2603e-01r08 4.0182e-01r08 2.0895e-01e
989 * fa-t * r08 5.7675e-01r08 8.0307e-01r08 1.8621e-01e
990 * fa-z * r08 3.6236e-01r08 8.0307e-01r08 1.8621e-01e
991 * fa-r * r08 5.7675e-01r08 8.0307e-01r08 1.8621e-01e
992 * hd-t * r08 3.6236e-01r08 8.0307e-01r08 1.8621e-01e
993 * hd-z * r08 4.9159e-01r08 9.0997e-01r08 1.0000e-12e
994 * hd-r * r08 4.9159e-01r08 9.0997e-01r08 1.0000e-12e
995 * alpn * f 1.0000e+00e
996 * vvn-t * f 0.0000e+00e
997 * vvn-z * f 0.0000e+00e
998 * vvn-r * f 0.0000e+00e
999 * vln-t * f 0.0000e+00e
1000 * vln-z * f 0.0000e+00e
1001 * vln-r * f 0.0000e+00e
1002 * tvn * r16 4.3252e+02r08 4.2340e+02e
1003 * tln * r16 4.3252e+02r08 4.2340e+02e
1004 * pn * f 2.6000e+05e
1005 * pan * f 0.0000e+00e

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1004 * vvm-z * f 0.0000e+00e
1005 * vvm-r * f 0.0000e+00e
1006 * vln-t * f 0.0000e+00e
1007 * vln-z * f 0.0000e+00e
1008 * vln-r * f 0.0000e+00e
1009 * tvn * f 4.3252e+02e
1010 * tln * f 4.3252e+02e
1011 * pn * f 2.6000e+05e
1012 * pan * f 0.0000e+00e
1013 *
1014 ***** type num id ctitle
1015 fill 107 $107$ vessel kta drain
1016 * jun1 ifty ioff
1017 * 107 8 1
1018 * iftr ifsv nftb nfv nfrf
1019 * 666 100 1 0 0
1020 * twtold rfmxc concin felv
1021 * 0.0000e+00 2.4000e+02 0.0000e+00 0.0000e+00
1022 * dxin volin alpin vlin tlin
1023 * 1.0000e+00 2.5140e-01 0.0000e+00 0.0000e+00 3.0815e+02
1024 * pin pain flowin vvin tvin
1025 * 4.0000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0815e+02
1026 * vmscl vvscl
1027 * 1.0000e+00 1.0000e+00
1028 *
1029 * vmtb * f 0.0000e+00e
1030 *
1031 ***** type num id ctitle
1032 tee 101 $101$ vessel drain loops 2,3
1033 * jcell nodes ichf cost epsw
1034 * 4 4 0 0.0000e+00 0.0000e+00
1035 * iconc1 ncell1 jun1 jun2 ipow1
1036 * 0 6 102 105 0
1037 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
1038 * 0 0 0 0 0
1039 * radin1 th1 hout11 houtv1 tout11
1040 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1041 * toutv1
1042 * 3.0000e+02
1043 * qpini qpoff1 rqpmsc1 qpscl1
1044 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1045 * iconc2 ncell2 jun3 ipow2
1046 * 0 2 103 0
1047 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
1048 * 0 0 0 0 0
1049 * radin2 th2 hout12 houtv2 tout12
1050 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1051 * toutv2
1052 * 3.0000e+02
1053 * qpini2 qpoff2 rqpmsc2 qpscl2
1054 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1055 *
1056 * dx * 3.9600e-01 1.7500e+00 4.1500e+00 2.6000e+00 4.4000e+00
1057 * dx * 1.2350e+01e
1058 * vol * 4.8000e-02 2.1230e-01 5.0340e-01 3.1540e-01 5.3370e-01
1059 * vol * 1.4981e+00e
1060 * fa * 0.0000e+00r06 1.2130e-01e
1061 * fric * 0.0000e+00 8.8200e-03 3.2100e-03 2.8000e-03r02 0.0000e+00
1062 * fric * 1.0700e-03e
1063 * rv fri* 0.0000e+00 8.8200e-03 3.2100e-03 2.8000e-03r02 0.0000e+00
1064 * rv fri* 1.0700e-03e
1065 * grav * -1.0000e+00 -2.7310e-01 -9.3000e-03 -8.6000e-03 -1.0000e-02
1066 * grav * -9.2000e-03 -3.0280e-01e
1067 * hd * f 3.9300e-01e
1068 * icflg * f 0e
1069 * nff * f -1e
1070 * alp * f 1.0000e+00e
1071 * vl * f 0.0000e+00e
1072 * vv * f 0.0000e+00e
1073 * tl * f 4.5000e+02e
1074 * tv * f 4.5000e+02e
1075 * p * f 2.6000e+05e
1076 * pa * f 0.0000e+00e
1077 * qppp * f 0.0000e+00e
1078 * matid * f 6e
1079 * tw * f 4.4900e+02e
1080 *
1081 * dx * 1.8500e+00 3.8300e-01e
1082 * vol * 2.2440e-01 4.6500e-02e
1083 * fa * r02 1.2130e-01 0.0000e+00e
1084 * fric * 1.0000e-04 8.4700e-03 0.0000e+00e
1085 * rv fri* 1.0000e-04 8.4700e-03 0.0000e+00e
1086 * grav * 0.0000e+00 2.6890e-01 1.0000e+00e
1087 * hd * f 3.9300e-01e
1088 * icflg * f 0e
1089 * nff * f 1 f -1e
1090 * alp * f 1.0000e+00e
1091 * vl * f 0.0000e+00e
1092 * vv * f 0.0000e+00e
1093 * tl * f 4.5000e+02e
1094 * tv * f 4.5000e+02e
1095 * p * f 2.6000e+05e

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1096 * pa * f 0.0000e+00e
1097 * qppp * f 0.0000e+00e
1098 * matid * f 6e
1099 * tw * f 4.4900e+02e
1100 *
1101 ***** type num id ctitle
1102 tee 102 102 $102$ vessel drain loops 1,4
1103 * jcell nodes ichf cost epsw
1104 * 3 4 0 0.0000e+00 0.0000e+00
1105 * iconc1 ncell1 jun1 jun2 ipow1
1106 * 0 4 104 106 0
1107 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
1108 * 0 0 0 0 0
1109 * radin1 th1 hout11 houtv1 tout11
1110 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1111 * toutv1
1112 * 3.0000e+02
1113 * qpnl qpoff1 rqpml1 qpscl1
1114 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1115 * iconc2 ncell2 jun3 ipow2
1116 * 0 2 101 0
1117 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
1118 * 0 0 0 0 0
1119 * radin2 th2 hout12 houtv2 tout12
1120 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1121 * toutv2
1122 * 3.0000e+02
1123 * qpnl qpoff2 rqpml2 qpscl2
1124 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1125 *
1126 * dx * 3.9600e-01 1.7500e+00 3.1500e+00 7.3500e+00e
1127 * vol * 4.8000e-02 2.1230e-01 2.8930e-01 8.9160e-01e
1128 * fa * 0.0000e+00r04 1.2130e-01e
1129 * fric * 0.0000e+00 8.8200e-03 3.8600e-03 0.0000e+00 1.8000e-03
1130 e
1131 * rv fri* 0.0000e+00 8.8200e-03 3.8600e-03 0.0000e+00 1.8000e-03
1132 e
1133 * grav * -1.0000e+00 -1.9340e-01 -9.4000e-03 -9.5000e-03 -3.0640e-01
1134 e
1135 * hd * f 3.9300e-01e
1136 * icflg * f 0e
1137 * nff * f -1e
1138 * alp * f 1.0000e+00e
1139 * vl * f 0.0000e+00e
1140 * vv * f 0.0000e+00e
1141 * tl * f 4.5000e+02e
1142 * tv * f 4.5000e+02e
1143 * p * f 2.6000e+05e
1144 * pa * f 0.0000e+00e
1145 * qppp * f 0.0000e+00e
1146 * matid * f 6e
1147 * tw * f 4.4900e+02e
1148 *
1149 * dx * 1.7500e+00 3.9100e-01e
1150 * vol * 2.1230e-01 4.7400e-02e
1151 * fa * r02 1.2130e-01 0.0000e+00e
1152 * fric * 1.0000e-04 8.8400e-03 0.0000e+00e
1153 * rv fri* 1.0000e-04 8.8400e-03 0.0000e+00e
1154 * grav * 0.0000e+00 2.0320e-01 1.0000e+00e
1155 * hd * f 3.9300e-01e
1156 * icflg * f 0e
1157 * nff * f 1 f -1e
1158 * alp * f 1.0000e+00e
1159 * vl * f 0.0000e+00e
1160 * vv * f 0.0000e+00e
1161 * tl * f 4.5000e+02e
1162 * tv * f 4.5000e+02e
1163 * p * f 2.6000e+05e
1164 * pa * f 0.0000e+00e
1165 * qppp * f 0.0000e+00e
1166 * matid * f 6e
1167 * tw * f 4.4900e+02e
1168 *
1169 ***** type num id ctitle
1170 tee 103 103 $103$ vessel drain part2-to fill
1171 * jcell nodes ichf cost epsw
1172 * 2 4 0 5.0000e-01 0.0000e+00
1173 * iconc1 ncell1 jun1 jun2 ipow1
1174 * 0 3 105 107 0
1175 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
1176 * 0 0 0 0 0
1177 * radin1 th1 hout11 houtv1 tout11
1178 * 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1179 * toutv1
1180 * 3.0000e+02
1181 * qpnl qpoff1 rqpml1 qpscl1
1182 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1183 * iconc2 ncell2 jun3 ipow2
1184 * 0 2 106 0
1185 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
1186 * 0 0 0 0 0
1187 * radin2 th2 hout12 houtv2 tout12

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1188 1.9650e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
1189 * toutv2
1190 3.0000e+02
1191 * qpin2 qpoff2 rqpox2 qpscl2
1192 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
1193 *
1194 * dx * 5.3320e+00 2.4610e+00 2.5140e+00e
1195 * vol * 6.4680e-01 2.9850e-01 3.0490e-01e
1196 * fa * f 1.2130e-01e
1197 * fric * 1.0700e-03 3.8600e-03r02 0.0000e+00e
1198 * rv fri* 1.0700e-03 3.8600e-03r02 0.0000e+00e
1199 * grav * -3.0280e-01 -6.8040e-01 -1.8000e-03 0.0000e+00e
1200 * hd * f 3.9300e-01e
1201 * icflg * f 0e
1202 * nff * f -1e
1203 * alp * f 1.0000e+00e
1204 * vl * f 0.0000e+00e
1205 * vv * f 0.0000e+00e
1206 * tl * f 4.5000e+02e
1207 * tv * f 4.5000e+02e
1208 * p * f 2.6000e+05e
1209 * pa * f 0.0000e+00e
1210 * qppp * f 0.0000e+00e
1211 * matid * f 6e
1212 * tw * f 4.4900e+02e
1213 *
1214 * dx * 2.5280e+00 3.1430e+00e
1215 * vol * 3.0660e-01 3.8120e-01e
1216 * fa * f 1.2130e-01e
1217 * fric * 1.9500e-03 8.5600e-04 1.8000e-03e
1218 * rv fri* 1.9500e-03 8.5600e-04 1.8000e-03e
1219 * grav * 4.3480e-01 9.3670e-01 3.0640e-01e
1220 * hd * f 3.9300e-01e
1221 * icflg * f 0e
1222 * nff * f 1 f -1e
1223 * alp * f 1.0000e+00e
1224 * vl * f 0.0000e+00e
1225 * vv * f 0.0000e+00e
1226 * tl * f 4.5000e+02e
1227 * tv * f 4.5000e+02e
1228 * p * f 2.6000e+05e
1229 * pa * f 0.0000e+00e
1230 * qppp * f 0.0000e+00e
1231 * matid * f 6e
1232 * tw * f 4.4900e+02e
1233 *
1234 ***** type num id ctitle
1235 tee 501 $501$ core simulator tee cell 1
1236 * jcell nodes ichf cost epsw
1237 3 0 0 1.0000e+00 0.0000e+00
1238 * iconc1 ncell1 jun1 jun2 ipow1
1239 0 4 621 501 0
1240 * radin1 th1 hout11 houtv1 tout11
1241 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1242 * toutv1
1243 3.0000e+02
1244 * iconc2 ncell2 jun3 ipow2
1245 0 2 601 0
1246 * radin2 th2 hout12 houtv2 tout12
1247 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1248 * toutv2
1249 3.0000e+02
1250 *
1251 * dx * f 9.0000e-01e
1252 * vol * f 2.6000e-01e
1253 * fa * f 2.8886e-01e
1254 * fric * f 0.0000e+00e
1255 * rv fri* f 1.0000e+15e
1256 * grav * f 0.0000e+00e
1257 * hd * f 7.1840e-01e
1258 * icflg * f 0e
1259 * nff * f -1e
1260 * alp * f 1.0000e+00e
1261 * vl * f 0.0000e+00e
1262 * vv * f 0.0000e+00e
1263 * tl * f 4.3252e+02e
1264 * tv * f 4.3252e+02e
1265 * p * f 2.6000e+05e
1266 * pa * f 0.0000e+00e
1267 *
1268 * dx * f 9.0000e-01e
1269 * vol * f 2.6000e-01e
1270 * fa * f 2.8886e-01e
1271 * fric * f 1.0000e+15e
1272 * rv fri* 1.0000e-04 f 0.0000e+00e
1273 * grav * f 0.0000e+00e
1274 * hd * f 7.1840e-01e
1275 * icflg * f 0e
1276 * nff * f 1 f -1e
1277 * alp * f 1.0000e+00e
1278 * vl * f 0.0000e+00e
1279 * vv * f 0.0000e+00e

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1280 * tl * f 4.3252e+02e
1281 * tv * f 4.3252e+02e
1282 * p * f 2.6000e+05e
1283 * pa * f 0.0000e+00e
1284 *
1285 ***** type num id ctitle
1286 tee 502 502 $502$ core simulator tee cell 2
1287 * jcell nodes ichf cost epsw
1288 * 3 0 0 1.0000e+00 0.0000e+00
1289 * iconc1 ncell1 jun1 jun2 ipow1
1290 * 0 4 622 502 0
1291 * radin1 th1 hout11 houtv1 tout11
1292 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1293 * toutv1
1294 * 3.0000e+02
1295 * iconc2 ncell2 jun3 ipow2
1296 * 0 2 602 0
1297 * radin2 th2 hout12 houtv2 tout12
1298 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1299 * toutv2
1300 * 3.0000e+02
1301 *
1302 * dx * f 9.0000e-01e
1303 * vol * f 2.6000e-01e
1304 * fa * f 2.8886e-01e
1305 * fric * f 0.0000e+00e
1306 * rv fri* f 1.0000e+15e
1307 * grav * f 0.0000e+00e
1308 * hd * f 7.1840e-01e
1309 * icflg * f 0e
1310 * nff * f -1e
1311 * alp * f 1.0000e+00e
1312 * vl * f 0.0000e+00e
1313 * vv * f 0.0000e+00e
1314 * tl * f 4.3252e+02e
1315 * tv * f 4.3252e+02e
1316 * p * f 2.6000e+05e
1317 * pa * f 0.0000e+00e
1318 *
1319 * dx * f 9.0000e-01e
1320 * vol * f 2.6000e-01e
1321 * fa * f 2.8886e-01e
1322 * fric * f 1.0000e+15e
1323 * rv fri* 1.0000e-04 f 0.0000e+00e
1324 * grav * f 0.0000e+00e
1325 * hd * f 7.1840e-01e
1326 * icflg * f 0e
1327 * nff * f 1 f -1e
1328 * alp * f 1.0000e+00e
1329 * vl * f 0.0000e+00e
1330 * vv * f 0.0000e+00e
1331 * tl * f 4.3252e+02e
1332 * tv * f 4.3252e+02e
1333 * p * f 2.6000e+05e
1334 * pa * f 0.0000e+00e
1335 *
1336 ***** type num id ctitle
1337 tee 503 503 $503$ core simulator tee cell 3
1338 * jcell nodes ichf cost epsw
1339 * 3 0 0 1.0000e+00 0.0000e+00
1340 * iconc1 ncell1 jun1 jun2 ipow1
1341 * 0 4 623 503 0
1342 * radin1 th1 hout11 houtv1 tout11
1343 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1344 * toutv1
1345 * 3.0000e+02
1346 * iconc2 ncell2 jun3 ipow2
1347 * 0 2 603 0
1348 * radin2 th2 hout12 houtv2 tout12
1349 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1350 * toutv2
1351 * 3.0000e+02
1352 *
1353 * dx * f 9.0000e-01e
1354 * vol * f 2.6000e-01e
1355 * fa * f 2.8886e-01e
1356 * fric * f 0.0000e+00e
1357 * rv fri* f 1.0000e+15e
1358 * grav * f 0.0000e+00e
1359 * hd * f 7.1840e-01e
1360 * icflg * f 0e
1361 * nff * f -1e
1362 * alp * f 1.0000e+00e
1363 * vl * f 0.0000e+00e
1364 * vv * f 0.0000e+00e
1365 * tl * f 4.3252e+02e
1366 * tv * f 4.3252e+02e
1367 * p * f 2.6000e+05e
1368 * pa * f 0.0000e+00e
1369 *
1370 * dx * f 9.0000e-01e
1371 * vol * f 2.6000e-01e

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1372 * fa * f 2.8886e-01e
1373 * fric * f 1.0000e+15e
1374 * rv fri* 1.0000e-04 f 0.0000e+00e
1375 * grav * f 1.0000e+00e
1376 * hd * f 7.1840e-01e
1377 * icflg * f 0e
1378 * nff * 1 f -1e
1379 * alp * f 1.0000e+00e
1380 * vl * f 0.0000e+00e
1381 * vv * f 0.0000e+00e
1382 * tl * f 4.3252e+02e
1383 * tv * f 4.3252e+02e
1384 * p * f 2.6000e+05e
1385 * pa * f 0.0000e+00e
1386 *
1387 ***** type num id ctitle
1388 tee 504 504 $504$ core simulator tee cell 4
1389 * jcell nodes ichf cost epsw
1390 3 0 0 1.0000e+00 0.0000e+00
1391 * iconc1 ncell1 jun1 jun2 ipow1
1392 0 4 624 504 0
1393 * radin1 th1 hout11 houtv1 tout11
1394 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1395 * toutv1
1396 3.0000e+02
1397 * iconc2 ncell2 jun3 ipow2
1398 0 2 604 0
1399 * radin2 th2 hout12 houtv2 tout12
1400 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1401 * toutv2
1402 3.0000e+02
1403 *
1404 * dx * f 9.0000e-01e
1405 * vol * f 2.6000e-01e
1406 * fa * f 2.8886e-01e
1407 * fric * f 0.0000e+00e
1408 * rv fri* f 1.0000e+15e
1409 * grav * f 0.0000e+00e
1410 * hd * f 7.1840e-01e
1411 * icflg * f 0e
1412 * nff * f -1e
1413 * alp * f 1.0000e+00e
1414 * vl * f 0.0000e+00e
1415 * vv * f 0.0000e+00e
1416 * tl * f 4.3252e+02e
1417 * tv * f 4.3252e+02e
1418 * p * f 2.6000e+05e
1419 * pa * f 0.0000e+00e
1420 *
1421 * dx * f 9.0000e-01e
1422 * vol * f 2.6000e-01e
1423 * fa * f 2.8886e-01e
1424 * fric * f 0.0000e+00e
1425 * rv fri* 1.0000e-04 f 0.0000e+00e
1426 * grav * f 0.0000e+00e
1427 * hd * f 7.1840e-01e
1428 * icflg * f 0e
1429 * nff * 1 f -1e
1430 * alp * f 1.0000e+00e
1431 * vl * f 0.0000e+00e
1432 * vv * f 0.0000e+00e
1433 * tl * f 4.3252e+02e
1434 * tv * f 4.3252e+02e
1435 * p * f 2.6000e+05e
1436 * pa * f 0.0000e+00e
1437 *
1438 ***** type num id ctitle
1439 tee 505 505 $505$ core simulator tee cell 5
1440 * jcell nodes ichf cost epsw
1441 3 0 0 1.0000e+00 0.0000e+00
1442 * iconc1 ncell1 jun1 jun2 ipow1
1443 0 4 625 505 0
1444 * radin1 th1 hout11 houtv1 tout11
1445 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1446 * toutv1
1447 3.0000e+02
1448 * iconc2 ncell2 jun3 ipow2
1449 0 2 605 0
1450 * radin2 th2 hout12 houtv2 tout12
1451 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1452 * toutv2
1453 3.0000e+02
1454 *
1455 * dx * f 9.0000e-01e
1456 * vol * f 2.6000e-01e
1457 * fa * f 2.8886e-01e
1458 * fric * f 0.0000e+00e
1459 * rv fri* f 1.0000e+15e
1460 * grav * f 0.0000e+00e
1461 * hd * f 7.1840e-01e
1462 * icflg * f 0e
1463 * nff * f -1e

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1464 * alp * f 1.0000e+00e
1465 * vl * f 0.0000e+00e
1466 * vv * f 0.0000e+00e
1467 * tl * f 4.3252e+02e
1468 * tv * f 4.3252e+02e
1469 * p * f 2.6000e+05e
1470 * pa * f 0.0000e+00e
1471 *
1472 * dx * f 9.0000e-01e
1473 * vol * f 2.6000e-01e
1474 * fa * f 2.8886e-01e
1475 * fric * f 1.0000e+15e
1476 * rv fri* 1.0000e-04 f 0.0000e+00e
1477 * grav * f 0.0000e+00e
1478 * hd * f 7.1840e-01e
1479 * icflg * f 0e
1480 * nff * f 1 f -1e
1481 * alp * f 1.0000e+00e
1482 * vl * f 0.0000e+00e
1483 * vv * f 0.0000e+00e
1484 * tl * f 4.3252e+02e
1485 * tv * f 4.3252e+02e
1486 * p * f 2.6000e+05e
1487 * pa * f 0.0000e+00e
1488 *
1489 ***** type num id ctitle
1490 tee 506 506 $506$ core simulator tee cell 6
1491 * jcell nodes ichf cost epsw
1492 * 3 0 0 1.0000e+00 0.0000e+00
1493 * iconc1 ncell1 jun1 jun2 ipow1
1494 * 0 4 626 506 0
1495 * radin1 th1 hout11 houtv1 tout11
1496 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1497 * toutv1
1498 * 3.0000e+02
1499 * iconc2 ncell2 jun3 ipow2
1500 * 0 2 606 0
1501 * radin2 th2 hout12 houtv2 tout12
1502 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1503 * toutv2
1504 * 3.0000e+02
1505 *
1506 * dx * f 9.0000e-01e
1507 * vol * f 2.6000e-01e
1508 * fa * f 2.8886e-01e
1509 * fric * f 0.0000e+00e
1510 * rv fri* f 1.0000e+15e
1511 * grav * f 0.0000e+00e
1512 * hd * f 7.1840e-01e
1513 * icflg * f 0e
1514 * nff * f -1e
1515 * alp * f 1.0000e+00e
1516 * vl * f 0.0000e+00e
1517 * vv * f 0.0000e+00e
1518 * tl * f 4.3252e+02e
1519 * tv * f 4.3252e+02e
1520 * p * f 2.6000e+05e
1521 * pa * f 0.0000e+00e
1522 *
1523 * dx * f 9.0000e-01e
1524 * vol * f 2.6000e-01e
1525 * fa * f 2.8886e-01e
1526 * fric * f 1.0000e+15e
1527 * rv fri* 1.0000e-04 f 0.0000e+00e
1528 * grav * f 0.0000e+00e
1529 * hd * f 7.1840e-01e
1530 * icflg * f 0e
1531 * nff * f 1 f -1e
1532 * alp * f 1.0000e+00e
1533 * vl * f 0.0000e+00e
1534 * vv * f 0.0000e+00e
1535 * tl * f 4.3252e+02e
1536 * tv * f 4.3252e+02e
1537 * p * f 2.6000e+05e
1538 * pa * f 0.0000e+00e
1539 *
1540 ***** type num id ctitle
1541 tee 507 507 $507$ core simulator tee cell 7
1542 * jcell nodes ichf cost epsw
1543 * 3 0 0 1.0000e+00 0.0000e+00
1544 * iconc1 ncell1 jun1 jun2 ipow1
1545 * 0 4 627 507 0
1546 * radin1 th1 hout11 houtv1 tout11
1547 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1548 * toutv1
1549 * 3.0000e+02
1550 * iconc2 ncell2 jun3 ipow2
1551 * 0 2 607 0
1552 * radin2 th2 hout12 houtv2 tout12
1553 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1554 * toutv2
1555 * 3.0000e+02

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1556 *
1557 * dx * f 9.0000e-01e
1558 * vol * f 2.6000e-01e
1559 * fa * f 2.8886e-01e
1560 * fric * f 0.0000e+00e
1561 * rv fri* f 1.0000e+15e
1562 * grav * f 0.0000e+00e
1563 * hd * f 7.1840e-01e
1564 * icflg * f 0e
1565 * nff * f -1e
1566 * alp * f 1.0000e+00e
1567 * vl * f 0.0000e+00e
1568 * vv * f 0.0000e+00e
1569 * tl * f 4.3252e+02e
1570 * tv * f 4.3252e+02e
1571 * p * f 2.6000e+05e
1572 * pa * f 0.0000e+00e
1573 *
1574 * dx * f 9.0000e-01e
1575 * vol * f 2.6000e-01e
1576 * fa * f 2.8886e-01e
1577 * fric * f 1.0000e+15e
1578 * rv fri* 1.0000e-04 f 0.0000e+00e
1579 * grav * f 1.0000e+00e
1580 * hd * f 7.1840e-01e
1581 * icflg * f 0e
1582 * nff * f 1 f -1e
1583 * alp * f 1.0000e+00e
1584 * vl * f 0.0000e+00e
1585 * vv * f 0.0000e+00e
1586 * tl * f 4.3252e+02e
1587 * tv * f 4.3252e+02e
1588 * p * f 2.6000e+05e
1589 * pa * f 0.0000e+00e
1590 *
1591 ***** type num id ctitle
1592 tee 508 508 $508$ core simulator tee cell 8
1593 * jcell nodes ichf cost epsw
1594 3 0 0 1.0000e+00 0.0000e+00
1595 * iconc1 ncell1 jun1 jun2 ipow1
1596 0 4 628 508 0
1597 * radin1 th1 hout11 houtv1 tout11
1598 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1599 * toutv1
1600 3.0000e+02
1601 * iconc2 ncell2 jun3 ipow2
1602 0 2 608 0
1603 * radin2 th2 hout12 houtv2 tout12
1604 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1605 * toutv2
1606 3.0000e+02
1607 *
1608 * dx * f 9.0000e-01e
1609 * vol * f 2.6000e-01e
1610 * fa * f 2.8886e-01e
1611 * fric * f 0.0000e+00e
1612 * rv fri* f 1.0000e+15e
1613 * grav * f 0.0000e+00e
1614 * hd * f 7.1840e-01e
1615 * icflg * f 0e
1616 * nff * f -1e
1617 * alp * f 1.0000e+00e
1618 * vl * f 0.0000e+00e
1619 * vv * f 0.0000e+00e
1620 * tl * f 4.3252e+02e
1621 * tv * f 4.3252e+02e
1622 * p * f 2.6000e+05e
1623 * pa * f 0.0000e+00e
1624 *
1625 * dx * f 9.0000e-01e
1626 * vol * f 2.6000e-01e
1627 * fa * f 2.8886e-01e
1628 * fric * f 1.0000e+15e
1629 * rv fri* 1.0000e-04 f 0.0000e+00e
1630 * grav * f 0.0000e+00e
1631 * hd * f 7.1840e-01e
1632 * icflg * f 0e
1633 * nff * f 1 f -1e
1634 * alp * f 1.0000e+00e
1635 * vl * f 0.0000e+00e
1636 * vv * f 0.0000e+00e
1637 * tl * f 4.3252e+02e
1638 * tv * f 4.3252e+02e
1639 * p * f 2.6000e+05e
1640 * pa * f 0.0000e+00e
1641 *
1642 ***** type num id ctitle
1643 tee 509 509 $509$ core simulator tee cell 9
1644 * jcell nodes ichf cost epsw
1645 3 0 0 1.0000e+00 0.0000e+00
1646 * iconc1 ncell1 jun1 jun2 ipow1
1647 0 4 629 509 0

```

```

1648 *      radin1      th1      houtl1      houtv1      toutl1
1649 * 6.5000e-01      6.0000e-03      0.0000e+00      0.0000e+00      3.0000e+02
1650 *      toutv1
1651 * 3.0000e+02
1652 *      iconc2      ncell2      jun3      ipow2
1653 * 0 2 609 0
1654 *      radin2      th2      houtl2      houtv2      toutl2
1655 * 6.5000e-01      6.0000e-03      0.0000e+00      0.0000e+00      3.0000e+02
1656 *      toutv2
1657 * 3.0000e+02
1658 *
1659 * dx * f 9.0000e-01e
1660 * vol * f 3.5968e-01e
1661 * fa * f 3.9997e-01e
1662 * fric * f 0.0000e+00e
1663 * rv fri* f 1.0000e+15e
1664 * grav * f 0.0000e+00e
1665 * hd * f 8.6100e-01e
1666 * icflg * f 0e
1667 * nff * f -1e
1668 * alp * f 1.0000e+00e
1669 * vl * f 0.0000e+00e
1670 * vv * f 0.0000e+00e
1671 * tl * f 4.3252e+02e
1672 * tv * f 4.3252e+02e
1673 * p * f 2.6000e+05e
1674 * pa * f 0.0000e+00e
1675 *
1676 * dx * f 9.0000e-01e
1677 * vol * f 3.5968e-01e
1678 * fa * f 3.9997e-01e
1679 * fric * f 1.0000e+15e
1680 * rv fri* 1.0000e-04 f 0.0000e+00e
1681 * grav * f 0.0000e+00e
1682 * hd * f 8.6100e-01e
1683 * icflg * f 0e
1684 * nff * f 1 f -1e
1685 * alp * f 1.0000e+00e
1686 * vl * f 0.0000e+00e
1687 * vv * f 0.0000e+00e
1688 * tl * f 4.3252e+02e
1689 * tv * f 4.3252e+02e
1690 * p * f 2.6000e+05e
1691 * pa * f 0.0000e+00e
1692 *
1693 * ***** type num id ctitle
1694 tee 510 510$ core simulator tee cell 10
1695 * jcell nodes ichf cost epsw
1696 * 3 0 0 1.0000e+00 0.0000e+00
1697 * iconc1 ncell1 jun1 jun2 ipow1
1698 * 0 4 630 510 0
1699 * radin1 th1 houtl1 houtv1 toutl1
1700 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1701 * toutv1
1702 * 3.0000e+02
1703 * iconc2 ncell2 jun3 ipow2
1704 * 0 2 610 0
1705 * radin2 th2 houtl2 houtv2 toutl2
1706 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1707 * toutv2
1708 * 3.0000e+02
1709 *
1710 * dx * f 9.0000e-01e
1711 * vol * f 3.5968e-01e
1712 * fa * f 3.9997e-01e
1713 * fric * f 0.0000e+00e
1714 * rv fri* f 1.0000e+15e
1715 * grav * f 0.0000e+00e
1716 * hd * f 8.6100e-01e
1717 * icflg * f 0e
1718 * nff * f -1e
1719 * alp * f 1.0000e+00e
1720 * vl * f 0.0000e+00e
1721 * vv * f 0.0000e+00e
1722 * tl * f 4.3252e+02e
1723 * tv * f 4.3252e+02e
1724 * p * f 2.6000e+05e
1725 * pa * f 0.0000e+00e
1726 *
1727 * dx * f 9.0000e-01e
1728 * vol * f 3.5968e-01e
1729 * fa * f 3.9997e-01e
1730 * fric * f 1.0000e+15e
1731 * rv fri* 1.0000e-04 f 0.0000e+00e
1732 * grav * f 0.0000e+00e
1733 * hd * f 8.6100e-01e
1734 * icflg * f 0e
1735 * nff * f 1 f -1e
1736 * alp * f 1.0000e+00e
1737 * vl * f 0.0000e+00e
1738 * vv * f 0.0000e+00e
1739 * tl * f 4.3252e+02e

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```

1740 * tv * f 4.3252e+02e
1741 * p * f 2.6000e+05e
1742 * pa * f 0.0000e+00e
1743 *
1744 ***** type num id ctitle
1745 tee 511 511 $511$ core simulator tee cell 11
1746 * jcell nodes ichf cost epsw
1747 * 3 0 0 1.0000e+00 0.0000e+00
1748 * iconc1 ncell1 jun1 jun2 ipow1
1749 * 0 4 631 511 0
1750 * radin1 th1 hout11 houtv1 tout11
1751 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1752 * toutv1
1753 * 3.0000e+02
1754 * iconc2 ncell2 jun3 ipow2
1755 * 0 2 611 0
1756 * radin2 th2 hout12 houtv2 tout12
1757 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1758 * toutv2
1759 * 3.0000e+02
1760 *
1761 * dx * f 9.0000e-01e
1762 * vol * f 3.5968e-01e
1763 * fa * f 3.9997e-01e
1764 * fric * f 0.0000e+00e
1765 * rv fri* f 1.0000e+15e
1766 * grav * f 0.0000e+00e
1767 * hd * f 8.6100e-01e
1768 * icflg * f 0e
1769 * nff * f -1e
1770 * alp * f 1.0000e+00e
1771 * vl * f 0.0000e+00e
1772 * vv * f 0.0000e+00e
1773 * tl * f 4.3252e+02e
1774 * tv * f 4.3252e+02e
1775 * p * f 2.6000e+05e
1776 * pa * f 0.0000e+00e
1777 *
1778 * dx * f 9.0000e-01e
1779 * vol * f 3.5968e-01e
1780 * fa * f 3.9997e-01e
1781 * fric * f 1.0000e+15e
1782 * rv fri* 1.0000e-04 f 0.0000e+00e
1783 * grav * f 0.0000e+00e
1784 * hd * f 8.6100e-01e
1785 * icflg * f 0e
1786 * nff * f 1 f -1e
1787 * alp * f 1.0000e+00e
1788 * vl * f 0.0000e+00e
1789 * vv * f 0.0000e+00e
1790 * tl * f 4.3252e+02e
1791 * tv * f 4.3252e+02e
1792 * p * f 2.6000e+05e
1793 * pa * f 0.0000e+00e
1794 *
1795 ***** type num id ctitle
1796 tee 512 512 $512$ core simulator tee cell 12
1797 * jcell nodes ichf cost epsw
1798 * 3 0 0 1.0000e+00 0.0000e+00
1799 * iconc1 ncell1 jun1 jun2 ipow1
1800 * 0 4 632 512 0
1801 * radin1 th1 hout11 houtv1 tout11
1802 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1803 * toutv1
1804 * 3.0000e+02
1805 * iconc2 ncell2 jun3 ipow2
1806 * 0 2 612 0
1807 * radin2 th2 hout12 houtv2 tout12
1808 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1809 * toutv2
1810 * 3.0000e+02
1811 *
1812 * dx * f 9.0000e-01e
1813 * vol * f 3.5968e-01e
1814 * fa * f 3.9997e-01e
1815 * fric * f 0.0000e+00e
1816 * rv fri* f 1.0000e+15e
1817 * grav * f 0.0000e+00e
1818 * hd * f 8.6100e-01e
1819 * icflg * f 0e
1820 * nff * f -1e
1821 * alp * f 1.0000e+00e
1822 * vl * f 0.0000e+00e
1823 * vv * f 0.0000e+00e
1824 * tl * f 4.3252e+02e
1825 * tv * f 4.3252e+02e
1826 * p * f 2.6000e+05e
1827 * pa * f 0.0000e+00e
1828 *
1829 * dx * f 9.0000e-01e
1830 * vol * f 3.5968e-01e
1831 * fa * f 3.9997e-01e

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```

1832 * fric * f 1.0000e+15e
1833 * rv fri* 1.0000e-04 f 0.0000e+00e
1834 * grav * f 0.0000e+00e
1835 * hd * f 8.6100e-01e
1836 * icflg * f 0e
1837 * nff * f 1 f -1e
1838 * alp * f 1.0000e+00e
1839 * vl * f 0.0000e+00e
1840 * vv * f 0.0000e+00e
1841 * tl * f 4.3252e+02e
1842 * tv * f 4.3252e+02e
1843 * p * f 2.6000e+05e
1844 * pa * f 0.0000e+00e
1845 *
1846 ***** type num id ctitle
1847 tee 513 514 $514$ core simulator tee cell 13
1848 * jcell nodes ichf cost epsw
1849 * 3 0 0 1.0000e+00 0.0000e+00
1850 * iconc1 ncell1 jun1 jun2 ipow1
1851 * 0 4 633 513 0
1852 * radin1 th1 hout11 houtv1 tout11
1853 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1854 * toutv1
1855 * 3.0000e+02
1856 * iconc2 ncell2 jun3 ipow2
1857 * 0 2 613 0
1858 * radin2 th2 hout12 houtv2 tout12
1859 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1860 * toutv2
1861 * 3.0000e+02
1862 *
1863 * dx * f 9.0000e-01e
1864 * vol * f 3.5968e-01e
1865 * fa * f 3.9997e-01e
1866 * fric * f 0.0000e+00e
1867 * rv fri* 1.0000e+15e
1868 * grav * f 0.0000e+00e
1869 * hd * f 8.6100e-01e
1870 * icflg * f 0e
1871 * nff * f -1e
1872 * alp * f 1.0000e+00e
1873 * vl * f 0.0000e+00e
1874 * vv * f 0.0000e+00e
1875 * tl * f 4.3252e+02e
1876 * tv * f 4.3252e+02e
1877 * p * f 2.6000e+05e
1878 * pa * f 0.0000e+00e
1879 *
1880 * dx * f 9.0000e-01e
1881 * vol * f 3.5968e-01e
1882 * fa * f 3.9997e-01e
1883 * fric * f 0.0000e+00e
1884 * rv fri* 1.0000e-04 f 0.0000e+00e
1885 * grav * f 0.0000e+00e
1886 * hd * f 8.6100e-01e
1887 * icflg * f 0e
1888 * nff * f 1 f -1e
1889 * alp * f 1.0000e+00e
1890 * vl * f 0.0000e+00e
1891 * vv * f 0.0000e+00e
1892 * tl * f 4.3252e+02e
1893 * tv * f 4.3252e+02e
1894 * p * f 2.6000e+05e
1895 * pa * f 0.0000e+00e
1896 *
1897 ***** type num id ctitle
1898 tee 514 514 $514$ core simulator tee cell 14
1899 * jcell nodes ichf cost epsw
1900 * 3 0 0 1.0000e+00 0.0000e+00
1901 * iconc1 ncell1 jun1 jun2 ipow1
1902 * 0 4 634 514 0
1903 * radin1 th1 hout11 houtv1 tout11
1904 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1905 * toutv1
1906 * 3.0000e+02
1907 * iconc2 ncell2 jun3 ipow2
1908 * 0 2 614 0
1909 * radin2 th2 hout12 houtv2 tout12
1910 * 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1911 * toutv2
1912 * 3.0000e+02
1913 *
1914 * dx * f 9.0000e-01e
1915 * vol * f 3.5968e-01e
1916 * fa * f 3.9997e-01e
1917 * fric * f 0.0000e+00e
1918 * rv fri* 1.0000e+15e
1919 * grav * f 0.0000e+00e
1920 * hd * f 8.6100e-01e
1921 * icflg * f 0e
1922 * nff * f -1e
1923 * alp * f 1.0000e+00e

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1924 * vl * f 0.0000e+00e
1925 * vv * f 0.0000e+00e
1926 * tl * f 4.3252e+02e
1927 * tv * f 4.3252e+02e
1928 * p * f 2.6000e+05e
1929 * pa * f 0.0000e+00e
1930 *
1931 * dx * f 9.0000e-01e
1932 * vol * f 3.5968e-01e
1933 * fa * f 3.9997e-01e
1934 * fric * f 1.0000e+15e
1935 * rv fri* 1.0000e-04 f 0.0000e+00e
1936 * grav * f 0.0000e+00e
1937 * hd * f 8.6100e-01e
1938 * icflg * f 0e
1939 * nff * 1 f -1e
1940 * alp * f 1.0000e+00e
1941 * vl * f 0.0000e+00e
1942 * vv * f 0.0000e+00e
1943 * tl * f 4.3252e+02e
1944 * tv * f 4.3252e+02e
1945 * p * f 2.6000e+05e
1946 * pa * f 0.0000e+00e
1947 *
1948 ***** type num id ctitle
1949 tee 515 515 $515$ core simulator tee cell 15
1950 * jcell nodes ichf cost epsw
1951 3 0 0 1.0000e+00 0.0000e+00
1952 * iconc1 ncell1 jun1 jun2 ipow1
1953 0 4 635 515 0
1954 * radin1 th1 hout11 houtv1 tout11
1955 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1956 * toutv1
1957 3.0000e+02
1958 * iconc2 ncell2 jun3 ipow2
1959 0 2 615 0
1960 * radin2 th2 hout12 houtv2 tout12
1961 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
1962 * toutv2
1963 3.0000e+02
1964 *
1965 * dx * f 9.0000e-01e
1966 * vol * f 3.5968e-01e
1967 * fa * f 3.9997e-01e
1968 * fric * f 0.0000e+00e
1969 * rv fri* f 1.0000e+15e
1970 * grav * f 0.0000e+00e
1971 * hd * f 8.6100e-01e
1972 * icflg * f 0e
1973 * nff * f -1e
1974 * alp * f 1.0000e+00e
1975 * vl * f 0.0000e+00e
1976 * vv * f 0.0000e+00e
1977 * tl * f 4.3252e+02e
1978 * tv * f 4.3252e+02e
1979 * p * f 2.6000e+05e
1980 * pa * f 0.0000e+00e
1981 *
1982 * dx * f 9.0000e-01e
1983 * vol * f 3.5968e-01e
1984 * fa * f 3.9997e-01e
1985 * fric * f 1.0000e+15e
1986 * rv fri* 1.0000e-04 f 0.0000e+00e
1987 * grav * f 0.0000e+00e
1988 * hd * f 8.6100e-01e
1989 * icflg * f 0e
1990 * nff * 1 f -1e
1991 * alp * f 1.0000e+00e
1992 * vl * f 0.0000e+00e
1993 * vv * f 0.0000e+00e
1994 * tl * f 4.3252e+02e
1995 * tv * f 4.3252e+02e
1996 * p * f 2.6000e+05e
1997 * pa * f 0.0000e+00e
1998 *
1999 ***** type num id ctitle
2000 tee 516 516 $516$ core simulator tee cell 16
2001 * jcell nodes ichf cost epsw
2002 3 0 0 1.0000e+00 0.0000e+00
2003 * iconc1 ncell1 jun1 jun2 ipow1
2004 0 4 636 516 0
2005 * radin1 th1 hout11 houtv1 tout11
2006 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
2007 * toutv1
2008 3.0000e+02
2009 * iconc2 ncell2 jun3 ipow2
2010 0 2 616 0
2011 * radin2 th2 hout12 houtv2 tout12
2012 6.5000e-01 6.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
2013 * toutv2
2014 3.0000e+02
2015 *

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```

2016 * dx * f 9.0000e-01e
2017 * vol * f 3.5968e-01e
2018 * fa * f 3.9997e-01e
2019 * fric * f 0.0000e+00e
2020 * rv fri* f 1.0000e+15e
2021 * grav * f 0.0000e+00e
2022 * hd * f 8.6100e-01e
2023 * icflg * f 0e
2024 * nff * f -1e
2025 * alp * f 1.0000e+00e
2026 * vl * f 0.0000e+00e
2027 * vv * f 0.0000e+00e
2028 * tl * f 4.3252e+02e
2029 * tv * f 4.3252e+02e
2030 * p * f 2.6000e+05e
2031 * pa * f 0.0000e+00e
2032 *
2033 * dx * f 9.0000e-01e
2034 * vol * f 3.5968e-01e
2035 * fa * f 3.9997e-01e
2036 * fric * f 1.0000e+15e
2037 * rv fri* 1.0000e-04 f 0.0000e+00e
2038 * grav * f 0.0000e+00e
2039 * hd * f 8.6100e-01e
2040 * icflg * f 0e
2041 * nff * 1 f -1e
2042 * alp * f 1.0000e+00e
2043 * vl * f 0.0000e+00e
2044 * vv * f 0.0000e+00e
2045 * tl * f 4.3252e+02e
2046 * tv * f 4.3252e+02e
2047 * p * f 2.6000e+05e
2048 * pa * f 0.0000e+00e
2049 *
2050 ***** type num id ctitle
2051 fill 621 621 $621$ core feedback fill cell 01
2052 * jun1 ifty ioff
2053 * 621 2 1
2054 * twtold rfmxc concin felv
2055 * 0.0000e+00 3.0000e+01 0.0000e+00 0.0000e+00
2056 * dxin volin alpin vlin tlin
2057 * 9.0000e-01 2.6000e-01 1.0000e+00 0.0000e+00 4.6114e+02
2058 * pin pain flowin vvin tvin
2059 * 1.9880e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.6114e+02
2060 *
2061 ***** type num id ctitle
2062 fill 622 622 $622$ core feedback fill cell 02
2063 * jun1 ifty ioff
2064 * 622 2 1
2065 * twtold rfmxc concin felv
2066 * 0.0000e+00 3.0000e+01 0.0000e+00 0.0000e+00
2067 * dxin volin alpin vlin tlin
2068 * 9.0000e-01 2.6000e-01 1.0000e+00 0.0000e+00 4.6114e+02
2069 * pin pain flowin vvin tvin
2070 * 1.9880e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.6114e+02
2071 *
2072 ***** type num id ctitle
2073 fill 623 623 $623$ core feedback fill cell 03
2074 * jun1 ifty ioff
2075 * 623 2 1
2076 * twtold rfmxc concin felv
2077 * 0.0000e+00 3.0000e+01 0.0000e+00 0.0000e+00
2078 * dxin volin alpin vlin tlin
2079 * 9.0000e-01 2.6000e-01 1.0000e+00 0.0000e+00 4.6114e+02
2080 * pin pain flowin vvin tvin
2081 * 1.9880e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.6114e+02
2082 *
2083 ***** type num id ctitle
2084 fill 624 624 $624$ core feedback fill cell 04
2085 * jun1 ifty ioff
2086 * 624 2 1
2087 * twtold rfmxc concin felv
2088 * 0.0000e+00 3.0000e+01 0.0000e+00 0.0000e+00
2089 * dxin volin alpin vlin tlin
2090 * 9.0000e-01 2.6000e-01 1.0000e+00 0.0000e+00 4.6114e+02
2091 * pin pain flowin vvin tvin
2092 * 1.9880e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.6114e+02
2093 *
2094 ***** type num id ctitle
2095 fill 625 625 $625$ core feedback fill cell 05
2096 * jun1 ifty ioff
2097 * 625 2 1
2098 * twtold rfmxc concin felv
2099 * 0.0000e+00 3.0000e+01 0.0000e+00 0.0000e+00
2100 * dxin volin alpin vlin tlin
2101 * 9.0000e-01 3.5968e-01 1.0000e+00 0.0000e+00 4.6114e+02
2102 * pin pain flowin vvin tvin
2103 * 1.9880e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.6114e+02
2104 *
2105 ***** type num id ctitle
2106 fill 626 626 $626$ core feedback fill cell 06
2107 * jun1 ifty ioff

```


2108		626	2	1					
2109	*	twtold	rfmx	concin	felv				
2110		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2111	*	dxin	volin	alpin	vlin			tlin	
2112		9.0000e-01	3.5968e-01	1.0000e+00	0.0000e+00			4.6114e+02	
2113	*	pin	pain	flowin	vvin			tvin	
2114		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00			4.6114e+02	
2115	*								
2116	*****	type	num	id	ctitle				
2117	fill	627	627	\$627\$	core feedback fill cell 07				
2118	*	jun1	ifty	ioff					
2119		627	2	1					
2120	*	twtold	rfmx	concin	felv				
2121		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2122	*	dxin	volin	alpin	vlin			tlin	
2123		9.0000e-01	3.5968e-01	1.0000e+00	0.0000e+00			4.6114e+02	
2124	*	pin	pain	flowin	vvin			tvin	
2125		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00			4.6114e+02	
2126	*								
2127	*****	type	num	id	ctitle				
2128	fill	628	628	\$628\$	core feedback fill cell 08				
2129	*	jun1	ifty	ioff					
2130		628	2	1					
2131	*	twtold	rfmx	concin	felv				
2132		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2133	*	dxin	volin	alpin	vlin			tlin	
2134		9.0000e-01	3.5968e-01	1.0000e+00	0.0000e+00			4.6114e+02	
2135	*	pin	pain	flowin	vvin			tvin	
2136		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00			4.6114e+02	
2137	*								
2138	*****	type	num	id	ctitle				
2139	fill	629	629	\$629\$	core feedback fill cell 09				
2140	*	jun1	ifty	ioff					
2141		629	2	1					
2142	*	twtold	rfmx	concin	felv				
2143		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2144	*	dxin	volin	alpin	vlin			tlin	
2145		9.0000e-01	2.6000e-01	1.0000e+00	0.0000e+00			4.6114e+02	
2146	*	pin	pain	flowin	vvin			tvin	
2147		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00			4.6114e+02	
2148	*								
2149	*****	type	num	id	ctitle				
2150	fill	630	630	\$630\$	core feedback fill cell 10				
2151	*	jun1	ifty	ioff					
2152		630	2	1					
2153	*	twtold	rfmx	concin	felv				
2154		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2155	*	dxin	volin	alpin	vlin			tlin	
2156		9.0000e-01	2.6000e-01	1.0000e+00	0.0000e+00			4.6114e+02	
2157	*	pin	pain	flowin	vvin			tvin	
2158		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00			4.6114e+02	
2159	*								
2160	*****	type	num	id	ctitle				
2161	fill	631	631	\$631\$	core feedback fill cell 11				
2162	*	jun1	ifty	ioff					
2163		631	2	1					
2164	*	twtold	rfmx	concin	felv				
2165		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2166	*	dxin	volin	alpin	vlin			tlin	
2167		9.0000e-01	2.6000e-01	1.0000e+00	0.0000e+00			4.6114e+02	
2168	*	pin	pain	flowin	vvin			tvin	
2169		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00			4.6114e+02	
2170	*								
2171	*****	type	num	id	ctitle				
2172	fill	632	632	\$632\$	core feedback fill cell 12				
2173	*	jun1	ifty	ioff					
2174		632	2	1					
2175	*	twtold	rfmx	concin	felv				
2176		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2177	*	dxin	volin	alpin	vlin			tlin	
2178		9.0000e-01	2.6000e-01	1.0000e+00	0.0000e+00			4.6114e+02	
2179	*	pin	pain	flowin	vvin			tvin	
2180		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00			4.6114e+02	
2181	*								
2182	*****	type	num	id	ctitle				
2183	fill	633	633	\$633\$	core feedback fill cell 13				
2184	*	jun1	ifty	ioff					
2185		633	2	1					
2186	*	twtold	rfmx	concin	felv				
2187		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2188	*	dxin	volin	alpin	vlin			tlin	
2189		9.0000e-01	3.5968e-01	1.0000e+00	0.0000e+00			4.6114e+02	
2190	*	pin	pain	flowin	vvin			tvin	
2191		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00			4.6114e+02	
2192	*								
2193	*****	type	num	id	ctitle				
2194	fill	634	634	\$634\$	core feedback fill cell 14				
2195	*	jun1	ifty	ioff					
2196		634	2	1					
2197	*	twtold	rfmx	concin	felv				
2198		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2199	*	dxin	volin	alpin	vlin			tlin	

2200		9.0000e-01	3.5968e-01	1.0000e+00	0.0000e+00	4.6114e+02			
2201	*	pin	pain	flowin	vvin	tvin			
2202		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00	4.6114e+02			
2203	*								
2204	*****	type	num	id	ctitle				
2205	fill	635	635	\$635\$	core feedback fill cell 15				
2206	*	juni	ifty	ioff					
2207		635	2	1					
2208	*	twtold	rfmx	concin	felv				
2209		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2210	*	dxin	volin	alpin	vlin	tlin			
2211		9.0000e-01	3.5968e-01	1.0000e+00	0.0000e+00	4.6114e+02			
2212	*	pin	pain	flowin	vvin	tvin			
2213		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00	4.6114e+02			
2214	*								
2215	*****	type	num	id	ctitle				
2216	fill	636	636	\$636\$	core feedback fill cell 16				
2217	*	juni	ifty	ioff					
2218		636	2	1					
2219	*	twtold	rfmx	concin	felv				
2220		0.0000e+00	3.0000e+01	0.0000e+00	0.0000e+00				
2221	*	dxin	volin	alpin	vlin	tlin			
2222		9.0000e-01	3.5968e-01	1.0000e+00	0.0000e+00	4.6114e+02			
2223	*	pin	pain	flowin	vvin	tvin			
2224		1.9880e+06	0.0000e+00	0.0000e+00	0.0000e+00	4.6114e+02			
2225	*								
2226	*****	type	num	id	ctitle				
2227	fill	601	601	\$601\$	base steam-water fill cell 1				
2228	*	juni	ifty	ioff					
2229		601	6	0					
2230	*	iftr	ifsv	nftb	nfsv	nfrf			
2231		600	100	7	0	0			
2232	*	twtold	rfmx	concin	felv				
2233		0.0000e+00	1.0000e+02	0.0000e+00	0.0000e+00				
2234	*	dxin	volin	alpin	vlin	tlin			
2235		9.0000e-01	2.6000e-01	1.0000e+00	0.0000e+00	4.8615e+02			
2236	*	pin	pain	flowin	vvin	tvin			
2237		1.9000e+06	0.0000e+00	0.0000e+00	0.0000e+00	4.8615e+02			
2238	*	vm scl	vv scl						
2239		1.0000e+00	0.8500e+00						
2240	*	tl scl	tv scl	pscl	pascl	conscl			
2241		1.0000e+00	1.0000e+00	1.0000e+05	1.0000e+00	1.0000e+00			
2242	*								
2243	* vmtb	* r02	0.0000e+00	3.0000e+01	0.0000e+00	3.4000e+01	0.0000e+00		
2244	* vmtb	*	4.0000e+01	0.0000e+00	7.0000e+01	0.0000e+00	1.2000e+02		
2245	* vmtb	*	0.0000e+00	1.4000e+02	0.0000e+00e				
2246	* vvtb	* r02	0.0000e+00	3.0000e+01	0.0000e+00	3.4000e+01	5.9800e+00		
2247	* vvtb	*	4.0000e+01	5.0200e+00	7.0000e+01	5.2400e+00	1.2000e+02		
2248	* vvtb	*	5.8500e+00	1.4000e+02	0.0000e+00e				
2249	* tl tb	*	0.0000e+00	4.8615e+02	3.0000e+01	4.8615e+02	3.4000e+01		
2250	* tl tb	*	4.8015e+02	4.0000e+01	4.7965e+02	7.0000e+01	4.7565e+02		
2251	* tl tb	*	1.2000e+02	4.6915e+02	1.4000e+02	4.6915e+02e			
2252	* tv tb	*	0.0000e+00	4.8615e+02	3.0000e+01	4.8615e+02	3.4000e+01		
2253	* tv tb	*	4.8015e+02	4.0000e+01	4.7965e+02	7.0000e+01	4.7565e+02		
2254	* tv tb	*	1.2000e+02	4.6915e+02	1.4000e+02	4.6915e+02e			
2255	* al ptb	*	0.0000e+00	1.0000e+00	3.0000e+01	1.0000e+00	3.4000e+01		
2256	* al ptb	*	1.0000e+00	4.0000e+01	1.0000e+00	7.0000e+01	1.0000e+00		
2257	* al ptb	*	1.2000e+02	1.0000e+00	1.4000e+02	1.0000e+00e			
2258	* ptb	*	0.0000e+00	1.9000e+01	3.0000e+01	1.9000e+01	3.4000e+01		
2259	* ptb	*	1.8000e+01	4.0000e+01	1.7800e+01	7.0000e+01	1.6300e+01		
2260	* ptb	*	1.2000e+02	1.4300e+01	1.4000e+02	1.4300e+01e			
2261	* patb	* r02	0.0000e+00	3.0000e+01	0.0000e+00	3.4000e+01	0.0000e+00		
2262	* patb	*	4.0000e+01	0.0000e+00	7.0000e+01	0.0000e+00	1.2000e+02		
2263	* patb	*	0.0000e+00	1.4000e+02	0.0000e+00e				
2264	*								
2265	*****	type	num	id	ctitle				
2266	fill	602	602	\$602\$	base steam-water fill cell 2				
2267	*	juni	ifty	ioff					
2268		602	6	0					
2269	*	iftr	ifsv	nftb	nfsv	nfrf			
2270		600	100	7	0	0			
2271	*	twtold	rfmx	concin	felv				
2272		0.0000e+00	1.0000e+02	0.0000e+00	0.0000e+00				
2273	*	dxin	volin	alpin	vlin	tlin			
2274		9.0000e-01	2.6000e-01	1.0000e+00	0.0000e+00	4.8615e+02			
2275	*	pin	pain	flowin	vvin	tvin			
2276		1.9000e+06	0.0000e+00	0.0000e+00	0.0000e+00	4.8615e+02			
2277	*	vm scl	vv scl						
2278		1.0000e+00	0.8500e+00						
2279	*	tl scl	tv scl	pscl	pascl	conscl			
2280		1.0000e+00	1.0000e+00	1.0000e+05	1.0000e+00	1.0000e+00			
2281	*								
2282	* vmtb	* r02	0.0000e+00	3.0000e+01	0.0000e+00	3.4000e+01	0.0000e+00		
2283	* vmtb	*	4.0000e+01	0.0000e+00	7.0000e+01	0.0000e+00	1.2000e+02		
2284	* vmtb	*	0.0000e+00	1.4000e+02	0.0000e+00e				
2285	* vvtb	* r02	0.0000e+00	3.0000e+01	0.0000e+00	3.4000e+01	5.9800e+00		
2286	* vvtb	*	4.0000e+01	5.0200e+00	7.0000e+01	5.2400e+00	1.2000e+02		
2287	* vvtb	*	5.8500e+00	1.4000e+02	0.0000e+00e				
2288	* tl tb	*	0.0000e+00	4.8615e+02	3.0000e+01	4.8615e+02	3.4000e+01		
2289	* tl tb	*	4.8015e+02	4.0000e+01	4.7965e+02	7.0000e+01	4.7565e+02		
2290	* tl tb	*	1.2000e+02	4.6915e+02	1.4000e+02	4.6915e+02e			
2291	* tv tb	*	0.0000e+00	4.8615e+02	3.0000e+01	4.8615e+02	3.4000e+01		

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2292 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2293 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.6915e+02e
2294 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01
2295 * alptb * 1.0000e+00 4.0000e+01 1.0000e+00 7.0000e+01 1.0000e+00
2296 * alptb * 1.2000e+02 1.0000e+00 1.4000e+02 1.0000e+00e 1.0000e+00e
2297 * ptb * 0.0000e+00 1.9000e+01 3.0000e+01 1.9000e+01 3.4000e+01
2298 * ptb * 1.8000e+01 4.0000e+01 1.7800e+01 7.0000e+01 1.6300e+01
2299 * ptb * 1.2000e+02 1.4300e+01 1.4000e+02 1.4300e+01e 1.4300e+01e
2300 * patb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2301 * patb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2302 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e
2303 *
2304 ***** type num id ctitle
2305 fill 603 $603$ base steam-water fill cell 3
2306 * junl ifty ioff
2307 * 603 6 0
2308 * iftr ifsv nftb nfsv nfrf
2309 * 600 100 7 0 0
2310 * twtold rfmv concin felv
2311 * 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
2312 * dbcin volin alpin vlin tlin
2313 * 9.0000e-01 2.6000e-01 1.0000e+00 0.0000e+00 4.8615e+02
2314 * pin pain flowin vvin tvin
2315 * 1.9000e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.8615e+02
2316 * vmscl vvscl
2317 * 1.0000e+00 0.8500e+00
2318 * tlsl tvscl pscl pascl conscl
2319 * 1.0000e+00 1.0000e+00 1.0000e+05 1.0000e+00 1.0000e+00
2320 *
2321 * vmtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2322 * vmtb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2323 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e
2324 * vvtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 5.9800e+00
2325 * vvtb * 4.0000e+01 5.0200e+00 7.0000e+01 5.2400e+00 1.2000e+02
2326 * vvtb * 5.8500e+00 1.4000e+02 0.0000e+00e
2327 * tlbt * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2328 * tlbt * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2329 * tlbt * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.6915e+02e
2330 * tvtb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2331 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2332 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.6915e+02e
2333 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01
2334 * alptb * 1.0000e+00 4.0000e+01 1.0000e+00 7.0000e+01 1.0000e+00
2335 * alptb * 1.2000e+02 1.0000e+00 1.4000e+02 1.0000e+00e 1.0000e+00e
2336 * ptb * 0.0000e+00 1.9000e+01 3.0000e+01 1.9000e+01 3.4000e+01
2337 * ptb * 1.8000e+01 4.0000e+01 1.7800e+01 7.0000e+01 1.6300e+01
2338 * ptb * 1.2000e+02 1.4300e+01 1.4000e+02 1.4300e+01e 1.4300e+01e
2339 * patb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2340 * patb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2341 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e
2342 *
2343 ***** type num id ctitle
2344 fill 604 $604$ base steam-water fill cell 4
2345 * junl ifty ioff
2346 * 604 6 0
2347 * iftr ifsv nftb nfsv nfrf
2348 * 600 100 7 0 0
2349 * twtold rfmv concin felv
2350 * 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
2351 * dbcin volin alpin vlin tlin
2352 * 9.0000e-01 2.6000e-01 1.0000e+00 0.0000e+00 4.8615e+02
2353 * pin pain flowin vvin tvin
2354 * 1.9000e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.8615e+02
2355 * vmscl vvscl
2356 * 1.0000e+00 0.8500e+00
2357 * tlsl tvscl pscl pascl conscl
2358 * 1.0000e+00 1.0000e+00 1.0000e+05 1.0000e+00 1.0000e+00
2359 *
2360 * vmtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2361 * vmtb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2362 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e
2363 * vvtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 5.9800e+00
2364 * vvtb * 4.0000e+01 5.0200e+00 7.0000e+01 5.2400e+00 1.2000e+02
2365 * vvtb * 5.8500e+00 1.4000e+02 0.0000e+00e
2366 * tlbt * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2367 * tlbt * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2368 * tlbt * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.6915e+02e
2369 * tvtb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2370 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2371 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.6915e+02e
2372 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01
2373 * alptb * 1.0000e+00 4.0000e+01 1.0000e+00 7.0000e+01 1.0000e+00
2374 * alptb * 1.2000e+02 1.0000e+00 1.4000e+02 1.0000e+00e 1.0000e+00e
2375 * ptb * 0.0000e+00 1.9000e+01 3.0000e+01 1.9000e+01 3.4000e+01
2376 * ptb * 1.8000e+01 4.0000e+01 1.7800e+01 7.0000e+01 1.6300e+01
2377 * ptb * 1.2000e+02 1.4300e+01 1.4000e+02 1.4300e+01e 1.4300e+01e
2378 * patb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2379 * patb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2380 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e
2381 *
2382 ***** type num id ctitle
2383 fill 605 $605$ base steam-water fill cell 5

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2384 *      junl      ifty      ioff
2385      605          6          0
2386 *      iftr      ifsv      nftb      nfsv      nfrf
2387      600          100         7          0          0
2388 *      twtold     rfmX      concin     felv
2389      0.0000e+00  1.0000e+02  0.0000e+00  0.0000e+00
2390 *      dxin      volin      alpin      vlin      tlin
2391      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.8615e+02
2392 *      pin       pain      flowin     vvin      tvin
2393      1.9000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.8615e+02
2394 *      vmscl     vvscl
2395      1.0000e+00  0.8500e+00
2396 *      t1scl     tvscl      pscl      pascl     conscl
2397      1.0000e+00  1.0000e+00  1.0000e+05  1.0000e+00  1.0000e+00
2398 *
2399 * vmtb * r02 0.0000e+00  3.0000e+01  0.0000e+00  3.4000e+01  0.0000e+00
2400 * vmtb *      4.0000e+01  0.0000e+00  7.0000e+01  0.0000e+00  1.2000e+02
2401 * vmtb *      0.0000e+00  1.4000e+02  0.0000e+00e  0.0000e+00  0.0000e+00
2402 * vvtb * r02 0.0000e+00  3.0000e+01  0.0000e+00  3.4000e+01  5.9800e+00
2403 * vvtb *      4.0000e+01  5.0200e+00  7.0000e+01  5.2400e+00  1.2000e+02
2404 * vvtb *      5.8500e+00  1.4000e+02  0.0000e+00e  0.0000e+00  0.0000e+00
2405 * tlbt *      0.0000e+00  4.8615e+02  3.0000e+01  4.8615e+02  3.4000e+01
2406 * tlbt *      4.8015e+02  4.0000e+01  4.7965e+02  7.0000e+01  4.7565e+02
2407 * tlbt *      1.2000e+02  4.6915e+02  1.4000e+02  4.6915e+02e  4.6915e+02e
2408 * tvtb *      0.0000e+00  4.8615e+02  3.0000e+01  4.8615e+02  3.4000e+01
2409 * tvtb *      4.8015e+02  4.0000e+01  4.7965e+02  7.0000e+01  4.7565e+02
2410 * tvtb *      1.2000e+02  4.6915e+02  1.4000e+02  4.6915e+02e  4.6915e+02e
2411 * alptb *      0.0000e+00  1.0000e+00  3.0000e+01  1.0000e+00  3.4000e+01
2412 * alptb *      1.0000e+00  4.0000e+01  1.0000e+00  7.0000e+01  1.0000e+00
2413 * alptb *      1.2000e+02  1.0000e+00  1.4000e+02  1.0000e+00e  1.0000e+00e
2414 * ptb *      0.0000e+00  1.9000e+01  3.0000e+01  1.9000e+01  3.4000e+01
2415 * ptb *      1.8000e+01  4.0000e+01  1.7800e+01  7.0000e+01  1.6300e+01
2416 * ptb *      1.2000e+02  1.4300e+01  1.4000e+02  1.4300e+01e  1.4300e+01e
2417 * patb * r02 0.0000e+00  3.0000e+01  0.0000e+00  3.4000e+01  0.0000e+00
2418 * patb *      4.0000e+01  0.0000e+00  7.0000e+01  0.0000e+00  1.2000e+02
2419 * patb *      0.0000e+00  1.4000e+02  0.0000e+00e  0.0000e+00e  0.0000e+00e
2420 *
2421 ***** type      num      id      ctitle
2422 fill      606      606 $606$ base steam-water fill cell 6
2423 *      junl      ifty      ioff
2424      606          6          0
2425 *      iftr      ifsv      nftb      nfsv      nfrf
2426      600          100         7          0          0
2427 *      twtold     rfmX      concin     felv
2428      0.0000e+00  1.0000e+02  0.0000e+00  0.0000e+00
2429 *      dxin      volin      alpin      vlin      tlin
2430      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.8615e+02
2431 *      pin       pain      flowin     vvin      tvin
2432      1.9000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.8615e+02
2433 *      vmscl     vvscl
2434      1.0000e+00  0.8500e+00
2435 *      t1scl     tvscl      pscl      pascl     conscl
2436      1.0000e+00  1.0000e+00  1.0000e+05  1.0000e+00  1.0000e+00
2437 *
2438 * vmtb * r02 0.0000e+00  3.0000e+01  0.0000e+00  3.4000e+01  0.0000e+00
2439 * vmtb *      4.0000e+01  0.0000e+00  7.0000e+01  0.0000e+00  1.2000e+02
2440 * vmtb *      0.0000e+00  1.4000e+02  0.0000e+00e  0.0000e+00  0.0000e+00
2441 * vvtb * r02 0.0000e+00  3.0000e+01  0.0000e+00  3.4000e+01  5.9800e+00
2442 * vvtb *      4.0000e+01  5.0200e+00  7.0000e+01  5.2400e+00  1.2000e+02
2443 * vvtb *      5.8500e+00  1.4000e+02  0.0000e+00e  0.0000e+00  0.0000e+00
2444 * tlbt *      0.0000e+00  4.8615e+02  3.0000e+01  4.8615e+02  3.4000e+01
2445 * tlbt *      4.8015e+02  4.0000e+01  4.7965e+02  7.0000e+01  4.7565e+02
2446 * tlbt *      1.2000e+02  4.6915e+02  1.4000e+02  4.6915e+02e  4.6915e+02e
2447 * tvtb *      0.0000e+00  4.8615e+02  3.0000e+01  4.8615e+02  3.4000e+01
2448 * tvtb *      4.8015e+02  4.0000e+01  4.7965e+02  7.0000e+01  4.7565e+02
2449 * tvtb *      1.2000e+02  4.6915e+02  1.4000e+02  4.6915e+02e  4.6915e+02e
2450 * alptb *      0.0000e+00  1.0000e+00  3.0000e+01  1.0000e+00  3.4000e+01
2451 * alptb *      1.0000e+00  4.0000e+01  1.0000e+00  7.0000e+01  1.0000e+00
2452 * alptb *      1.2000e+02  1.0000e+00  1.4000e+02  1.0000e+00e  1.0000e+00e
2453 * ptb *      0.0000e+00  1.9000e+01  3.0000e+01  1.9000e+01  3.4000e+01
2454 * ptb *      1.8000e+01  4.0000e+01  1.7800e+01  7.0000e+01  1.6300e+01
2455 * ptb *      1.2000e+02  1.4300e+01  1.4000e+02  1.4300e+01e  1.4300e+01e
2456 * patb * r02 0.0000e+00  3.0000e+01  0.0000e+00  3.4000e+01  0.0000e+00
2457 * patb *      4.0000e+01  0.0000e+00  7.0000e+01  0.0000e+00  1.2000e+02
2458 * patb *      0.0000e+00  1.4000e+02  0.0000e+00e  0.0000e+00e  0.0000e+00e
2459 *
2460 ***** type      num      id      ctitle
2461 fill      607      607 $607$ base steam-water fill cell 7
2462 *      junl      ifty      ioff
2463      607          6          0
2464 *      iftr      ifsv      nftb      nfsv      nfrf
2465      600          100         7          0          0
2466 *      twtold     rfmX      concin     felv
2467      0.0000e+00  1.0000e+02  0.0000e+00  0.0000e+00
2468 *      dxin      volin      alpin      vlin      tlin
2469      9.0000e-01  2.6000e-01  1.0000e+00  0.0000e+00  4.8615e+02
2470 *      pin       pain      flowin     vvin      tvin
2471      1.9000e+06  0.0000e+00  0.0000e+00  0.0000e+00  4.8615e+02
2472 *      vmscl     vvscl
2473      1.0000e+00  0.8500e+00
2474 *      t1scl     tvscl      pscl      pascl     conscl
2475      1.0000e+00  1.0000e+00  1.0000e+05  1.0000e+00  1.0000e+00

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2476 *
2477 * vmtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2478 * vmtb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2479 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e 0.0000e+00 0.0000e+00 1.2000e+02
2480 * vvtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 5.9800e+00
2481 * vvtb * 4.0000e+01 5.0200e+00 7.0000e+01 5.2400e+00 1.2000e+02
2482 * vvtb * 5.8500e+00 1.4000e+02 0.0000e+00e 0.0000e+00 0.0000e+00 1.2000e+02
2483 * tltb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2484 * tltb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2485 * tltb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.7565e+02
2486 * tvtb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2487 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2488 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.7565e+02
2489 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01
2490 * alptb * 1.0000e+00 4.0000e+01 1.0000e+00 7.0000e+01 1.0000e+00
2491 * alptb * 1.2000e+02 1.0000e+00 1.4000e+02 1.0000e+00e 3.4000e+01
2492 * ptb * 0.0000e+00 1.9000e+01 3.0000e+01 1.9000e+01 1.6300e+01
2493 * ptb * 1.8000e+01 4.0000e+01 1.7800e+01 7.0000e+01 1.6300e+01
2494 * ptb * 1.2000e+02 1.4300e+01 1.4000e+02 1.4300e+01e 1.6300e+01
2495 * patb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2496 * patb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2497 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e 0.0000e+00 0.0000e+00 1.2000e+02
2498 *
2499 ***** type num id ctitle
2500 fill 608 608 $608$ base steam-water fill cell 8
2501 * junl ifty ioff
2502 608 6 0
2503 * iftr ifsv nftb nfsv nfrf
2504 600 100 7 0 0
2505 * twtold rfmxc concin felv
2506 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
2507 * dxin volin alpin vlin tlin
2508 9.0000e-01 2.6000e-01 1.0000e+00 0.0000e+00 4.8615e+02
2509 * pin pain flowin vvin tvin
2510 1.9000e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.8615e+02
2511 * vmscl vvscl
2512 1.0000e+00 0.8500e+00
2513 * tlscl tvscl pscl pascl conscl
2514 1.0000e+00 1.0000e+00 1.0000e+05 1.0000e+00 1.0000e+00
2515 *
2516 * vmtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2517 * vmtb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2518 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e 0.0000e+00 0.0000e+00 1.2000e+02
2519 * vvtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 5.9800e+00
2520 * vvtb * 4.0000e+01 5.0200e+00 7.0000e+01 5.2400e+00 1.2000e+02
2521 * vvtb * 5.8500e+00 1.4000e+02 0.0000e+00e 0.0000e+00 0.0000e+00 1.2000e+02
2522 * tltb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2523 * tltb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2524 * tltb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.7565e+02
2525 * tvtb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2526 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2527 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.7565e+02
2528 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01
2529 * alptb * 1.0000e+00 4.0000e+01 1.0000e+00 7.0000e+01 1.0000e+00
2530 * alptb * 1.2000e+02 1.0000e+00 1.4000e+02 1.0000e+00e 3.4000e+01
2531 * ptb * 0.0000e+00 1.9000e+01 3.0000e+01 1.9000e+01 1.6300e+01
2532 * ptb * 1.8000e+01 4.0000e+01 1.7800e+01 7.0000e+01 1.6300e+01
2533 * ptb * 1.2000e+02 1.4300e+01 1.4000e+02 1.4300e+01e 1.6300e+01
2534 * patb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2535 * patb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2536 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e 0.0000e+00 0.0000e+00 1.2000e+02
2537 *
2538 ***** type num id ctitle
2539 fill 609 609 $609$ base steam-water fill cell 9
2540 * junl ifty ioff
2541 609 6 0
2542 * iftr ifsv nftb nfsv nfrf
2543 600 100 7 0 0
2544 * twtold rfmxc concin felv
2545 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
2546 * dxin volin alpin vlin tlin
2547 9.0000e-01 3.5968e-01 1.0000e+00 0.0000e+00 4.8615e+02
2548 * pin pain flowin vvin tvin
2549 1.9000e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.8615e+02
2550 * vmscl vvscl
2551 1.0000e+00 0.8500e+00
2552 * tlscl tvscl pscl pascl conscl
2553 1.0000e+00 1.0000e+00 1.0000e+05 1.0000e+00 1.0000e+00
2554 *
2555 * vmtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2556 * vmtb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2557 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e 0.0000e+00 0.0000e+00 1.2000e+02
2558 * vvtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 5.9800e+00
2559 * vvtb * 4.0000e+01 5.0200e+00 7.0000e+01 5.2400e+00 1.2000e+02
2560 * vvtb * 5.8500e+00 1.4000e+02 0.0000e+00e 0.0000e+00 0.0000e+00 1.2000e+02
2561 * tltb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2562 * tltb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2563 * tltb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.7565e+02
2564 * tvtb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2565 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2566 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e 4.7565e+02
2567 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01

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2568 * alptb *      1.0000e+00    4.0000e+01    1.0000e+00    7.0000e+01    1.0000e+00
2569 * alptb *      1.2000e+02    1.0000e+00    1.4000e+02    1.0000e+00e    1.0000e+00
2570 * ptb *        0.0000e+00    1.9000e+01    3.0000e+01    1.9000e+01    3.4000e+01
2571 * ptb *        1.8000e+01    4.0000e+01    1.7800e+01    7.0000e+01    1.6300e+01
2572 * ptb *        1.2000e+02    1.4300e+01    1.4000e+02    1.4300e+01e    1.6300e+01
2573 * patb * r02  0.0000e+00    3.0000e+01    0.0000e+00    3.4000e+01    0.0000e+00
2574 * patb *      4.0000e+01    0.0000e+00    7.0000e+01    0.0000e+00    1.2000e+02
2575 * patb *      0.0000e+00    1.4000e+02    0.0000e+00e
2576 *
2577 ***** type          num          id          ctitle
2578 fill          610          610 $610$ base steam-water fill cell 10
2579 *            jun1          ifty          ioff
2580            610            6            0
2581 *            iftr          ifsv          nftb          nfsv          nfrf
2582            600            100           7            0            0
2583 *            twtold        rfmX          concin        felv
2584            0.0000e+00    1.0000e+02    0.0000e+00    0.0000e+00
2585 *            dxin          volin        alpin          vlin          tlin
2586            9.0000e-01    3.5968e-01    1.0000e+00    0.0000e+00    4.8615e+02
2587 *            pin          pain        flowin        vvin          tvin
2588            1.9000e+06    0.0000e+00    0.0000e+00    0.0000e+00    4.8615e+02
2589 *            vmscl        vvscl
2590            1.0000e+00    0.8500e+00
2591 *            tlscl        tvscl          pscl          pascl          conscl
2592            1.0000e+00    1.0000e+00    1.0000e+05    1.0000e+00    1.0000e+00
2593 *
2594 * vmtb * r02  0.0000e+00    3.0000e+01    0.0000e+00    3.4000e+01    0.0000e+00
2595 * vmtb *      4.0000e+01    0.0000e+00    7.0000e+01    0.0000e+00    1.2000e+02
2596 * vmtb *      0.0000e+00    1.4000e+02    0.0000e+00e
2597 * vvtb * r02  0.0000e+00    3.0000e+01    0.0000e+00    3.4000e+01    5.9800e+00
2598 * vvtb *      4.0000e+01    5.0200e+00    7.0000e+01    5.2400e+00    1.2000e+02
2599 * vvtb *      5.8500e+00    1.4000e+02    0.0000e+00e
2600 * tlbt *      0.0000e+00    4.8615e+02    3.0000e+01    4.8615e+02    3.4000e+01
2601 * tlbt *      4.8015e+02    4.0000e+01    4.7965e+02    7.0000e+01    4.7565e+02
2602 * tlbt *      1.2000e+02    4.6915e+02    1.4000e+02    4.6915e+02e
2603 * tvtb *      0.0000e+00    4.8615e+02    3.0000e+01    4.8615e+02    3.4000e+01
2604 * tvtb *      4.8015e+02    4.0000e+01    4.7965e+02    7.0000e+01    4.7565e+02
2605 * tvtb *      1.2000e+02    4.6915e+02    1.4000e+02    4.6915e+02e
2606 * alptb *      0.0000e+00    1.0000e+00    3.0000e+01    1.0000e+00    3.4000e+01
2607 * alptb *      1.0000e+00    4.0000e+01    1.0000e+00    7.0000e+01    1.0000e+00
2608 * alptb *      1.2000e+02    1.0000e+00    1.4000e+02    1.0000e+00e
2609 * ptb *        0.0000e+00    1.9000e+01    3.0000e+01    1.9000e+01    3.4000e+01
2610 * ptb *      1.8000e+01    4.0000e+01    1.7800e+01    7.0000e+01    1.6300e+01
2611 * ptb *      1.2000e+02    1.4300e+01    1.4000e+02    1.4300e+01e
2612 * patb * r02  0.0000e+00    3.0000e+01    0.0000e+00    3.4000e+01    0.0000e+00
2613 * patb *      4.0000e+01    0.0000e+00    7.0000e+01    0.0000e+00    1.2000e+02
2614 * patb *      0.0000e+00    1.4000e+02    0.0000e+00e
2615 *
2616 ***** type          num          id          ctitle
2617 fill          611          611 $611$ base steam-water fill cell 11
2618 *            jun1          ifty          ioff
2619            611            6            0
2620 *            iftr          ifsv          nftb          nfsv          nfrf
2621            600            100           7            0            0
2622 *            twtold        rfmX          concin        felv
2623            0.0000e+00    1.0000e+02    0.0000e+00    0.0000e+00
2624 *            dxin          volin        alpin          vlin          tlin
2625            9.0000e-01    3.5968e-01    1.0000e+00    0.0000e+00    4.8615e+02
2626 *            pin          pain        flowin        vvin          tvin
2627            1.9000e+06    0.0000e+00    0.0000e+00    0.0000e+00    4.8615e+02
2628 *            vmscl        vvscl
2629            1.0000e+00    0.8500e+00
2630 *            tlscl        tvscl          pscl          pascl          conscl
2631            1.0000e+00    1.0000e+00    1.0000e+05    1.0000e+00    1.0000e+00
2632 *
2633 * vmtb * r02  0.0000e+00    3.0000e+01    0.0000e+00    3.4000e+01    0.0000e+00
2634 * vmtb *      4.0000e+01    0.0000e+00    7.0000e+01    0.0000e+00    1.2000e+02
2635 * vmtb *      0.0000e+00    1.4000e+02    0.0000e+00e
2636 * vvtb * r02  0.0000e+00    3.0000e+01    0.0000e+00    3.4000e+01    5.9800e+00
2637 * vvtb *      4.0000e+01    5.0200e+00    7.0000e+01    5.2400e+00    1.2000e+02
2638 * vvtb *      5.8500e+00    1.4000e+02    0.0000e+00e
2639 * tlbt *      0.0000e+00    4.8615e+02    3.0000e+01    4.8615e+02    3.4000e+01
2640 * tlbt *      4.8015e+02    4.0000e+01    4.7965e+02    7.0000e+01    4.7565e+02
2641 * tlbt *      1.2000e+02    4.6915e+02    1.4000e+02    4.6915e+02e
2642 * tvtb *      0.0000e+00    4.8615e+02    3.0000e+01    4.8615e+02    3.4000e+01
2643 * tvtb *      4.8015e+02    4.0000e+01    4.7965e+02    7.0000e+01    4.7565e+02
2644 * tvtb *      1.2000e+02    4.6915e+02    1.4000e+02    4.6915e+02e
2645 * alptb *      0.0000e+00    1.0000e+00    3.0000e+01    1.0000e+00    3.4000e+01
2646 * alptb *      1.0000e+00    4.0000e+01    1.0000e+00    7.0000e+01    1.0000e+00
2647 * alptb *      1.2000e+02    1.0000e+00    1.4000e+02    1.0000e+00e
2648 * ptb *      0.0000e+00    1.9000e+01    3.0000e+01    1.9000e+01    3.4000e+01
2649 * ptb *      1.8000e+01    4.0000e+01    1.7800e+01    7.0000e+01    1.6300e+01
2650 * ptb *      1.2000e+02    1.4300e+01    1.4000e+02    1.4300e+01e
2651 * patb * r02  0.0000e+00    3.0000e+01    0.0000e+00    3.4000e+01    0.0000e+00
2652 * patb *      4.0000e+01    0.0000e+00    7.0000e+01    0.0000e+00    1.2000e+02
2653 * patb *      0.0000e+00    1.4000e+02    0.0000e+00e
2654 *
2655 ***** type          num          id          ctitle
2656 fill          612          612 $612$ base steam-water fill cell 12
2657 *            jun1          ifty          ioff
2658            612            6            0
2659 *            iftr          ifsv          nftb          nfsv          nfrf

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2660          600          100          7          0          0
2661 *          twtold          rfmix          concin          felv
2662          0.0000e+00          1.0000e+02          0.0000e+00          0.0000e+00
2663 *          dxin          volin          alpin          vlin          tlin
2664          9.0000e-01          3.5968e-01          1.0000e+00          0.0000e+00          4.8615e+02
2665 *          pin          pain          flowin          vvin          tvin
2666          1.9000e+06          0.0000e+00          0.0000e+00          0.0000e+00          4.8615e+02
2667 *          vmscl          vvscl
2668          1.0000e+00          0.8500e+00
2669 *          t1scl          tvscl          pscl          pascl          conscl
2670          1.0000e+00          1.0000e+00          1.0000e+05          1.0000e+00          1.0000e+00
2671 *
2672 * vmtb * r02 0.0000e+00          3.0000e+01          0.0000e+00          3.4000e+01          0.0000e+00
2673 * vmtb *          4.0000e+01          0.0000e+00          7.0000e+01          0.0000e+00          1.2000e+02
2674 * vmtb *          0.0000e+00          1.4000e+02          0.0000e+00e          0.0000e+00          0.0000e+00
2675 * vvtb * r02 0.0000e+00          3.0000e+01          0.0000e+00          3.4000e+01          5.9800e+00
2676 * vvtb *          4.0000e+01          5.0200e+00          7.0000e+01          5.2400e+00          1.2000e+02
2677 * vvtb *          5.8500e+00          1.4000e+02          0.0000e+00e          0.0000e+00          0.0000e+00
2678 * tltb *          0.0000e+00          4.8615e+02          3.0000e+01          4.8615e+02          3.4000e+01
2679 * tltb *          4.8015e+02          4.0000e+01          4.7965e+02          7.0000e+01          4.7565e+02
2680 * tltb *          1.2000e+02          4.6915e+02          1.4000e+02          4.6915e+02e          3.4000e+01
2681 * tvtb *          0.0000e+00          4.8615e+02          3.0000e+01          4.8615e+02          3.4000e+01
2682 * tvtb *          4.8015e+02          4.0000e+01          4.7965e+02          7.0000e+01          4.7565e+02
2683 * tvtb *          1.2000e+02          4.6915e+02          1.4000e+02          4.6915e+02e          3.4000e+01
2684 * alptb *          0.0000e+00          1.0000e+00          3.0000e+01          1.0000e+00          3.4000e+01
2685 * alptb *          1.0000e+00          4.0000e+01          1.0000e+00          7.0000e+01          1.0000e+00
2686 * alptb *          1.2000e+02          1.0000e+00          1.4000e+02          1.0000e+00e          3.4000e+01
2687 * ptb *          0.0000e+00          1.9000e+01          3.0000e+01          1.9000e+01          3.4000e+01
2688 * ptb *          1.8000e+01          4.0000e+01          1.7800e+01          7.0000e+01          1.6300e+01
2689 * ptb *          1.2000e+02          1.4300e+01          1.4000e+02          1.4300e+01e          3.4000e+01
2690 * patb * r02 0.0000e+00          3.0000e+01          0.0000e+00          3.4000e+01          0.0000e+00
2691 * patb *          4.0000e+01          0.0000e+00          7.0000e+01          0.0000e+00          1.2000e+02
2692 * patb *          0.0000e+00          1.4000e+02          0.0000e+00e          0.0000e+00          0.0000e+00
2693 *
2694 ***** type          num          id          ctitle
2695 fill          613          613 $613$ base steam-water fill cell 13
2696 *          jun1          ifty          ioff
2697          613          6          0
2698 *          iftr          ifsv          nftb          nfsv          nfrf
2699          600          100          7          0          0
2700 *          twtold          rfmix          concin          felv
2701          0.0000e+00          1.0000e+02          0.0000e+00          0.0000e+00
2702 *          dxin          volin          alpin          vlin          tlin
2703          9.0000e-01          3.5968e-01          1.0000e+00          0.0000e+00          4.8615e+02
2704 *          pin          pain          flowin          vvin          tvin
2705          1.9000e+06          0.0000e+00          0.0000e+00          0.0000e+00          4.8615e+02
2706 *          vmscl          vvscl
2707          1.0000e+00          0.8500e+00
2708 *          t1scl          tvscl          pscl          pascl          conscl
2709          1.0000e+00          1.0000e+00          1.0000e+05          1.0000e+00          1.0000e+00
2710 *
2711 * vmtb * r02 0.0000e+00          3.0000e+01          0.0000e+00          3.4000e+01          0.0000e+00
2712 * vmtb *          4.0000e+01          0.0000e+00          7.0000e+01          0.0000e+00          1.2000e+02
2713 * vmtb *          0.0000e+00          1.4000e+02          0.0000e+00e          0.0000e+00          0.0000e+00
2714 * vvtb * r02 0.0000e+00          3.0000e+01          0.0000e+00          3.4000e+01          5.9800e+00
2715 * vvtb *          4.0000e+01          5.0200e+00          7.0000e+01          5.2400e+00          1.2000e+02
2716 * vvtb *          5.8500e+00          1.4000e+02          0.0000e+00e          0.0000e+00          0.0000e+00
2717 * tltb *          0.0000e+00          4.8615e+02          3.0000e+01          4.8615e+02          3.4000e+01
2718 * tltb *          4.8015e+02          4.0000e+01          4.7965e+02          7.0000e+01          4.7565e+02
2719 * tltb *          1.2000e+02          4.6915e+02          1.4000e+02          4.6915e+02e          3.4000e+01
2720 * tvtb *          0.0000e+00          4.8615e+02          3.0000e+01          4.8615e+02          3.4000e+01
2721 * tvtb *          4.8015e+02          4.0000e+01          4.7965e+02          7.0000e+01          4.7565e+02
2722 * tvtb *          1.2000e+02          4.6915e+02          1.4000e+02          4.6915e+02e          3.4000e+01
2723 * alptb *          0.0000e+00          1.0000e+00          3.0000e+01          1.0000e+00          3.4000e+01
2724 * alptb *          1.0000e+00          4.0000e+01          1.0000e+00          7.0000e+01          1.0000e+00
2725 * alptb *          1.2000e+02          1.0000e+00          1.4000e+02          1.0000e+00e          3.4000e+01
2726 * ptb *          0.0000e+00          1.9000e+01          3.0000e+01          1.9000e+01          3.4000e+01
2727 * ptb *          1.8000e+01          4.0000e+01          1.7800e+01          7.0000e+01          1.6300e+01
2728 * ptb *          1.2000e+02          1.4300e+01          1.4000e+02          1.4300e+01e          3.4000e+01
2729 * patb * r02 0.0000e+00          3.0000e+01          0.0000e+00          3.4000e+01          0.0000e+00
2730 * patb *          4.0000e+01          0.0000e+00          7.0000e+01          0.0000e+00          1.2000e+02
2731 * patb *          0.0000e+00          1.4000e+02          0.0000e+00e          0.0000e+00          0.0000e+00
2732 *
2733 ***** type          num          id          ctitle
2734 fill          614          614 $614$ base steam-water fill cell 14
2735 *          jun1          ifty          ioff
2736          614          6          0
2737 *          iftr          ifsv          nftb          nfsv          nfrf
2738          600          100          7          0          0
2739 *          twtold          rfmix          concin          felv
2740          0.0000e+00          1.0000e+02          0.0000e+00          0.0000e+00
2741 *          dxin          volin          alpin          vlin          tlin
2742          9.0000e-01          3.5968e-01          1.0000e+00          0.0000e+00          4.8615e+02
2743 *          pin          pain          flowin          vvin          tvin
2744          1.9000e+06          0.0000e+00          0.0000e+00          0.0000e+00          4.8615e+02
2745 *          vmscl          vvscl
2746          1.0000e+00          0.8500e+00
2747 *          t1scl          tvscl          pscl          pascl          conscl
2748          1.0000e+00          1.0000e+00          1.0000e+05          1.0000e+00          1.0000e+00
2749 *
2750 * vmtb * r02 0.0000e+00          3.0000e+01          0.0000e+00          3.4000e+01          0.0000e+00
2751 * vmtb *          4.0000e+01          0.0000e+00          7.0000e+01          0.0000e+00          1.2000e+02

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2752 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e
2753 * vvtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 5.9800e+00
2754 * vvtb * 4.0000e+01 5.0200e+00 7.0000e+01 5.2400e+00 1.2000e+02
2755 * vvtb * 5.8500e+00 1.4000e+02 0.0000e+00e
2756 * tlbt * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2757 * tlbt * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2758 * tlbt * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e
2759 * tvtb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2760 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2761 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e
2762 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01
2763 * alptb * 1.0000e+00 4.0000e+01 1.0000e+00 7.0000e+01 1.0000e+00
2764 * alptb * 1.2000e+02 1.0000e+00 1.4000e+02 1.0000e+00e
2765 * ptb * 0.0000e+00 1.9000e+01 3.0000e+01 1.9000e+01 3.4000e+01
2766 * ptb * 1.8000e+01 4.0000e+01 1.7800e+01 7.0000e+01 1.6300e+01
2767 * ptb * 1.2000e+02 1.4300e+01 1.4000e+02 1.4300e+01e
2768 * patb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2769 * patb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2770 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e
2771 *
2772 ***** type num id ctitle
2773 fill 615 615 $615$ base steam-water fill cell 15
2774 * junl ifty ioff
2775 * 615 6 0
2776 * iftr ifsv nftb nfv nfrf
2777 * 600 100 7 0 0
2778 * twtold rfmv concin felv
2779 * 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
2780 * dxin volin alpin vlin tlin
2781 * 9.0000e-01 3.5968e-01 1.0000e+00 0.0000e+00 4.8615e+02
2782 * pin pain flowin vvin tvin
2783 * 1.9000e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.8615e+02
2784 * vmscl vvscl
2785 * 1.0000e+00 0.8500e+00
2786 * tlvcl tvscl pscl pascl conscl
2787 * 1.0000e+00 1.0000e+00 1.0000e+05 1.0000e+00 1.0000e+00
2788 *
2789 * vmtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2790 * vmtb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2791 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e
2792 * vvtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 5.9800e+00
2793 * vvtb * 4.0000e+01 5.0200e+00 7.0000e+01 5.2400e+00 1.2000e+02
2794 * vvtb * 5.8500e+00 1.4000e+02 0.0000e+00e
2795 * tlbt * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2796 * tlbt * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2797 * tlbt * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e
2798 * tvtb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2799 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2800 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e
2801 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01
2802 * alptb * 1.0000e+00 4.0000e+01 1.0000e+00 7.0000e+01 1.0000e+00
2803 * alptb * 1.2000e+02 1.0000e+00 1.4000e+02 1.0000e+00e
2804 * ptb * 0.0000e+00 1.9000e+01 3.0000e+01 1.9000e+01 3.4000e+01
2805 * ptb * 1.8000e+01 4.0000e+01 1.7800e+01 7.0000e+01 1.6300e+01
2806 * ptb * 1.2000e+02 1.4300e+01 1.4000e+02 1.4300e+01e
2807 * patb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2808 * patb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2809 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e
2810 *
2811 ***** type num id ctitle
2812 fill 616 616 $616$ base steam-water fill cell 16
2813 * junl ifty ioff
2814 * 616 6 0
2815 * iftr ifsv nftb nfv nfrf
2816 * 600 100 7 0 0
2817 * twtold rfmv concin felv
2818 * 0.0000e+00 1.0000e+02 0.0000e+00 0.0000e+00
2819 * dxin volin alpin vlin tlin
2820 * 9.0000e-01 3.5968e-01 1.0000e+00 0.0000e+00 4.8615e+02
2821 * pin pain flowin vvin tvin
2822 * 1.9000e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.8615e+02
2823 * vmscl vvscl
2824 * 1.0000e+00 0.8500e+00
2825 * tlvcl tvscl pscl pascl conscl
2826 * 1.0000e+00 1.0000e+00 1.0000e+05 1.0000e+00 1.0000e+00
2827 *
2828 * vmtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2829 * vmtb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2830 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e
2831 * vvtb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 5.9800e+00
2832 * vvtb * 4.0000e+01 5.0200e+00 7.0000e+01 5.2400e+00 1.2000e+02
2833 * vvtb * 5.8500e+00 1.4000e+02 0.0000e+00e
2834 * tlbt * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2835 * tlbt * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2836 * tlbt * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e
2837 * tvtb * 0.0000e+00 4.8615e+02 3.0000e+01 4.8615e+02 3.4000e+01
2838 * tvtb * 4.8015e+02 4.0000e+01 4.7965e+02 7.0000e+01 4.7565e+02
2839 * tvtb * 1.2000e+02 4.6915e+02 1.4000e+02 4.6915e+02e
2840 * alptb * 0.0000e+00 1.0000e+00 3.0000e+01 1.0000e+00 3.4000e+01
2841 * alptb * 1.0000e+00 4.0000e+01 1.0000e+00 7.0000e+01 1.0000e+00
2842 * alptb * 1.2000e+02 1.0000e+00 1.4000e+02 1.0000e+00e
2843 * ptb * 0.0000e+00 1.9000e+01 3.0000e+01 1.9000e+01 3.4000e+01

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2844 * ptb * 1.8000e+01 4.0000e+01 1.7800e+01 7.0000e+01 1.6300e+01
2845 * ptb * 1.2000e+02 1.4300e+01 1.4000e+02 1.4000e+01e 1.4300e+01e
2846 * patb * r02 0.0000e+00 3.0000e+01 0.0000e+00 3.4000e+01 0.0000e+00
2847 * patb * 4.0000e+01 0.0000e+00 7.0000e+01 0.0000e+00 1.2000e+02
2848 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e
2849 *
2850 ***** type num id ctitle
2851 tee 10 10 $10$ hot-leg loop 1
2852 * jcell nodes ichf cost epsw
2853 * 4 4 1 -1.0000e+00 0.0000e+00
2854 * iconc1 ncell1 jun1 jun2 ipow1
2855 * 0 9 10 11 0
2856 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
2857 * 0 0 0 0 0
2858 * radin1 th1 hout11 houtv1 tout11
2859 * 3.7500e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2860 * toutv1
2861 * 3.0000e+02
2862 * qpin1 qpoff1 rqpms1 qpscl1
2863 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2864 * iconc2 ncell2 jun3 ipow2
2865 * 0 1 15 0
2866 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
2867 * 0 0 0 0 0
2868 * radin2 th2 hout12 houtv2 tout12
2869 * 1.1000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2870 * toutv2
2871 * 3.0000e+02
2872 * qpin2 qpoff2 rqpms2 qpscl2
2873 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2874 *
2875 * dx * r03 5.1070e-01r03 1.2867e+00 1.3370e+00 1.0420e+00 6.2600e-01
2876 e
2877 * vol * r03 2.2560e-01r03 5.1130e-01 5.9070e-01 4.6030e-01 2.7660e-01
2878 e
2879 * fa * r03 4.4179e-01r03 3.9740e-01r04 4.4179e-01e
2880 * fric * r02 0.0000e+00r06 1.6000e-02r02 0.0000e+00e
2881 * rv fri* r02 0.0000e+00r06 1.6000e-02r02 0.0000e+00e
2882 * grav * r07 0.0000e+00 1.8020e-01 5.6120e-01 6.8030e-01e
2883 * hd * r03 7.5000e-01r03 6.3880e-01r04 7.5000e-01e
2884 * icflg * r04 0 1r05 0e
2885 * nff * -1r09 -1e
2886 * alp * f 1.0000e+00e
2887 * vl * f 0.0000e+00e
2888 * vv * f 0.0000e+00e
2889 * tl * f 4.1895e+02e
2890 * tv * f 4.1895e+02e
2891 * p * f 2.6000e+05e
2892 * pa * f 0.0000e+00e
2893 * qppp * f 0.0000e+00e
2894 * matid * f 6e
2895 * tw * f 4.1895e+02e
2896 *
2897 * dx * 1.0000e+01e
2898 * vol * 4.0660e-01e
2899 * fa * f 4.0660e-02e
2900 * fric * 1.0000e-04 f 0.0000e+00e
2901 * rv fri* 1.0000e-04 f 0.0000e+00e
2902 * grav * f -1.0000e+00e
2903 * hd * f 2.0770e-01e
2904 * icflg * f 0e
2905 * nff * 1 f -1e
2906 * alp * 1.0000e+00e
2907 * vl * f 0.0000e+00e
2908 * vv * f 0.0000e+00e
2909 * tl * 4.1895e+02e
2910 * tv * 4.1895e+02e
2911 * p * 2.6000e+05e
2912 * pa * 0.0000e+00e
2913 * qppp * f 0.0000e+00e
2914 * matid * f 6e
2915 * tw * f 4.1895e+02e
2916 *
2917 ***** type num id ctitle
2918 tee 11 11 $11$ separator-bottom loop 1
2919 * jcell nodes ichf cost epsw
2920 * 1 4 1 0.0000e+00 0.0000e+00
2921 * iconc1 ncell1 jun1 jun2 ipow1
2922 * 0 4 11 12 0
2923 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
2924 * 0 0 0 0 0
2925 * radin1 th1 hout11 houtv1 tout11
2926 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
2927 * toutv1
2928 * 3.0000e+02
2929 * qpin1 qpoff1 rqpms1 qpscl1
2930 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
2931 * iconc2 ncell2 jun3 ipow2
2932 * 0 1 18 0
2933 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
2934 * 0 0 0 0 0
2935 * radin2 th2 hout12 houtv2 tout12

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2936      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
2937 *      toutv2
2938      3.0000e+02
2939 *      qpin2      qpoff2      rqpms2      qpscl2
2940      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
2941 *
2942 * dx *      9.5560e-01r02 3.2510e-01      4.2400e-01e
2943 * vol *      2.5970e+00      1.5266e+00      1.5253e+00      2.5870e-01e
2944 * fa *      4.4179e-01      4.5584e+00      4.7298e+00r02 6.1010e-01e
2945 * fric * r04 0.0000e+00      3.6210e-01e
2946 * rv fri* r04 0.0000e+00      9.0530e-01e
2947 * grav *      6.8030e-01r04 1.0000e+00e
2948 * hd *      7.5000e-01r02 2.3000e+00r02 1.5830e-01e
2949 * icflg * f      0e
2950 * nff * f      -1e
2951 * alp * f      1.0000e+00e
2952 * vl * f      0.0000e+00e
2953 * vv * f      0.0000e+00e
2954 * tl * f      4.1895e+02e
2955 * tv * f      4.1895e+02e
2956 * p * f      2.6000e+05e
2957 * pa * f      0.0000e+00e
2958 * qppp * f      0.0000e+00e
2959 * matid * f      6e
2960 * tw * f      4.1895e+02e
2961 *
2962 * dx *      2.0000e-01e
2963 * vol *      1.0700e-02e
2964 * fa * f      5.3260e-02e
2965 * fric * 1.0000e-04 f      0.0000e+00e
2966 * rv fri* 1.0000e-04 f      0.0000e+00e
2967 * grav *      0.0000e+00      -4.2200e-01e
2968 * hd * f      2.6040e-01e
2969 * icflg * f      0e
2970 * nff *      1 f      -1e
2971 * alp *      1.0000e+00e
2972 * vl * f      0.0000e+00e
2973 * vv * f      0.0000e+00e
2974 * tl *      4.1895e+02e
2975 * tv *      4.1895e+02e
2976 * p *      2.6000e+05e
2977 * pa *      0.0000e+00e
2978 * qppp * f      0.0000e+00e
2979 * matid * f      6e
2980 * tw * f      4.1895e+02e
2981 *
2982 *****      type      num      id      ctitle
2983 tee      12      $12$ separator-middle loop 1
2984 *      jcell      nodes      ichf      cost      epsw
2985      4      4      1      1.0000e+00      0.0000e+00
2986 *      iconc1      ncell1      jun1      jun2      ipow1
2987      0      4      12      13      0
2988 *      iqptr1      iqpsv1      nqptb1      nqpsv1      nqprf1
2989      0      0      0      0      0
2990 *      radin1      th1      hout11      houtv1      tout11
2991      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
2992 *      toutv1
2993      3.0000e+02
2994 *      qpin1      qpoff1      rqpms1      qpscl1
2995      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
2996 *      iconc2      ncell2      jun3      ipow2
2997      0      4      19      0
2998 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
2999      0      0      0      0      0
3000 *      radin2      th2      hout12      houtv2      tout12
3001      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
3002 *      toutv2
3003      3.0000e+02
3004 *      qpin2      qpoff2      rqpms2      qpscl2
3005      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
3006 *
3007 * dx *      1.8800e-01r02 7.1000e-01      2.0000e-01e
3008 * vol *      1.5740e-01r02 7.5580e-01      2.1290e-01e
3009 * fa *      6.1010e-01r04 1.0645e+00e
3010 * fric *      3.6210e-01r03 0.0000e+00      1.0000e+30e
3011 * rv fri*      9.0530e-01r04 0.0000e+00e
3012 * grav * f      1.0000e+00e
3013 * hd *      1.5830e-01r04 2.0910e-01e
3014 * icflg * f      0e
3015 * nff * f      -1e
3016 * alp * f      1.0000e+00e
3017 * vl * f      0.0000e+00e
3018 * vv * f      0.0000e+00e
3019 * tl * f      4.1895e+02e
3020 * tv * f      4.1895e+02e
3021 * p * f      2.6000e+05e
3022 * pa * f      0.0000e+00e
3023 * qppp * f      0.0000e+00e
3024 * matid * f      6e
3025 * tw * f      4.1895e+02e
3026 *
3027 * dx * r02 7.1000e-01      1.8800e-01      4.2400e-01e

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3028 * vol * r02 2.4617e+00 7.0570e-01 1.7130e+00e
3029 * fa * r03 3.4673e+00r02 4.0401e+00e
3030 * fric * 1.0000e-04 f 0.0000e+00e
3031 * rv fri* 1.0000e-04 f 0.0000e+00e
3032 * grav * f -1.0000e+00e
3033 * hd * f 4.4000e-01e
3034 * icflg * f 0e
3035 * nff * f 1 f -1e
3036 * alp * f 1.0000e+00e
3037 * vl * f 0.0000e+00e
3038 * vv * f 0.0000e+00e
3039 * tl * f 4.1895e+02e
3040 * tv * f 4.1895e+02e
3041 * p * f 2.6000e+05e
3042 * pa * f 0.0000e+00e
3043 * qppp * f 0.0000e+00e
3044 * matid * f 6e
3045 * tw * f 4.1895e+02e
3046 *
3047 ***** type num id ctitle
3048 tee 13 13 $13$ separator-top loop 1
3049 * jcell nodes ichf cost epsw
3050 3 4 1 0.0000e+00 0.0000e+00
3051 * iconcl ncell1 jun1 jun2 ipow1
3052 0 4 13 14 0
3053 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
3054 0 0 0 0 0
3055 * radin1 th1 hout11 houtv1 tout11
3056 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3057 * toutv1
3058 3.0000e+02
3059 * qpini qpoff1 rqpms1 qpscl1
3060 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3061 * iconc2 ncell2 jun3 ipow2
3062 0 1 113 0
3063 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
3064 0 0 0 0 0
3065 * radin2 th2 hout12 houtv2 tout12
3066 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3067 * toutv2
3068 3.0000e+02
3069 * qpini qpoff2 rqpms2 qpscl2
3070 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3071 *
3072 * dx * 2.0000e-01 2.8500e-01 4.0000e-01 8.1000e-01e
3073 * vol * 2.1290e-01 1.5732e+00 1.8919e+00 3.0974e+00e
3074 * fa * r02 1.0645e+00r02 4.7298e+00 4.4179e-01e
3075 * fric * 1.0000e+30r04 0.0000e+00e
3076 * rv fri* f 0.0000e+00e
3077 * grav * f 1.0000e+00e
3078 * hd * r02 2.0910e-01r02 2.4540e+00 7.5000e-01e
3079 * icflg * f 0e
3080 * nff * f -1e
3081 * alp * f 1.0000e+00e
3082 * vl * f 0.0000e+00e
3083 * vv * f 0.0000e+00e
3084 * tl * f 4.1895e+02e
3085 * tv * f 4.1895e+02e
3086 * p * f 2.6000e+05e
3087 * pa * f 0.0000e+00e
3088 * qppp * f 0.0000e+00e
3089 * matid * f 6e
3090 * tw * f 4.1895e+02e
3091 *
3092 * dx * 1.0000e+00e
3093 * vol * 1.2600e-01e
3094 * fa * f 1.2600e-01e
3095 * fric * 1.0000e-04 f 0.0000e+00e
3096 * rv fri* 1.0000e-04 f 0.0000e+00e
3097 * grav * f 0.0000e+00e
3098 * hd * f 4.0000e-01e
3099 * icflg * f 0e
3100 * nff * f 1 f -1e
3101 * alp * f 1.0000e+00e
3102 * vl * f 0.0000e+00e
3103 * vv * f 0.0000e+00e
3104 * tl * f 4.1895e+02e
3105 * tv * f 4.1895e+02e
3106 * p * f 2.6000e+05e
3107 * pa * f 0.0000e+00e
3108 * qppp * f 0.0000e+00e
3109 * matid * f 6e
3110 * tw * f 4.1895e+02e
3111 *
3112 ***** type num id ctitle
3113 tee 14 14 $14$ loop-seal cold-leg loop 1
3114 * jcell nodes ichf cost epsw
3115 17 4 1 5.0000e-01 0.0000e+00
3116 * iconcl ncell1 jun1 jun2 ipow1
3117 0 21 14 17 0
3118 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
3119 0 0 0 0 0

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```

3120 *      radin1      th1      hout11      houtv1      tout11
3121 * 3.7500e-01  1.0000e-02  0.0000e+00  0.0000e+00  3.0000e+02
3122 *      toutv1
3123 * 3.0000e+02
3124 *      qpin1      qpoff1      rqpax1      qpscl1
3125 * 0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
3126 *      iconc2      ncell2      jun3      ipow2
3127 *      0      1      160      0
3128 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
3129 *      0      0      0      0      0
3130 *      radin2      th2      hout12      houtv2      tout12
3131 * 1.1000e-01  1.0000e-02  0.0000e+00  0.0000e+00  3.0000e+02
3132 *      toutv2
3133 * 3.0000e+02
3134 *      qpin2      qpoff2      rqpax2      qpscl2
3135 * 0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
3136 *
3137 * dx * 1.2000e+00r02 1.9125e+00 1.2000e+00r03 2.3170e+00 1.5140e+00
3138 * dx * r02 1.6650e+00r02 1.0920e+00 6.5000e-01 6.0000e-01r02 1.4950e+00
3139 * dx * 1.5050e+00 1.9110e+00r02 1.6825e+00 7.1000e-01e
3140 * vol * 5.3010e-01r02 8.4490e-01 5.3010e-01r03 1.0236e+00 6.6890e-01
3141 * vol * r02 7.3560e-01r02 4.8240e-01 7.2000e-01 9.4800e-01r02 6.6048e-01
3142 * vol * 6.6489e-01 4.0247e-01r02 7.4331e-01 3.8058e-01e
3143 * fa * r12 4.4179e-01 0.0000e+00 6.8920e-01r07 4.4179e-01 5.0527e-01
3144 e
3145 * fric * 0.0000e+00r11 1.9000e-02 1.0760e+01r08 8.0000e-03 2.0500e-02
3146 e
3147 * rv fri* 0.0000e+00r11 1.9000e-02 7.7500e+00r08 8.0000e-03 2.0500e-02
3148 e
3149 * grav * 1.0000e+00 2.3130e-01 0.0000e+00 -2.3130e-01r04 -1.0000e+00
3150 * grav * -4.9350e-01 0.0000e+00 7.9780e-01 1.0000e+00 3.7200e-01
3151 * grav * -7.7520e-01 1.4110e-01r07 0.0000e+00e
3152 * hd * r21 7.5000e-01 9.0000e-01e
3153 * icflg * r12 0 1r09 0e
3154 * nff * f -1e
3155 * alp * f 1.0000e+00e
3156 * vl * f 0.0000e+00e
3157 * vv * f 0.0000e+00e
3158 * tl * f 4.1118e+02e
3159 * tv * f 4.1118e+02e
3160 * p * f 2.6000e+05e
3161 * pa * f 0.0000e+00e
3162 * qppp * f 0.0000e+00e
3163 * matid * f 6e
3164 * tw * f 4.1118e+02e
3165 *
3166 * dx * 5.0000e-02e
3167 * vol * 1.9000e-02e
3168 * fa * f 3.4000e-02e
3169 * fric * 1.0000e-04 f 0.0000e+00e
3170 * rv fri* 1.0000e-04 f 0.0000e+00e
3171 * grav * f 1.0000e+00e
3172 * hd * f 2.2000e-01e
3173 * icflg * f 0e
3174 * nff * 1 f -1e
3175 * alp * 1.0000e+00e
3176 * vl * f 0.0000e+00e
3177 * vv * f 0.0000e+00e
3178 * tl * 4.1118e+02e
3179 * tv * 4.1118e+02e
3180 * p * 2.6000e+05e
3181 * pa * 0.0000e+00e
3182 * qppp * f 0.0000e+00e
3183 * matid * f 6e
3184 * tw * f 4.1118e+02e
3185 *
3186 ***** type num id ctitle
3187 tee 18 18 $18$ sep. drain tee loop 1
3188 * jcell nodes ichf cost epsw
3189 * 5 4 1 0.0000e+00 0.0000e+00
3190 * iconc1 ncell1 jun1 jun2 ipow1
3191 * 0 6 19 119 0
3192 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
3193 * 0 0 0 0 0
3194 * radin1 th1 hout11 houtv1 tout11
3195 * 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3196 * toutv1
3197 * 3.0000e+02
3198 * qpin1 qpoff1 rqpax1 qpscl1
3199 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3200 * iconc2 ncell2 jun3 ipow2
3201 * 0 1 130 0
3202 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
3203 * 0 0 0 0 0
3204 * radin2 th2 hout12 houtv2 tout12
3205 * 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3206 * toutv2
3207 * 3.0000e+02
3208 * qpin2 qpoff2 rqpax2 qpscl2
3209 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3210 *
3211 * dx * 9.0000e-01r02 9.2500e-01r03 4.9130e-01e

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3212 * vol * 2.8300e-02r02 2.9000e-02r03 9.6400e-02e
3213 * fa * 4.0401e+00r02 3.1400e-02r04 1.9630e-01e
3214 * fric * f 0.0000e+00e
3215 * rv fri* f 0.0000e+00e
3216 * grav * -1.0000e+00 -3.3640e-01 0.0000e+00 -3.4700e-01r03-1.0000e+00
3217 e
3218 * hd * 4.4000e-01r02 2.0000e-01r04 5.0000e-01e
3219 * icflg * f 0e
3220 * nff * f -1e
3221 * alp * f 1.0000e+00e
3222 * vl * f 0.0000e+00e
3223 * vv * f 0.0000e+00e
3224 * tl * r05 4.1895e+02 3.0815e+02e
3225 * tv * r05 4.1895e+02 3.0815e+02e
3226 * p * f 2.6000e+05e
3227 * pa * f 0.0000e+00e
3228 * qppp * f 0.0000e+00e
3229 * matid * f 6e
3230 * tw * r20 4.1895e+02r04 3.0815e+02e
3231 *
3232 * dx * 5.0000e-01e
3233 * vol * 2.6600e-02e
3234 * fa * f 5.3260e-02e
3235 * fric * 1.0000e-04 f 0.0000e+00e
3236 * rv fri* 1.0000e-04 f 0.0000e+00e
3237 * grav * f 0.0000e+00e
3238 * hd * f 2.6040e-01e
3239 * icflg * f 0e
3240 * nff * 1 f -1e
3241 * alp * 1.0000e+00e
3242 * vl * f 0.0000e+00e
3243 * vv * f 0.0000e+00e
3244 * tl * 4.1895e+02e
3245 * tv * 4.1895e+02e
3246 * p * 2.6000e+05e
3247 * pa * 0.0000e+00e
3248 * qppp * f 0.0000e+00e
3249 * matid * f 6e
3250 * tw * f 4.1895e+02e
3251 *
3252 ***** type num id ctitle
3253 valve 19 19$ separator drain valve
3254 * ncells nodes jun1 jun2 epsw
3255 2 4 130 18 0.0000e+00
3256 * ichf iconc ivty ivps nvtb2
3257 1 0 1 2 0
3258 * ivtr ivsv nvtb1 nvsv nvrfrf
3259 0 100 2 0 0
3260 * iq3tr iq3sv nqp3tb nqp3sv nqp3rf
3261 0 0 0 0 0
3262 * ivtrov ivtyov
3263 0 0
3264 * rvmx rvov fminov fmaxov
3265 1.0000e+10 0.0000e+00 0.0000e+00 1.0000e+00
3266 * radin th hout1 houtv tout1
3267 1.5000e-02 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
3268 * toutv avlve hvlve favlve xpos
3269 3.0000e+02 3.1400e-02 2.0000e-01 1.0000e+00 0.0000e+00
3270 * qp3in qp3off rqp3mx qp3scl
3271 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3272 *
3273 * dx * 5.0000e-01 1.0000e+00e
3274 * vol * 2.6600e-02 5.3260e-02e
3275 * fa * f 5.3260e-02e
3276 * fric * 0.0000e+00 1.9440e+00 0.0000e+00e
3277 * rv fri* 0.0000e+00 1.9440e+00 0.0000e+00e
3278 * grav * r02 0.0000e+00 4.2200e-01e
3279 * hd * f 2.6040e-01e
3280 * icflg * f 0e
3281 * nff * f -1e
3282 * alp * f 1.0000e+00e
3283 * vl * f 0.0000e+00e
3284 * vv * f 0.0000e+00e
3285 * tl * f 4.1895e+02e
3286 * tv * f 4.1895e+02e
3287 * p * f 2.6000e+05e
3288 * pa * f 0.0000e+00e
3289 * qppp * f 0.0000e+00e
3290 * matid * f 6e
3291 * tw * f 4.1895e+02e
3292 * vtbl * 0.0000e+00 1.0000e+00 3.0000e+02 1.0000e+00e
3293 *
3294 ***** type num id ctitle
3295 fill 113 113 $113$ steam supply loop 1
3296 * jun1 ifty ioff
3297 113 5 0
3298 * iftr ifsv nftb nfsv nfrfrf
3299 0 -901 0 0 0
3300 * twtold rfmx concin felv
3301 0.0000e+00 1.5000e+01 0.0000e+00 0.0000e+00
3302 * dxkin volin alpin vlin tlin
3303 1.0000e+00 1.2600e-01 1.0000e+00 0.0000e+00 4.0188e+02

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3304 *      pin      pain      flowin      vvin      tvin
3305 1.9880e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.0188e+02
3306 *
3307 ***** type      num      id      ctitle
3308 fill 119 119 $119$ separator drain fill loop 1
3309 *      jun1      ifty      ioff
3310      119      8      1
3311 *      iftr      ifsv      nftb      nfsv      nfrf
3312      666      100      -2      0      0
3313 *      twtold      rfmX      concin      felv
3314 0.0000e+00 2.0000e+01 0.0000e+00 0.0000e+00
3315 *      dxin      volin      alpin      vlin      tlin
3316 4.9130e-01 9.6400e-02 0.0000e+00 0.0000e+00 3.0815e+02
3317 *      pin      pain      flowin      vvin      tvin
3318 2.6000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0815e+02
3319 *      vm scl      vvscl
3320 1.0000e+00 1.0000e+00
3321 *
3322 * vmtb * r02 0.0000e+00 5.0000e+00 -2.5000e+01e
3323 *
3324 ***** type      num      id      ctitle
3325 fill 15 15 $15$ hot-leg-ecc loop 1
3326 *      jun1      ifty      ioff
3327      15      8      0
3328 *      iftr      ifsv      nftb      nfsv      nfrf
3329      666      100      -6      0      0
3330 *      twtold      rfmX      concin      felv
3331 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
3332 *      dxin      volin      alpin      vlin      tlin
3333 3.3000e+00 1.3400e-01 0.0000e+00 0.0000e+00 3.0335e+02
3334 *      pin      pain      flowin      vvin      tvin
3335 1.9800e+06 0.0000e+00 0.0000e+00 0.0000e+00 3.0335e+02
3336 *      vm scl      vvscl
3337 1.0000e+00 1.0000e+00
3338 *
3339 * vmtb * r02 0.0000e+00 5.0000e-01 0.0000e+00 2.0000e+00 5.0000e+02
3340 * vmtb * 1.2000e+01 5.0000e+02 3.2000e+01 4.0000e+02 1.1000e+02
3341 * vmtb * 3.0000e+02e
3342 *
3343 ***** type      num      id      ctitle
3344 fill 16 16 $16$ cold-leg-ecc loop 1
3345 *      jun1      ifty      ioff
3346      16      6      0
3347 *      iftr      ifsv      nftb      nfsv      nfrf
3348      116      100      12      0      0
3349 *      twtold      rfmX      concin      felv
3350 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
3351 *      dxin      volin      alpin      vlin      tlin
3352 3.3000e+00 1.2500e-01 0.0000e+00 0.0000e+00 3.7515e+02
3353 *      pin      pain      flowin      vvin      tvin
3354 1.1000e+06 0.0000e+00 0.0000e+00 0.0000e+00 3.7515e+02
3355 *      vm scl      vvscl
3356 1.0000e+00 1.0000e+00
3357 *      t l s c l      t v s c l      p s c l      p a s c l      c o n s c l
3358 1.0000e+00 1.0000e+00 1.0000e+05 1.0000e+00 1.0000e+00
3359 *
3360 * vmtb * r02 0.0000e+00 3.2000e+01 0.0000e+00 3.4000e+01 0.0000e+00
3361 * vmtb * 4.2000e+01 1.6500e+00 4.6000e+01 1.3260e+01 5.0000e+01
3362 * vmtb * 1.3680e+01 8.0000e+01 1.3730e+01 1.0600e+02 1.3730e+01
3363 * vmtb * 1.1000e+02 1.4110e+01 1.1800e+02 1.3870e+01 1.2200e+02
3364 * vmtb * 1.0000e+00 1.4000e+02 0.0000e+00e
3365 * vvtb * r02 0.0000e+00 3.2000e+01 0.0000e+00 3.4000e+01 0.0000e+00
3366 * vvtb * 4.2000e+01 0.0000e+00 4.6000e+01 0.0000e+00 5.0000e+01
3367 * vvtb * 0.0000e+00 8.0000e+01 0.0000e+00 1.0600e+02 0.0000e+00
3368 * vvtb * 1.1000e+02 0.0000e+00 1.1800e+02 0.0000e+00 1.2200e+02
3369 * vvtb * 0.0000e+00 1.4000e+02 0.0000e+00e
3370 * tltb * 0.0000e+00 3.7515e+02 3.2000e+01 3.7515e+02 3.4000e+01
3371 * tltb * 4.0315e+02 4.2000e+01 4.0315e+02 4.6000e+01 3.7515e+02
3372 * tltb * 5.0000e+01 3.7965e+02 8.0000e+01 3.8465e+02 1.0600e+02
3373 * tltb * 3.8465e+02 1.1000e+02 3.8465e+02 1.1800e+02 3.8515e+02
3374 * tltb * 1.2200e+02 3.8515e+02 1.4000e+02 3.8515e+02e
3375 * tvtb * 0.0000e+00 4.5730e+02 3.2000e+01 4.5730e+02 3.4000e+01
3376 * tvtb * 4.5730e+02 4.2000e+01 4.5730e+02 4.6000e+01 4.5730e+02
3377 * tvtb * 5.0000e+01 4.5730e+02 8.0000e+01 4.5730e+02 1.0600e+02
3378 * tvtb * 4.5730e+02 1.1000e+02 4.5730e+02 1.1800e+02 4.5730e+02
3379 * tvtb * 1.2200e+02 4.5730e+02 1.4000e+02 4.5730e+02e
3380 * alptb * r02 0.0000e+00 3.2000e+01 0.0000e+00 3.4000e+01 0.0000e+00
3381 * alptb * 4.2000e+01 0.0000e+00 4.6000e+01 0.0000e+00 5.0000e+01
3382 * alptb * 0.0000e+00 8.0000e+01 0.0000e+00 1.0600e+02 0.0000e+00
3383 * alptb * 1.1000e+02 0.0000e+00 1.1800e+02 0.0000e+00 1.2200e+02
3384 * alptb * 0.0000e+00 1.4000e+02 0.0000e+00e
3385 * ptb * 0.0000e+00 1.1000e+01 3.2000e+01 1.1000e+01 3.4000e+01
3386 * ptb * 1.1000e+01 4.2000e+01 1.1000e+01 4.6000e+01 1.1000e+01
3387 * ptb * 5.0000e+01 1.1000e+01 8.0000e+01 1.1000e+01 1.0600e+02
3388 * ptb * 1.1000e+01 1.1000e+02 1.1000e+01 1.1800e+02 1.1000e+01
3389 * ptb * 1.2200e+02 1.1000e+01 1.4000e+02 1.1000e+01e
3390 * patb * r02 0.0000e+00 3.2000e+01 0.0000e+00 3.4000e+01 0.0000e+00
3391 * patb * 4.2000e+01 0.0000e+00 4.6000e+01 0.0000e+00 5.0000e+01
3392 * patb * 0.0000e+00 8.0000e+01 0.0000e+00 1.0600e+02 0.0000e+00
3393 * patb * 1.1000e+02 0.0000e+00 1.1800e+02 0.0000e+00 1.2200e+02
3394 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e
3395 *

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3396 ***** type          num          id          ctitle
3397 tee                20          20 $20$ hot-leg loop 2
3398 *                jcell          nodes          ichf          cost          epsw
3399 *                4                4                1          -1.0000e+00          0.0000e+00
3400 *                iconc1          ncell1          jun1          jun2          ipow1
3401 *                0                5                20          227          .0
3402 *                iqptr1          iqpsv1          ngptb1          ngpsv1          nqprf1
3403 *                0                0                0                0          0
3404 *                radin1          th1          hout11          houtv1          tout11
3405 *                3.7500e-01          1.0000e-02          0.0000e+00          0.0000e+00          3.0000e+02
3406 *                toutv1
3407 *                3.0000e+02
3408 *                qpin1          qpoff1          rqpms1          qpscl1
3409 *                0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
3410 *                iconc2          ncell2          jun3          ipow2
3411 *                0                1                25          0          0
3412 *                iqptr2          iqpsv2          ngptb2          ngpsv2          nqprf2
3413 *                0                0                0                0          0
3414 *                radin2          th2          hout12          houtv2          tout12
3415 *                1.1000e-01          1.0000e-02          0.0000e+00          0.0000e+00          3.0000e+02
3416 *                toutv2
3417 *                3.0000e+02
3418 *                qpin2          qpoff2          rqpms2          qpscl2
3419 *                0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
3420 *
3421 * dx * r03 5.1070e-01r02 1.2867e+00e
3422 * vol * r03 2.2560e-01r02 5.1130e-01e
3423 * fa * r03 4.4179e-01r03 3.9740e-01e
3424 * fric * r02 0.0000e+00r04 1.6000e-02e
3425 * rv fri* r02 0.0000e+00r04 1.6000e-02e
3426 * grav * f 0.0000e+00e
3427 * hd * r03 7.5000e-01r03 6.3880e-01e
3428 * icflg * r03 0 1r02 0e
3429 * nff * -1r05 -1e
3430 * alp * f 1.0000e+00e
3431 * vl * f 0.0000e+00e
3432 * vv * f 0.0000e+00e
3433 * tl * f 4.2227e+02e
3434 * tv * f 4.2227e+02e
3435 * p * f 2.6000e+05e
3436 * pa * f 0.0000e+00e
3437 * qppp * f 0.0000e+00e
3438 * matid * f 6e
3439 * tw * f 4.2227e+02e
3440 *
3441 * dx * 1.0000e+01e
3442 * vol * 4.0660e-01e
3443 * fa * f 4.0660e-02e
3444 * fric * 1.0000e-04 f 0.0000e+00e
3445 * rv fri* 1.0000e-04 f 0.0000e+00e
3446 * grav * f -1.0000e+00e
3447 * hd * f 2.0770e-01e
3448 * icflg * f 0e
3449 * nff * 1 f -1e
3450 * alp * 1.0000e+00e
3451 * vl * f 0.0000e+00e
3452 * vv * f 0.0000e+00e
3453 * tl * 4.2227e+02e
3454 * tv * 4.2227e+02e
3455 * p * 2.6000e+05e
3456 * pa * 0.0000e+00e
3457 * qppp * f 0.0000e+00e
3458 * matid * f 6e
3459 * tw * f 4.2227e+02e
3460 *
3461 ***** type          num          id          ctitle
3462 tee                27          27 $27$ pressurizer tee
3463 *                jcell          nodes          ichf          cost          epsw
3464 *                1                4                1          0.0000e+00          0.0000e+00
3465 *                iconc1          ncell1          jun1          jun2          ipow1
3466 *                0                4                227          21          0
3467 *                iqptr1          iqpsv1          ngptb1          ngpsv1          nqprf1
3468 *                0                0                0                0          0
3469 *                radin1          th1          hout11          houtv1          tout11
3470 *                3.7500e-01          1.0000e-02          0.0000e+00          0.0000e+00          3.0000e+02
3471 *                toutv1
3472 *                3.0000e+02
3473 *                qpin1          qpoff1          rqpms1          qpscl1
3474 *                0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
3475 *                iconc2          ncell2          jun3          ipow2
3476 *                0                2                228          0          0
3477 *                iqptr2          iqpsv2          ngptb2          ngpsv2          nqprf2
3478 *                0                0                0                0          0
3479 *                radin2          th2          hout12          houtv2          tout12
3480 *                2.6000e-01          1.0000e-02          0.0000e+00          0.0000e+00          3.0000e+02
3481 *                toutv2
3482 *                3.0000e+02
3483 *                qpin2          qpoff2          rqpms2          qpscl2
3484 *                0.0000e+00          0.0000e+00          0.0000e+00          0.0000e+00
3485 *
3486 * dx * 1.2867e+00 1.3370e+00 1.0420e+00 6.2600e-01e
3487 * vol * 5.1130e-01 5.9070e-01 4.6030e-01 2.7660e-01e

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3488 * fa * 3.9740e-01r04 4.4179e-01e
3489 * fric * r03 1.6000e-02r02 0.0000e+00e
3490 * rv fri* r03 1.6000e-02r02 0.0000e+00e
3491 * grav * r02 0.0000e+00 1.8020e-01 5.6120e-01 6.8030e-01e
3492 * hd * r02 6.3880e-01r03 7.5000e-01e
3493 * icflg * f 0e
3494 * nff * f -1e
3495 * alp * f 1.0000e+00e
3496 * vl * f 0.0000e+00e
3497 * vv * f 0.0000e+00e
3498 * tl * f 4.2227e+02e
3499 * tv * f 4.2227e+02e
3500 * p * f 2.6000e+05e
3501 * pa * f 0.0000e+00e
3502 * qppp * f 0.0000e+00e
3503 * matid * f 6e
3504 * tw * f 4.2227e+02e
3505 *
3506 * dx * 5.6000e-01 7.1840e-01e
3507 * vol * 3.3390e-02 6.8330e-02e
3508 * fa * 3.1416e-02r02 9.1150e-02e
3509 * fric * 1.0000e-04 1.8200e-02 0.0000e+00e
3510 * rv fri* 1.0000e-04 f 0.0000e+00e
3511 * grav * 7.0050e-01 3.6217e-01 -9.7929e-01e
3512 * hd * 2.0000e-01r02 3.4800e-01e
3513 * icflg * f 0e
3514 * nff * 1 f -1e
3515 * alp * f 1.0000e+00e
3516 * vl * f 0.0000e+00e
3517 * vv * f 0.0000e+00e
3518 * tl * f 4.2227e+02e
3519 * tv * f 4.2227e+02e
3520 * p * f 2.6000e+05e
3521 * pa * f 0.0000e+00e
3522 * qppp * f 0.0000e+00e
3523 * matid * f 6e
3524 * tw * f 4.2227e+02e
3525 *
3526 ***** type num id ctitle
3527 tee 21 21 $21$ separator-bottom loop 2
3528 * jcell nodes ichf cost epsw
3529 * 1 4 1 0.0000e+00 0.0000e+00
3530 * iconcl ncell1 jun1 jun2 ipow1
3531 * 0 4 21 22 0
3532 * iqptr1 iqpsv1 ngptb1 ngpsv1 ngprf1
3533 * 0 0 0 0 0
3534 * radin1 th1 hout11 houtv1 tout11
3535 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3536 * toutv1
3537 * 3.0000e+02
3538 * qpin1 qpoff1 rqpms1 qpscl1
3539 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3540 * iconc2 ncell2 jun3 ipow2
3541 * 0 1 28 0
3542 * iqptr2 iqpsv2 ngptb2 ngpsv2 ngprf2
3543 * 0 0 0 0 0
3544 * radin2 th2 hout12 houtv2 tout12
3545 * 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3546 * toutv2
3547 * 3.0000e+02
3548 * qpin2 qpoff2 rqpms2 qpscl2
3549 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3550 *
3551 * dx * 9.5560e-01r02 3.2510e-01 4.2400e-01e
3552 * vol * 2.5970e+00 1.5266e+00 1.5253e+00 2.5870e-01e
3553 * fa * 4.4179e-01 4.5584e+00 4.7298e+00r02 6.1010e-01e
3554 * fric * r04 0.0000e+00 3.6210e-01e
3555 * rv fri* r04 0.0000e+00 9.0530e-01e
3556 * grav * 6.8030e-01r04 1.0000e+00e
3557 * hd * 7.5000e-01r02 2.3000e+00r02 1.5830e-01e
3558 * icflg * f 0e
3559 * nff * f -1e
3560 * alp * f 1.0000e+00e
3561 * vl * f 0.0000e+00e
3562 * vv * f 0.0000e+00e
3563 * tl * f 4.2227e+02e
3564 * tv * f 4.2227e+02e
3565 * p * f 2.6000e+05e
3566 * pa * f 0.0000e+00e
3567 * qppp * f 0.0000e+00e
3568 * matid * f 6e
3569 * tw * f 4.2227e+02e
3570 *
3571 * dx * 2.0000e-01e
3572 * vol * 1.0700e-02e
3573 * fa * f 5.3260e-02e
3574 * fric * 1.0000e-04 f 0.0000e+00e
3575 * rv fri* 1.0000e-04 f 0.0000e+00e
3576 * grav * 0.0000e+00 -4.2200e-01e
3577 * hd * f 2.6040e-01e
3578 * icflg * f 0e
3579 * nff * 1 f -1e

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3580 * alp * 1.0000e+00e
3581 * vl * f 0.0000e+00e
3582 * vv * f 0.0000e+00e
3583 * tl * 4.2227e+02e
3584 * tv * 4.2227e+02e
3585 * p * 2.6000e+05e
3586 * pa * 0.0000e+00e
3587 * qppp * f 0.0000e+00e
3588 * matid * f 6e
3589 * tw * f 4.2227e+02e
3590 *
3591 ***** type num id ctitle
3592 tee 22 22 $22$ separator-middle loop 2
3593 * jcell nodes ichf cost epsw
3594 4 4 1 1.0000e+00 0.0000e+00
3595 * iconc1 ncell1 jun1 jun2 ipow1
3596 0 4 22 23 0
3597 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
3598 0 0 0 0 0
3599 * radin1 th1 hout11 houtv1 tout11
3600 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3601 * toutv1
3602 3.0000e+02
3603 * qpin1 qpoff1 rqpms1 qpscl1
3604 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3605 * iconc2 ncell2 jun3 ipow2
3606 0 4 29 0
3607 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
3608 0 0 0 0 0
3609 * radin2 th2 hout12 houtv2 tout12
3610 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3611 * toutv2
3612 3.0000e+02
3613 * qpin2 qpoff2 rqpms2 qpscl2
3614 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3615 *
3616 * dx * 1.8800e-01r02 7.1000e-01 2.0000e-01e
3617 * vol * 1.5740e-01r02 7.5580e-01 2.1290e-01e
3618 * fa * 6.1010e-01r04 1.0645e+00e
3619 * fric * 3.6210e-01r03 0.0000e+00 1.0000e+30e
3620 * rv fri* 9.0530e-01r04 0.0000e+00e
3621 * grav * f 1.0000e+00e
3622 * hd * f 1.5830e-01r04 2.0910e-01e
3623 * icflg * f 0e
3624 * nff * f -1e
3625 * alp * f 1.0000e+00e
3626 * vl * f 0.0000e+00e
3627 * vv * f 0.0000e+00e
3628 * tl * f 4.2227e+02e
3629 * tv * f 4.2227e+02e
3630 * p * f 2.6000e+05e
3631 * pa * f 0.0000e+00e
3632 * qppp * f 0.0000e+00e
3633 * matid * f 6e
3634 * tw * f 4.2227e+02e
3635 *
3636 * dx * r02 7.1000e-01 1.8800e-01 4.2400e-01e
3637 * vol * r02 2.4617e+00 7.0570e-01 1.7130e+00e
3638 * fa * r03 3.4673e+00r02 4.0401e+00e
3639 * fric * 1.0000e-04 f 0.0000e+00e
3640 * rv fri* 1.0000e-04 f 0.0000e+00e
3641 * grav * f -1.0000e+00e
3642 * hd * f 4.4000e-01e
3643 * icflg * f 0e
3644 * nff * 1 f -1e
3645 * alp * f 1.0000e+00e
3646 * vl * f 0.0000e+00e
3647 * vv * f 0.0000e+00e
3648 * tl * f 4.2227e+02e
3649 * tv * f 4.2227e+02e
3650 * p * f 2.6000e+05e
3651 * pa * f 0.0000e+00e
3652 * qppp * f 0.0000e+00e
3653 * matid * f 6e
3654 * tw * f 4.2227e+02e
3655 *
3656 ***** type num id ctitle
3657 tee 23 23 $23$ separator-top loop 2
3658 * jcell nodes ichf cost epsw
3659 3 4 1 0.0000e+00 0.0000e+00
3660 * iconc1 ncell1 jun1 jun2 ipow1
3661 0 4 23 24 0
3662 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
3663 0 0 0 0 0
3664 * radin1 th1 hout11 houtv1 tout11
3665 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3666 * toutv1
3667 3.0000e+02
3668 * qpin1 qpoff1 rqpms1 qpscl1
3669 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3670 * iconc2 ncell2 jun3 ipow2
3671 0 1 223 0

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3672 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
3673 *          0          0          0          0          0
3674 *      radin2      th2      hout12      houtv2      tout12
3675 * 1.2500e+00  2.5000e-02  0.0000e+00  0.0000e+00  3.0000e+02
3676 *      toutv2
3677 * 3.0000e+02
3678 *      qpin2      qpoff2      rqpms2      qpscl2
3679 * 0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
3680 *
3681 * dx * 2.0000e-01  2.8500e-01  4.0000e-01  8.1000e-01e
3682 * vol * 2.1290e-01  1.5732e+00  1.8919e+00  3.0974e+00e
3683 * fa * r02 1.0645e+00r02 4.7298e+00  4.4179e-01e
3684 * fric * 1.0000e+30r04 0.0000e+00e
3685 * rv fri* f 0.0000e+00e
3686 * grav * f 1.0000e+00e
3687 * hd * r02 2.0910e-01r02 2.4540e+00  7.5000e-01e
3688 * icflg * f 0e
3689 * nff * f -1e
3690 * alp * f 1.0000e+00e
3691 * vl * f 0.0000e+00e
3692 * vv * f 0.0000e+00e
3693 * tl * f 4.2227e+02e
3694 * tv * f 4.2227e+02e
3695 * p * f 2.6000e+05e
3696 * pa * f 0.0000e+00e
3697 * qppp * f 0.0000e+00e
3698 * matid * f 6e
3699 * tw * f 4.2227e+02e
3700 *
3701 * dx * 1.0000e+00e
3702 * vol * 1.2600e-01e
3703 * fa * f 1.2600e-01e
3704 * fric * 1.0000e-04 f 0.0000e+00e
3705 * rv fri* 1.0000e-04 f 0.0000e+00e
3706 * grav * f 0.0000e+00e
3707 * hd * f 4.0000e-01e
3708 * icflg * f 0e
3709 * nff * 1 f -1e
3710 * alp * 1.0000e+00e
3711 * vl * f 0.0000e+00e
3712 * vv * f 0.0000e+00e
3713 * tl * 4.2227e+02e
3714 * tv * 4.2227e+02e
3715 * p * 2.6000e+05e
3716 * pa * 0.0000e+00e
3717 * qppp * f 0.0000e+00e
3718 * matid * f 6e
3719 * tw * f 4.2227e+02e
3720 *
3721 * type num id ctitle
3722 tee 24 24 $24$ loop-seal cold-leg loop 2
3723 * jcell nodes ichf cost epsw
3724 * 17 4 1 5.0000e-01 0.0000e+00
3725 * iconc1 ncell1 jun1 jun2 ipow1
3726 * 0 21 24 27 0
3727 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
3728 * 0 0 0 0 0
3729 * radin1 th1 hout11 houtv1 tout11
3730 * 3.7500e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3731 * toutv1
3732 * 3.0000e+02
3733 * qpin1 qpoff1 rqpms1 qpscl1
3734 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3735 * iconc2 ncell2 jun3 ipow2
3736 * 0 1 260 0
3737 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
3738 * 0 0 0 0 0
3739 * radin2 th2 hout12 houtv2 tout12
3740 * 1.1000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3741 * toutv2
3742 * 3.0000e+02
3743 * qpin2 qpoff2 rqpms2 qpscl2
3744 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3745 *
3746 * dx * 1.2000e+00r02 1.9125e+00 1.2000e+00r03 2.3170e+00 1.5140e+00
3747 * dx * r02 1.6650e+00r02 1.0920e+00 6.5000e-01 6.0000e-01r02 1.4950e+00
3748 * dx * 1.5050e+00 1.9110e+00r02 1.6825e+00 7.1000e-01e
3749 * vol * 5.3010e-01r02 8.4490e-01 5.3010e-01r03 1.0236e+00 6.6890e-01
3750 * vol * r02 7.3560e-01r02 4.8240e-01 7.2000e-01 9.4800e-01r02 6.6048e-01
3751 * vol * 6.6489e-01 4.0247e-01r02 7.4331e-01 3.8058e-01e
3752 * fa * r12 4.4179e-01 0.0000e+00 6.8920e-01r07 4.4179e-01 5.0527e-01
3753 e
3754 * fric * 0.0000e+00r11 1.9000e-02 1.0760e+01r08 8.0000e-03 2.0500e-02
3755 e
3756 * rv fri* 0.0000e+00r11 1.9000e-02 7.7500e+00r08 8.0000e-03 2.0500e-02
3757 e
3758 * grav * 1.0000e+00 2.3130e-01 0.0000e+00 -2.3130e-01r04 -1.0000e+00
3759 * grav * -4.9350e-01 0.0000e+00 7.9780e-01 1.0000e+00 3.7200e-01
3760 * grav * -7.7520e-01 1.4110e-01r07 0.0000e+00e
3761 * hd * r21 7.5000e-01 9.0000e-01e
3762 * icflg * r12 0 1r09 0e
3763 * nff * f -1e

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3764 * alp * f 1.0000e+00e
3765 * vl * f 0.0000e+00e
3766 * vv * f 0.0000e+00e
3767 * tl * f 4.1415e+02e
3768 * tv * f 4.1415e+02e
3769 * p * f 2.6000e+05e
3770 * pa * f 0.0000e+00e
3771 * qppp * f 0.0000e+00e
3772 * matid * f 6e
3773 * tw * f 4.1415e+02e
3774 *
3775 * dx * 5.0000e-02e
3776 * vol * 1.9000e-02e
3777 * fa * f 3.4000e-02e
3778 * fric * 1.0000e-04 f 0.0000e+00e
3779 * rv fri* 1.0000e-04 f 0.0000e+00e
3780 * grav * f 1.0000e+00e
3781 * hd * f 2.2000e-01e
3782 * icflg * f 0e
3783 * nff * 1 f -1e
3784 * alp * 1.0000e+00e
3785 * vl * f 0.0000e+00e
3786 * vv * f 0.0000e+00e
3787 * tl * 4.1415e+02e
3788 * tv * 4.1415e+02e
3789 * p * 2.6000e+05e
3790 * pa * 0.0000e+00e
3791 * qppp * f 0.0000e+00e
3792 * matid * f 6e
3793 * tw * f 4.1415e+02e
3794 *
3795 ***** type num id ctitle
3796 tee 28 28 $28$ sep. drain tee loop 2
3797 * jcell nodes ichf cost epsw
3798 5 4 1 0.0000e+00 0.0000e+00
3799 * iconc1 ncell1 jun1 jun2 ipow1
3800 0 6 29 229 0
3801 * iqptr1 iqpsv1 ngptb1 ngpsv1 ngprf1
3802 0 0 0 0 0
3803 * radin1 th1 hout11 houtv1 tout11
3804 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3805 * toutv1
3806 3.0000e+02
3807 * qpoff1 rqpms1 qpscl1
3808 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3809 * iconc2 ncell2 jun3 ipow2
3810 0 1 230 0
3811 * iqptr2 iqpsv2 ngptb2 ngpsv2 ngprf2
3812 0 0 0 0 0
3813 * radin2 th2 hout12 houtv2 tout12
3814 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
3815 * toutv2
3816 3.0000e+02
3817 * qpoff2 rqpms2 qpscl2
3818 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3819 *
3820 * dx * 9.0000e-01r02 9.2500e-01r03 4.9130e-01e
3821 * vol * 2.8300e-02r02 2.9000e-02r03 9.6400e-02e
3822 * fa * 4.0401e+00r02 3.1400e-02r04 1.9630e-01e
3823 * fric * f 0.0000e+00e
3824 * rv fri* f 0.0000e+00e
3825 * grav * -1.0000e+00 -3.3640e-01 0.0000e+00 -3.4700e-01r03-1.0000e+00
3826 e
3827 * hd * 4.4000e-01r02 2.0000e-01r04 5.0000e-01e
3828 * icflg * f 0e
3829 * nff * f -1e
3830 * alp * f 1.0000e+00e
3831 * vl * f 0.0000e+00e
3832 * vv * f 0.0000e+00e
3833 * tl * r05 4.2275e+02 3.0815e+02e
3834 * tv * f 4.2275e+02e
3835 * p * f 2.6000e+05e
3836 * pa * f 0.0000e+00e
3837 * qppp * f 0.0000e+00e
3838 * matid * f 6e
3839 * tw * r20 4.2275e+02r04 3.0815e+02e
3840 *
3841 * dx * 5.0000e-01e
3842 * vol * 2.6600e-02e
3843 * fa * f 5.3260e-02e
3844 * fric * 1.0000e-04 f 0.0000e+00e
3845 * rv fri* 1.0000e-04 f 0.0000e+00e
3846 * grav * f 0.0000e+00e
3847 * hd * f 2.6040e-01e
3848 * icflg * f 0e
3849 * nff * 1 f -1e
3850 * alp * 1.0000e+00e
3851 * vl * f 0.0000e+00e
3852 * vv * f 0.0000e+00e
3853 * tl * 4.2275e+02e
3854 * tv * 4.2275e+02e
3855 * p * 2.6000e+05e

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3856 * pa * 0.0000e+00e
3857 * qppp * f 0.0000e+00e
3858 * matid * f 6e
3859 * tw * f 4.2275e+02e
3860 *
3861 ***** type num id ctitle
3862 valve 29 29 $29$ separator drain valve
3863 * ncells nodes jun1 jun2 epsw
3864 * 2 4 230 28 0.0000e+00
3865 * ichf iconc ivty ivps nvtb2
3866 * 1 0 1 2 0
3867 * ivtr ivsv nvtb1 nvsv nvrfr
3868 * 0 100 2 0 0
3869 * iqp3tr iqp3sv nqp3tb nqp3sv nqp3rf
3870 * 0 0 0 0 0
3871 * ivtrov ivtyov
3872 * 0 0
3873 * rvmx rvov fminov fmaxov
3874 * 1.0000e+10 0.0000e+00 0.0000e+00 1.0000e+00
3875 * radin th houtl houtv toutl
3876 * 1.5000e-02 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
3877 * toutv avlve hvlve favlve xpos
3878 * 3.0000e+02 3.1400e-02 2.0000e-01 1.0000e+00 0.0000e+00
3879 * qp3in qp3off rqp3mx qp3scl
3880 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
3881 *
3882 * dx * 5.0000e-01 1.0000e+00e
3883 * vol * 2.6600e-02 5.3260e-02e
3884 * fa * f 5.3260e-02e
3885 * fric * 0.0000e+00 1.9440e+00 0.0000e+00e
3886 * rv fri* 0.0000e+00 1.9440e+00 0.0000e+00e
3887 * grav * r02 0.0000e+00 4.2200e-01e
3888 * hd * f 2.6040e-01e
3889 * icflg * f 0e
3890 * nff * f -1e
3891 * alp * f 1.0000e+00e
3892 * vl * f 0.0000e+00e
3893 * vv * f 0.0000e+00e
3894 * tl * f 4.2275e+02e
3895 * tv * f 4.2275e+02e
3896 * p * f 2.6000e+05e
3897 * pa * f 0.0000e+00e
3898 * qppp * f 0.0000e+00e
3899 * matid * f 6e
3900 * tw * f 4.2275e+02e
3901 * vtb1 * 0.0000e+00 1.0000e+00 3.0000e+02 1.0000e+00e
3902 *
3903 ***** type num id ctitle
3904 fill 223 223 $223$ steam supply loop 2
3905 * jun1 ifty ioff
3906 * 223 5 0
3907 * iftr ifsv nftb nfvsv nvrfr
3908 * 0 -902 0 0 0
3909 * twtold rfmv concin felv
3910 * 0.0000e+00 1.5000e+01 0.0000e+00 0.0000e+00
3911 * dxin volin alpin vlin tlin
3912 * 1.0000e+00 1.2600e-01 1.0000e+00 0.0000e+00 4.2275e+02
3913 * pin pain flowin vvin tvin
3914 * 1.9880e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.2275e+02
3915 *
3916 ***** type num id ctitle
3917 fill 229 229 $229$ separator drain fill loop 2
3918 * jun1 ifty ioff
3919 * 229 8 1
3920 * iftr ifsv nftb nfvsv nvrfr
3921 * 666 100 -2 0 0
3922 * twtold rfmv concin felv
3923 * 0.0000e+00 2.0000e+01 0.0000e+00 0.0000e+00
3924 * dxin volin alpin vlin tlin
3925 * 4.9130e-01 9.6400e-02 0.0000e+00 0.0000e+00 3.0815e+02
3926 * pin pain flowin vvin tvin
3927 * 2.6000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0815e+02
3928 * vmscl vvscl
3929 * 1.0000e+00 1.0000e+00
3930 *
3931 * vmtb * r02 0.0000e+00 5.0000e+00 -2.5000e+01e
3932 *
3933 ***** type num id ctitle
3934 fill 228 228 $228$ pressurizer fill
3935 * jun1 ifty ioff
3936 * 228 8 0
3937 * iftr ifsv nftb nfvsv nvrfr
3938 * 666 100 -9 0 0
3939 * twtold rfmv concin felv
3940 * 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
3941 * dxin volin alpin vlin tlin
3942 * 7.1840e-01 6.8330e-02 1.0000e+00 0.0000e+00 4.2275e+02
3943 * pin pain flowin vvin tvin
3944 * 2.6000e+05 0.0000e+00 0.0000e+00 0.0000e+00 4.2275e+02
3945 * vmscl vvscl
3946 * 1.0000e+00 1.0000e+00
3947 *

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3948 * vmtb * r02 0.0000e+00 2.0000e+00 1.0000e+02 3.0000e-02 8.4000e+01
3949 * vmtb * 5.0000e+00 5.6000e+01 7.0000e+00 5.0000e+01 9.0000e+00
3950 * vmtb * 3.6000e+01 1.1000e+01 3.0000e+01 1.3200e+01 0.0000e+00
3951 * vmtb * 1.0000e+02 0.0000e+00e
3952 *
3953 ***** type num id ctitle
3954 fill 25 25 $25$ hot-leg-ecc loop 2
3955 * jun1 ifty ioff
3956 * 25 8 0
3957 * iftr ifsv nftb nfvsv nfrf
3958 * 666 100 -6 0 0
3959 * twtold rfmv concin felv
3960 * 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
3961 * dxin volin alpin vlin tlin
3962 * 3.3000e+00 1.3400e-01 0.0000e+00 0.0000e+00 3.0335e+02
3963 * pin pain flowin vvin tvin
3964 * 1.9800e+06 0.0000e+00 0.0000e+00 0.0000e+00 3.0335e+02
3965 * vmscl vvscl
3966 * 1.0000e+00 1.0000e+00
3967 *
3968 * vmtb * r02 0.0000e+00 2.5000e+00 5.0000e+02 1.2500e+01 5.0000e+02
3969 * vmtb * 1.2500e+01 5.0000e+02 3.2500e+01 4.0000e+02 1.1050e+02
3970 * vmtb * 3.0000e+02e
3971 *
3972 ***** type num id ctitle
3973 fill 26 26 $26$ cold-leg-ecc loop 2
3974 * jun1 ifty ioff
3975 * 26 6 0
3976 * iftr ifsv nftb nfvsv nfrf
3977 * 116 100 12 0 0
3978 * twtold rfmv concin felv
3979 * 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
3980 * dxin volin alpin vlin tlin
3981 * 3.3000e+00 1.2500e-01 0.0000e+00 0.0000e+00 3.9415e+02
3982 * pin pain flowin vvin tvin
3983 * 1.1000e+06 0.0000e+00 0.0000e+00 0.0000e+00 3.9415e+02
3984 * vmscl vvscl
3985 * 1.0000e+00 1.0000e+00
3986 * t1scl tvscl pscl pascl conscl
3987 * 1.0000e+00 1.0000e+00 1.0000e+05 1.0000e+00 1.0000e+00
3988 *
3989 * vmtb * r02 0.0000e+00 3.2000e+01 0.0000e+00 3.4000e+01 0.0000e+00
3990 * vmtb * 4.2000e+01 0.0000e+00 4.6000e+01 1.3370e+01 5.0000e+01
3991 * vmtb * 1.3790e+01 8.0000e+01 1.3840e+01 1.0600e+02 1.3840e+01
3992 * vmtb * 1.1000e+02 1.3590e+01 1.1800e+02 1.3600e+01 1.2200e+02
3993 * vmtb * 0.0000e+00 1.4000e+02 0.0000e+00e
3994 * vvtb * r02 0.0000e+00 3.2000e+01 0.0000e+00 3.4000e+01 0.0000e+00
3995 * vvtb * 4.2000e+01 0.0000e+00 4.6000e+01 0.0000e+00 5.0000e+01
3996 * vvtb * 0.0000e+00 8.0000e+01 0.0000e+00 1.0600e+02 0.0000e+00
3997 * vvtb * 1.1000e+02 0.0000e+00 1.1800e+02 0.0000e+00 1.2200e+02
3998 * vvtb * 0.0000e+00 1.4000e+02 0.0000e+00e
3999 * tltb * 0.0000e+00 3.9415e+02 3.2000e+01 3.9415e+02 3.4000e+01
4000 * tltb * 3.9415e+02 4.2000e+01 3.9415e+02 4.6000e+01 3.8515e+02
4001 * tltb * 5.0000e+01 3.8915e+02 8.0000e+01 3.9415e+02 1.0600e+02
4002 * tltb * 3.9415e+02 1.1000e+02 3.9415e+02 1.1800e+02 3.9465e+02
4003 * tltb * 1.2200e+02 3.9465e+02 1.4000e+02 3.9465e+02e
4004 * tvtb * 0.0000e+00 4.5730e+02 3.2000e+01 4.5730e+02 3.4000e+01
4005 * tvtb * 4.5730e+02 4.2000e+01 4.5730e+02 4.6000e+01 4.5730e+02
4006 * tvtb * 5.0000e+01 4.5730e+02 8.0000e+01 4.5730e+02 1.0600e+02
4007 * tvtb * 4.5730e+02 1.1000e+02 4.5730e+02 1.1800e+02 4.5730e+02
4008 * tvtb * 1.2200e+02 4.5730e+02 1.4000e+02 4.5730e+02e
4009 * alptb * r02 0.0000e+00 3.2000e+01 0.0000e+00 3.4000e+01 0.0000e+00
4010 * alptb * 4.2000e+01 0.0000e+00 4.6000e+01 0.0000e+00 5.0000e+01
4011 * alptb * 0.0000e+00 8.0000e+01 0.0000e+00 1.0600e+02 0.0000e+00
4012 * alptb * 1.1000e+02 0.0000e+00 1.1800e+02 0.0000e+00 1.2200e+02
4013 * alptb * 0.0000e+00 1.4000e+02 0.0000e+00e
4014 * ptb * 0.0000e+00 1.1000e+01 3.2000e+01 1.1000e+01 3.4000e+01
4015 * ptb * 1.1000e+01 4.2000e+01 1.1000e+01 4.6000e+01 1.1000e+01
4016 * ptb * 5.0000e+01 1.1000e+01 8.0000e+01 1.1000e+01 1.0600e+02
4017 * ptb * 1.1000e+01 1.1000e+02 1.1000e+01 1.1800e+02 1.1000e+01
4018 * ptb * 1.2200e+02 1.1000e+01 1.4000e+02 1.1000e+01e
4019 * patb * r02 0.0000e+00 3.2000e+01 0.0000e+00 3.4000e+01 0.0000e+00
4020 * patb * 4.2000e+01 0.0000e+00 4.6000e+01 0.0000e+00 5.0000e+01
4021 * patb * 0.0000e+00 8.0000e+01 0.0000e+00 1.0600e+02 0.0000e+00
4022 * patb * 1.1000e+02 0.0000e+00 1.1800e+02 0.0000e+00 1.2200e+02
4023 * patb * 0.0000e+00 1.4000e+02 0.0000e+00e
4024 *
4025 ***** type num id ctitle
4026 tee 30 30 $30$ hot-leg loop 3
4027 * jcell nodes ichf cost epsw
4028 * 4 4 1 -1.0000e+00 0.0000e+00
4029 * iconc1 ncell1 jun1 jun2 ipow1
4030 * 0 9 30 31 0
4031 * iqpr1 iqpsv1 ngpbt1 ngpsv1 ngprf1
4032 * 0 0 0 0 0
4033 * radin1 th1 hout11 houtv1 tout11
4034 * 3.7500e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4035 * toutv1
4036 * 3.0000e+02
4037 * qpnl qpoff1 rqpml1 qpocl1
4038 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4039 * iconc2 ncell2 jun3 ipow2

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4040      0      1      35      0
4041 *      iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
4042      0      0      0      0      0
4043 *      radin2      th2      houtl2      houtv2      toutl2
4044      1.1000e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
4045 *      toutv2
4046      3.0000e+02
4047 *      qpini2      qpoff2      rqpms2      qpscl2
4048      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
4049 *
4050 * dx * r03 5.1070e-01r03 1.2867e+00 1.3370e+00 1.0420e+00 6.2600e-01
4051 e
4052 * vol * r03 2.2560e-01r03 5.1130e-01 5.9070e-01 4.6030e-01 2.7660e-01
4053 e
4054 * fa * r03 4.4179e-01r03 3.9740e-01r04 4.4179e-01e
4055 * fric * r02 0.0000e+00r06 1.6000e-02r02 0.0000e+00e
4056 * rv fri* r02 0.0000e+00r06 1.6000e-02r02 0.0000e+00e
4057 * grav * r07 0.0000e+00 1.8020e-01 5.6120e-01 6.8030e-01e
4058 * hd * r03 7.5000e-01r03 6.3880e-01r04 7.5000e-01e
4059 * icflg * r04 0 1r05 0e
4060 * nff * -1r09 -1e
4061 * alp * f 1.0000e+00e
4062 * vl * f 0.0000e+00e
4063 * vv * f 0.0000e+00e
4064 * tl * f 4.2275e+02e
4065 * tv * f 4.2275e+02e
4066 * p * f 2.6000e+05e
4067 * pa * f 0.0000e+00e
4068 * qppp * f 0.0000e+00e
4069 * matid * f 6e
4070 * tw * f 4.2275e+02e
4071 *
4072 * dx * 1.0000e+01e
4073 * vol * 4.0660e-01e
4074 * fa * f 4.0660e-02e
4075 * fric * 1.0000e-04 f 0.0000e+00e
4076 * rv fri* 1.0000e-04 f 0.0000e+00e
4077 * grav * f -1.0000e+00e
4078 * hd * f 2.0770e-01e
4079 * icflg * f 0e
4080 * nff * 1 f -1e
4081 * alp * 1.0000e+00e
4082 * vl * f 0.0000e+00e
4083 * vv * f 0.0000e+00e
4084 * tl * 4.2275e+02e
4085 * tv * 4.2275e+02e
4086 * p * 2.6000e+05e
4087 * pa * 0.0000e+00e
4088 * qppp * f 0.0000e+00e
4089 * matid * f 6e
4090 * tw * f 4.2275e+02e
4091 *
4092 ***** type num id ctitle
4093 tee 31 31 $31$ separator-bottom loop 3
4094 * jcell nodes ichf cost epsw
4095 1 4 1 0.0000e+00 0.0000e+00
4096 * iconcl ncell1 jun1 jun2 ipow1
4097 0 4 31 32 0
4098 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
4099 0 0 0 0 0
4100 * radin1 th1 houtl1 houtv1 toutl1
4101 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4102 * toutv1
4103 3.0000e+02
4104 * qpini1 qpoff1 rqpms1 qpscl1
4105 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4106 * iconc2 ncell2 jun3 ipow2
4107 0 1 38 0
4108 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
4109 0 0 0 0 0
4110 * radin2 th2 houtl2 houtv2 toutl2
4111 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4112 * toutv2
4113 3.0000e+02
4114 * qpini2 qpoff2 rqpms2 qpscl2
4115 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4116 *
4117 * dx * 9.5560e-01r02 3.2510e-01 4.2400e-01e
4118 * vol * 2.5970e+00 1.5266e+00 1.5253e+00 2.5870e-01e
4119 * fa * 4.4179e-01 4.5584e+00 4.7298e+00r02 6.1010e-01e
4120 * fric * r04 0.0000e+00 3.6210e-01e
4121 * rv fri* r04 0.0000e+00 9.0530e-01e
4122 * grav * 6.8030e-01r04 1.0000e+00e
4123 * hd * 7.5000e-01r02 2.3000e+00r02 1.5830e-01e
4124 * icflg * f 0e
4125 * nff * f -1e
4126 * alp * f 1.0000e+00e
4127 * vl * f 0.0000e+00e
4128 * vv * f 0.0000e+00e
4129 * tl * f 4.2275e+02e
4130 * tv * f 4.2275e+02e
4131 * p * f 2.6000e+05e

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```

4132 * pa * f 0.0000e+00e
4133 * qppp * f 0.0000e+00e
4134 * matid * f 6e
4135 * tw * f 4.2275e+02e
4136 *
4137 * dx * 2.0000e-01e
4138 * vol * 1.0700e-02e
4139 * fa * f 5.3260e-02e
4140 * fric * 1.0000e-04 f 0.0000e+00e
4141 * rv fri* 1.0000e-04 f 0.0000e+00e
4142 * grav * 0.0000e+00 -4.2200e-01e
4143 * hd * f 2.6040e-01e
4144 * icflg * f 0e
4145 * nff * 1 f -1e
4146 * alp * 1.0000e+00e
4147 * vl * f 0.0000e+00e
4148 * vv * f 0.0000e+00e
4149 * tl * 4.2275e+02e
4150 * tv * 4.2275e+02e
4151 * p * 2.6000e+05e
4152 * pa * 0.0000e+00e
4153 * qppp * f 0.0000e+00e
4154 * matid * f 6e
4155 * tw * f 4.2275e+02e
4156 *
4157 ***** type num id ctitle
4158 tee 32 32 $32$ separator-middle loop 3
4159 * jcell nodes ichf cost epsw
4160 4 4 1 1.0000e+00 0.0000e+00
4161 * iconc1 ncell1 jun1 jun2 ipow1
4162 0 4 32 33 0
4163 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
4164 0 0 0 0 0
4165 * radin1 th1 hout11 houtv1 tout11
4166 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4167 * toutv1
4168 3.0000e+02
4169 * qpin1 qpoff1 rqpms1 qpscl1
4170 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4171 * iconc2 ncell2 jun3 ipow2
4172 0 4 39 0
4173 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
4174 0 0 0 0 0
4175 * radin2 th2 hout12 houtv2 tout12
4176 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4177 * toutv2
4178 3.0000e+02
4179 * qpin2 qpoff2 rqpms2 qpscl2
4180 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4181 *
4182 * dx * 1.8800e-01r02 7.1000e-01 2.0000e-01e
4183 * vol * 1.5740e-01r02 7.5580e-01 2.1290e-01e
4184 * fa * 6.1010e-01r04 1.0645e+00e
4185 * fric * 3.6210e-01r03 0.0000e+00 1.0000e+30e
4186 * rv fri* 9.0530e-01r04 0.0000e+00e
4187 * grav * f 1.0000e+00e
4188 * hd * 1.5830e-01r04 2.0910e-01e
4189 * icflg * f 0e
4190 * nff * f -1e
4191 * alp * f 1.0000e+00e
4192 * vl * f 0.0000e+00e
4193 * vv * f 0.0000e+00e
4194 * tl * f 4.2275e+02e
4195 * tv * f 4.2275e+02e
4196 * p * f 2.6000e+05e
4197 * pa * f 0.0000e+00e
4198 * qppp * f 0.0000e+00e
4199 * matid * f 6e
4200 * tw * f 4.2275e+02e
4201 *
4202 * dx * r02 7.1000e-01 1.8800e-01 4.2400e-01e
4203 * vol * r02 2.4617e+00 7.0570e-01 1.7130e+00e
4204 * fa * r03 3.4673e+00r02 4.0401e+00e
4205 * fric * 1.0000e-04 f 0.0000e+00e
4206 * rv fri* 1.0000e-04 f 0.0000e+00e
4207 * grav * f -1.0000e+00e
4208 * hd * f 4.4000e-01e
4209 * icflg * f 0e
4210 * nff * 1 f -1e
4211 * alp * f 1.0000e+00e
4212 * vl * f 0.0000e+00e
4213 * vv * f 0.0000e+00e
4214 * tl * 4.2275e+02r03 4.2275e+02e
4215 * tv * 4.2275e+02r03 4.2275e+02e
4216 * p * f 2.6000e+05e
4217 * pa * f 0.0000e+00e
4218 * qppp * f 0.0000e+00e
4219 * matid * f 6e
4220 * tw * f 4.2275e+02e
4221 *
4222 ***** type num id ctitle
4223 tee 33 33 $33$ separator-top loop 3

```

```

4224 *      jcell      nodes      ichf      cost      epsw
4225 *          3          4          1      0.0000e+00      0.0000e+00
4226 *      iconc1      ncell1      jun1      jun2      ipow1
4227 *          0          4          33          34          0
4228 *      iqptr1      iqpsv1      ngptb1      nqpsv1      nqprf1
4229 *          0          0          0          0          0
4230 *      radin1      th1      hout11      houtv1      tout11
4231 *      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
4232 *      toutv1
4233 *      3.0000e+02
4234 *      qpin1      qpoff1      rqpms1      qpscl1
4235 *      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
4236 *      iconc2      ncell2      jun3      ipow2
4237 *          0          1          333          0
4238 *      iqptr2      iqpsv2      ngptb2      nqpsv2      nqprf2
4239 *          0          0          0          0          0
4240 *      radin2      th2      hout12      houtv2      tout12
4241 *      1.2500e+00      2.5000e-02      0.0000e+00      0.0000e+00      3.0000e+02
4242 *      toutv2
4243 *      3.0000e+02
4244 *      qpin2      qpoff2      rqpms2      qpscl2
4245 *      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
4246 *
4247 * dx *      2.0000e-01      2.8500e-01      4.0000e-01      8.1000e-01e
4248 * vol *      2.1290e-01      1.5732e+00      1.8919e+00      3.0974e+00e
4249 * fa * r02 1.0645e+00r02 4.7298e+00      4.4179e-01e
4250 * fric *      1.0000e+30r04 0.0000e+00e
4251 * rv fri * f 0.0000e+00e
4252 * grav * f 1.0000e+00e
4253 * hd * r02 2.0910e-01r02 2.4540e+00      7.5000e-01e
4254 * icflg * f 0e
4255 * nff * f -1e
4256 * alp * f 1.0000e+00e
4257 * vl * f 0.0000e+00e
4258 * vv * f 0.0000e+00e
4259 * tl * f 4.2275e+02e
4260 * tv * f 4.2275e+02e
4261 * p * f 2.6000e+05e
4262 * pa * f 0.0000e+00e
4263 * qppp * f 0.0000e+00e
4264 * matid * f 6e
4265 * tw * f 4.2275e+02e
4266 *
4267 * dx *      1.0000e+00e
4268 * vol *      1.2600e-01e
4269 * fa * f 1.2600e-01e
4270 * fric * 1.0000e-04 f 0.0000e+00e
4271 * rv fri * 1.0000e-04 f 0.0000e+00e
4272 * grav * 1.0000e-04 f 0.0000e+00e
4273 * hd * f 4.0000e-01e
4274 * icflg * f 0e
4275 * nff * 1 f -1e
4276 * alp * 1.0000e+00e
4277 * vl * f 0.0000e+00e
4278 * vv * f 0.0000e+00e
4279 * tl * 4.2275e+02e
4280 * tv * 4.2275e+02e
4281 * p * 2.6000e+05e
4282 * pa * 0.0000e+00e
4283 * qppp * f 0.0000e+00e
4284 * matid * f 6e
4285 * tw * f 4.2275e+02e
4286 *
4287 ***** type num id ctitle
4288 tee 34 34 $34$ loop-seal cold-leg loop 3
4289 *      jcell      nodes      ichf      cost      epsw
4290 *          17          4          1      5.0000e-01      0.0000e+00
4291 *      iconc1      ncell1      jun1      jun2      ipow1
4292 *          0          21          34          37          0
4293 *      iqptr1      iqpsv1      ngptb1      nqpsv1      nqprf1
4294 *          0          0          0          0          0
4295 *      radin1      th1      hout11      houtv1      tout11
4296 *      3.7500e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
4297 *      toutv1
4298 *      3.0000e+02
4299 *      qpin1      qpoff1      rqpms1      qpscl1
4300 *      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
4301 *      iconc2      ncell2      jun3      ipow2
4302 *          0          1          360          0
4303 *      iqptr2      iqpsv2      ngptb2      nqpsv2      nqprf2
4304 *          0          0          0          0          0
4305 *      radin2      th2      hout12      houtv2      tout12
4306 *      1.1000e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
4307 *      toutv2
4308 *      3.0000e+02
4309 *      qpin2      qpoff2      rqpms2      qpscl2
4310 *      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
4311 *
4312 * dx *      1.2000e+00r02 1.9125e+00      1.2000e+00r03 2.3170e+00      1.5140e+00
4313 * dx * r02 1.6650e+00r02 1.0920e+00      6.5000e-01      6.0000e-01r02 1.4950e+00
4314 * dx *      1.5050e+00      1.9110e+00r02 1.6825e+00      7.1000e-01e
4315 * vol *      5.3010e-01r02 8.4490e-01      5.3010e-01r03 1.0236e+00      6.6890e-01

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4316 * vol * r02 7.3560e-01r02 4.8240e-01 7.2000e-01 9.4800e-01r02 6.6048e-01
4317 * vol * 6.6489e-01 4.0247e-01r02 7.4331e-01 3.8038e-01e
4318 * fa * r12 4.4179e-01 0.0000e+00 6.8920e-01r07 4.4179e-01 5.0527e-01
4319 e
4320 * fric * 0.0000e+00r11 1.9000e-02 1.0760e+01r08 8.0000e-03 2.0500e-02
4321 e
4322 * rv fri* 0.0000e+00r11 1.9000e-02 7.7500e+00r08 8.0000e-03 2.0500e-02
4323 e
4324 * grav * 1.0000e+00 2.3130e-01 0.0000e+00 -2.3130e-01r04-1.0000e+00
4325 * grav * -4.9350e-01 0.0000e+00 7.9780e-01 1.0000e+00 3.7200e-01
4326 * grav * -7.7520e-01 1.4110e-01r07 0.0000e+00e
4327 * hd * r21 7.5000e-01 9.0000e-01e
4328 * icflg * r12 0 1r09 0e
4329 * nff * f -1e
4330 * alp * f 1.0000e+00e
4331 * vl * f 0.0000e+00e
4332 * vv * f 0.0000e+00e
4333 * tl * f 4.1678e+02e
4334 * tv * f 4.1678e+02e
4335 * p * f 2.6000e+05e
4336 * pa * f 0.0000e+00e
4337 * qppp * f 0.0000e+00e
4338 * matid * f 6e
4339 * tw * f 4.1678e+02e
4340 *
4341 * dx * 5.0000e-01e
4342 * vol * 1.9000e-02e
4343 * fa * f 3.4000e-02e
4344 * fric * 1.0000e-04 f 0.0000e+00e
4345 * rv fri* 1.0000e-04 f 0.0000e+00e
4346 * grav * f 1.0000e+00e
4347 * hd * f 2.2000e-01e
4348 * icflg * f 0e
4349 * nff * 1 f -1e
4350 * alp * 1.0000e+00e
4351 * vl * f 0.0000e+00e
4352 * vv * f 0.0000e+00e
4353 * tl * 4.1678e+02e
4354 * tv * 4.1678e+02e
4355 * p * 2.6000e+05e
4356 * pa * 0.0000e+00e
4357 * qppp * f 0.0000e+00e
4358 * matid * f 6e
4359 * tw * f 4.1678e+02e
4360 *
4361 ***** type num id ctitle
4362 tee 38 38 $38$ sep. drain tee loop 3
4363 * jcell nodes ichf cost epsw
4364 5 4 1 0.0000e+00 0.0000e+00
4365 * iconc1 ncell1 jun1 jun2 ipow1
4366 0 6 39 339 0
4367 * iqptr1 iqpsv1 nqpth1 nqpsv1 nqprf1
4368 0 0 0 0 0
4369 * radin1 th1 hout11 houtv1 tout11
4370 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4371 * toutv1
4372 3.0000e+02
4373 * qpin1 qpoff1 rqpms1 qpscl1
4374 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4375 * iconc2 ncell2 jun3 ipow2
4376 0 1 330 0
4377 * iqptr2 iqpsv2 nqpth2 nqpsv2 nqprf2
4378 0 0 0 0 0
4379 * radin2 th2 hout12 houtv2 tout12
4380 1.0000e-01 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4381 * toutv2
4382 3.0000e+02
4383 * qpin2 qpoff2 rqpms2 qpscl2
4384 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4385 *
4386 * dx * 9.0000e-01r02 9.2500e-01r03 4.9130e-01e
4387 * vol * 2.8300e-02r02 2.9000e-02r03 9.6400e-02e
4388 * fa * 4.0401e+00r02 3.1400e-02r04 1.9630e-01e
4389 * fric * f 0.0000e+00e
4390 * rv fri* f 0.0000e+00e
4391 * grav * -1.0000e+00 -3.3640e-01 0.0000e+00 -3.4700e-01r03-1.0000e+00
4392 e
4393 * hd * 4.4000e-01r02 2.0000e-01r04 5.0000e-01e
4394 * icflg * f 0e
4395 * nff * f -1e
4396 * alp * f 1.0000e+00e
4397 * vl * f 0.0000e+00e
4398 * vv * f 0.0000e+00e
4399 * tl * r05 4.2275e+02 3.0815e+02e
4400 * tv * r05 4.2275e+02 3.0815e+02e
4401 * p * f 2.6000e+05e
4402 * pa * f 0.0000e+00e
4403 * qppp * f 0.0000e+00e
4404 * matid * f 6e
4405 * tw * r20 4.2275e+02r04 3.0815e+02e
4406 *
4407 * dx * 5.0000e-01e

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4408 * vol * 2.6600e-02e
4409 * fa * f 5.3260e-02e
4410 * fric * 1.0000e-04 f 0.0000e+00e
4411 * rv fri* 1.0000e-04 f 0.0000e+00e
4412 * grav * f 0.0000e+00e
4413 * hd * f 2.6040e-01e
4414 * icflg * f 0e
4415 * nff * 1 f -1e
4416 * alp * 1.0000e+00e
4417 * vl * f 0.0000e+00e
4418 * vv * f 0.0000e+00e
4419 * tl * 4.2275e+02e
4420 * tv * 4.2275e+02e
4421 * p * 2.6000e+05e
4422 * pa * 0.0000e+00e
4423 * qppp * f 0.0000e+00e
4424 * matid * f 6e
4425 * tw * f 4.2275e+02e
4426 *
4427 ***** type num id ctitle
4428 valve 39 $39$ separator drain valve
4429 * ncells 2 nodes jun1 jun2 epsw
4430 * 2 4 330 38 0.0000e+00
4431 * ichf iconc ivty ivps nvtb2
4432 * 1 0 1 2 0
4433 * ivtr ivsv nvtbl nvsv nvrfr
4434 * 0 100 2 0 0
4435 * iq3tr iq3sv nqp3tb nqp3sv nqp3rf
4436 * 0 0 0 0 0
4437 * ivtrov ivtyov
4438 * 0 0
4439 * rvmx rvov fminov fmaxov
4440 * 1.0000e+10 0.0000e+00 0.0000e+00 1.0000e+00
4441 * radin th hout1 houtv toutl
4442 * 1.5000e-02 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
4443 * toutv avlve hvlve favlve xpos
4444 * 3.0000e+02 3.1400e-02 2.0000e-01 1.0000e+00 0.0000e+00
4445 * qp3in qp3off rqp3mx qp3scl
4446 * 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4447 *
4448 * dx * 5.0000e-01 1.0000e+00e
4449 * vol * 2.6600e-02 5.3260e-02e
4450 * fa * f 5.3260e-02e
4451 * fric * 0.0000e+00 1.9440e+00 0.0000e+00e
4452 * rv fri* 0.0000e+00 1.9440e+00 0.0000e+00e
4453 * grav * r02 0.0000e+00 4.2200e-01e
4454 * hd * f 2.6040e-01e
4455 * icflg * f 0e
4456 * nff * f -1e
4457 * alp * f 1.0000e+00e
4458 * vl * f 0.0000e+00e
4459 * vv * f 0.0000e+00e
4460 * tl * f 4.2275e+02e
4461 * tv * f 4.2275e+02e
4462 * p * f 2.6000e+05e
4463 * pa * f 0.0000e+00e
4464 * qppp * f 0.0000e+00e
4465 * matid * f 6e
4466 * tw * f 4.2275e+02e
4467 * vtbl * 0.0000e+00 1.0000e+00 3.0000e+02 1.0000e+00e
4468 *
4469 ***** type num id ctitle
4470 fill 333 333 $333$ steam supply loop 3
4471 * jun1 ifty ioff
4472 * 333 5 0
4473 * iftr ifsv nftb nfvsv nfrf
4474 * 0 -903 0 0 0
4475 * twtold rfmxc concin felv
4476 * 0.0000e+00 1.5000e+01 0.0000e+00 0.0000e+00
4477 * dxin volin alpin vlin tlin
4478 * 1.0000e+00 1.2600e-01 1.0000e+00 0.0000e+00 4.2275e+02
4479 * pin pain flowin vvin tvin
4480 * 1.9880e+06 0.0000e+00 0.0000e+00 0.0000e+00 4.2275e+02
4481 *
4482 ***** type num id ctitle
4483 fill 339 339 $339$ separator drain fill loop 3
4484 * jun1 ifty ioff
4485 * 339 8 1
4486 * iftr ifsv nftb nfvsv nfrf
4487 * 666 100 -2 0 0
4488 * twtold rfmxc concin felv
4489 * 0.0000e+00 2.0000e+01 0.0000e+00 0.0000e+00
4490 * dxin volin alpin vlin tlin
4491 * 4.9130e-01 9.6400e-02 0.0000e+00 0.0000e+00 3.0815e+02
4492 * pin pain flowin vvin tvin
4493 * 2.6000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0815e+02
4494 * vmscl vvscl
4495 * 1.0000e+00 1.0000e+00
4496 *
4497 * vmtb * r02 0.0000e+00 5.0000e+00 -2.5000e+01e
4498 *
4499 ***** type num id ctitle

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```

4500 fill      35      35 $35$ hot-leg-ecc loop 3
4501 *        jun1      ifty      ioff
4502 *          35          8          0
4503 *        iftr      ifsv      nftb      nfsv      nfrf
4504 *          666          100      -6          0          0
4505 *        twtold      rfmx      concin      felv
4506 * 0.0000e+00      1.0000e+10      0.0000e+00      0.0000e+00
4507 *        dxin      volin      alpin      vlin      tlin
4508 * 3.3000e+00      1.3400e-01      0.0000e+00      0.0000e+00      3.0335e+02
4509 *        pin      pain      flowin      vvin      tvin
4510 * 2.6000e+05      0.0000e+00      0.0000e+00      0.0000e+00      3.0335e+02
4511 *        vmscl      vvscl
4512 * 1.0000e+00      1.0000e+00
4513 *
4514 * vmtb * r02 0.0000e+00      2.5000e+00      5.0000e+02      1.2500e+01      5.0000e+02
4515 * vmtb *      1.2500e+01      5.0000e+02      3.2500e+01      4.0000e+02      1.1050e+02
4516 * vmtb *      3.0000e+02e
4517 *
4518 * type      num      id      ctitle
4519 fill      36      36 $36$ cold-leg-ecc loop 3
4520 *        jun1      ifty      ioff
4521 *          36          6          0
4522 *        iftr      ifsv      nftb      nfsv      nfrf
4523 *          116          100          12          0          0
4524 *        twtold      rfmx      concin      felv
4525 * 0.0000e+00      1.0000e+10      0.0000e+00      0.0000e+00
4526 *        dxin      volin      alpin      vlin      tlin
4527 * 3.3000e+00      1.2500e-01      0.0000e+00      0.0000e+00      3.8615e+02
4528 *        pin      pain      flowin      vvin      tvin
4529 * 1.1000e+06      0.0000e+00      0.0000e+00      0.0000e+00      3.8615e+02
4530 *        vmscl      vvscl
4531 * 1.0000e+00      1.0000e+00
4532 *        tlsc1      tvscl      pscl      pascl      conscl
4533 * 1.0000e+00      1.0000e+00      1.0000e+05      1.0000e+00      1.0000e+00
4534 *
4535 * vmtb * r02 0.0000e+00      3.2000e+01      0.0000e+00      3.4000e+01      0.0000e+00
4536 * vmtb *      4.2000e+01      0.0000e+00      4.6000e+01      1.3360e+01      5.0000e+01
4537 * vmtb *      1.3790e+01      8.0000e+01      1.3820e+01      1.0600e+02      1.3820e+01
4538 * vmtb *      1.1000e+02      1.3570e+01      1.1800e+02      1.3590e+01      1.2200e+02
4539 * vmtb *      0.0000e+00      1.4000e+02      0.0000e+00e
4540 * vvtb * r02 0.0000e+00      3.2000e+01      0.0000e+00      3.4000e+01      0.0000e+00
4541 * vvtb *      4.2000e+01      0.0000e+00      4.6000e+01      0.0000e+00      5.0000e+01
4542 * vvtb *      0.0000e+00      8.0000e+01      0.0000e+00      1.0600e+02      0.0000e+00
4543 * vvtb *      1.1000e+02      0.0000e+00      1.1800e+02      0.0000e+00      1.2200e+02
4544 * vvtb *      0.0000e+00      1.4000e+02      0.0000e+00e
4545 * tltb *      0.0000e+00      3.8615e+02      3.2000e+01      3.8615e+02      3.4000e+01
4546 * tltb *      3.8615e+02      4.2000e+01      3.8615e+02      4.6000e+01      3.8465e+02
4547 * tltb *      5.0000e+01      3.8915e+02      8.0000e+01      3.9265e+02      1.0600e+02
4548 * tltb *      3.9265e+02      1.1000e+02      3.9265e+02      1.1800e+02      3.9415e+02
4549 * tltb *      1.2200e+02      3.9415e+02      1.4000e+02      3.9415e+02e
4550 * tvtb *      0.0000e+00      4.5730e+02      3.2000e+01      4.5730e+02      3.4000e+01
4551 * tvtb *      4.5730e+02      4.2000e+01      4.5730e+02      4.6000e+01      4.5730e+02
4552 * tvtb *      5.0000e+01      4.5730e+02      8.0000e+01      4.5730e+02      1.0600e+02
4553 * tvtb *      4.5730e+02      1.1000e+02      4.5730e+02      1.1800e+02      4.5730e+02
4554 * tvtb *      1.2200e+02      4.5730e+02      1.4000e+02      4.5730e+02e
4555 * alptb * r02 0.0000e+00      3.2000e+01      0.0000e+00      3.4000e+01      0.0000e+00
4556 * alptb *      4.2000e+01      0.0000e+00      4.6000e+01      0.0000e+00      5.0000e+01
4557 * alptb *      0.0000e+00      8.0000e+01      0.0000e+00      1.0600e+02      0.0000e+00
4558 * alptb *      1.1000e+02      0.0000e+00      1.1800e+02      0.0000e+00      1.2200e+02
4559 * alptb *      0.0000e+00      1.4000e+02      0.0000e+00e
4560 * ptb *      0.0000e+00      1.1000e+01      3.2000e+01      1.1000e+01      3.4000e+01
4561 * ptb *      1.1000e+01      4.2000e+01      1.1000e+01      4.6000e+01      1.1000e+01
4562 * ptb *      5.0000e+01      1.1000e+01      8.0000e+01      1.1000e+01      1.0600e+02
4563 * ptb *      1.1000e+01      1.1000e+02      1.1000e+01      1.1800e+02      1.1000e+01
4564 * ptb *      1.2200e+02      1.1000e+01      1.4000e+02      1.1000e+01e
4565 * patb * r02 0.0000e+00      3.2000e+01      0.0000e+00      3.4000e+01      0.0000e+00
4566 * patb *      4.2000e+01      0.0000e+00      4.6000e+01      0.0000e+00      5.0000e+01
4567 * patb *      0.0000e+00      8.0000e+01      0.0000e+00      1.0600e+02      0.0000e+00
4568 * patb *      1.1000e+02      0.0000e+00      1.1800e+02      0.0000e+00      1.2200e+02
4569 * patb *      0.0000e+00      1.4000e+02      0.0000e+00e
4570 *
4571 * type      num      id      ctitle
4572 tee      40      40 $40$ hot-leg loop 4
4573 *        jcell      nodes      ichf      cost      epsw
4574 *          4          4          1      -1.0000e+00      0.0000e+00
4575 *        iconcl      ncell1      jun1      jun2      ipow1
4576 *          0          8          40          41          0
4577 *        iqptr1      iqpsv1      nqptb1      nqpsv1      nqprf1
4578 *          0          0          0          0          0
4579 *        radin1      th1      hout11      houtv1      tout11
4580 * 3.7500e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
4581 *        toutv1
4582 * 3.0000e+02
4583 *        qpnl      qpoff1      rqpmx1      qpscl1
4584 * 0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
4585 *        iconc2      ncell2      jun3      ipow2
4586 *          0          1          45          0
4587 *        iqptr2      iqpsv2      nqptb2      nqpsv2      nqprf2
4588 *          0          0          0          0          0
4589 *        radin2      th2      hout12      houtv2      tout12
4590 * 1.1000e-01      1.0000e-02      0.0000e+00      0.0000e+00      3.0000e+02
4591 *        toutv2

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4592      3.0000e+02
4593 *      qpin2      qpoff2      rqpms2      qpscl2
4594      0.0000e+00      0.0000e+00      0.0000e+00      0.0000e+00
4595 *
4596 * dx * r03 5.1070e-01r02 1.8718e+00      2.1350e+00      9.8170e-01      6.3960e-01
4597 e
4598 * vol * r03 2.2560e-01r02 7.3200e-01      9.4320e-01      4.3370e-01      2.8260e-01
4599 e
4600 * fa * r03 4.4179e-01r02 3.9130e-01r04 4.4179e-01e
4601 * fric * r02 0.0000e+00r05 1.6000e-02r02 0.0000e+00e
4602 * rv fri* r02 0.0000e+00r05 1.6000e-02r02 0.0000e+00e
4603 * grav * r07 0.0000e+00      7.7600e-01      7.6600e-01e
4604 * hd * r03 7.5000e-01r02 6.3290e-01r04 7.5000e-01e
4605 * icflg * r03      0      1r05      0e
4606 * nff *      -1r08      -1e
4607 * alp * f 1.0000e+00e
4608 * vl * f 0.0000e+00e
4609 * vv * f 0.0000e+00e
4610 * tl * f 4.2315e+02e
4611 * tv * f 4.2315e+02e
4612 * p * f 2.6000e+05e
4613 * pa * f 0.0000e+00e
4614 * qppp * f 0.0000e+00e
4615 * matid * f 6e
4616 * tw * f 4.2315e+02e
4617 *
4618 * dx * 1.0000e+01e
4619 * vol * 4.0660e-01e
4620 * fa * f 4.0660e-02e
4621 * fric * 1.0000e-04 f 0.0000e+00e
4622 * rv fri* 1.0000e-04 f 0.0000e+00e
4623 * grav * f -1.0000e+00e
4624 * hd * f 2.0770e-01e
4625 * icflg * f 0e
4626 * nff * 1 f -1e
4627 * alp * 1.0000e+00e
4628 * vl * f 0.0000e+00e
4629 * vv * f 0.0000e+00e
4630 * tl * 4.1908e+02e
4631 * tv * 4.1908e+02e
4632 * p * 2.6000e+05e
4633 * pa * 0.0000e+00e
4634 * qppp * f 0.0000e+00e
4635 * matid * f 6e
4636 * tw * f 4.1908e+02e
4637 *
4638 ***** type num id ctitle
4639 fill 45 45 $45$ hot-leg-ecc loop 4
4640 * jun1 ifty ioff
4641 45 8 0
4642 * iftr ifsv nftb nfvf nfrf
4643 666 100 -6 0 0
4644 * twtold rfmv concin felv
4645 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
4646 * dxin volin alpin vlin tlin
4647 3.3000e+00 1.3400e-01 0.0000e+00 0.0000e+00 3.0335e+02
4648 * pin pain flowin vvin tvin
4649 2.6000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0335e+02
4650 * vmscl vvscl
4651 1.0000e+00 1.0000e+00
4652 *
4653 * vmtb * r02 0.0000e+00 2.5000e+00 5.0000e+02 1.2500e+01 5.0000e+02
4654 * vmtb * 1.2500e+01 5.0000e+02 3.2500e+01 4.0000e+02 1.1050e+02
4655 * vmtb * 3.0000e+02e
4656 *
4657 ***** type num id ctitle
4658 tee 41 41 $41$ bhl separator
4659 * jcell nodes ichf cost epsw
4660 8 4 1 1.0000e+00 0.0000e+00
4661 * iconc1 ncell1 jun1 jun2 ipow1
4662 0 11 41 42 0
4663 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
4664 0 0 0 0 0
4665 * radin1 th1 hout11 houtv1 tout11
4666 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4667 * toutv1
4668 3.0000e+02
4669 * qpin1 qpoff1 rqpms1 qpscl1
4670 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4671 * iconc2 ncell2 jun3 ipow2
4672 0 7 449 0
4673 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
4674 0 0 0 0 0
4675 * radin2 th2 hout12 houtv2 tout12
4676 1.2500e+00 2.5000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4677 * toutv2
4678 3.0000e+02
4679 * qpin2 qpoff2 rqpms2 qpscl2
4680 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4681 *
4682 * dx * 9.5560e-01 2.8140e-01 2.0200e-01 4.2400e-01 1.8800e-01
4683 * dx * r02 7.1000e-01 6.0500e-01 2.0000e-01 3.4600e-01 7.9100e-01

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4684 e
4685 * vol * 2.5970e+00 1.3300e+00 9.4770e-01 3.6700e-01 2.2300e-01
4686 * vol * r02 7.3560e-01 6.4400e-01 9.4600e-01 1.6365e+00 2.7340e+00
4687 e
4688 * fa * 4.4179e-01 4.5584e+00 4.7298e+00r02 8.6600e-01r04 1.0361e+00
4689 * fa * r02 4.7298e+00 4.4179e-01e
4690 * fric * r03 0.0000e+00 3.6210e-01r08 0.0000e+00e
4691 * rv fri* r03 0.0000e+00 9.0530e-01r08 0.0000e+00e
4692 * grav * 7.6600e-01r11 1.0000e+00e
4693 * hd * 7.5000e-01r02 2.3000e+00r02 1.5830e-01r04 2.0910e-01r03 7.5000e-01
4694 e
4695 * icflg * f 0e
4696 * nff * f -1e
4697 * alp * f 1.0000e+00e
4698 * vl * f 0.0000e+00e
4699 * vv * f 0.0000e+00e
4700 * tl * f 4.1908e+02e
4701 * tv * f 4.1908e+02e
4702 * p * f 2.6000e+05e
4703 * pa * f 0.0000e+00e
4704 * qppp * f 0.0000e+00e
4705 * matid * f 6e
4706 * tw * f 4.1908e+02e
4707 *
4708 * dx * r02 7.1000e-01 1.8800e-01 4.2400e-01 9.0000e-01 1.8500e+00
4709 * dx * 1.4740e+00e
4710 * vol * r02 2.3590e+00 7.0100e-01 1.7550e+00 2.8300e-02 5.8000e-02
4711 * vol * 2.8920e-01e
4712 * fa * r03 3.3230e+00r02 4.1380e+00r02 3.1400e-02 1.9630e-01e
4713 * fric * 1.0000e-04 f 0.0000e+00e
4714 * rv fri* 1.0000e-04 f 0.0000e+00e
4715 * grav * r05-1.0000e+00 -2.2300e-01 -4.4300e-01 -1.0000e+00e
4716 * hd * r04 3.1800e-01r03 2.0000e-01 4.0000e-01e
4717 * icflg * f 0e
4718 * nff * 1 f -1e
4719 * alp * f 1.0000e+00e
4720 * vl * f 0.0000e+00e
4721 * vv * f 0.0000e+00e
4722 * tl * r04 4.1908e+02r03 3.0815e+02e
4723 * tv * r04 4.1908e+02r03 3.0815e+02e
4724 * p * f 2.6000e+05e
4725 * pa * f 0.0000e+00e
4726 * qppp * f 0.0000e+00e
4727 * matid * f 6e
4728 * tw * r08 4.1908e+02r20 3.0815e+02e
4729 *
4730 ***** type num id cttitle
4731 fill 449 449 $449$ bhl separator drain
4732 * jun1 ifty ioff
4733 * 449 8 1
4734 * iftr ifsv nftb nfsv nfrf
4735 * 666 100 -2 0 0
4736 * twtold rfmxc concin felv
4737 * 0.0000e+00 2.0000e+01 0.0000e+00 0.0000e+00
4738 * dxin volin alpin vlin tlin
4739 * 1.4740e+00 2.8920e-01 0.0000e+00 0.0000e+00 3.0815e+02
4740 * pin pain flowin vvin tvin
4741 * 2.6000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.0815e+02
4742 * vmscl vvscl
4743 * 1.0000e+00 1.0000e+00
4744 *
4745 * vmtb * r02 0.0000e+00 5.0000e+00 1.0000e+02e
4746 *
4747 ***** type num id cttitle
4748 valve 42 42 $42$ bhl valve
4749 * ncells nodes jun1 jun2 epsw
4750 * 12 0 42 91 0.0000e+00
4751 * ichf iconc ivty ivps nvtb2
4752 * 0 0 4 7 0
4753 * ivtr ivsv nvtb1 nvsv nvrif
4754 * 666 100 -2 0 0
4755 * ivtrov ivtyov
4756 * 0 0
4757 * rvmx rvov fminov fmaxov
4758 * 1.0000e+10 0.0000e+00 0.0000e+00 1.0000e+00
4759 * radin th hout1 houtv tout1
4760 * 3.7500e-01 5.0000e-03 0.0000e+00 0.0000e+00 3.0000e+02
4761 * toutv avlve hvlve favlve xpos
4762 * 3.0000e+02 4.4179e-01 7.5000e-01 0.0000e+00 0.0000e+00
4763 *
4764 * dx * 1.0800e+00 3.8250e+00 1.2250e+00 5.0770e+00 3.1480e+00
4765 * dx * 4.1810e+00 1.4000e+00 1.3400e+00 8.3000e+00r02 1.3585e+01
4766 * dx * 4.3300e+00e
4767 * vol * 4.7710e-01 1.6898e+00 5.4130e-01 2.2429e+00 1.3907e+00
4768 * vol * 1.8471e+00 6.1850e-01 1.7786e+00 1.1017e+01r02 1.8032e+01
4769 * vol * 5.7473e+00e
4770 * fa * r04 4.4179e-01 1.3250e-01r02 4.4179e-01r06 1.3273e+00e
4771 * fric * 0.0000e+00 2.5920e-02 2.5150e-02 0.0000e+00 5.5500e-02
4772 * fric * 1.6880e-02r02 0.0000e+00 2.0230e-02 8.9100e-03 0.0000e+00
4773 * fric * 1.0880e-02 0.0000e+00e
4774 * rv fri* 0.0000e+00 2.5920e-02 2.5150e-02 0.0000e+00 2.5000e-01
4775 * rv fri* 1.6880e-02r02 0.0000e+00 2.0230e-02 8.9100e-03 0.0000e+00

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4776 * rv fri*      1.0880e-02   0.0000e+00e
4777 * grav *      1.0000e+00   2.2020e-01   -2.4250e-01r02-1.0000e+00   -4.2950e-01
4778 * grav * r02  0.0000e+00   8.6100e-01   3.7930e-01   0.0000e+00   -2.4170e-01
4779 * grav *      -1.0000e+00e
4780 * hd * r07  7.5000e-01r06  1.3000e+00e
4781 * icflg * r04      0      1      0      1r06      0
4782 e
4783 * nff * f      -1e
4784 * alp * f      1.0000e+00e
4785 * vl * f      0.0000e+00e
4786 * vv * f      0.0000e+00e
4787 * tl * r06  4.1908e+02r06  4.1615e+02e
4788 * tv * r06  4.1908e+02r06  4.1615e+02e
4789 * p * f      2.6000e+05e
4790 * pa * f      0.0000e+00e
4791 * vtbl * r02  0.0000e+00   4.0000e+00   0.0000e+00e
4792 *
4793 ***** type      num      id      ctitle
4794 valve      46      $46$ bcl pipe and valve
4795 *      ncells      nodes      jun1      jun2      epsw
4796 *      6      4      47      46      0.0000e+00
4797 *      ichf      iconc      ivty      ivps      nvtb2
4798 *      1      0      4      6      0
4799 *      ivtr      ivsv      nvtbl1     nvsv      nvrfl
4800 *      446      100      20      0      0
4801 *      iqp3tr     iqp3sv     nqp3tb     nqp3sv     nqp3rf
4802 *      0      0      0      0      0
4803 *      ivtrov     ivtyov
4804 *      0      0
4805 *      rvmx      rvov      fminov     fmaxov
4806 *      1.0000e+10   0.0000e+00   0.0000e+00   1.0000e+00
4807 *      radin      th      houtl      houtv      toutl
4808 *      3.7500e-01   5.0000e-03   0.0000e+00   0.0000e+00   3.0000e+02
4809 *      toutv      avlve     hvlve     favlve     xpos
4810 *      3.0000e+02   4.4179e-01   7.5000e-01   9.7530e-01   0.0000e+00
4811 *      qp3in     qp3off     rqp3mx     qp3scl
4812 *      0.0000e+00   0.0000e+00   0.0000e+00   0.0000e+00
4813 *
4814 * dx *      6.7000e-01r02  1.5475e+00r02  1.7580e+00   1.9450e+00e
4815 * vol *      3.6110e-01r02  6.8370e-01   2.2867e+00   7.7670e-01   4.4180e-01
4816 e
4817 * fa *      5.0527e-01r06  4.4179e-01e
4818 * fric * f      0.0000e+00e
4819 * rv fri* f      0.0000e+00e
4820 * grav * f      0.0000e+00e
4821 * hd *      9.0000e-01r06  7.5000e-01e
4822 * icflg * r05      0      1      0e
4823 * nff * f      -1e
4824 * alp * f      1.0000e+00e
4825 * vl * f      0.0000e+00e
4826 * vv * f      0.0000e+00e
4827 * tl * f      4.1215e+02e
4828 * tv * f      4.1215e+02e
4829 * p * f      2.6000e+05e
4830 * pa * f      0.0000e+00e
4831 * qppp * f      0.0000e+00e
4832 * matid * f      6e
4833 * tw * f      4.1215e+02e
4834 * vtbl *      0.0000e+00   9.7530e-01   2.2400e+01   9.7530e-01   2.3490e+01
4835 * vtbl *      9.7550e-01   2.4490e+01   9.7620e-01   9.9990e+01   9.7550e-01
4836 * vtbl *      1.5049e+02   9.7560e-01   2.0049e+02   9.7560e-01   2.5049e+02
4837 * vtbl *      9.7550e-01   2.6949e+02   9.7550e-01   2.7099e+02   9.1170e-01
4838 * vtbl *      2.7249e+02   7.4230e-01   2.7399e+02   5.7810e-01   2.7599e+02
4839 * vtbl *      3.5820e-01   2.7799e+02   1.4730e-01   2.7999e+02   3.3590e-02
4840 * vtbl *      2.8149e+02   1.5480e-02   2.8299e+02   7.3620e-03   2.8399e+02
4841 * vtbl *      6.7660e-03   2.8499e+02   6.7130e-03   2.9999e+02   6.5110e-03
4842 e
4843 *
4844 ***** type      num      id      ctitle
4845 break      90      90 $90$ bcl containment break
4846 *      jun1      ibty      isat      ioff
4847 *      46      1      3      1
4848 *      ibtr      ibsv      nbtb      nbsv      nbrf
4849 *      90      100      14      0      0
4850 *      dxkin      volin      alpin      tin      pin
4851 *      5.0000e-01   2.5000e+01   1.0000e+00   4.3400e+02   2.5200e+05
4852 *      pain      concin      rbmx      poff      balv
4853 *      0.0000e+00   0.0000e+00   1.0000e+10   2.5210e+05   0.0000e+00
4854 *      pscl      tpscl      tvscl      pascl      conscl
4855 *      1.0000e+00   1.0000e+00   1.0000e+00   1.0000e+00   1.0000e+00
4856 * ptb *      0.0000e+00   2.5200e+05   3.1000e+01   2.3900e+05   3.5500e+01
4857 * ptb *      3.1000e+05   4.0000e+01   3.1400e+05   4.4000e+01   3.0500e+05
4858 * ptb *      4.8000e+01   2.7600e+05   6.0000e+01   3.1200e+05   7.6000e+01
4859 * ptb *      3.1500e+05   8.6000e+01   4.0500e+05   1.0600e+02   4.5900e+05
4860 * ptb *      1.1500e+02   4.5500e+05   1.2000e+02   4.9200e+05   1.3200e+02
4861 * ptb *      3.1800e+05   1.4000e+02   2.5800e+05e
4862 *
4863 ***** type      num      id      ctitle
4864 break      91      91 $91$ bhl containment break
4865 *      jun1      ibty      isat      ioff
4866 *      91      1      3      1
4867 *      ibtr      ibsv      nbtb      nbsv      nbrf

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4868		91	100	61	0	0	
4869	*	dxin	volin	alpin	tin	pin	
4870	*	5.0000e-01	2.5000e+01	1.0000e+00	4.1615e+02	2.5920e+05	
4871	*	pain	concin	rbmx	poFF	belv	
4872	*	0.0000e+00	0.0000e+00	1.0000e+10	2.5920e+05	0.0000e+00	
4873	*	pscl	tlsc1	tvsc1	pascl	conscl	
4874	*	1.0000e+00	1.0000e+00	1.0000e+00	1.0000e+00	1.0000e+00	
4875	* ptb	*	0.0000e+00	2.5920e+05	4.8010e-01	2.5920e+05	5.4801e+00
4876	* ptb	*	2.5980e+05	1.0480e+01	2.5990e+05	1.5480e+01	2.5930e+05
4877	* ptb	*	2.0480e+01	2.5720e+05	2.5480e+01	2.5850e+05	3.0480e+01
4878	* ptb	*	2.5680e+05	3.5480e+01	2.5140e+05	4.0480e+01	2.4890e+05
4879	* ptb	*	4.5480e+01	2.4620e+05	5.0480e+01	2.4580e+05	5.5480e+01
4880	* ptb	*	2.4670e+05	6.0480e+01	2.4660e+05	6.5480e+01	2.4630e+05
4881	* ptb	*	7.0480e+01	2.4720e+05	7.5480e+01	2.4690e+05	8.0480e+01
4882	* ptb	*	2.4820e+05	8.5480e+01	2.5080e+05	9.0480e+01	2.5120e+05
4883	* ptb	*	9.5480e+01	2.5190e+05	1.0048e+02	2.5270e+05	1.0548e+02
4884	* ptb	*	2.5360e+05	1.1048e+02	2.5500e+05	1.1548e+02	2.5540e+05
4885	* ptb	*	1.2048e+02	2.5550e+05	1.2548e+02	2.5450e+05	1.3048e+02
4886	* ptb	*	2.5400e+05	1.3548e+02	2.5400e+05	1.4048e+02	2.5280e+05
4887	* ptb	*	1.4548e+02	2.5290e+05	1.5048e+02	2.5190e+05	1.5548e+02
4888	* ptb	*	2.5260e+05	1.6048e+02	2.5300e+05	1.6548e+02	2.5390e+05
4889	* ptb	*	1.7048e+02	2.5510e+05	1.7548e+02	2.5600e+05	1.8048e+02
4890	* ptb	*	2.5610e+05	1.8548e+02	2.5610e+05	1.9048e+02	2.5650e+05
4891	* ptb	*	1.9548e+02	2.5630e+05	2.0048e+02	2.5580e+05	2.0548e+02
4892	* ptb	*	2.5540e+05	2.1048e+02	2.5500e+05	2.1548e+02	2.5460e+05
4893	* ptb	*	2.2048e+02	2.5460e+05	2.2548e+02	2.5380e+05	2.3048e+02
4894	* ptb	*	2.5120e+05	2.3548e+02	2.5190e+05	2.4048e+02	2.5780e+05
4895	* ptb	*	2.4548e+02	2.5810e+05	2.5048e+02	2.5290e+05	2.5548e+02
4896	* ptb	*	2.5380e+05	2.6048e+02	2.5540e+05	2.6548e+02	2.5600e+05
4897	* ptb	*	2.7048e+02	2.5650e+05	2.7548e+02	2.5700e+05	2.8048e+02
4898	* ptb	*	2.5720e+05	2.8548e+02	2.5710e+05	2.9048e+02	2.5720e+05
4899	* ptb	*	2.9548e+02	2.5730e+05e			
4900	*						
4901	*****	type	num	id	ctitle		
4902	tee	160	160	\$160\$ ecc & n2 inj.	pipes loop 1		
4903	*	jcell	nodes	ichf	cost	epsw	
4904	*	2	4	0	0.0000e+00	0.0000e+00	
4905	* iconc1	ncell1	jun1	jun2	ipow1		
4906	*	0	3	16	160	0	
4907	* iqptr1	iqpsv1	ngptb1	ngpsv1	ngprf1		
4908	*	0	0	0	0	0	
4909	* radin1	th1	hout11	houtv1	tout11		
4910	*	1.1000e-01	1.0000e-02	0.0000e+00	0.0000e+00	3.0000e+02	
4911	*	toutv1					
4912	*	3.0000e+02					
4913	* qpin1	qpoff1	rqpmx1	qpscl1			
4914	*	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00		
4915	* iconc2	ncell2	jun3	ipow2			
4916	*	0	1	161	0		
4917	* iqptr2	iqpsv2	ngptb2	ngpsv2	ngprf2		
4918	*	0	0	0	0	0	
4919	* radin2	th2	hout12	houtv2	tout12		
4920	*	1.1000e-01	1.0000e-02	0.0000e+00	0.0000e+00	3.0000e+02	
4921	*	toutv2					
4922	*	3.0000e+02					
4923	* qpin2	qpoff2	rqpmx2	qpscl2			
4924	*	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00		
4925	*						
4926	* dx	* f	5.0000e-01e				
4927	* vol	* f	1.7000e-02e				
4928	* fa	* f	3.4000e-02e				
4929	* fric	* f	0.0000e+00e				
4930	* rv fri*	* f	0.0000e+00e				
4931	* grav	* r03	0.0000e+00	-1.0000e+00e			
4932	* hd	* f	2.2000e-01e				
4933	* icflg	* f	0e				
4934	* nff	* f	-1e				
4935	* alp	* f	1.0000e+00e				
4936	* vl	* f	0.0000e+00e				
4937	* vv	* f	0.0000e+00e				
4938	* tl	* f	4.1118e+02e				
4939	* tv	* f	4.1118e+02e				
4940	* p	* f	2.6000e+05e				
4941	* pa	* f	0.0000e+00e				
4942	* qppp	* f	0.0000e+00e				
4943	* matid	* f	6e				
4944	* tw	* f	4.1118e+02e				
4945	*						
4946	* dx	* f	5.0000e-01e				
4947	* vol	* f	1.7000e-02e				
4948	* fa	* f	3.8010e-02e				
4949	* fric	* f	1.0000e-04 f	0.0000e+00e			
4950	* rv fri*	* f	1.0000e-04 f	0.0000e+00e			
4951	* grav	* f	1.0000e+00e				
4952	* hd	* f	2.2000e-01e				
4953	* icflg	* f	0e				
4954	* nff	* f	1 f -1e				
4955	* alp	* f	1.0000e+00e				
4956	* vl	* f	0.0000e+00e				
4957	* vv	* f	0.0000e+00e				
4958	* tl	* f	4.1118e+02e				
4959	* tv	* f	4.1118e+02e				

```

4960 * p * 2.6000e+05e
4961 * pa * 0.0000e+00e
4962 * qppp * f 0.0000e+00e
4963 * matid * f 6e
4964 * tw * f 4.1118e+02e
4965 *
4966 ***** type num id ctitle
4967 fill 161 161 $161$ n2 inj. fill loop 1
4968 * jun1 ifty ioff
4969 161 8 0
4970 * iftr ifsv nftb nfsv nfrf
4971 90 100 6 0 0
4972 * twtold rfmv concin felv
4973 0.0000e+00 1.0000e+10 0.0000e+00 0.0000e+00
4974 * dxin volin alpin vlin tlin
4975 5.0000e-01 1.7000e-02 1.0000e+00 0.0000e+00 3.1000e+02
4976 * pin pain flowin vwin tvin
4977 2.2150e+06 2.2125e+06 0.0000e+00 0.0000e+00 3.1000e+02
4978 * vmscl vvscl
4979 1.0000e+00 1.0000e+00
4980 *
4981 * vmtb * r02 0.0000e+00 3.8000e+01 0.0000e+00 4.0000e+01 3.4000e-01
4982 * vmtb * 1.2000e+02 3.4000e-01 1.2250e+02 0.0000e+00 1.0000e+05
4983 * vmtb * 0.0000e+00e
4984 *
4985 ***** type num id ctitle
4986 tee 260 260 $260$ ecc & n2 inj. pipes loop 2
4987 * jcell nodes ichf cost epsw
4988 2 4 0 0.0000e+00 0.0000e+00
4989 * iconc1 ncell1 jun1 jun2 ipow1
4990 0 3 26 260 0
4991 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
4992 0 0 0 0 0
4993 * radin1 th1 hout11 houtv1 tout11
4994 1.1000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
4995 * toutv1
4996 3.0000e+02
4997 * qpin1 qpoff1 rqpvc1 qpscl1
4998 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
4999 * iconc2 ncell2 jun3 ipow2
5000 0 1 261 0
5001 * iqptr2 iqpsv2 nqptb2 nqpsv2 nqprf2
5002 0 0 0 0 0
5003 * radin2 th2 hout12 houtv2 tout12
5004 1.1000e-01 1.0000e-02 0.0000e+00 0.0000e+00 3.0000e+02
5005 * toutv2
5006 0.0000e+00
5007 * qpin2 qpoff2 rqpvc2 qpscl2
5008 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
5009 *
5010 * dx * f 5.0000e-01e
5011 * vol * f 1.7000e-02e
5012 * fa * f 3.4000e-02e
5013 * fric * f 0.0000e+00e
5014 * rv fri* f 0.0000e+00e
5015 * grav * r03 0.0000e+00 -1.0000e+00e
5016 * hd * f 2.2000e-01e
5017 * icflg * f 0e
5018 * nff * f -1e
5019 * alp * f 1.0000e+00e
5020 * vl * f 0.0000e+00e
5021 * vv * f 0.0000e+00e
5022 * tl * f 4.1415e+02e
5023 * tv * f 4.1415e+02e
5024 * p * f 2.6000e+05e
5025 * pa * f 0.0000e+00e
5026 * qppp * f 0.0000e+00e
5027 * matid * f 6e
5028 * tw * f 4.1415e+02e
5029 *
5030 * dx * 5.0000e-01e
5031 * vol * 1.7000e-02e
5032 * fa * f 3.8010e-02e
5033 * fric * 1.0000e-04 f 0.0000e+00e
5034 * rv fri* 1.0000e-04 f 0.0000e+00e
5035 * grav * f 1.0000e+00e
5036 * hd * f 2.2000e-01e
5037 * icflg * f 0e
5038 * nff * 1 f -1e
5039 * alp * 1.0000e+00e
5040 * vl * f 0.0000e+00e
5041 * vv * f 0.0000e+00e
5042 * tl * 4.1415e+02e
5043 * tv * 4.1415e+02e
5044 * p * 2.6000e+05e
5045 * pa * 0.0000e+00e
5046 * qppp * f 0.0000e+00e
5047 * matid * f 6e
5048 * tw * f 4.1415e+02e
5049 *
5050 ***** type num id ctitle
5051 fill 261 261 $261$ n2 inj. fill loop 2

```



```

5052 *      jun1      ifty      ioff
5053      261          8          0
5054 *      iftr      ifsv      nftb      nfsv      nfrf
5055      90          100        6          0
5056 *      twtold    rfmix      concin    felv
5057      0.0000e+00  1.0000e+10  0.0000e+00  0.0000e+00
5058 *      dxin      volin      alpin      vlin      tlin
5059      5.0000e-01  1.7000e-02  1.0000e+00  0.0000e+00  3.1000e+02
5060 *      pin      pain      flowin    vvin      tvin
5061      2.2150e+06  2.2125e+06  0.0000e+00  0.0000e+00  3.1000e+02
5062 *      vmscl    vvscl
5063      1.0000e+00  1.0000e+00
5064 *
5065 * vmtb * r02 0.0000e+00  3.8000e+01  0.0000e+00  4.0000e+01  3.4000e-01
5066 * vmtb *      1.2000e+02  3.4000e-01  1.2250e+02  0.0000e+00  1.0000e+05
5067 * vmtb *      0.0000e+00e
5068 *
5069 ***** type num id ctitle
5070 tee 360 360 $360$ ecc & n2 inj. pipes loop 3
5071 * jcell nodes ichf cost epsw
5072      2          4          0  0.0000e+00  0.0000e+00
5073 * iconc1 ncell1 jun1 jun2 ipow1
5074      0          3          36          360          0
5075 * iqptr1 iqpsv1 nqptb1 nqpsv1 nqprf1
5076      0          0          0          0          0
5077 * radin1 th1 hout11 houtv1 tout11
5078      1.1000e-01  1.0000e-02  0.0000e+00  0.0000e+00  3.0000e+02
5079 *      toutv1
5080      3.0000e+02
5081 *      qpnl      qpoff1      rqpml      qpscl1
5082      0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
5083 *      iconc2    ncell2      jun3      ipow2
5084      0          1          361          0
5085 *      iqptr2    iqpsv2      nqptb2    nqpsv2    nqprf2
5086      0          0          0          0          0
5087 *      radin2    th2      hout12    houtv2    tout12
5088      1.1000e-01  1.0000e-02  0.0000e+00  0.0000e+00  3.0000e+02
5089 *      toutv2
5090      0.0000e+00
5091 *      qpnl      qpoff2      rqpml      qpscl2
5092      0.0000e+00  0.0000e+00  0.0000e+00  0.0000e+00
5093 *
5094 * dx * f 5.0000e-01e
5095 * vol * f 1.7000e-02e
5096 * fa * f 3.4000e-02e
5097 * fric * f 0.0000e+00e
5098 * rv fri * f 0.0000e+00e
5099 * grav * r03 0.0000e+00 -1.0000e+00e
5100 * hd * f 2.2000e-01e
5101 * icflg * f 0e
5102 * nff * f -1e
5103 * alp * f 1.0000e+00e
5104 * vl * f 0.0000e+00e
5105 * vv * f 0.0000e+00e
5106 * tl * f 4.1678e+02e
5107 * tv * f 4.1678e+02e
5108 * p * f 2.6000e+05e
5109 * pa * f 0.0000e+00e
5110 * qppp * f 0.0000e+00e
5111 * matid * f 6e
5112 * tw * f 4.1678e+02e
5113 *
5114 * dx * 5.0000e-01e
5115 * vol * 1.7000e-02e
5116 * fa * f 3.8010e-02e
5117 * fric * 1.0000e-04 f 0.0000e+00e
5118 * rv fri * 1.0000e-04 f 0.0000e+00e
5119 * grav * f 1.0000e+00e
5120 * hd * f 2.2000e-01e
5121 * icflg * f 0e
5122 * nff * 1 f -1e
5123 * alp * 1.0000e+00e
5124 * vl * f 0.0000e+00e
5125 * vv * f 0.0000e+00e
5126 * tl * 4.1678e+02e
5127 * tv * 4.1678e+02e
5128 * p * 2.6000e+05e
5129 * pa * 0.0000e+00e
5130 * qppp * f 0.0000e+00e
5131 * matid * f 6e
5132 * tw * f 4.1678e+02e
5133 *
5134 ***** type num id ctitle
5135 fill 361 361 $361$ n2 inj. fill loop 3
5136 *      jun1      ifty      ioff
5137      361          8          0
5138 *      iftr      ifsv      nftb      nfsv      nfrf
5139      90          100        6          0
5140 *      twtold    rfmix      concin    felv
5141      0.0000e+00  1.0000e+10  0.0000e+00  0.0000e+00
5142 *      dxin      volin      alpin      vlin      tlin
5143      5.0000e-01  1.7000e-02  1.0000e+00  0.0000e+00  3.1000e+02

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```

5144 *          pin          pain          flowin          vvin          tvin
5145 * 2.2150e+06 2.2125e+06 0.0000e+00 0.0000e+00 3.1000e+02
5146 *          vmscl          vvscl
5147 * 1.0000e+00 1.0000e+00
5148 *
5149 * vmtb * r02 0.0000e+00 3.8000e+01 0.0000e+00 4.0000e+01 3.4000e-01
5150 * vmtb * 1.2000e+02 3.4000e-01 1.2250e+02 0.0000e+00 1.0000e+05
5151 * vmtb * 0.0000e+00e
5152 *
5153 * type num id ctitle
5154 slab 999 999 $999$ slab level 1 cells 1-8
5155 * ncrx ncrz
5156 * 8 1
5157 * nopowr nrldr modez liqlev iaxcnd
5158 * 1 1 1 0 0
5159 * idbci idbco
5160 * 0 2
5161 * width
5162 * 1.9442e+00
5163 * nrods nodes irftr nzmaz
5164 * 8 5 0 5
5165 * dtxht(1) dtxht(2) dznht hgapo
5166 * 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5167 * nhcomo * f 1e
5168 * nhcelo * -1 1 2e
5169 * dz * f 2.0070e+00e
5170 * grav * f 1.0000e+00e
5171 * idrod
5172 * 1 2 3 4 s
5173 * 5 6 7 8 e
5174 * rdx * f 1.0000e+00e
5175 * radrd
5176 * 0.0000e+00s
5177 * 5.0000e-03s
5178 * 1.0000e-02s
5179 * 1.3000e-02s
5180 * 1.5000e-02e
5181 * matrdr * f 6e
5182 * nfax * f 1e
5183 * rftn
5184 f 4.752e+02e
5185 f 4.752e+02e
5186 f 4.752e+02e
5187 f 4.752e+02e
5188 f 4.752e+02e
5189 f 4.752e+02e
5190 f 4.752e+02e
5191 f 4.752e+02e
5192 *
5193 * type num id ctitle
5194 slab 991 991 $991$ slab level 1 cells 9-16
5195 * ncrx ncrz
5196 * 8 1
5197 * nopowr nrldr modez liqlev iaxcnd
5198 * 1 1 1 0 0
5199 * idbci idbco
5200 * 0 2
5201 * width
5202 * 2.3026e+00
5203 * nrods nodes irftr nzmaz
5204 * 8 5 0 5
5205 * dtxht(1) dtxht(2) dznht hgapo
5206 * 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5207 * nhcomo * f 1e
5208 * nhcelo * -1 1 2e
5209 * dz * f 2.0070e+00e
5210 * grav * f 1.0000e+00e
5211 * idrod
5212 * 9 10 11 12 s
5213 * 13 14 15 16 e
5214 * rdx * f 1.0000e+00e
5215 * radrd
5216 * 0.0000e+00s
5217 * 9.4000e-03s
5218 * 1.5000e-02s
5219 * 1.7000e-02s
5220 * 1.8800e-02e
5221 * matrdr * f 6e
5222 * nfax * f 1e
5223 * rftn
5224 f 4.752e+02e
5225 f 4.752e+02e
5226 f 4.752e+02e
5227 f 4.752e+02e
5228 f 4.752e+02e
5229 f 4.752e+02e
5230 f 4.752e+02e
5231 f 4.752e+02e
5232 *
5233 * type num id ctitle
5234 slab 983 983 $983$ slab level 1 cells 17-24
5235 * ncrx ncrz

```

```

5236      8      1
5237 * nopowr nridr modez liqlev iaxcnd
5238      1      1      1      0      0
5239 * idbci idbco
5240      0      2
5241 * width
5242      5.5700e-01
5243 * nrods nodes irftr nzmaz
5244      8      5      0      5
5245 * dtxht(1) dtxht(2) dznht hgapo
5246      3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5247 * nhcomo * f 1e
5248 * nhcelo * -1 1 2e
5249 * dz * f 2.0070e+00e
5250 * grav * f 1.0000e+00e
5251 * idrod
5252 17 18 19 20 s
5253 21 22 23 24 e
5254 * rdx * f 1.0000e+00e
5255 * radrd
5256 0.0000e+00s
5257 2.5000e-02s
5258 4.0000e-02s
5259 4.7000e-02s
5260 5.0000e-02e
5261 * matrdr * f 6e
5262 * nfax * f 1e
5263 * rftn
5264 f 4.752e+02e
5265 f 4.752e+02e
5266 f 4.752e+02e
5267 f 4.752e+02e
5268 f 4.752e+02e
5269 f 4.752e+02e
5270 f 4.752e+02e
5271 f 4.752e+02e
5272 *
5273 * type num id ctitle
5274 slab 975 975 $975$ slab level 2 cells 1-8
5275 * ncrx ncrz
5276 8 1
5277 * nopowr nridr modez liqlev iaxcnd
5278 1 1 1 0 0
5279 * idbci idbco
5280 0 2
5281 * width
5282 9.2515e-01
5283 * nrods nodes irftr nzmaz
5284 8 5 0 5
5285 * dtxht(1) dtxht(2) dznht hgapo
5286 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5287 * nhcomo * f 1e
5288 * nhcelo * -2 2 3e
5289 * dz * f 4.7300e-01e
5290 * grav * f 1.0000e+00e
5291 * idrod
5292 1 2 3 4 s
5293 5 6 7 8 e
5294 * rdx * f 1.0000e+00e
5295 * radrd
5296 0.0000e+00s
5297 5.0000e-03s
5298 1.0000e-02s
5299 1.3000e-02s
5300 1.5000e-02e
5301 * matrdr * f 6e
5302 * nfax * f 1e
5303 * rftn
5304 f 4.752e+02e
5305 f 4.752e+02e
5306 f 4.752e+02e
5307 f 4.752e+02e
5308 f 4.752e+02e
5309 f 4.752e+02e
5310 f 4.752e+02e
5311 f 4.752e+02e
5312 *
5313 * type num id ctitle
5314 slab 967 967 $967$ slab level 2 cells 9-16
5315 * ncrx ncrz
5316 8 1
5317 * nopowr nridr modez liqlev iaxcnd
5318 1 1 1 0 0
5319 * idbci idbco
5320 0 2
5321 * width
5322 2.0046e+00
5323 * nrods nodes irftr nzmaz
5324 8 5 0 5
5325 * dtxht(1) dtxht(2) dznht hgapo
5326 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5327 * nhcomo * f 1e

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5328 * nhcelo * -2 2 3e
5329 * dz * f 4.7300e-01e
5330 * grav * f 1.0000e+00e
5331 * idrod
5332 9 10 11 12 s
5333 13 14 15 16 e
5334 * rdx * f 1.0000e+00e
5335 * radrdr
5336 0.0000e+00s
5337 1.0200e-02s
5338 1.6340e-02s
5339 1.8390e-02s
5340 2.0430e-02e
5341 * matrdr * f 6e
5342 * nfax * f 1e
5343 * rftn
5344 f 4.752e+02e
5345 f 4.752e+02e
5346 f 4.752e+02e
5347 f 4.752e+02e
5348 f 4.752e+02e
5349 f 4.752e+02e
5350 f 4.752e+02e
5351 f 4.752e+02e
5352 *
5353 * type num id ctitle
5354 slab 959 959 $959$ slab level 2 cells 17-24
5355 * ncrx ncrz
5356 8 1
5357 * nopowr nrldr modez liqlev iaxcnd
5358 1 1 1 0 0
5359 * idbci idbco
5360 0 2
5361 * width
5362 4.3630e+00
5363 * nrods nodes irftr nzmaz
5364 8 5 0 5
5365 * dtxht(1) dtxht(2) dznht hgapo
5366 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5367 * nhcomo * f 1e
5368 * nhcelo * -2 2 3e
5369 * dz * f 4.7300e-01e
5370 * grav * f 1.0000e+00e
5371 * idrod
5372 17 18 19 20 s
5373 21 22 23 24 e
5374 * rdx * f 1.0000e+00e
5375 * radrdr
5376 0.0000e+00s
5377 2.5000e-02s
5378 4.0000e-02s
5379 4.7000e-02s
5380 5.0000e-02e
5381 * matrdr * f 6e
5382 * nfax * f 1e
5383 * rftn
5384 f 4.752e+02e
5385 f 4.752e+02e
5386 f 4.752e+02e
5387 f 4.752e+02e
5388 f 4.752e+02e
5389 f 4.752e+02e
5390 f 4.752e+02e
5391 f 4.752e+02e
5392 *
5393 * type num id ctitle
5394 slab 951 951 $951$ slab level 3 cells 1-8
5395 * ncrx ncrz
5396 8 1
5397 * nopowr nrldr modez liqlev iaxcnd
5398 1 1 1 0 0
5399 * idbci idbco
5400 0 2
5401 * width
5402 5.9485e+00
5403 * nrods nodes irftr nzmaz
5404 8 5 0 5
5405 * dtxht(1) dtxht(2) dznht hgapo
5406 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5407 * nhcomo * f 1e
5408 * nhcelo * -3 3 4e
5409 * dz * f 4.3500e-01e
5410 * grav * f 1.0000e+00e
5411 * idrod
5412 1 2 3 4 s
5413 5 6 7 8 e
5414 * rdx * f 1.0000e+00e
5415 * radrdr
5416 0.0000e+00s
5417 5.0000e-03s
5418 1.0000e-02s
5419 1.3000e-02s

```

```

5420      1.5000e-02e
5421 * matr * f      6e
5422 * nfax * f      1e
5423 * rftn
5424 f      4.752e+02e
5425 f      4.752e+02e
5426 f      4.752e+02e
5427 f      4.752e+02e
5428 f      4.752e+02e
5429 f      4.752e+02e
5430 f      4.752e+02e
5431 f      4.752e+02e
5432 *
5433 * type      num      id      ctitle
5434 slab      943      943      $943$ slab level 3 cells 9-16
5435 *      ncrx      ncrz
5436      8      1
5437 * nopowr      nrldr      modez      liqlev      iaxcnd
5438      1      1      1      0      0
5439 *      idbci      idbco
5440      0      2
5441 *      width
5442      1.1431e+01
5443 *      nrods      nodes      irftr      nzmaz
5444      8      5      0      5
5445 *      dtxht(1)      dtxht(2)      dznht      hgapo
5446      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
5447 * nhcomo * f      1e
5448 * nhcelo * f      -3      3      4e
5449 * dz * f      4.3500e-01e
5450 * grav * f      1.0000e+00e
5451 * idrod
5452      9      10      11      12 s
5453      13      14      15      16 e
5454 * rdx * f      1.0000e+00e
5455 * radrd
5456      0.0000e+00s
5457      5.8290e-02s
5458      9.3260e-02s
5459      1.0492e-01s
5460      1.1658e-01e
5461 * matr * f      6e
5462 * nfax * f      1e
5463 * rftn
5464 f      4.752e+02e
5465 f      4.752e+02e
5466 f      4.752e+02e
5467 f      4.752e+02e
5468 f      4.752e+02e
5469 f      4.752e+02e
5470 f      4.752e+02e
5471 f      4.752e+02e
5472 *
5473 * type      num      id      ctitle
5474 slab      935      935      $935$ slab level 3 cells 17-24
5475 *      ncrx      ncrz
5476      8      1
5477 * nopowr      nrldr      modez      liqlev      iaxcnd
5478      1      1      1      0      0
5479 *      idbci      idbco
5480      0      2
5481 *      width
5482      2.9189e+00
5483 *      nrods      nodes      irftr      nzmaz
5484      8      5      0      5
5485 *      dtxht(1)      dtxht(2)      dznht      hgapo
5486      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
5487 * nhcomo * f      1e
5488 * nhcelo * f      -3      3      4e
5489 * dz * f      4.3500e-01e
5490 * grav * f      1.0000e+00e
5491 * idrod
5492      17      18      19      20 s
5493      21      22      23      24 e
5494 * rdx * f      1.0000e+00e
5495 * radrd
5496      0.0000e+00s
5497      2.5000e-02s
5498      4.0000e-02s
5499      4.7000e-02s
5500      5.0000e-02e
5501 * matr * f      6e
5502 * nfax * f      1e
5503 * rftn
5504 f      4.752e+02e
5505 f      4.752e+02e
5506 f      4.752e+02e
5507 f      4.752e+02e
5508 f      4.752e+02e
5509 f      4.752e+02e
5510 f      4.752e+02e
5511 f      4.752e+02e

```

```

5512 *
5513 * type num id ctitle
5514 slab 927 927 $927$ slab level 4 cells 1-8
5515 * ncrx ncrz
5516 8 1
5517 * nopowr nrldr modez liqlev iaxcnd
5518 1 1 0 0
5519 * idbci idbco
5520 0 2
5521 * width
5522 2.5554e+00
5523 * nrods nodes irftr nzmaz
5524 8 5 0 5
5525 * dtxht(1) dtxht(2) dznht hgapo
5526 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5527 * nhcomo * f 1e
5528 * nhcelo * -4 4 5e
5529 * dz * f 1.4675e+00e
5530 * grav * f 1.0000e+00e
5531 * idrod
5532 1 2 3 4 s
5533 5 6 7 8 e
5534 * rdx * f 1.0000e+00e
5535 * radrd
5536 0.0000e+00s
5537 5.0000e-03s
5538 1.0000e-02s
5539 1.3000e-02s
5540 1.5000e-02e
5541 * matrd * f 6e
5542 * nfax * f 1e
5543 * rftn
5544 f 4.752e+02e
5545 f 4.752e+02e
5546 f 4.752e+02e
5547 f 4.752e+02e
5548 f 4.752e+02e
5549 f 4.752e+02e
5550 f 4.752e+02e
5551 f 4.752e+02e
5552 *
5553 * type num id ctitle
5554 slab 919 919 $919$ slab level 4 cells 9-16
5555 * ncrx ncrz
5556 8 1
5557 * nopowr nrldr modez liqlev iaxcnd
5558 1 1 1 0 0
5559 * idbci idbco
5560 0 2
5561 * width
5562 6.9590e+00
5563 * nrods nodes irftr nzmaz
5564 8 5 0 5
5565 * dtxht(1) dtxht(2) dznht hgapo
5566 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5567 * nhcomo * f 1e
5568 * nhcelo * -4 4 5e
5569 * dz * f 1.4675e+00e
5570 * grav * f 1.0000e+00e
5571 * idrod
5572 9 10 11 12 s
5573 13 14 15 16 e
5574 * rdx * f 1.0000e+00e
5575 * radrd
5576 0.0000e+00s
5577 1.0700e-02s
5578 1.7160e-02s
5579 1.9300e-02s
5580 2.1440e-02e
5581 * matrd * f 6e
5582 * nfax * f 1e
5583 * rftn
5584 f 4.752e+02e
5585 f 4.752e+02e
5586 f 4.752e+02e
5587 f 4.752e+02e
5588 f 4.752e+02e
5589 f 4.752e+02e
5590 f 4.752e+02e
5591 f 4.752e+02e
5592 *
5593 * type num id ctitle
5594 slab 911 911 $911$ slab level 4 cells 17-24
5595 * ncrx ncrz
5596 8 1
5597 * nopowr nrldr modez liqlev iaxcnd
5598 1 1 1 0 0
5599 * idbci idbco
5600 0 2
5601 * width
5602 3.3683e+00
5603 * nrods nodes irftr nzmaz

```

```

5604      8      5      0      5
5605 * dtxht(1) dtxht(2) dznht hgapo
5606 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5607 * nhcomo * f 1e
5608 * nhcelo * -4 4 5e
5609 * dz * f 1.4675e+00e
5610 * grav * f 1.0000e+00e
5611 * idrod
5612 17 18 19 20 s
5613 21 22 23 24 e
5614 * rdx * f 1.0000e+00e
5615 * radrd
5616 0.0000e+00s
5617 2.5000e-02s
5618 4.0000e-02s
5619 4.7000e-02s
5620 5.0000e-02e
5621 * matrD * f 6e
5622 * nfax * f 1e
5623 * rftn
5624 f 4.752e+02e
5625 f 4.752e+02e
5626 f 4.752e+02e
5627 f 4.752e+02e
5628 f 4.752e+02e
5629 f 4.752e+02e
5630 f 4.752e+02e
5631 f 4.752e+02e
5632 *
5633 * type num id ctitle
5634 slab 903 903 $903$ slab level 5 cells 1-8
5635 * ncrx ncrz
5636 8 1
5637 * nopowr nrldr modez liqlev iaxcnd
5638 1 1 1 0 0
5639 * idbci idbco
5640 0 2
5641 * width
5642 2.6151e+00
5643 * nrods nodes irftr nzmaz
5644 8 5 0 5
5645 * dtxht(1) dtxht(2) dznht hgapo
5646 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5647 * nhcomo * f 1e
5648 * nhcelo * -5 5 6e
5649 * dz * f 1.4675e+00e
5650 * grav * f 1.0000e+00e
5651 * idrod
5652 1 2 3 4 s
5653 5 6 7 8 e
5654 * rdx * f 1.0000e+00e
5655 * radrd
5656 0.0000e+00s
5657 5.0000e-03s
5658 1.0000e-02s
5659 1.3000e-02s
5660 1.5000e-02e
5661 * matrD * f 6e
5662 * nfax * f 1e
5663 * rftn
5664 f 4.752e+02e
5665 f 4.752e+02e
5666 f 4.752e+02e
5667 f 4.752e+02e
5668 f 4.752e+02e
5669 f 4.752e+02e
5670 f 4.752e+02e
5671 f 4.752e+02e
5672 *
5673 * type num id ctitle
5674 slab 895 895 $895$ slab level 5 cells 9-16
5675 * ncrx ncrz
5676 8 1
5677 * nopowr nrldr modez liqlev iaxcnd
5678 1 1 1 0 0
5679 * idbci idbco
5680 0 2
5681 * width
5682 7.0100e+00
5683 * nrods nodes irftr nzmaz
5684 8 5 0 5
5685 * dtxht(1) dtxht(2) dznht hgapo
5686 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
5687 * nhcomo * f 1e
5688 * nhcelo * -5 5 6e
5689 * dz * f 1.4675e+00e
5690 * grav * f 1.0000e+00e
5691 * idrod
5692 9 10 11 12 s
5693 13 14 15 16 e
5694 * rdx * f 1.0000e+00e
5695 * radrd

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5696      0.0000e+00s
5697      1.0700e-02s
5698      1.7100e-02s
5699      1.9260e-02s
5700      2.1397e-02e
5701 * matr * f      6e
5702 * nfax * f      1e
5703 * rftn
5704 f      4.752e+02e
5705 f      4.752e+02e
5706 f      4.752e+02e
5707 f      4.752e+02e
5708 f      4.752e+02e
5709 f      4.752e+02e
5710 f      4.752e+02e
5711 f      4.752e+02e
5712 *
5713 * type      num      id      ctitle
5714 slab      887      887      $887$ slab level 5 cells 17-24
5715 *      ncrx      ncrz
5716      8      1
5717 * nopowr      nrldr      modez      liqlev      iaxcnd
5718      1      1      1      0      0
5719 *      idbci      idbco
5720      0      2
5721 *      width
5722      3.3683e+00
5723 *      nrods      nodes      irftr      nzmaz
5724      8      5      0      5
5725 *      dtxht(1)      dtxht(2)      dznht      hgapo
5726      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
5727 * nhcomo * f      1e
5728 * nhcelo *      -5      5      6e
5729 * dz * f      1.4675e+00e
5730 * grav * f      1.0000e+00e
5731 * idrod
5732      17 18 19 20 s
5733      21 22 23 24 e
5734 * rdx * f      1.0000e+00e
5735 * radrd
5736      0.0000e+00s
5737      2.5000e-02s
5738      4.0000e-02s
5739      4.7000e-02s
5740      5.0000e-02e
5741 * matr * f      6e
5742 * nfax * f      1e
5743 * rftn
5744 f      4.752e+02e
5745 f      4.752e+02e
5746 f      4.752e+02e
5747 f      4.752e+02e
5748 f      4.752e+02e
5749 f      4.752e+02e
5750 f      4.752e+02e
5751 f      4.752e+02e
5752 *
5753 * type      num      id      ctitle
5754 slab      879      879      $879$ slab level 6 cells 1-8
5755 *      ncrx      ncrz
5756      8      1
5757 * nopowr      nrldr      modez      liqlev      iaxcnd
5758      1      1      1      0      0
5759 *      idbci      idbco
5760      0      2
5761 *      width
5762      5.9630e+00
5763 *      nrods      nodes      irftr      nzmaz
5764      8      5      0      5
5765 *      dtxht(1)      dtxht(2)      dznht      hgapo
5766      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
5767 * nhcomo * f      1e
5768 * nhcelo *      -6      6      7e
5769 * dz * f      8.7000e-01e
5770 * grav * f      1.0000e+00e
5771 * idrod
5772      1 2 3 4 s
5773      5 6 7 8 e
5774 * rdx * f      1.0000e+00e
5775 * radrd
5776      0.0000e+00s
5777      5.0000e-03s
5778      1.0000e-02s
5779      1.3000e-02s
5780      1.5000e-02e
5781 * matr * f      6e
5782 * nfax * f      1e
5783 * rftn
5784 f      4.752e+02e
5785 f      4.752e+02e
5786 f      4.752e+02e
5787 f      4.752e+02e

```



```

5788 f      4.752e+02e
5789 f      4.752e+02e
5790 f      4.752e+02e
5791 f      4.752e+02e
5792 *
5793 * type      num      id      ctitle
5794 slab      871      871      $871$ slab level 6 cells 9-16
5795 *      ncrx      ncrz
5796 *      8      1
5797 * nopowr  nrldr  modez  liqlev  iaxcnd
5798 *      1      1      1      0      0
5799 *      idbci  idbco
5800 *      0      2
5801 *      width
5802 *      1.5246e+01
5803 *      nrods      nodes      irftr      nzmaz
5804 *      8      5      0      5
5805 *      dtxht(1)  dtxht(2)  dznht      hgapo
5806 *      3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00
5807 * nhcomo * f      1e
5808 * nhcelo * f      -6      6      7e
5809 * dz * f      8.7000e-01e
5810 * grav * f      1.0000e+00e
5811 * idrod
5812 *      9 10 11 12 s
5813 *      13 14 15 16 e
5814 * rdx * f      1.0000e+00e
5815 * radrd
5816 *      0.0000e+00s
5817 *      9.9300e-03s
5818 *      1.5890e-02s
5819 *      1.7880e-02s
5820 *      1.9870e-02e
5821 * matrdr * f      6e
5822 * nfax * f      1e
5823 * rftn
5824 f      4.752e+02e
5825 f      4.752e+02e
5826 f      4.752e+02e
5827 f      4.752e+02e
5828 f      4.752e+02e
5829 f      4.752e+02e
5830 f      4.752e+02e
5831 f      4.752e+02e
5832 *
5833 * type      num      id      ctitle
5834 slab      863      863      $863$ slab level 6 cells 17-24
5835 *      ncrx      ncrz
5836 *      8      1
5837 * nopowr  nrldr  modez  liqlev  iaxcnd
5838 *      1      1      1      0      0
5839 *      idbci  idbco
5840 *      0      2
5841 *      width
5842 *      4.1363e+00
5843 *      nrods      nodes      irftr      nzmaz
5844 *      8      5      0      5
5845 *      dtxht(1)  dtxht(2)  dznht      hgapo
5846 *      3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00
5847 * nhcomo * f      1e
5848 * nhcelo * f      -6      6      7e
5849 * dz * f      8.7000e-01e
5850 * grav * f      1.0000e+00e
5851 * idrod
5852 *      17 18 19 20 s
5853 *      21 22 23 24 e
5854 * rdx * f      1.0000e+00e
5855 * radrd
5856 *      0.0000e+00s
5857 *      2.5000e-02s
5858 *      4.0000e-02s
5859 *      4.7000e-02s
5860 *      5.0000e-02e
5861 * matrdr * f      6e
5862 * nfax * f      1e
5863 * rftn
5864 f      4.752e+02e
5865 f      4.752e+02e
5866 f      4.752e+02e
5867 f      4.752e+02e
5868 f      4.752e+02e
5869 f      4.752e+02e
5870 f      4.752e+02e
5871 f      4.752e+02e
5872 *
5873 * type      num      id      ctitle
5874 slab      855      855      $855$ slab level 7 cells 1-8
5875 *      ncrx      ncrz
5876 *      8      1
5877 * nopowr  nrldr  modez  liqlev  iaxcnd
5878 *      1      1      1      0      0
5879 *      idbci  idbco

```

```

5880      0      2
5881 *      width
5882      2.2434e+01
5883 *      nrods      nodes      irftr      nzmaz
5884      8      5      0      5
5885 *      dtxht(1)      dtxht(2)      dznht      hgapo
5886      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
5887 * nhcomo * f      1e
5888 * nhcelo *      -7      7      8e
5889 * dz * f      7.7500e-01e
5890 * grav * f      1.0000e+00e
5891 * idrod
5892      1 2 3 4 s
5893      5 6 7 8 e
5894 * rdx * f      1.0000e+00e
5895 * radrd
5896      0.0000e+00s
5897      1.3700e-03s
5898      2.1800e-03s
5899      2.4600e-03s
5900      2.7300e-03e
5901 * matrd * f      6e
5902 * nfax * f      1e
5903 * rftn
5904 f      4.752e+02e
5905 f      4.752e+02e
5906 f      4.752e+02e
5907 f      4.752e+02e
5908 f      4.752e+02e
5909 f      4.752e+02e
5910 f      4.752e+02e
5911 f      4.752e+02e
5912 *
5913 * type      num      id      cttitle
5914 slab      847      847      $847$ slab level 7 cells 9-16
5915 *      ncrx      ncrz
5916      8      1
5917 * nopowr      nrldr      modez      liqlev      iaxcnd
5918      1      1      0      0
5919 * idbci      idbco
5920      0      2
5921 *      width
5922      3.3113e+01
5923 *      nrods      nodes      irftr      nzmaz
5924      8      5      0      5
5925 *      dtxht(1)      dtxht(2)      dznht      hgapo
5926      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
5927 * nhcomo * f      1e
5928 * nhcelo *      -7      7      8e
5929 * dz * f      7.7500e-01e
5930 * grav * f      1.0000e+00e
5931 * idrod
5932      9 10 11 12 s
5933      13 14 15 16 e
5934 * rdx * f      1.0000e+00e
5935 * radrd
5936      0.0000e+00s
5937      1.7580e-03s
5938      2.8130e-03s
5939      3.1640e-03s
5940      3.5760e-03e
5941 * matrd * f      6e
5942 * nfax * f      1e
5943 * rftn
5944 f      4.752e+02e
5945 f      4.752e+02e
5946 f      4.752e+02e
5947 f      4.752e+02e
5948 f      4.752e+02e
5949 f      4.752e+02e
5950 f      4.752e+02e
5951 f      4.752e+02e
5952 *
5953 * type      num      id      cttitle
5954 slab      839      839      $839$ slab level 7 cells 17-24
5955 *      ncrx      ncrz
5956      8      1
5957 * nopowr      nrldr      modez      liqlev      iaxcnd
5958      1      1      0      0
5959 * idbci      idbco
5960      0      2
5961 *      width
5962      9.4955e-01
5963 *      nrods      nodes      irftr      nzmaz
5964      8      5      0      5
5965 *      dtxht(1)      dtxht(2)      dznht      hgapo
5966      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
5967 * nhcomo * f      1e
5968 * nhcelo *      -7      7      8e
5969 * dz * f      7.7500e-01e
5970 * grav * f      1.0000e+00e
5971 * idrod

```

```

5972 17 18 19 20 s
5973 21 22 23 24 e
5974 * rdx * f 1.0000e+00e
5975 * radrd
5976 0.0000e+00s
5977 4.6300e-02s
5978 7.4000e-02s
5979 8.3300e-02s
5980 9.2500e-02e
5981 * matrd * f 6e
5982 * nfax * f 1e
5983 * rftn
5984 f 4.752e+02e
5985 f 4.752e+02e
5986 f 4.752e+02e
5987 f 4.752e+02e
5988 f 4.752e+02e
5989 f 4.752e+02e
5990 f 4.752e+02e
5991 f 4.752e+02e
5992 *
5993 * type num id ctitle
5994 slab 831 831 $831$ slab level 8 cells 1-8
5995 * ncrx ncrz
5996 8 1
5997 * nopowr nrldr modez liqlev iaxcnd
5998 1 1 1 0 0
5999 * idbci idbco
6000 0 2
6001 * width
6002 4.0854e+01
6003 * nrods nodes irftr nzmaz
6004 8 5 0 5
6005 * dtxht(1) dtxht(2) dznht hgapo
6006 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6007 * nhcomo * f 1e
6008 * nhcelo * -8 8 9e
6009 * dz * f 2.6500e-01e
6010 * grav * f 1.0000e+00e
6011 * idrod
6012 1 2 3 4 s
6013 5 6 7 8 e
6014 * rdx * f 1.0000e+00e
6015 * radrd
6016 0.0000e+00s
6017 7.4400e-04s
6018 1.1900e-03s
6019 1.3390e-03s
6020 1.4880e-03e
6021 * matrd * f 6e
6022 * nfax * f 1e
6023 * rftn
6024 f 4.752e+02e
6025 f 4.752e+02e
6026 f 4.752e+02e
6027 f 4.752e+02e
6028 f 4.752e+02e
6029 f 4.752e+02e
6030 f 4.752e+02e
6031 f 4.752e+02e
6032 *
6033 * type num id ctitle
6034 slab 823 823 $823$ slab level 8 cells 9-16
6035 * ncrx ncrz
6036 8 1
6037 * nopowr nrldr modez liqlev iaxcnd
6038 1 1 1 0 0
6039 * idbci idbco
6040 0 2
6041 * width
6042 6.3640e+01
6043 * nrods nodes irftr nzmaz
6044 8 5 0 5
6045 * dtxht(1) dtxht(2) dznht hgapo
6046 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6047 * nhcomo * f 1e
6048 * nhcelo * -8 8 9e
6049 * dz * f 2.6500e-01e
6050 * grav * f 1.0000e+00e
6051 * idrod
6052 9 10 11 12 s
6053 13 14 15 16 e
6054 * rdx * f 1.0000e+00e
6055 * radrd
6056 0.0000e+00s
6057 1.5700e-03s
6058 2.5120e-03s
6059 2.8255e-03s
6060 3.1395e-03e
6061 * matrd * f 6e
6062 * nfax * f 1e
6063 * rftn

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6064 f      4.752e+02e
6065 f      4.752e+02e
6066 f      4.752e+02e
6067 f      4.752e+02e
6068 f      4.752e+02e
6069 f      4.752e+02e
6070 f      4.752e+02e
6071 f      4.752e+02e
6072 *
6073 *   type      num      id      ctitle
6074 slab      815      815      $815$ slab level 8 cells 17-24
6075 *   ncrx      ncrz
6076 *   8          1
6077 *   nopowr   nridr   modez   liqlev   iaxcnd
6078 *   1          1          1          0          0
6079 *   idbci    idbco
6080 *   0          2
6081 *   width
6082 *   3.5546e+00
6083 *   nrods      nodes      irftr      nzmaz
6084 *   8          5          0          5
6085 *   dtxht(1)  dtxht(2)  dznht      hgapo
6086 *   3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00
6087 *   nhcomo * f      1e
6088 *   nhcelo * f      -8      8      9e
6089 *   dz * f      2.6500e-01e
6090 *   grav * f      1.0000e+00e
6091 *   idrod
6092 *   17 18 19 20 s
6093 *   21 22 23 24 e
6094 *   rdx * f      1.0000e+00e
6095 *   radrd
6096 *   1.0000e-03s
6097 *   4.6300e-02s
6098 *   7.4000e-02s
6099 *   8.3300e-02s
6100 *   9.2500e-02e
6101 *   matrdr * f      6e
6102 *   nfax * f      1e
6103 *   rftn
6104 f      4.752e+02e
6105 f      4.752e+02e
6106 f      4.752e+02e
6107 f      4.752e+02e
6108 f      4.752e+02e
6109 f      4.752e+02e
6110 f      4.752e+02e
6111 f      4.752e+02e
6112 *
6113 *   type      num      id      ctitle
6114 slab      807      807      $807$ slab level 9 cells 1-8
6115 *   ncrx      ncrz
6116 *   8          1
6117 *   nopowr   nridr   modez   liqlev   iaxcnd
6118 *   1          1          1          0          0
6119 *   idbci    idbco
6120 *   0          2
6121 *   width
6122 *   1.0575e+01
6123 *   nrods      nodes      irftr      nzmaz
6124 *   8          5          0          5
6125 *   dtxht(1)  dtxht(2)  dznht      hgapo
6126 *   3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00
6127 *   nhcomo * f      1e
6128 *   nhcelo * f      -9      9      10e
6129 *   dz * f      2.5000e-01e
6130 *   grav * f      1.0000e+00e
6131 *   idrod
6132 *   1 2 3 4 s
6133 *   5 6 7 8 e
6134 *   rdx * f      1.0000e+00e
6135 *   radrd
6136 *   0.0000e+00s
6137 *   9.9840e-03s
6138 *   1.5974e-02s
6139 *   1.7970e-02s
6140 *   1.9967e-02e
6141 *   matrdr * f      6e
6142 *   nfax * f      1e
6143 *   rftn
6144 f      4.752e+02e
6145 f      4.752e+02e
6146 f      4.752e+02e
6147 f      4.752e+02e
6148 f      4.752e+02e
6149 f      4.752e+02e
6150 f      4.752e+02e
6151 f      4.752e+02e
6152 *
6153 *   type      num      id      ctitle
6154 slab      799      799      $799$ slab level 9 cells 9-16
6155 *   ncrx      ncrz

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6156      8      1
6157 * nopowr nridr modez liqlev iaxcnd
6158      1      1      1      0      0
6159 * idbci idbco
6160      0      2
6161 *      width
6162      1.5136e+01
6163 * nrods      nodes      irftr      nzmaz
6164      8      5      0      5
6165 * dtxht(1) dtxht(2) dznht      hgapo
6166      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
6167 * nhcomo * f      1e
6168 * nhcelo *      -9      9      10e
6169 * dz * f      2.5000e-01e
6170 * grav * f      1.0000e+00e
6171 * idrod
6172      9      10      11      12 s
6173      13      14      15      16 e
6174 * rdx * f      1.0000e+00e
6175 * radrd
6176      0.0000e+00s
6177      9.9840e-03s
6178      1.5974e-02s
6179      1.7970e-02s
6180      1.9967e-02e
6181 * matrd * f      6e
6182 * nfax * f      1e
6183 * rftn
6184 f      4.752e+02e
6185 f      4.752e+02e
6186 f      4.752e+02e
6187 f      4.752e+02e
6188 f      4.752e+02e
6189 f      4.752e+02e
6190 f      4.752e+02e
6191 f      4.752e+02e
6192 *
6193 * type      num      id      ctitle
6194 slab      791      791      $791$ slab level 9 cells 17-24
6195 * ncrx      ncrz
6196      8      1
6197 * nopowr nridr modez liqlev iaxcnd
6198      1      1      1      0      0
6199 * idbci idbco
6200      0      2
6201 *      width
6202      3.6796e+00
6203 * nrods      nodes      irftr      nzmaz
6204      8      5      0      5
6205 * dtxht(1) dtxht(2) dznht      hgapo
6206      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
6207 * nhcomo * f      1e
6208 * nhcelo *      -9      9      10e
6209 * dz * f      2.5000e-01e
6210 * grav * f      1.0000e+00e
6211 * idrod
6212      17      18      19      20 s
6213      21      22      23      24 e
6214 * rdx * f      1.0000e+00e
6215 * radrd
6216      0.0000e+00s
6217      5.6300e-02s
6218      9.0000e-02s
6219      1.0130e-01s
6220      1.1250e-01e
6221 * matrd * f      6e
6222 * nfax * f      1e
6223 * rftn
6224 f      4.752e+02e
6225 f      4.752e+02e
6226 f      4.752e+02e
6227 f      4.752e+02e
6228 f      4.752e+02e
6229 f      4.752e+02e
6230 f      4.752e+02e
6231 f      4.752e+02e
6232 *
6233 * type      num      id      ctitle
6234 slab      783      783      $783$ slab level 10 cells 1-8
6235 * ncrx      ncrz
6236      8      1
6237 * nopowr nridr modez liqlev iaxcnd
6238      1      1      1      0      0
6239 * idbci idbco
6240      0      2
6241 *      width
6242      3.1965e+00
6243 * nrods      nodes      irftr      nzmaz
6244      8      5      0      5
6245 * dtxht(1) dtxht(2) dznht      hgapo
6246      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
6247 * nhcomo * f      1e

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```

6248 * nhcelo * -10 10 11e
6249 * dz * f 7.3500e-01e
6250 * grav * f 1.0000e+00e
6251 * idrod
6252 1 2 3 4 s
6253 5 6 7 8 e
6254 * rdx * f 1.0000e+00e
6255 * radrd
6256 0.0000e+00s
6257 7.2500e-03s
6258 1.1590e-02s
6259 1.3040e-02s
6260 1.4490e-02e
6261 * matr * f 6e
6262 * nfax * f 1e
6263 * rftn
6264 f 4.752e+02e
6265 f 4.752e+02e
6266 f 4.752e+02e
6267 f 4.752e+02e
6268 f 4.752e+02e
6269 f 4.752e+02e
6270 f 4.752e+02e
6271 f 4.752e+02e
6272 *
6273 * type num id ctitle
6274 slab 775 775 $775$ slab level 10 cells 9-16
6275 * ncrx ncrz
6276 8 1
6277 * nopowr nrldr modez liqlev iaxcnd
6278 1 1 1 0 0
6279 * idbci idbco
6280 0 2
6281 * width
6282 5.8365e+00
6283 * nrods nodes irftr nzmaz
6284 8 5 0 5
6285 * dtxht(1) dtxht(2) dznht hgapo
6286 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6287 * nhcomo * f 1e
6288 * nhcelo * -10 10 11e
6289 * dz * f 7.3500e-01e
6290 * grav * f 1.0000e+00e
6291 * idrod
6292 9 10 11 12 s
6293 13 14 15 16 e
6294 * rdx * f 1.0000e+00e
6295 * radrd
6296 0.0000e+00s
6297 8.3400e-03s
6298 1.3343e-02s
6299 1.5010e-02s
6300 1.6679e-02e
6301 * matr * f 6e
6302 * nfax * f 1e
6303 * rftn
6304 f 4.752e+02e
6305 f 4.752e+02e
6306 f 4.752e+02e
6307 f 4.752e+02e
6308 f 4.752e+02e
6309 f 4.752e+02e
6310 f 4.752e+02e
6311 f 4.752e+02e
6312 *
6313 * type num id ctitle
6314 slab 767 767 $767$ slab level 10 cells 17-24
6315 * ncrx ncrz
6316 8 1
6317 * nopowr nrldr modez liqlev iaxcnd
6318 1 1 1 0 0
6319 * idbci idbco
6320 0 2
6321 * width
6322 1.7687e+00
6323 * nrods nodes irftr nzmaz
6324 8 5 0 5
6325 * dtxht(1) dtxht(2) dznht hgapo
6326 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6327 * nhcomo * f 1e
6328 * nhcelo * -10 10 11e
6329 * dz * f 7.3500e-01e
6330 * grav * f 1.0000e+00e
6331 * idrod
6332 17 18 19 20 s
6333 21 22 23 24 e
6334 * rdx * f 1.0000e+00e
6335 * radrd
6336 0.0000e+00s
6337 5.6300e-02s
6338 9.0000e-02s
6339 1.0130e-01s

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6340      1.1250e-01e
6341 * matr * f      6e
6342 * nfax * f      1e
6343 * rftn
6344 f      4.752e+02e
6345 f      4.752e+02e
6346 f      4.752e+02e
6347 f      4.752e+02e
6348 f      4.752e+02e
6349 f      4.752e+02e
6350 f      4.752e+02e
6351 f      4.752e+02e
6352 *
6353 * type      num      id      ctitle
6354 slab      759      759      $759$ slab level 11 cells 1-8
6355 * ncrx      ncrz
6356      8      1
6357 * nopowr  nrldr  modez  liqlev  iaxcnd
6358      1      1      1      0      0
6359 * idbci  idbco
6360      0      2
6361 * width
6362      3.1659e+00
6363 * nrods      nodes      irftr      nzmaz
6364      8      5      0      5
6365 * dtxht(1)  dtxht(2)  dznht      hgapo
6366      3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00
6367 * nhcomo * f      1e
6368 * nhcelo * -11  11  12e
6369 * dz * f      7.5000e-01e
6370 * grav * f      1.0000e+00e
6371 * idrod
6372  1  2  3  4 s
6373  5  6  7  8 e
6374 * rdx * f      1.0000e+00e
6375 * radrd
6376      0.0000e+00s
6377      7.0100e-03s
6378      1.1220e-02s
6379      1.2620e-02s
6380      1.5680e-02e
6381 * matr * f      6e
6382 * nfax * f      1e
6383 * rftn
6384 f      4.752e+02e
6385 f      4.752e+02e
6386 f      4.752e+02e
6387 f      4.752e+02e
6388 f      4.752e+02e
6389 f      4.752e+02e
6390 f      4.752e+02e
6391 f      4.752e+02e
6392 *
6393 * type      num      id      ctitle
6394 slab      751      751      $751$ slab level 11 cells 9-16
6395 * ncrx      ncrz
6396      8      1
6397 * nopowr  nrldr  modez  liqlev  iaxcnd
6398      1      1      1      0      0
6399 * idbci  idbco
6400      0      2
6401 * width
6402      5.5660e+00
6403 * nrods      nodes      irftr      nzmaz
6404      8      5      0      5
6405 * dtxht(1)  dtxht(2)  dznht      hgapo
6406      3.0000e+00  1.0000e+01  0.0000e+00  0.0000e+00
6407 * nhcomo * f      1e
6408 * nhcelo * -11  11  12e
6409 * dz * f      7.5000e-01e
6410 * grav * f      1.0000e+00e
6411 * idrod
6412  9  10  11  12 s
6413  13  14  15  16 e
6414 * rdx * f      1.0000e+00e
6415 * radrd
6416      0.0000e+00s
6417      7.8400e-03s
6418      1.2545e-02s
6419      1.4113e-02s
6420      1.5680e-02e
6421 * matr * f      6e
6422 * nfax * f      1e
6423 * rftn
6424 f      4.752e+02e
6425 f      4.752e+02e
6426 f      4.752e+02e
6427 f      4.752e+02e
6428 f      4.752e+02e
6429 f      4.752e+02e
6430 f      4.752e+02e
6431 f      4.752e+02e

```

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6432 *
6433 *   type      num      id      ctitle
6434 slab        743      743  $743$ slab level 11 cells 17-24
6435 *   ncrx      ncrz
6436 *       8       1
6437 *   nopowr    nrldr    modez    liqlev    iaxcnd
6438 *       1       1       0       0
6439 *   idbci     idbco
6440 *       0       2
6441 *   width
6442 *   2.1075e+00
6443 *   nrods      nodes      irftr      nzmaz
6444 *       8       5       0       5
6445 *   dtxht(1)  dtxht(2)  dznht      hgapo
6446 *   3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6447 *   nhcomo * f 1e
6448 *   nhcelo * -11 11 12e
6449 *   dz * f 7.5000e-01e
6450 *   grav * f 1.0000e+00e
6451 *   idrod
6452 *   17 18 19 20 s
6453 *   21 22 23 24 e
6454 *   rdx * f 1.0000e+00e
6455 *   radrd
6456 *   0.0000e+00s
6457 *   6.1460e-02s
6458 *   9.8340e-02s
6459 *   1.1063e-01s
6460 *   1.2293e-01e
6461 *   matrdr * f 6e
6462 *   nfax * f 1e
6463 *   rftn
6464 f 4.752e+02e
6465 f 4.752e+02e
6466 f 4.752e+02e
6467 f 4.752e+02e
6468 f 4.752e+02e
6469 f 4.752e+02e
6470 f 4.752e+02e
6471 f 4.752e+02e
6472 *
6473 *   type      num      id      ctitle
6474 slab        735      735  $735$ slab level 12 cells 1-8
6475 *   ncrx      ncrz
6476 *       8       1
6477 *   nopowr    nrldr    modez    liqlev    iaxcnd
6478 *       1       1       0       0
6479 *   idbci     idbco
6480 *       0       2
6481 *   width
6482 *   4.6348e+00
6483 *   nrods      nodes      irftr      nzmaz
6484 *       8       5       0       5
6485 *   dtxht(1)  dtxht(2)  dznht      hgapo
6486 *   3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6487 *   nhcomo * f 1e
6488 *   nhcelo * -12 12 13e
6489 *   dz * f 7.4500e-01e
6490 *   grav * f 1.0000e+00e
6491 *   idrod
6492 *   1 2 3 4 s
6493 *   5 6 7 8 e
6494 *   rdx * f 1.0000e+00e
6495 *   radrd
6496 *   0.0000e+00s
6497 *   7.7100e-03s
6498 *   1.2330e-02s
6499 *   1.3880e-02s
6500 *   1.5420e-02e
6501 *   matrdr * f 6e
6502 *   nfax * f 1e
6503 *   rftn
6504 f 4.752e+02e
6505 f 4.752e+02e
6506 f 4.752e+02e
6507 f 4.752e+02e
6508 f 4.752e+02e
6509 f 4.752e+02e
6510 f 4.752e+02e
6511 f 4.752e+02e
6512 *
6513 *   type      num      id      ctitle
6514 slab        727      727  $727$ slab level 12 cells 9-16
6515 *   ncrx      ncrz
6516 *       8       1
6517 *   nopowr    nrldr    modez    liqlev    iaxcnd
6518 *       1       1       0       0
6519 *   idbci     idbco
6520 *       0       2
6521 *   width
6522 *   1.1815e+01
6523 *   nrods      nodes      irftr      nzmaz

```



```

6524      8      5      0      5
6525 * dtxht(1) dtxht(2) dznht hgapo
6526 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6527 * nhcomo * f 1e
6528 * nhcelo * -12 12 13e
6529 * dz * f 7.4500e-01e
6530 * grav * f 1.0000e+00e
6531 * idrod
6532 9 10 11 12 s
6533 13 14 15 16 e
6534 * rdx * f 1.0000e+00e
6535 * radrd
6536 0.0000e+00s
6537 1.1960e-02s
6538 1.9140e-02s
6539 2.1530e-02s
6540 2.3922e-02e
6541 * matrd * f 6e
6542 * nfax * f 1e
6543 * rftn
6544 f 4.752e+02e
6545 f 4.752e+02e
6546 f 4.752e+02e
6547 f 4.752e+02e
6548 f 4.752e+02e
6549 f 4.752e+02e
6550 f 4.752e+02e
6551 f 4.752e+02e
6552 *
6553 * type num id ctitle
6554 slab 719 719 $719$ slab level 12 cells 17-24
6555 * ncrx ncrz
6556 8 1
6557 * nopowr nrldr modez liqlev iaxcnd
6558 1 1 1 0 0
6559 * idbci idbco
6560 0 2
6561 * width
6562 3.5760e+00
6563 * nrods nodes irftr nzmaz
6564 8 5 0 5
6565 * dtxht(1) dtxht(2) dznht hgapo
6566 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6567 * nhcomo * f 1e
6568 * nhcelo * -12 12 13e
6569 * dz * f 7.4500e-01e
6570 * grav * f 1.0000e+00e
6571 * idrod
6572 17 18 19 20 s
6573 21 22 23 24 e
6574 * rdx * f 1.0000e+00e
6575 * radrd
6576 0.0000e+00s
6577 6.0000e-02s
6578 9.6000e-02s
6579 1.0800e-01s
6580 1.2000e-01e
6581 * matrd * f 6e
6582 * nfax * f 1e
6583 * rftn
6584 f 4.752e+02e
6585 f 4.752e+02e
6586 f 4.752e+02e
6587 f 4.752e+02e
6588 f 4.752e+02e
6589 f 4.752e+02e
6590 f 4.752e+02e
6591 f 4.752e+02e
6592 *
6593 * type num id ctitle
6594 slab 711 711 $711$ slab level 13 cells 1-8
6595 * ncrx ncrz
6596 8 1
6597 * nopowr nrldr modez liqlev iaxcnd
6598 1 1 1 0 0
6599 * idbci idbco
6600 0 2
6601 * width
6602 4.7885e+00
6603 * nrods nodes irftr nzmaz
6604 8 5 0 5
6605 * dtxht(1) dtxht(2) dznht hgapo
6606 3.0000e+00 1.0000e+01 0.0000e+00 0.0000e+00
6607 * nhcomo * f 1e
6608 * nhcelo * -13 13 14e
6609 * dz * f 3.1515e+00e
6610 * grav * f 1.0000e+00e
6611 * idrod
6612 1 2 3 4 s
6613 5 6 7 8 e
6614 * rdx * f 1.0000e+00e
6615 * radrd

```

```

6616      0.0000e+00s
6617      7.0390e-03s
6618      1.1262e-02s
6619      1.2670e-02s
6620      1.4078e-02e
6621 * matr * f      6e
6622 * nfax * f      1e
6623 * rftn
6624 f      4.752e+02e
6625 f      4.752e+02e
6626 f      4.752e+02e
6627 f      4.752e+02e
6628 f      4.752e+02e
6629 f      4.752e+02e
6630 f      4.752e+02e
6631 f      4.752e+02e
6632 *
6633 * type      num      id      ctitle
6634 slab      703      703      $703$ slab level 13 cells 9-16
6635 *      ncrx      ncrz
6636      8      1
6637 * nopowr      nrldr      modez      liqlev      iaxcnd
6638      1      1      1      0      0
6639 *      idbci      idbco
6640      0      2
6641 *      width
6642      6.6460e+00
6643 *      nrods      nodes      irftr      nzmaz
6644      8      5      0      5
6645 *      dtxht(1)      dtxht(2)      dznht      hgapo
6646      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
6647 * nhcomo * f      1e
6648 * nhcelo *      -13      13      14e
6649 * dz * f      3.1515e+00e
6650 * grav * f      1.0000e+00e
6651 * idrod
6652      9      10      11      12 s
6653      13      14      15      16 e
6654 * rdx * f      1.0000e+00e
6655 * radrd
6656      0.0000e+00s
6657      1.0800e-02s
6658      1.7280e-02s
6659      1.9440e-02s
6660      2.1600e-02e
6661 * matr * f      6e
6662 * nfax * f      1e
6663 * rftn
6664 f      4.752e+02e
6665 f      4.752e+02e
6666 f      4.752e+02e
6667 f      4.752e+02e
6668 f      4.752e+02e
6669 f      4.752e+02e
6670 f      4.752e+02e
6671 f      4.752e+02e
6672 *
6673 * type      num      id      ctitle
6674 slab      695      695      $695$ slab level 13 cells 17-24
6675 *      ncrx      ncrz
6676      8      1
6677 * nopowr      nrldr      modez      liqlev      iaxcnd
6678      1      1      1      0      0
6679 *      idbci      idbco
6680      0      2
6681 *      width
6682      1.4557e+00
6683 *      nrods      nodes      irftr      nzmaz
6684      8      5      0      5
6685 *      dtxht(1)      dtxht(2)      dznht      hgapo
6686      3.0000e+00      1.0000e+01      0.0000e+00      0.0000e+00
6687 * nhcomo * f      1e
6688 * nhcelo *      -13      13      14e
6689 * dz * f      3.1515e+00e
6690 * grav * f      1.0000e+00e
6691 * idrod
6692      17      18      19      20 s
6693      21      22      23      24 e
6694 * rdx * f      1.0000e+00e
6695 * radrd
6696      0.0000e+00s
6697      6.5000e-02s
6698      1.0400e-01s
6699      1.1700e-01s
6700      1.3000e-01e
6701 * matr * f      6e
6702 * nfax * f      1e
6703 * rftn
6704 f      4.752e+02e
6705 f      4.752e+02e
6706 f      4.752e+02e
6707 f      4.752e+02e

```

```

6708 f      4.752e+02e
6709 f      4.752e+02e
6710 f      4.752e+02e
6711 f      4.752e+02e
6712 *
6713 end
6714 *
6715 *****
6716 * time-step data *
6717 *****
6718 *
6719 *      dtmin      dtmax      tend      rtwfp
6720 * 1.0000e-06  5.0000e-01  2.0000e+01  0.0000e+00
6721 *      edint      gfint      dmpint      sedint
6722 * 10.000e+00  5.0000e-01  10.000e+00  10.000e+00
6723 *
6724 *      dtmin      dtmax      tend      rtwfp
6725 * 1.0000e-06  5.0000e-03  4.0000e+01  0.0000e+00
6726 *      edint      gfint      dmpint      sedint
6727 * 10.0000e+00  5.0000e-01  10.0000e+00  10.000e+00
6728 *
6729 *      dtmin      dtmax      tend      rtwfp
6730 * 1.0000e-06  1.0000e-02  9.5670e+01  0.0000e+00
6731 *      edint      gfint      dmpint      sedint
6732 * 10.0000e+00  5.0000e-01  10.0000e+00  10.000e+00
6733 *
6734 *      endflag
6735 * -1.0000e+00

```

APPENDIX I

CCTF RUN 14 INPUT LISTING

```

1 free format
2 *
3 *****
4 * main data *
5 *****
6 *
7 *          numtcr          ieos          inopt          nmat
8           19              0              1              4
9 CCTF Core I Test C1-5 (Run 14)
10 *
11 revised by j. f. lime, october 1999
12 (1) fill component mass flow modified to reflect measured
13     mass flow entering the lower plenum.
14 *
15 cctf run 14 core separate calculation
16 jaeri recommendation used for some heater rod material properties
17 vessel noding:
18     one radial rings
19     one azimuthal zones
20     twenty-four axial levels
21         one level in lower plenum
22         eighteen levels in core
23         five levels in upper plenum
24 system noding:
25     a break component --- upper plenum boundary condition
26     a fill component --- core inlet conditions
27 *****
28 *
29 *****
30 * namelist data *
31 *****
32 *
33 &inopts
34     nhtstr=3, iadded=20, ithd=1, nrslv=1, newrfd=3, imfr=3,
35 &end
36 *
37 *          dstep          timet
38           0          0.0000e+00
39 *          stdyst          transi          ncomp          njun          ipak
40           0              1              8              4              1
41 *          epso          epss
42     1.0000e-04    1.0000e-04
43 *          oitmax          sitmax          isolut          ncontr          nccfl
44           10             10             0              0              0
45 *          ntsv          ntcb          ntcf          ntrp          ntcp
46           1              5             200            2              1
47 *
48 *****
49 * component-number data *
50 *****
51 *
52 * iorder*          1          2          3          4          5
53 * iorder*          6          7          100e
54 *
55 *****
56 * material-properties data *
57 *****
58 *
59 * matb *          55          58          59          60e
60 * ptbln * r02          8          7          6e
61 *
62 * prptb(1,i) prptb(2,i) prptb(3,i) prptb(4,i) prptb(5,i)
63     3.0000e+02    8.3500e+03    4.4490e+02    1.2340e+01    1.0000e+00
64     5.0000e+02    8.3500e+03    4.9040e+02    1.5830e+01    1.0000e+00
65     7.0000e+02    8.3500e+03    5.3950e+02    1.9330e+01    1.0000e+00
66     9.0000e+02    8.3500e+03    5.8890e+02    2.2830e+01    1.0000e+00
67     1.1000e+03    8.3500e+03    6.3940e+02    2.6320e+01    1.0000e+00
68     1.3000e+03    8.3500e+03    6.8590e+02    2.9820e+01    1.0000e+00
69     2.0000e+03    8.3500e+03    8.6440e+02    4.2070e+01    1.0000e+00
70     2.5000e+03    8.3500e+03    8.6440e+02    4.2070e+01    1.0000e+00
71 e
72 *
73 * prptb(1,i) prptb(2,i) prptb(3,i) prptb(4,i) prptb(5,i)
74     3.0000e+02    3.8000e+03    8.4970e+02    3.5870e+01    1.0000e+00
75     5.0000e+02    3.8000e+03    9.6550e+02    2.0170e+01    1.0000e+00
76     7.0000e+02    3.8000e+03    1.0810e+03    1.2530e+01    1.0000e+00

```

```

77      9.0000e+02    3.8000e+03    1.1970e+03    8.9510e+00    1.0000e+00
78      1.1000e+03    3.8000e+03    1.3130e+03    7.1620e+00    1.0000e+00
79      1.3000e+03    3.8000e+03    1.4290e+03    6.1230e+00    1.0000e+00
80      2.0000e+03    3.8000e+03    1.8350e+03    2.4870e+00    1.0000e+00
81      2.5000e+03    3.8000e+03    1.8350e+03    2.4870e+00    1.0000e+00
82      e
83      *
84      *   prptb(1,i)   prptb(2,i)   prptb(3,i)   prptb(4,i)   prptb(5,i)
85      3.0000e+02    2.8000e+03    9.8640e+01    1.6300e+00    1.0000e+00
86      6.0000e+02    2.8000e+03    1.1360e+03    1.4200e+00    1.0000e+00
87      9.0000e+02    2.8000e+03    1.2850e+03    1.2100e+00    1.0000e+00
88      1.2000e+03    2.8000e+03    1.4350e+03    1.0000e+00    1.0000e+00
89      1.5000e+03    2.8000e+03    1.8000e+03    7.9000e-01    1.1000e+00
90      2.0000e+03    2.8000e+03    2.0000e+03    4.9000e-01    1.1000e+00
91      2.5000e+03    2.8000e+03    2.0000e+03    4.9000e-01    1.1000e+00
92      e
93      *
94      *   prptb(1,i)   prptb(2,i)   prptb(3,i)   prptb(4,i)   prptb(5,i)
95      3.0000e+02    8.4100e+03    4.4030e+02    1.4340e+01    8.4000e-01
96      6.0000e+02    8.2930e+03    5.0640e+02    1.9330e+01    8.4000e-01
97      9.0000e+02    8.1750e+03    5.7240e+02    2.4320e+01    8.4000e-01
98      1.2000e+03    8.0570e+03    6.3840e+02    2.9310e+01    8.4000e-01
99      2.0000e+03    7.7420e+03    8.1440e+02    4.2610e+01    8.4000e-01
100     2.5000e+03    7.7420e+03    8.1440e+02    4.2610e+01    8.4000e-01
101     e
102     *
103     *****
104     * control-parameter data *
105     *****
106     *
107     *
108     * signal variables
109     *   idsv       isvn       ilcn       icn1       icn2
110     *   101         0         0         0         0
111     *
112     * control blocks
113     *
114     * idcb icbn   funct   icb1   icb2   icb3
115     *   cbgain cbxmin cbxmax cbcon1 cbcon2
116     *
117     *   constant 1.0
118     * -1      9      *const*
119     *   1.0      1.0      1.0      1.0      0.0
120     *
121     *   constant 0.0
122     * -2      9      *const*
123     *   1.0      0.0      0.0      0.0      0.0
124     *
125     *   constant pressure
126     * -3      9      *const*
127     *   1.0      3.0e05  3.0e05  3.0e05  0.0
128     *
129     *   table lookup of mass flow vs time
130     * -4      101   *table*  101   64
131     *   1.0      -100.0  100.0  0.0      0.0
132     *   5.300e+01  0.0 s
133     *   5.800e+01  9.000e+00 s
134     *   6.300e+01  1.612e+01 s
135     *   6.805e+01  1.565e+01 s
136     *   7.067e+01  1.186e+01 s
137     *   7.239e+01  9.095e+00 s
138     *   7.600e+01  6.500e+00 s
139     *   8.059e+01  5.172e+00 s
140     *   1.017e+02  5.158e+00 s
141     *   1.057e+02  5.837e+00 s
142     *   1.238e+02  5.825e+00 s
143     *   1.409e+02  6.495e+00 s
144     *   1.649e+02  4.547e+00 s
145     *   1.790e+02  5.674e+00 s
146     *   1.850e+02  5.215e+00 s
147     *   1.901e+02  5.666e+00 s
148     *   1.990e+02  4.864e+00 s
149     *   2.031e+02  5.998e+00 s
150     *   2.161e+02  4.625e+00 s
151     *   2.221e+02  3.712e+00 s
152     *   2.312e+02  5.411e+00 s
153     *   2.380e+02  5.188e+00 s
154     *   2.481e+02  6.209e+00 s
155     *   2.531e+02  5.167e+00 s
156     *   2.549e+02  3.785e+00 s
157     *   2.590e+02  3.780e+00 s
158     *   2.642e+02  6.186e+00 s
159     *   2.673e+02  6.182e+00 s

```

```

160      2.710e+02      3.763e+00 s
161      2.740e+02      3.759e+00 s
162      2.804e+02      6.394e+00 s
163      2.834e+02      6.390e+00 s
164      2.872e+02      4.086e+00 s
165      2.901e+02      3.852e+00 s
166      2.952e+02      4.534e+00 s
167      3.004e+02      5.677e+00 s
168      3.084e+02      5.551e+00 s
169      3.144e+02      4.738e+00 s
170      3.213e+02      3.923e+00 s
171      3.295e+02      4.602e+00 s
172      3.346e+02      5.170e+00 s
173      3.425e+02      4.699e+00 s
174      3.487e+02      5.725e+00 s
175      3.537e+02      5.258e+00 s
176      3.566e+02      4.679e+00 s
177      3.628e+02      5.706e+00 s
178      3.687e+02      4.203e+00 s
179      3.746e+02      3.045e+00 s
180      3.870e+02      6.822e+00 s
181      3.948e+02      3.707e+00 s
182      4.008e+02      3.699e+00 s
183      4.050e+02      5.188e+00 s
184      4.101e+02      5.985e+00 s
185      4.201e+02      5.052e+00 s
186      4.279e+02      3.432e+00 s
187      4.361e+02      5.030e+00 s
188      4.433e+02      6.284e+00 s
189      4.503e+02      5.240e+00 s
190      4.533e+02      5.466e+00 s
191      4.631e+02      2.808e+00 s
192      4.744e+02      4.977e+00 s
193      4.813e+02      3.473e+00 s
194      4.907e+02      6.909e+00 s
195      4.991e+02      1.069e+01 e
196 *
197 *      table lookup of liquid temperature vs time
198 -5      101      *table*      101      18
199      1.0      300.0      500.0      0.0      0.0
200      0.0000e+00      3.9400e+02      5.3000e+01      3.9400e+02      6.8000e+01 s
201      3.7000e+02      7.5000e+01      3.8000e+02      8.8000e+01      3.8050e+02 s
202      9.7000e+01      3.8200e+02      1.4000e+02      3.7700e+02      1.5000e+02 s
203      3.7800e+02      1.8500e+02      3.8300e+02      1.9300e+02      3.8300e+02 s
204      2.2100e+02      3.8680e+02      3.0000e+02      3.9400e+02      5.0000e+02 s
205      3.9940e+02      6.5000e+02      3.9940e+02      6.6800e+02      3.9860e+02 s
206      6.8700e+02      3.9520e+02      8.2400e+02      3.9000e+02      1.0000e+03 s
207      3.9000e+02 e
208 *
209 * trips
210 *      ntse      ntct      ntsf      ntqp      ntsd
211      0      0      0      0      0
212 *
213 *      idtp      isrt      iset      itst      idsg
214      1001      2      0      1      101
215 *      setp(1)      setp(2)
216      6.2500e+01      6.2510e+01
217 *      dtsp(1)      dtsp(2)
218      0.0000e+00      0.0000e+00
219 *      ifsp(1)      ifsp(2)
220      0      0
221 *
222 *      idtp      isrt      iset      itst      idsg
223      1002      2      0      1      101
224 *      setp(1)      setp(2)
225      0.0      1.0e-06
226 *      dtsp(1)      dtsp(2)
227      0.0000e+00      0.0000e+00
228 *      ifsp(1)      ifsp(2)
229      0      0
230 *
231 *****
232 * component data *
233 *****
234 *
235 ***** type      num      id      ctitle
236 vessel      3      3 $3$ vessel
237 *      nasx      nrxx      ntsx      ncsr      ivssbf
238      24      1      1      2      0
239 *      idcu      idcl      idcr      icru      icrl
240      0      0      0      19      1
241 *      icrr      ilcsp      iucsp      iuhp      iconc
242      1      1      19      24      0

```

```

243 *           igeom           nvent           nvvtb           nsgrid
244           1           0           0           *6* 0
245 *           shelv           epsw
246           0.0000e+00           0.0000e+00
247 * z *           2.0000e-01           3.2750e-01           5.8000e-01           8.1000e-01           1.0150e+00
248 * z *           1.2150e+00           1.4200e+00           1.6250e+00           1.8250e+00           2.0300e+00
249 * z *           2.2350e+00           2.4350e+00           2.6400e+00           2.8450e+00           3.0450e+00
250 * z *           3.2500e+00           3.4800e+00           3.7325e+00           3.8600e+00           3.9800e+00
251 * z *           4.2170e+00           4.7170e+00           5.5370e+00           6.7470e+00e
252 * rad *           6.6644e-01e
253 * th *           6.6644e-01e
254 * funh *           1.0000e-01e
255 * nhsca *           6e
256 * zsgrid           8.3000e-01           1.4750e+00           2.1400e+00           2.8050e+00s
257 * zsgrid           3.4600e+00           3.8780e+00e
258 *
259 *           lisrl           lisrc           lisrf           ljuns
260           23           1           3           3
261           1           1           3           2
262 *
263 * level 1
264 *
265 * cfzl-t*           0.0000e+00e
266 * cfzl-z*          -0.0001 e
267 * cfzl-r*           0.0000e+00e
268 * cfzv-t*           0.0000e+00e
269 * cfzv-z*           0.0000e+00e
270 * cfzv-r*           0.0000e+00e
271 * vol *           1.2637e-01e
272 * fa-t *           0.0000e+00e
273 * fa-z *           1.2637e-01e
274 * fa-r *           0.0000e+00e
275 * hd-t *           1.0000e+00e
276 * hd-z *           6.5000e-03e
277 * hd-r *           0.0000e+00e
278 * alpn *           1.0000e+00e
279 * vvn-t *           0.0000e+00e
280 * vvn-z *           0.0000e+00e
281 * vvn-r *           0.0000e+00e
282 * vln-t *           0.0000e+00e
283 * vln-z *           0.0000e+00e
284 * vln-r *           0.0000e+00e
285 * tvn *           3.9300e+02e
286 * tln *           3.9100e+02e
287 * pn *           1.9680e+05e
288 * pan *           0.0000e+00e
289 *
290 * level 2
291 *
292 * cfzl-t*           0.0000e+00e
293 * cfzl-z*           2.4500e-02e
294 * cfzl-r*           0.0000e+00e
295 * cfzv-t*           0.0000e+00e
296 * cfzv-z*           2.4500e-02e
297 * cfzv-r*           0.0000e+00e
298 * vol *           5.8472e-01e
299 * fa-t *           0.0000e+00e
300 * fa-z *           5.8472e-01e
301 * fa-r *           0.0000e+00e
302 * hd-t *           6.3440e-03e
303 * hd-z *           1.3531e-02e
304 * hd-r *           0.0000e+00e
305 * alpn *           1.0000e+00e
306 * vvn-t *           0.0000e+00e
307 * vvn-z *           0.0000e+00e
308 * vvn-r *           0.0000e+00e
309 * vln-t *           0.0000e+00e
310 * vln-z *           0.0000e+00e
311 * vln-r *           0.0000e+00e
312 * tvn *           3.9300e+02e
313 * tln *           3.9300e+02e
314 * pn *           1.9680e+05e
315 * pan *           0.0000e+00e
316 *
317 * level 3
318 *
319 * cfzl-t*           0.0000e+00e
320 * cfzl-z*           2.4500e-02e
321 * cfzl-r*           0.0000e+00e
322 * cfzv-t*           0.0000e+00e
323 * cfzv-z*           2.4500e-02e
324 * cfzv-r*           0.0000e+00e
325 * vol *           5.8472e-01e

```

326 * fa-t * 0.0000e+00e
327 * fa-z * 5.8472e-01e
328 * fa-r * 0.0000e+00e
329 * hd-t * 6.3440e-03e
330 * hd-z * 1.3531e-02e
331 * hd-r * 0.0000e+00e
332 * alpn * 1.0000e+00e
333 * vvn-t * 0.0000e+00e
334 * vvn-z * 0.0000e+00e
335 * vvn-r * 0.0000e+00e
336 * vln-t * 0.0000e+00e
337 * vln-z * 0.0000e+00e
338 * vln-r * 0.0000e+00e
339 * tvn * 3.9300e+02e
340 * tln * 3.9300e+02e
341 * pn * 1.9680e+05e
342 * pan * 0.0000e+00e
343 * *
344 * level 4

4

345 * *
346 * cfzl-t* 0.0000e+00e
347 * cfzl-z* 2.4500e-02e
348 * cfzl-r* 0.0000e+00e
349 * cfzv-t* 0.0000e+00e
350 * cfzv-z* 2.4500e-02e
351 * cfzv-r* 0.0000e+00e
352 * vol * 5.8472e-01e
353 * fa-t * 0.0000e+00e
354 * fa-z * 5.8472e-01e
355 * fa-r * 0.0000e+00e
356 * hd-t * 6.3440e-03e
357 * hd-z * 1.3531e-02e
358 * hd-r * 0.0000e+00e
359 * alpn * 1.0000e+00e
360 * vvn-t * 0.0000e+00e
361 * vvn-z * 0.0000e+00e
362 * vvn-r * 0.0000e+00e
363 * vln-t * 0.0000e+00e
364 * vln-z * 0.0000e+00e
365 * vln-r * 0.0000e+00e
366 * tvn * 3.9300e+02e
367 * tln * 3.9300e+02e
368 * pn * 1.9680e+05e
369 * pan * 0.0000e+00e
370 * *
371 * level 5

5

372 * *
373 * cfzl-t* 0.0000e+00e
374 * cfzl-z* 2.4500e-02e
375 * cfzl-r* 0.0000e+00e
376 * cfzv-t* 0.0000e+00e
377 * cfzv-z* 2.4500e-02e
378 * cfzv-r* 0.0000e+00e
379 * vol * 5.8472e-01e
380 * fa-t * 0.0000e+00e
381 * fa-z * 5.8472e-01e
382 * fa-r * 0.0000e+00e
383 * hd-t * 6.3440e-03e
384 * hd-z * 1.3531e-02e
385 * hd-r * 0.0000e+00e
386 * alpn * 1.0000e+00e
387 * vvn-t * 0.0000e+00e
388 * vvn-z * 0.0000e+00e
389 * vvn-r * 0.0000e+00e
390 * vln-t * 0.0000e+00e
391 * vln-z * 0.0000e+00e
392 * vln-r * 0.0000e+00e
393 * tvn * 3.9300e+02e
394 * tln * 3.9300e+02e
395 * pn * 1.9680e+05e
396 * pan * 0.0000e+00e
397 * *
398 * level 6

6

399 * *
400 * cfzl-t* 0.0000e+00e
401 * cfzl-z* 2.4500e-02e
402 * cfzl-r* 0.0000e+00e
403 * cfzv-t* 0.0000e+00e
404 * cfzv-z* 2.4500e-02e
405 * cfzv-r* 0.0000e+00e
406 * vol * 5.8472e-01e
407 * fa-t * 0.0000e+00e
408 * fa-z * 5.8472e-01e

409 * fa-r * 0.0000e+00e
410 * hd-t * 6.3440e-03e
411 * hd-z * 1.3531e-02e
412 * hd-r * 0.0000e+00e
413 * alpn * 1.0000e+00e
414 * vvn-t * 0.0000e+00e
415 * vvn-z * 0.0000e+00e
416 * vvn-r * 0.0000e+00e
417 * vln-t * 0.0000e+00e
418 * vln-z * 0.0000e+00e
419 * vln-r * 0.0000e+00e
420 * tvn * 3.9300e+02e
421 * tln * 3.9300e+02e
422 * pn * 1.9680e+05e
423 * pan * 0.0000e+00e
424 * * * *

7

425 * level *
426 * * * *
427 * cfzl-t* 0.0000e+00e
428 * cfzl-z* 2.4500e-02e
429 * cfzl-r* 0.0000e+00e
430 * cfzv-t* 0.0000e+00e
431 * cfzv-z* 2.4500e-02e
432 * cfzv-r* 0.0000e+00e
433 * vol * 5.8472e-01e
434 * fa-t * 0.0000e+00e
435 * fa-z * 5.8472e-01e
436 * fa-r * 0.0000e+00e
437 * hd-t * 6.3440e-03e
438 * hd-z * 1.3531e-02e
439 * hd-r * 0.0000e+00e
440 * alpn * 1.0000e+00e
441 * vvn-t * 0.0000e+00e
442 * vvn-z * 0.0000e+00e
443 * vvn-r * 0.0000e+00e
444 * vln-t * 0.0000e+00e
445 * vln-z * 0.0000e+00e
446 * vln-r * 0.0000e+00e
447 * tvn * 3.9300e+02e
448 * tln * 3.9300e+02e
449 * pn * 1.9680e+05e
450 * pan * 0.0000e+00e
451 * * * *

8

452 * level *
453 * * * *
454 * cfzl-t* 0.0000e+00e
455 * cfzl-z* 2.4500e-02e
456 * cfzl-r* 0.0000e+00e
457 * cfzv-t* 0.0000e+00e
458 * cfzv-z* 2.4500e-02e
459 * cfzv-r* 0.0000e+00e
460 * vol * 5.8472e-01e
461 * fa-t * 0.0000e+00e
462 * fa-z * 5.8472e-01e
463 * fa-r * 0.0000e+00e
464 * hd-t * 6.3440e-03e
465 * hd-z * 1.3531e-02e
466 * hd-r * 0.0000e+00e
467 * alpn * 1.0000e+00e
468 * vvn-t * 0.0000e+00e
469 * vvn-z * 0.0000e+00e
470 * vvn-r * 0.0000e+00e
471 * vln-t * 0.0000e+00e
472 * vln-z * 0.0000e+00e
473 * vln-r * 0.0000e+00e
474 * tvn * 3.9300e+02e
475 * tln * 3.9300e+02e
476 * pn * 1.9680e+05e
477 * pan * 0.0000e+00e
478 * * * *

9

479 * level *
480 * * * *
481 * cfzl-t* 0.0000e+00e
482 * cfzl-z* 2.4500e-02e
483 * cfzl-r* 0.0000e+00e
484 * cfzv-t* 0.0000e+00e
485 * cfzv-z* 2.4500e-02e
486 * cfzv-r* 0.0000e+00e
487 * vol * 5.8472e-01e
488 * fa-t * 0.0000e+00e
489 * fa-z * 5.8472e-01e
490 * fa-r * 0.0000e+00e
491 * hd-t * 6.3440e-03e

492 * hd-z * 1.3531e-02e
493 * hd-r * 0.0000e+00e
494 * alpn * 1.0000e+00e
495 * vvn-t * 0.0000e+00e
496 * vvn-z * 0.0000e+00e
497 * vvn-r * 0.0000e+00e
498 * vln-t * 0.0000e+00e
499 * vln-z * 0.0000e+00e
500 * vln-r * 0.0000e+00e
501 * tvn * 3.9300e+02e
502 * tln * 3.9300e+02e
503 * pn * 1.9680e+05e
504 * pan * 0.0000e+00e
505 *

506 * level 10

507 *
508 * cfzl-t* 0.0000e+00e
509 * cfzl-z* 2.4500e-02e
510 * cfzl-r* 0.0000e+00e
511 * cfzv-t* 0.0000e+00e
512 * cfzv-z* 2.4500e-02e
513 * cfzv-r* 0.0000e+00e
514 * vol * 5.8472e-01e
515 * fa-t * 0.0000e+00e
516 * fa-z * 5.8472e-01e
517 * fa-r * 0.0000e+00e
518 * hd-t * 6.3440e-03e
519 * hd-z * 1.3531e-02e
520 * hd-r * 0.0000e+00e
521 * alpn * 1.0000e+00e
522 * vvn-t * 0.0000e+00e
523 * vvn-z * 0.0000e+00e
524 * vvn-r * 0.0000e+00e
525 * vln-t * 0.0000e+00e
526 * vln-z * 0.0000e+00e
527 * vln-r * 0.0000e+00e
528 * tvn * 3.9300e+02e
529 * tln * 3.9300e+02e
530 * pn * 1.9680e+05e
531 * pan * 0.0000e+00e
532 *

533 * level 11

534 *
535 * cfzl-t* 0.0000e+00e
536 * cfzl-z* 2.4500e-02e
537 * cfzl-r* 0.0000e+00e
538 * cfzv-t* 0.0000e+00e
539 * cfzv-z* 2.4500e-02e
540 * cfzv-r* 0.0000e+00e
541 * vol * 5.8472e-01e
542 * fa-t * 0.0000e+00e
543 * fa-z * 5.8472e-01e
544 * fa-r * 0.0000e+00e
545 * hd-t * 6.3440e-03e
546 * hd-z * 1.3531e-02e
547 * hd-r * 0.0000e+00e
548 * alpn * 1.0000e+00e
549 * vvn-t * 0.0000e+00e
550 * vvn-z * 0.0000e+00e
551 * vvn-r * 0.0000e+00e
552 * vln-t * 0.0000e+00e
553 * vln-z * 0.0000e+00e
554 * vln-r * 0.0000e+00e
555 * tvn * 3.9300e+02e
556 * tln * 3.9300e+02e
557 * pn * 1.9680e+05e
558 * pan * 0.0000e+00e
559 *

560 * level 12

561 *
562 * cfzl-t* 0.0000e+00e
563 * cfzl-z* 2.4500e-02e
564 * cfzl-r* 0.0000e+00e
565 * cfzv-t* 0.0000e+00e
566 * cfzv-z* 2.4500e-02e
567 * cfzv-r* 0.0000e+00e
568 * vol * 5.8472e-01e
569 * fa-t * 0.0000e+00e
570 * fa-z * 5.8472e-01e
571 * fa-r * 0.0000e+00e
572 * hd-t * 6.3440e-03e
573 * hd-z * 1.3531e-02e
574 * hd-r * 0.0000e+00e

575	* alpn *	1.0000e+00e
576	* vvn-t *	0.0000e+00e
577	* vvn-z *	0.0000e+00e
578	* vvn-i *	0.0000e+00e
579	* vln-t *	0.0000e+00e
580	* vln-z *	0.0000e+00e
581	* vln-i *	0.0000e+00e
582	* tvn *	3.9300e+02e
583	* tln *	3.9300e+02e
584	* pn *	1.9680e+05e
585	* pan *	0.0000e+00e
586	*	
587	* level 13	
588	*	
589	* cfzl-t*	0.0000e+00e
590	* cfzl-z*	2.4500e-02e
591	* cfzl-r*	0.0000e+00e
592	* cfzv-t*	0.0000e+00e
593	* cfzv-z*	2.4500e-02e
594	* cfzv-r*	0.0000e+00e
595	* vol *	5.8472e-01e
596	* fa-t *	0.0000e+00e
597	* fa-z *	5.8472e-01e
598	* fa-r *	0.0000e+00e
599	* hd-t *	6.3440e-03e
600	* hd-z *	1.3531e-02e
601	* hd-r *	0.0000e+00e
602	* alpn *	1.0000e+00e
603	* vvn-t *	0.0000e+00e
604	* vvn-z *	0.0000e+00e
605	* vvn-i *	0.0000e+00e
606	* vln-t *	0.0000e+00e
607	* vln-z *	0.0000e+00e
608	* vln-r *	0.0000e+00e
609	* tvn *	3.9300e+02e
610	* tln *	3.9300e+02e
611	* pn *	1.9680e+05e
612	* pan *	0.0000e+00e
613	*	
614	* level 14	
615	*	
616	* cfzl-t*	0.0000e+00e
617	* cfzl-z*	2.4500e-02e
618	* cfzl-r*	0.0000e+00e
619	* cfzv-t*	0.0000e+00e
620	* cfzv-z*	2.4500e-02e
621	* cfzv-r*	0.0000e+00e
622	* vol *	5.8472e-01e
623	* fa-t *	0.0000e+00e
624	* fa-z *	5.8472e-01e
625	* fa-r *	0.0000e+00e
626	* hd-t *	6.3440e-03e
627	* hd-z *	1.3531e-02e
628	* hd-r *	0.0000e+00e
629	* alpn *	1.0000e+00e
630	* vvn-t *	0.0000e+00e
631	* vvn-z *	0.0000e+00e
632	* vvn-i *	0.0000e+00e
633	* vln-t *	0.0000e+00e
634	* vln-z *	0.0000e+00e
635	* vln-r *	0.0000e+00e
636	* tvn *	3.9300e+02e
637	* tln *	3.9300e+02e
638	* pn *	1.9680e+05e
639	* pan *	0.0000e+00e
640	*	
641	* level 15	
642	*	
643	* cfzl-t*	0.0000e+00e
644	* cfzl-z*	2.4500e-02e
645	* cfzl-r*	0.0000e+00e
646	* cfzv-t*	0.0000e+00e
647	* cfzv-z*	2.4500e-02e
648	* cfzv-r*	0.0000e+00e
649	* vol *	5.8472e-01e
650	* fa-t *	0.0000e+00e
651	* fa-z *	5.8472e-01e
652	* fa-r *	0.0000e+00e
653	* hd-t *	6.3440e-03e
654	* hd-z *	1.3531e-02e
655	* hd-r *	0.0000e+00e
656	* alpn *	1.0000e+00e
657	* vvn-t *	0.0000e+00e

658 * vvn-z * 0.0000e+00e
 659 * vvn-r * 0.0000e+00e
 660 * vln-t * 0.0000e+00e
 661 * vln-z * 0.0000e+00e
 662 * vln-r * 0.0000e+00e
 663 * tvn * 3.9300e+02e
 664 * tln * 3.9300e+02e
 665 * pn * 1.9680e+05e
 666 * pan * 0.0000e+00e
 667 *
 668 * level 16
 669 *
 670 * cfzl-t* 0.0000e+00e
 671 * cfzl-z* 2.4500e-02e
 672 * cfzl-r* 0.0000e+00e
 673 * cfzv-t* 0.0000e+00e
 674 * cfzv-z* 2.4500e-02e
 675 * cfzv-r* 0.0000e+00e
 676 * vol 5.8472e-01e
 677 * fa-t * 0.0000e+00e
 678 * fa-z * 5.8472e-01e
 679 * fa-r * 0.0000e+00e
 680 * hd-t * 6.3440e-03e
 681 * hd-z * 1.3531e-02e
 682 * hd-r * 0.0000e+00e
 683 * alpn * 1.0000e+00e
 684 * vvn-t * 0.0000e+00e
 685 * vvn-z * 0.0000e+00e
 686 * vvn-r * 0.0000e+00e
 687 * vln-t * 0.0000e+00e
 688 * vln-z * 0.0000e+00e
 689 * vln-r * 0.0000e+00e
 690 * tvn * 3.9300e+02e
 691 * tln * 3.9300e+02e
 692 * pn * 1.9680e+05e
 693 * pan * 0.0000e+00e
 694 *
 695 * level 17
 696 *
 697 * cfzl-t* 0.0000e+00e
 698 * cfzl-z* 2.4500e-02e
 699 * cfzl-r* 0.0000e+00e
 700 * cfzv-t* 0.0000e+00e
 701 * cfzv-z* 2.4500e-02e
 702 * cfzv-r* 0.0000e+00e
 703 * vol 5.8472e-01e
 704 * fa-t * 0.0000e+00e
 705 * fa-z * 5.8472e-01e
 706 * fa-r * 0.0000e+00e
 707 * hd-t * 6.3440e-03e
 708 * hd-z * 1.3531e-02e
 709 * hd-r * 0.0000e+00e
 710 * alpn * 1.0000e+00e
 711 * vvn-t * 0.0000e+00e
 712 * vvn-z * 0.0000e+00e
 713 * vvn-r * 0.0000e+00e
 714 * vln-t * 0.0000e+00e
 715 * vln-z * 0.0000e+00e
 716 * vln-r * 0.0000e+00e
 717 * tvn * 3.9300e+02e
 718 * tln * 3.9300e+02e
 719 * pn * 1.9680e+05e
 720 * pan * 0.0000e+00e
 721 *
 722 * level 18
 723 *
 724 * cfzl-t* 0.0000e+00e
 725 * cfzl-z* 2.4500e-02e
 726 * cfzl-r* 0.0000e+00e
 727 * cfzv-t* 0.0000e+00e
 728 * cfzv-z* 2.4500e-02e
 729 * cfzv-r* 0.0000e+00e
 730 * vol 5.8472e-01e
 731 * fa-t * 0.0000e+00e
 732 * fa-z * 5.8472e-01e
 733 * fa-r * 0.0000e+00e
 734 * hd-t * 6.3440e-03e
 735 * hd-z * 1.3531e-02e
 736 * hd-r * 0.0000e+00e
 737 * alpn * 1.0000e+00e
 738 * vvn-t * 0.0000e+00e
 739 * vvn-z * 0.0000e+00e
 740 * vvn-r * 0.0000e+00e

741	* vln-t *	0.0000e+00e
742	* vln-z *	0.0000e+00e
743	* vln-r *	0.0000e+00e
744	* tvn *	3.9300e+02e
745	* tln *	3.9300e+02e
746	* pn *	1.9680e+05e
747	* pan *	0.0000e+00e
748	*	
749	* level 19	
750	*	
751	* cfzl-t*	0.0000e+00e
752	* cfzl-z*	2.4500e-02e
753	* cfzl-r*	0.0000e+00e
754	* cfzv-t*	0.0000e+00e
755	* cfzv-z*	2.4500e-02e
756	* cfzv-r*	0.0000e+00e
757	* vol *	5.8472e-01e
758	* fa-t *	0.0000e+00e
759	* fa-z *	5.8472e-01e
760	* fa-r *	0.0000e+00e
761	* hd-t *	6.3440e-03e
762	* hd-z *	1.3531e-02e
763	* hd-r *	0.0000e+00e
764	* alpn *	1.0000e+00e
765	* vvn-t *	0.0000e+00e
766	* vvn-z *	0.0000e+00e
767	* vvn-r *	0.0000e+00e
768	* vln-t *	0.0000e+00e
769	* vln-z *	0.0000e+00e
770	* vln-r *	0.0000e+00e
771	* tvn *	3.9300e+02e
772	* tln *	3.9300e+02e
773	* pn *	1.9680e+05e
774	* pan *	0.0000e+00e
775	*	
776	* level 20	
777	*	
778	* cfzl-t*	0.0000e+00e
779	* cfzl-z*	6.2300e-02e
780	* cfzl-r*	0.0000e+00e
781	* cfzv-t*	0.0000e+00e
782	* cfzv-z*	6.2300e-02e
783	* cfzv-r*	0.0000e+00e
784	* vol *	5.8472e-01e
785	* fa-t *	0.0000e+00e
786	* fa-z *	5.8472e-01e
787	* fa-r *	0.0000e+00e
788	* hd-t *	6.3440e-03e
789	* hd-z *	1.3531e-02e
790	* hd-r *	0.0000e+00e
791	* alpn *	1.0000e+00e
792	* vvn-t *	0.0000e+00e
793	* vvn-z *	0.0000e+00e
794	* vvn-r *	0.0000e+00e
795	* vln-t *	0.0000e+00e
796	* vln-z *	0.0000e+00e
797	* vln-r *	0.0000e+00e
798	* tvn *	3.9300e+02e
799	* tln *	3.9300e+02e
800	* pn *	1.9680e+05e
801	* pan *	0.0000e+00e
802	*	
803	* level 21	
804	*	
805	* cfzl-t*	0.0000e+00e
806	* cfzl-z*	0.0000e+00e
807	* cfzl-r*	0.0000e+00e
808	* cfzv-t*	0.0000e+00e
809	* cfzv-z*	0.0000e+00e
810	* cfzv-r*	0.0000e+00e
811	* vol *	1.2900e+00e
812	* fa-t *	0.0000e+00e
813	* fa-z *	3.5930e-01e
814	* fa-r *	0.0000e+00e
815	* hd-t *	2.8150e-01e
816	* hd-z *	8.2855e-02e
817	* hd-r *	0.0000e+00e
818	* alpn *	1.0000e+00e
819	* vvn-t *	0.0000e+00e
820	* vvn-z *	0.0000e+00e
821	* vvn-r *	0.0000e+00e
822	* vln-t *	0.0000e+00e
823	* vln-z *	0.0000e+00e

824	* vln-r *	0.0000e+00e
825	* tvn *	3.9300e+02e
826	* tln *	3.9300e+02e
827	* pn *	1.9680e+05e
828	* pan *	0.0000e+00e
829	*	
830	* level 22	
831	*	
832	* cfzlj-t*	0.0000e+00e
833	* cfzlj-z*	0.0000e+00e
834	* cfzlj-r*	0.0000e+00e
835	* cfzlv-t*	0.0000e+00e
836	* cfzlv-z*	0.0000e+00e
837	* cfzlv-r*	0.0000e+00e
838	* vol	1.2681e+00e
839	* fa-t *	0.0000e+00e
840	* fa-z *	1.2681e+00e
841	* fa-r *	0.0000e+00e
842	* hd-t *	7.2090e-02e
843	* hd-z *	1.7809e-01e
844	* hd-r *	0.0000e+00e
845	* alpn *	1.0000e+00e
846	* vvn-t *	0.0000e+00e
847	* vvn-z *	0.0000e+00e
848	* vvn-r *	0.0000e+00e
849	* vln-t *	0.0000e+00e
850	* vln-z *	0.0000e+00e
851	* vln-r *	0.0000e+00e
852	* tvn *	3.9300e+02e
853	* tln *	3.9300e+02e
854	* pn *	1.9680e+05e
855	* pan *	0.0000e+00e
856	*	
857	* level 23	
858	*	
859	* cfzlj-t*	0.0000e+00e
860	* cfzlj-z*	0.0000e+00e
861	* cfzlj-r*	0.0000e+00e
862	* cfzlv-t*	0.0000e+00e
863	* cfzlv-z*	0.0000e+00e
864	* cfzlv-r*	0.0000e+00e
865	* vol	1.2681e+00e
866	* fa-t *	0.0000e+00e
867	* fa-z *	1.2681e+00e
868	* fa-r *	0.0000e+00e
869	* hd-t *	7.2090e-02e
870	* hd-z *	1.7809e-01e
871	* hd-r *	0.0000e+00e
872	* alpn *	1.0000e+00e
873	* vvn-t *	0.0000e+00e
874	* vvn-z *	0.0000e+00e
875	* vvn-r *	0.0000e+00e
876	* vln-t *	0.0000e+00e
877	* vln-z *	0.0000e+00e
878	* vln-r *	0.0000e+00e
879	* tvn *	3.9300e+02e
880	* tln *	3.9300e+02e
881	* pn *	1.9680e+05e
882	* pan *	0.0000e+00e
883	*	
884	* level 24	
885	*	
886	* cfzlj-t*	0.0000e+00e
887	* cfzlj-z*	0.0000e+00e
888	* cfzlj-r*	0.0000e+00e
889	* cfzlv-t*	0.0000e+00e
890	* cfzlv-z*	0.0000e+00e
891	* cfzlv-r*	0.0000e+00e
892	* vol	1.4407e+00e
893	* fa-t *	0.0000e+00e
894	* fa-z *	1.4407e+00e
895	* fa-r *	0.0000e+00e
896	* hd-t *	7.2090e-02e
897	* hd-z *	1.1844e+00e
898	* hd-r *	0.0000e+00e
899	* alpn *	1.0000e+00e
900	* vvn-t *	0.0000e+00e
901	* vvn-z *	0.0000e+00e
902	* vvn-r *	0.0000e+00e
903	* vln-t *	0.0000e+00e
904	* vln-z *	0.0000e+00e
905	* vln-r *	0.0000e+00e
906	* tvn *	3.9300e+02e

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907 * tln * 3.9300e+02e
908 * pn * 1.9680e+05e
909 * pan * 0.0000e+00e
910 *
911 ***** type num id ctitle
912 pipe 2 2 $2$ pipe connection to lower plen.
913 * ncells nodes jun1 jun2 epsw
914 * 1 0 1 2 0.0000e+00
915 * ichf iconc iacc ipow
916 * 0 0 0 0
917 * radin th houtl houtv toutl
918 * 7.7600e-02 1.0000e-03 0.0000e+00 0.0000e+00 2.9300e+02
919 * toutv
920 * 2.9300e+02
921 *
922 * dx * 2.0000e-01e
923 * vol * 8.8820e-02e
924 * fa * f 4.4410e-01e
925 * fric * f 0.0000e+00e
926 * grav * f 0.0000e+00e
927 * hd * f 1.5520e-01e
928 * nff * f -1e
929 * alp * 0.6000e+00e
930 * vl * f 0.0000e+00e
931 * vv * f 0.0000e+00e
932 * tl * 3.9100e+02e
933 * tv * 3.9100e+02e
934 * p * 1.9680e+05e
935 * pa * 0.0000e+00e
936 *
937 ***** type num id ctitle
938 fill 1 1 $1$ core inlet conditions
939 * jun1 ifty ioff
940 * 1 10 0
941 * iftr ifsv nftb nfsv nfrf
942 * 1002 101 0 0 0
943 * twtold rfmv concin felv
944 * 9.0000e-01 1.0000e+20 0.0000e+00 0.0000e+00
945 * dxin volin alpin vlin tlin
946 * 1.0000e-01 1.8900e-04 0.0000e+00 0.0000e+00 3.9400e+02
947 * pin pain flowin vvin tvin
948 * 3.0000e+05 0.0000e+00 0.0000e+00 0.0000e+00 3.9400e+02
949 * fill signal variables or control blocks
950 * mliq mvap tliq tvap alp
951 * -4 -2 -5 -5 -2
952 * p pa
953 * -3 -2
954 *
955 ***** type num id ctitle
956 break 5 5 $5$ break-up pressure
957 * jun1 ibty isat ioff
958 * 4 1 3 0
959 * ibtr ibsv nbtt nbsv nbrf
960 * 0 101 20 0 0
961 * dxin volin alpin tin pin
962 * 1.0000e+00 4.4410e+01 1.0000e+00 3.9300e+02 1.9700e+05
963 * pain concin rbmv poff belv
964 * 0.0000e+00 0.0000e+00 1.0000e+06 0.0000e+00 0.0000e+00
965 * pscl tlscl tvscl pascl conscl
966 * 1.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00
967 * ptb * 0.0000e+00 1.9680e+05 5.2000e+01 1.9680e+05 6.3000e+01
968 * ptb * 2.0120e+05 6.9000e+01 2.2400e+05 8.1000e+01 2.3060e+05
969 * ptb * 2.3600e+02 2.6320e+05 2.7500e+02 2.6450e+05 3.0000e+02
970 * ptb * 2.6000e+05 3.5000e+02 2.5630e+05 4.1400e+02 2.5500e+05
971 * ptb * 4.8000e+02 2.5690e+05 5.1100e+02 2.5500e+05 5.6300e+02
972 * ptb * 2.4380e+05 6.0000e+02 2.4940e+05 6.5000e+02 2.4940e+05
973 * ptb * 6.6300e+02 2.1810e+05 6.8300e+02 1.9650e+05 7.0000e+02
974 * ptb * 1.9500e+05 7.4100e+02 1.7670e+05 1.0000e+03 1.8690e+05
975 * ptb * e
976 *
977 ***** type num id ctitle
978 pipe 4 4 $4$ pipe connecting up to break
979 * ncells nodes jun1 jun2 epsw
980 * 1 0 3 4 0.0000e+00
981 * ichf iconc iacc ipow
982 * 0 0 0 0
983 * radin th houtl houtv toutl
984 * 7.7600e-02 1.0000e-03 0.0000e+00 0.0000e+00 2.9300e+02
985 * toutv
986 * 2.9300e+02
987 *
988 * dx * 1.0000e+00e
989 * vol * 4.4410e-01e

```

```

990 * fa * f 4.4410e-01e
991 * fric * f 0.0000e+00e
992 * grav * f 0.0000e+00e
993 * hd * f 1.5520e-01e
994 * nff * f -1e
995 * alp * 1.0000e+00e
996 * vl * f 0.0000e+00e
997 * vv * f 0.0000e+00e
998 * tl * 3.9300e+02e
999 * tv * 3.9300e+02e
1000 * p * 1.9680e+05e
1001 * pa * 0.0000e+00e
1002 *
1003 ***** type num id ctitle
1004 rod 6 6 $6$ heated rod
1005 * ncrx ncrz
1006 1 18
1007 * nopowr nrldr modez liqlev iaxcnd
1008 0 0 0 *1* 0 1
1009 * idbci idbco hdri hdro
1010 0 2 0.0000e+00 1.3650e-02 *0.01069*
1011 * nrods nodes irftr nzmax irftr2
1012 1 6 *1001* 1002 250 1001
1013 * dtxht(1) dtxht(2) dznht hgapo shelv
1014 2.5000e+00 1.0000e+01 1.0000e-03 1.0000e+10 2.0000e-01
1015 * irpwty ndgx ndhx nrts nhist
1016 7 0 0 10 0
1017 * irpwtr irpwsv nrpwtb nrpwsv nrpwrf
1018 *1001* 1002 101 15 0 0
1019 * izpwtr izpwsv nzpwtb nzpwsv nzpwrf
1020 0 101 1 0 0
1021 * nmwrx nfcil nfcil
1022 0 0 0
1023 * nzpwz nzpwi nfbpwt
1024 18 -1 0
1025 * react tneut rpwoff rrpwmx rpwscl
1026 0.0000e+00 1.6250e-05 0.0000e+00 1.0000e+30 1.0000e+00
1027 * rpowri zpwin zpwoff rzpwmx
1028 9.3600e+06 0.0000e+00 0.0000e+00 * -1.0000e+20* 0.0
1029 * extsou pldr pdrat fucrac
1030 0.0000e+00 0.0000e+00 1.3364e+00 1.0000e+00
1031 *
1032 * nhcomom* f 3e
1033 * nhcelom* 1 2 3 4 5
1034 * nhcelom* 6 7 8 9 10
1035 * nhcelom* 11 12 13 14 15
1036 * nhcelom* 16 17 18 19 20
1037 * nhcelom* e
1038 * z * 2.0000e-01 3.2750e-01 5.8000e-01 8.1000e-01 1.0150e+00
1039 * z * 1.2150e+00 1.4200e+00 1.6250e+00 1.8250e+00 2.0300e+00
1040 * z * 2.2350e+00 2.4350e+00 2.6400e+00 2.8450e+00 3.0450e+00
1041 * z * 3.2500e+00 3.4800e+00 3.7325e+00 3.8600e+00e
1042 * grav * f 1.0000e+00e
1043 * rdx * 1.8240e+03e
1044 * radrd * 0.0000e+00 2.7000e-03 3.3000e-03 4.3500e-03 4.8500e-03
1045 * radrd * 5.3500e-03e
1046 * matrdr * 58 55 59r02 60e
1047 * nfax * f 1e
1048 * rftn * r99 3.9100e+02r15 3.9100e+02e
1049 * rdpwr * 0.0000e+00r02 1.0000e+00r03 0.0000e+00e
1050 * cpowr * 1.0000e+00e
1051 * zpwzt array (new)
1052 0.2s
1053 0.455s
1054 0.705s
1055 0.915s
1056 1.115s
1057 1.315s
1058 1.525s
1059 1.725s
1060 1.925s
1061 2.135s
1062 2.335s
1063 2.535s
1064 2.745s
1065 2.945s
1066 3.145s
1067 3.355s
1068 3.605s
1069 3.86e
1070 * zpwtb array (new)
1071 0.0s
1072 0.275s

```



```

1073 0.568s
1074 0.815s
1075 1.011s
1076 1.176s
1077 1.312s
1078 1.412s
1079 1.471s
1080 1.492s
1081 1.471s
1082 1.412s
1083 1.312s
1084 1.176s
1085 1.011s
1086 0.815s
1087 0.568s
1088 0.275s
1089 0.0 e
1090 *
1091 * rpwtb * r02 0.0000e+00 5.0000e+00 9.3600e+06 6.3000e+01 9.3600e+06
1092 * rpwtb * 7.3000e+01 8.9100e+06 8.8000e+01 8.4500e+06 1.0800e+02
1093 * rpwtb * 8.0200e+06 1.3300e+02 7.6400e+06 1.6300e+02 7.3100e+06
1094 * rpwtb * 2.2300e+02 6.8200e+06 2.8300e+02 6.2200e+06 3.8300e+02
1095 * rpwtb * 5.8100e+06 4.8300e+02 5.4300e+06 6.3300e+02 5.0600e+06
1096 * rpwtb * 8.3300e+02 4.6600e+06 1.0330e+03 4.3900e+06e
1097 * fpuo2 * 0.0000e+00e
1098 * ftd * 1.0000e+00e
1099 * gmix * f 0.0000e+00e
1100 * gmles * 0.0000e+00e
1101 * pgapt * 0.0000e+00e
1102 * plvol * 0.0000e+00e
1103 * pslen * 0.0000e+00e
1104 * clenm * 0.0000e+00e
1105 * burn * f 0.0000e+00e
1106 *
1107 ***** type num id ctitle
1108 slab 7 7 $7$ downcomer heat structure
1109 * ncrx ncrz
1110 1 19
1111 * nopowr nridr modez liqlev iaxcnd
1112 1 0 0 0 1
1113 * idbci idbco hdri hdro
1114 0 2 0.0000e+00 1.3650e-02
1115 * width ipatch
1116 7.6000e+00 0
1117 * nrods nodes irftr nzmax
1118 1 5 1001 200
1119 * dtxht(1) dtxht(2) dznht hgapo shelv
1120 2.5000e+00 1.0000e+01 1.0000e-03 1.0000e+10 2.0000e-01
1121 *
1122 * nhcomco* f 3e
1123 * nhcelo* 1 2 3 4 5
1124 * nhcelo* 6 7 8 9 10
1125 * nhcelo* 11 12 13 14 15
1126 * nhcelo* 16 17 18 19 20
1127 * nhcelo* 21e
1128 * z * 2.0000e-01 3.2750e-01 5.8000e-01 8.1000e-01 1.0150e+00
1129 * z * 1.2150e+00 1.4200e+00 1.6250e+00 1.8250e+00 2.0300e+00
1130 * z * 2.2350e+00 2.4350e+00 2.6400e+00 2.8450e+00 3.0450e+00
1131 * z * 3.2500e+00 3.4800e+00 3.7325e+00 3.8600e+00 3.9800e+00
1132 * z * e
1133 * grav * f 1.0000e+00e
1134 * rdx * 1.0000e+00e
1135 * radrd * 0.0000e+00 2.0000e-03 4.0000e-03 5.5000e-03 6.9000e-03
1136 * radrd * e
1137 * matrd * f 6e
1138 * nfax * f 1e
1139 * rftn * r99 3.9300e+02 3.9300e+02e
1140 *
1141 ***** type num id ctitle
1142 slab 100 100 $100$ lower plenum slab
1143 * ncrx ncrz
1144 1 1
1145 * nopowr nridr modez liqlev iaxcnd
1146 1 0 1 0 0
1147 * idbci idbco hdri hdro
1148 2 0 1.3650e-02 0.0000e+00
1149 * width ipatch
1150 2.8400e+02 0
1151 * nrods nodes irftr nzmax
1152 1 4 0 3
1153 * dtxht(1) dtxht(2) dznht hgapo shelv
1154 3.0000e+00 1.0000e+01 1.0000e-01 1.0000e+10 0.0000e+00
1155 *

```

```

1156 * nhcomi* f          3e
1157 * nhceli* r02       1          2e
1158 * dz *             2.0000e-01e
1159 * grav *           1.0000e+00e
1160 * rdx *             1.0000e+00e
1161 * radrd *          9.1770e+00  9.1784e+00  9.1799e+00  9.1813e+00e
1162 * matrdr * f        6e
1163 * nfax *            1e
1164 * rftn * f         3.9100e+02e
1165 *
1166 end
1167 *
1168 *****
1169 *                time step data                *
1170 *****
1171 *
1172 *          dtmin          dtmax          tend          rtwfp
1173 *          1.0e-6          0.020          5.0          10.0
1174 *          edint          gfint          dmpint          sedint
1175 *          5.0            0.5            5.0            5.0
1176 *
1177 *          dtmin          dtmax          tend          rtwfp
1178 *          1.0e-6          0.050          50.0          10.0
1179 *          edint          gfint          dmpint          sedint
1180 *          45.0            0.5            45.0          45.0
1181 *
1182 *          dtmin          dtmax          tend          rtwfp
1183 *          1.0e-6          0.050          100.0          10.0
1184 *          edint          gfint          dmpint          sedint
1185 *          50.0            0.5            50.0          50.0
1186 *
1187 *          dtmin          dtmax          tend          rtwfp
1188 *          1.0e-6          0.100          450.0          10.0
1189 *          edint          gfint          dmpint          sedint
1190 *          50.0            0.5            50.0          50.0
1191 *
1192 *          endflag
1193 *          -1.0000e+00

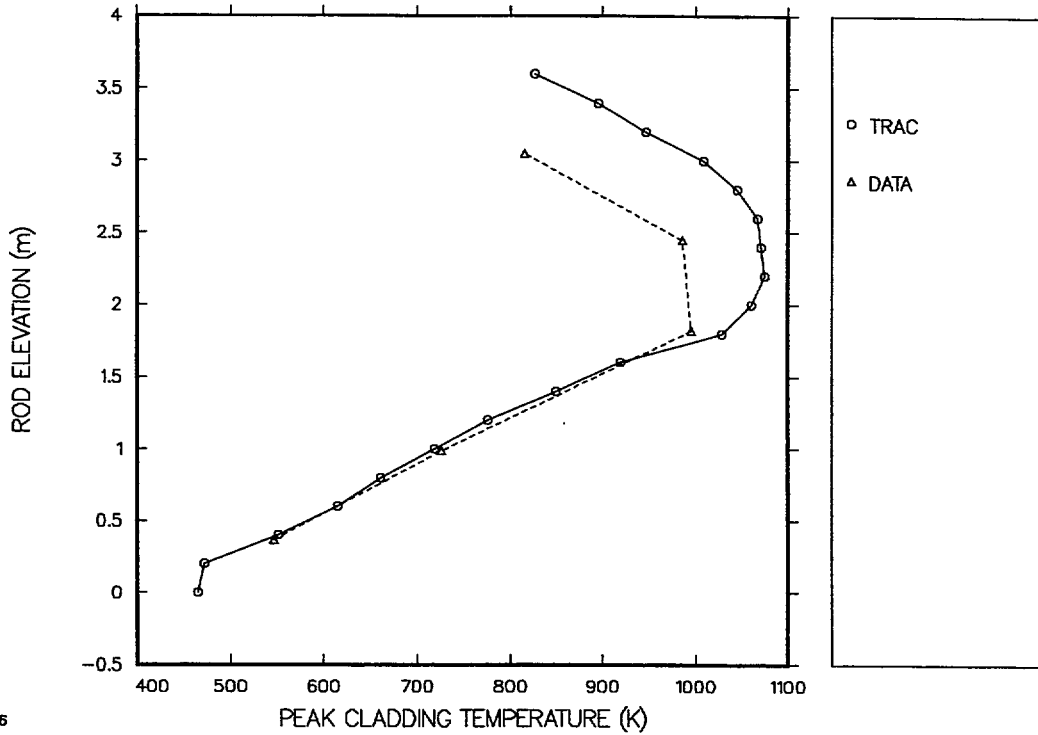
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APPENDIX J

CODE-DATA COMPARISON FOR CCTF RUN 14 WITH NEWRFD=1

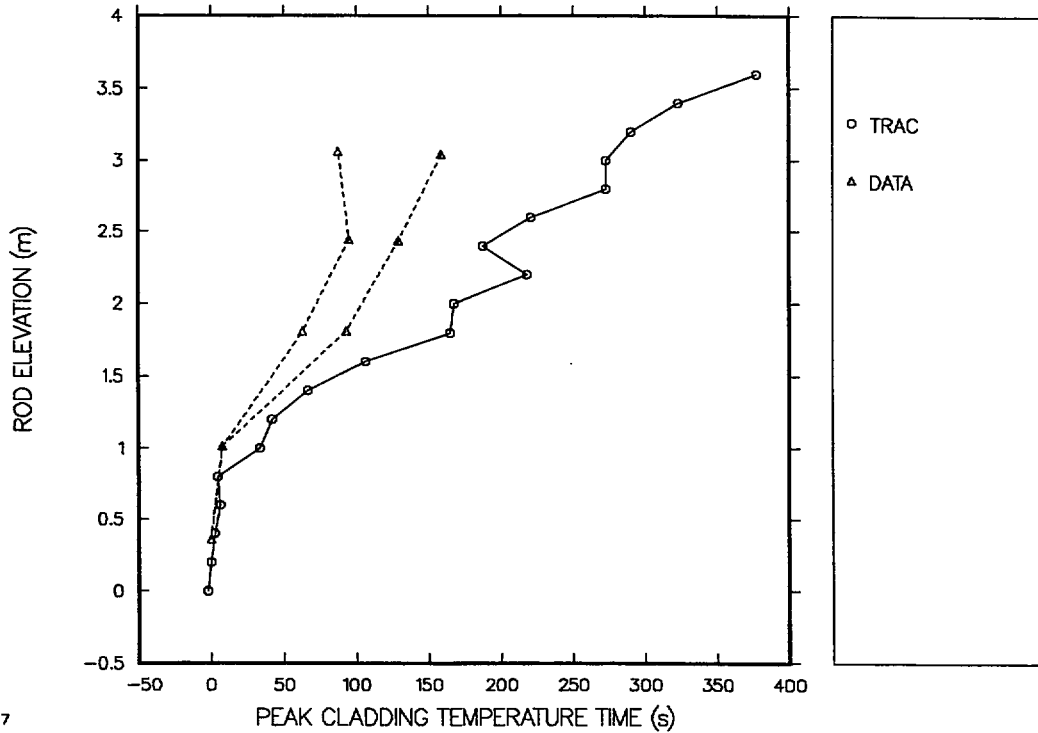
This appendix presents the calculation results for the reflood option newrfd=1, without and with grid spacers modeled. The same set of plots that is presented in the main body of the report for the reflood option newrfd=3 also is presented for the reflood option newrfd=1. For reference purposes, the figure numbers for the two reflood options are listed below.

Without Grid Spacers		With Grid Spacers	
newrfd=1	newrfd=3	newrfd=1	newrfd=3
J-1	4.7-8	J-16	4.7-23
J-2	4.7-9	J-17	4.7-24
J-3	4.7-10	J-18	4.7-25
J-4	4.7-11	J-19	4.7-26
J-5	4.7-12	J-20	4.7-27
J-6	4.7-13	J-21	4.7-28
J-7	4.7-14	J-22	4.7-29
J-8	4.7-15	J-23	4.7-30
J-9	4.7-16	J-24	4.7-31
J-10	4.7-17	J-25	4.7-32
J-11	4.7-18	J-26	4.7-33
J-12	4.7-19	J-27	4.7-34
J-13	4.7-20	J-28	4.7-35
J-14	4.7-21	J-29	4.7-36
J-15	4.7-22	J-30	4.7-37



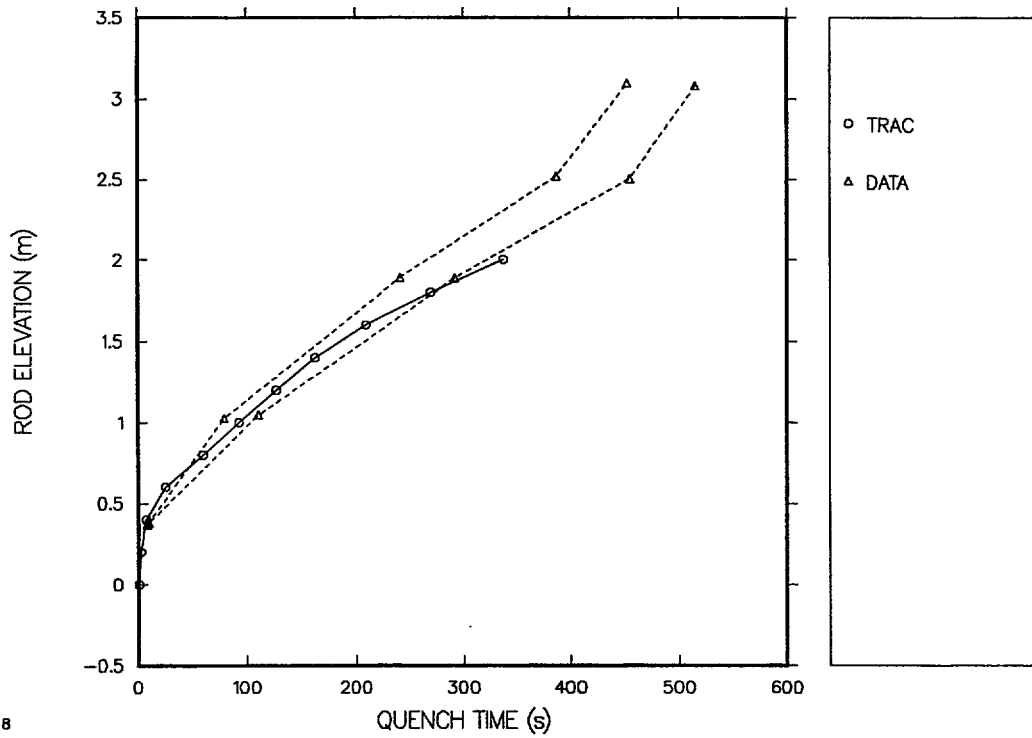
6

Fig. J-1. Comparison of predicted and measured PCTs (experimental data from Ref. 4.7-7).



7

Fig. J-2. Comparison of predicted and measured PCT times (experimental data from Ref. 4.7-7).



8

Fig. J-3. Comparison of predicted and measured quench times (experimental data from Ref. 4.7-7).

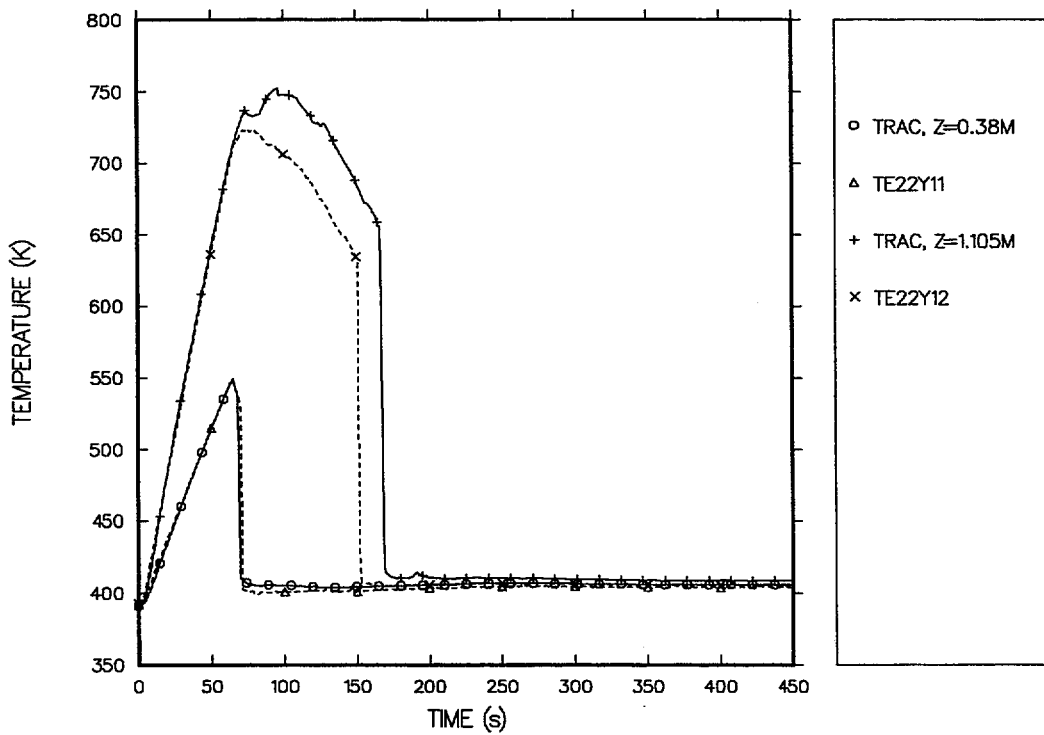


Fig. J-4. CCTF-14 run: Wall-temperature histories at 0.38- and 1.105-m elevations.

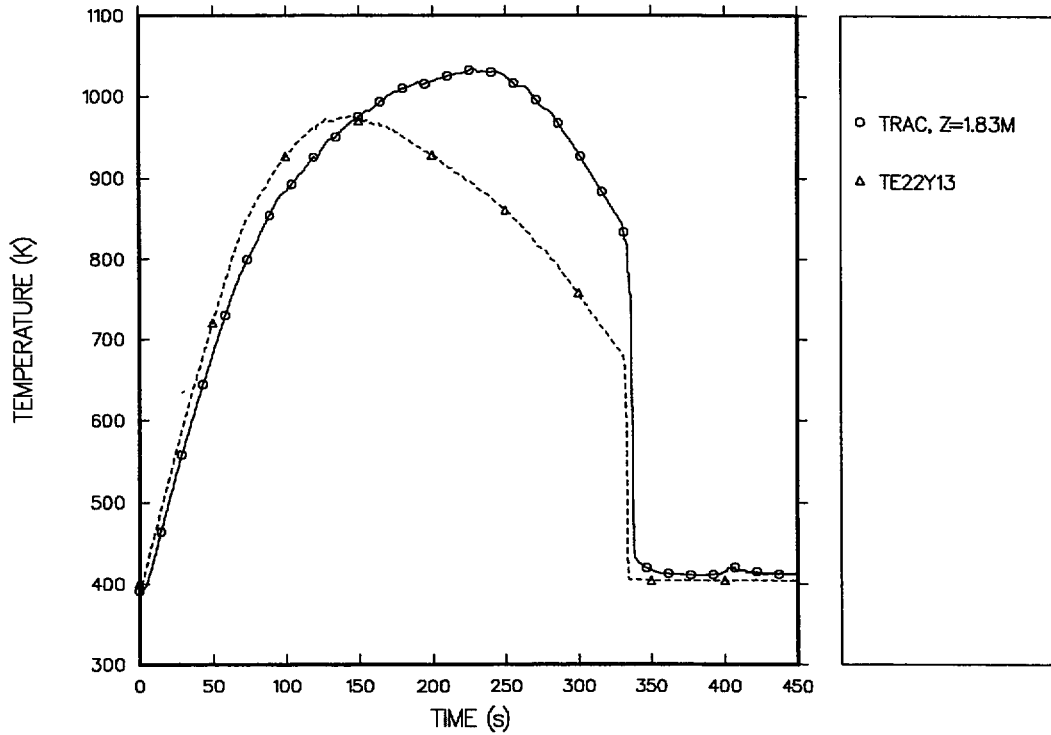


Fig. J-5. CCTF-14 run: Wall-temperature histories at 1.83-m elevations.

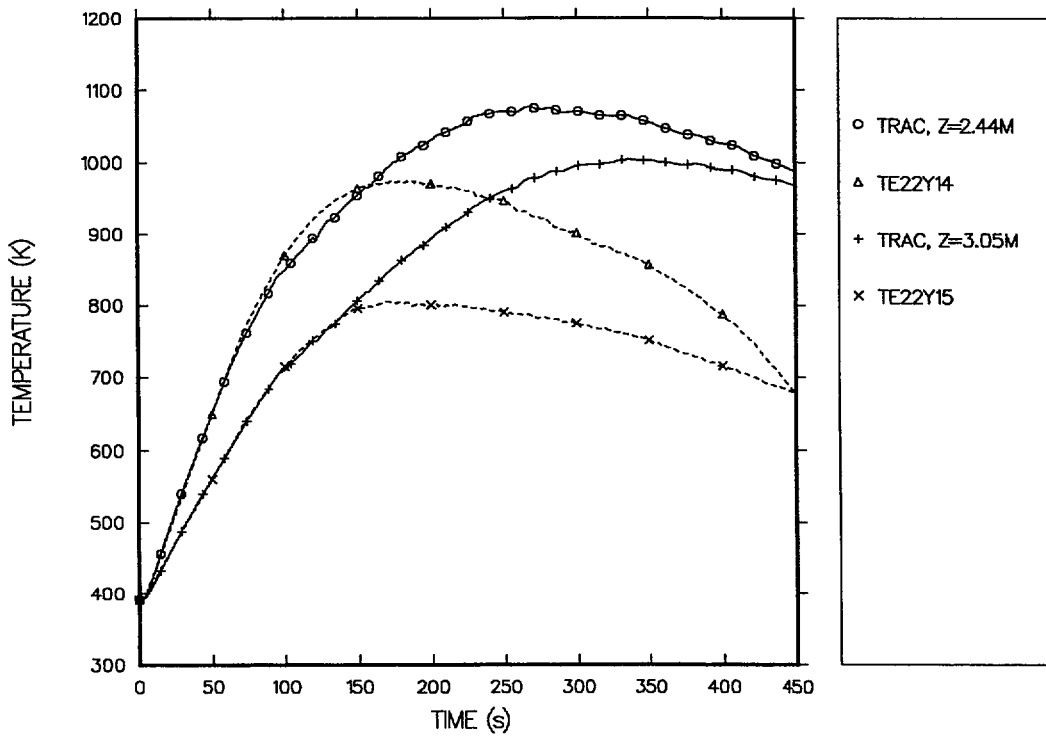


Fig. J-6. CCTF-14 run: Wall-temperature histories at 2.44- and 3.05-m elevations.

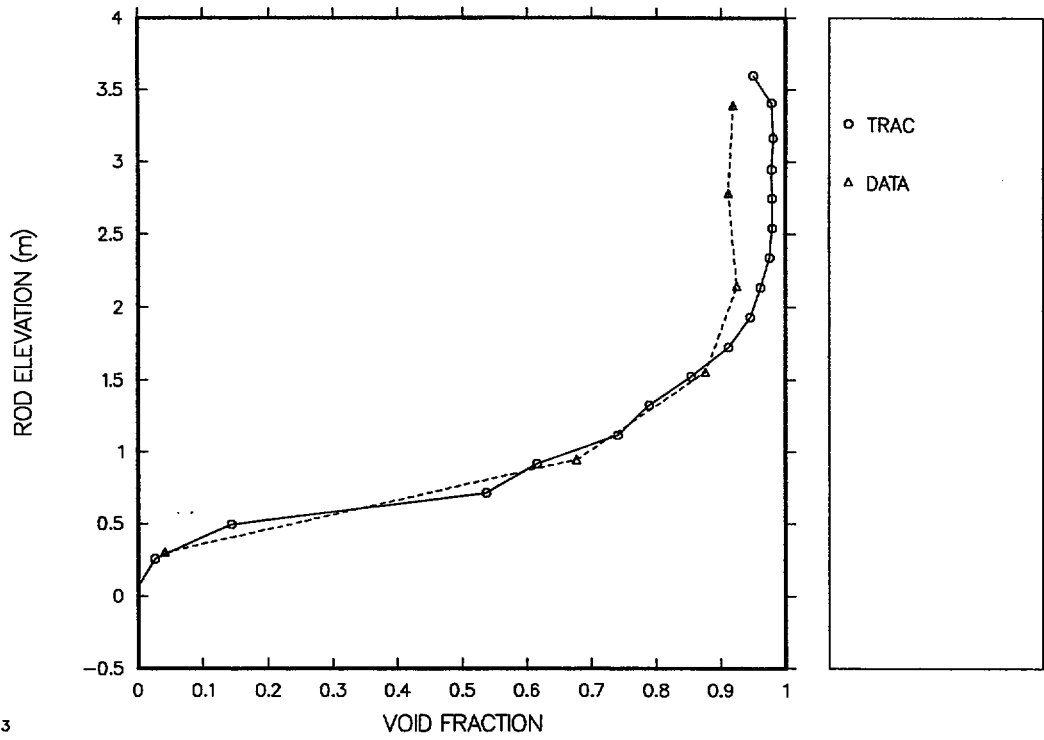


Fig. J-7. Comparison of predicted and measured core-axial void-fraction profiles at 37 s (experimental data from Ref. 4.7-7).

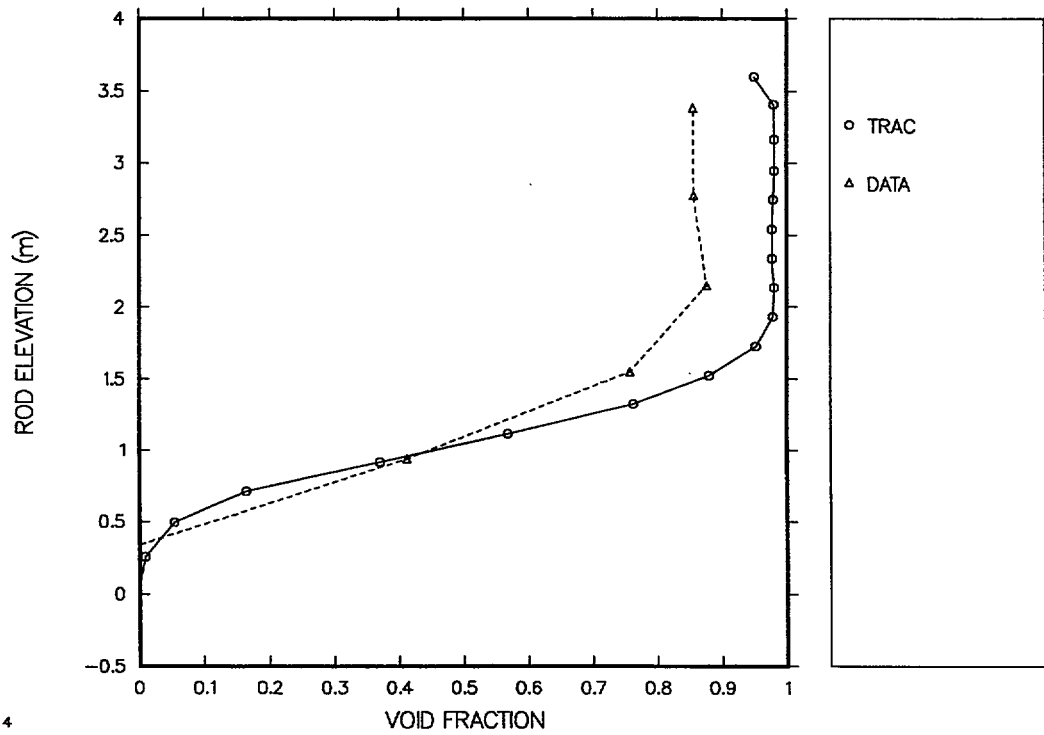


Fig. J-8. Comparison of predicted and measured core-axial void-fraction profiles at 137 s (experimental data from Ref. 4.7-7).

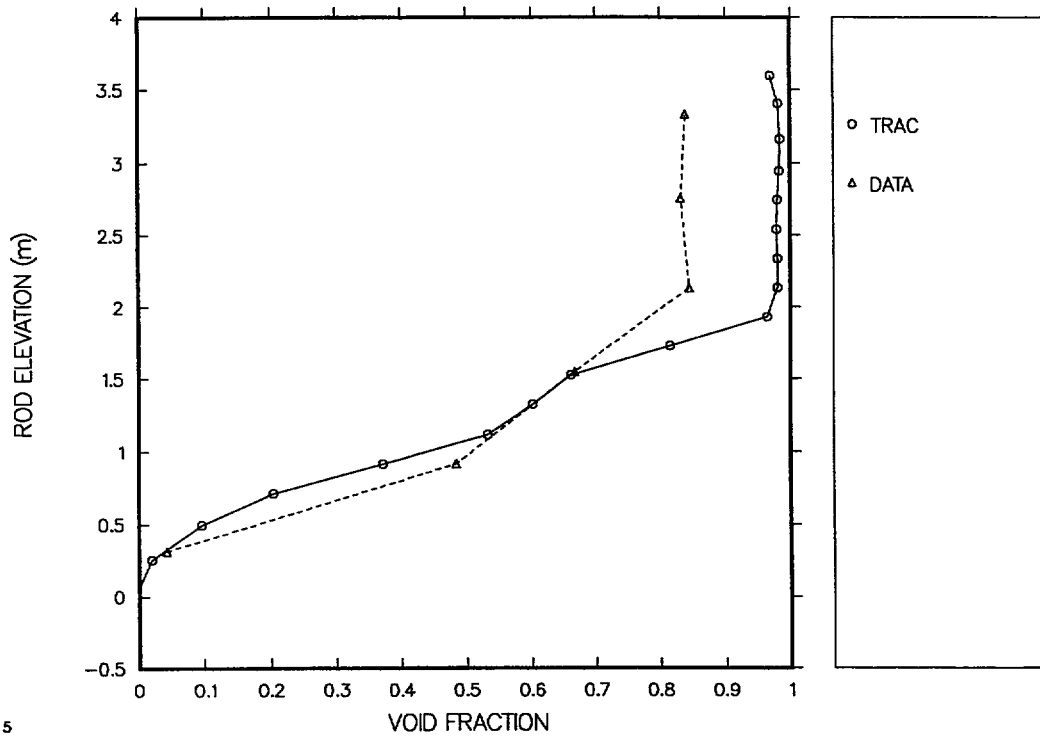


Fig. J-9. Comparison of predicted and measured core-axial void-fraction profiles at 237 s (experimental data from Ref. 4.7-7).

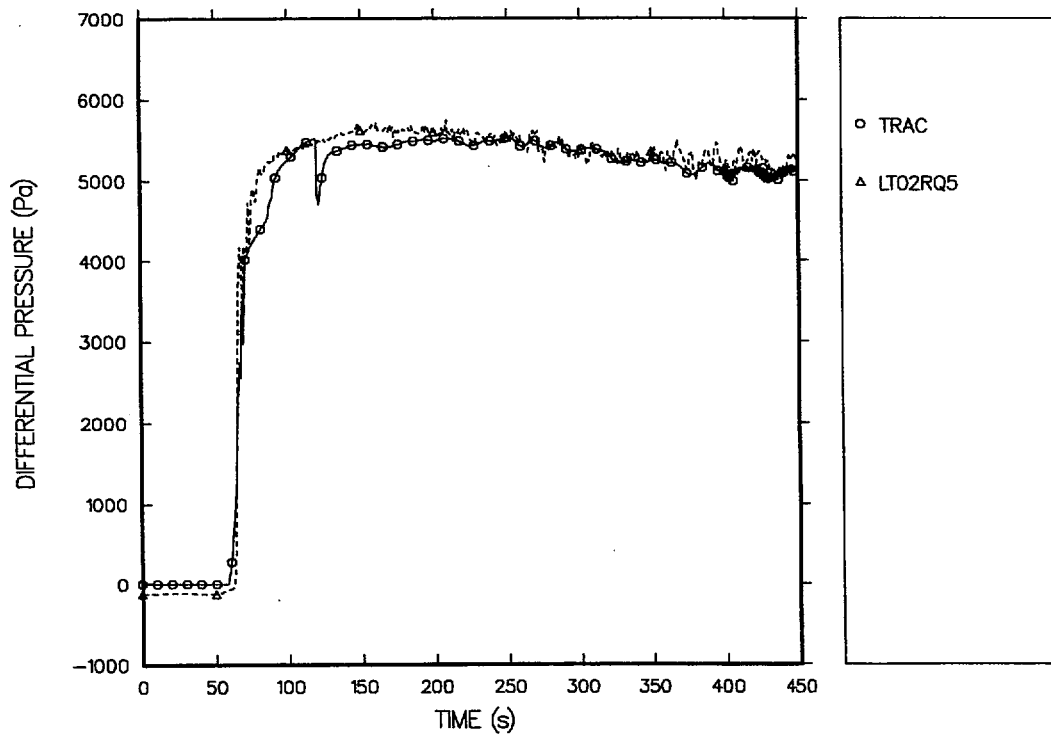


Fig. J-10. CCTF-14 run: Core ΔP history between the 0.0- and 0.61-m elevations.

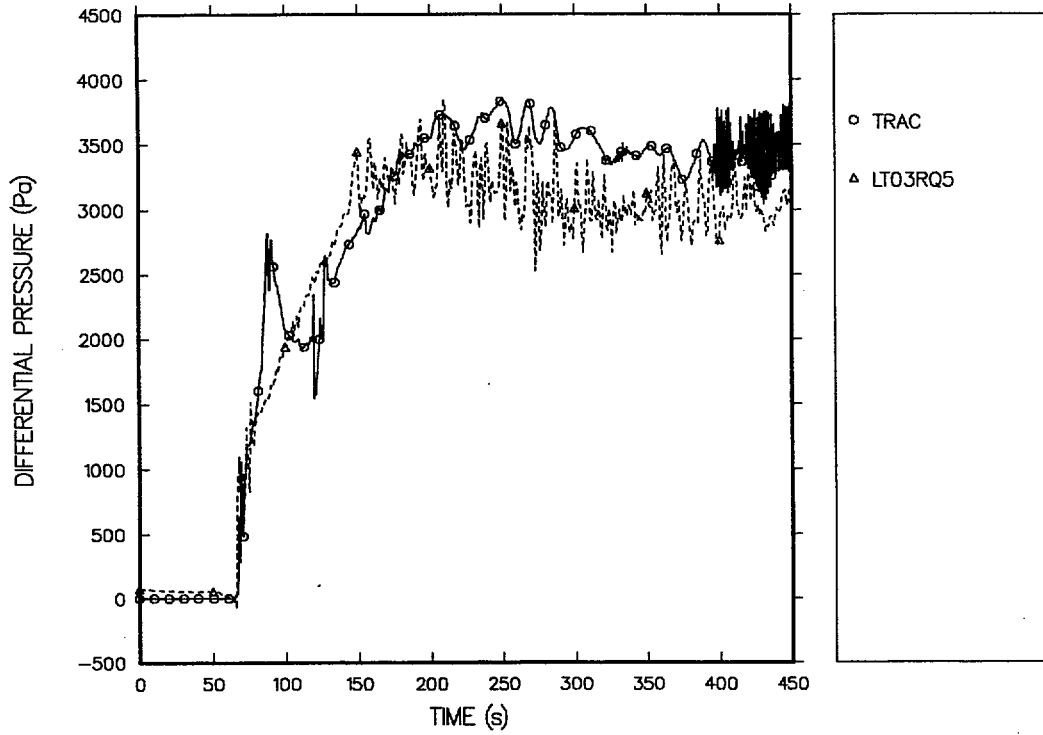


Fig. J-11. CCTF-14 run: Core ΔP history between the 0.61- and 1.22-m elevations.

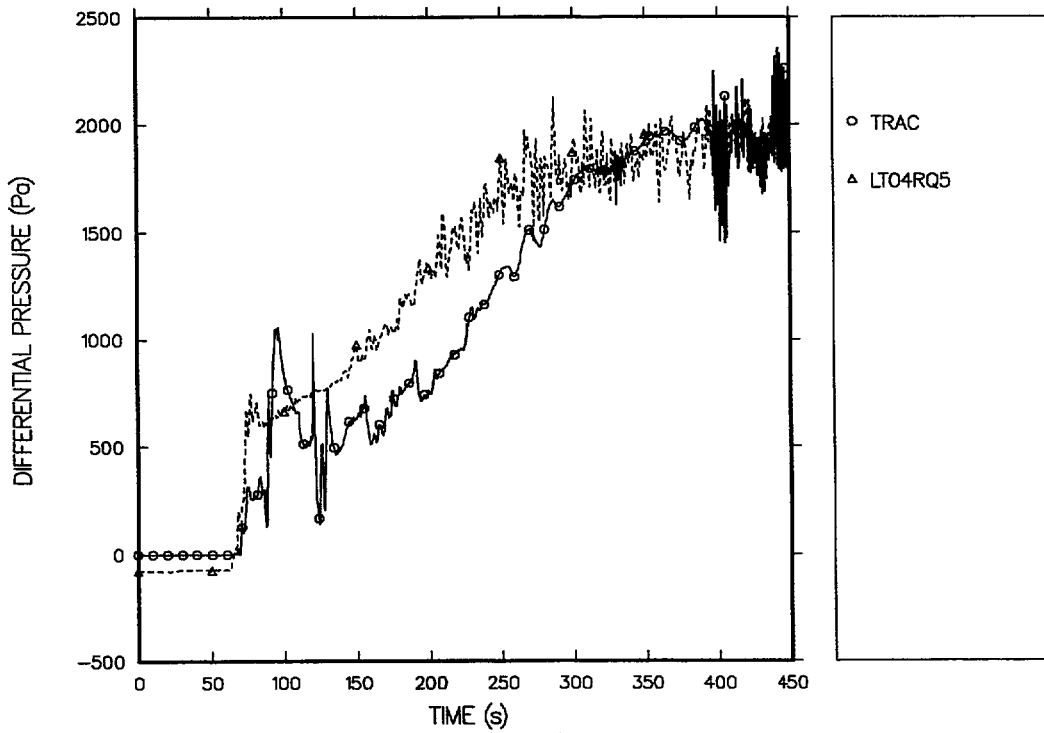


Fig. J-12. CCTF-14 run: Core ΔP history between the 1.22- and 1.83-m elevations.

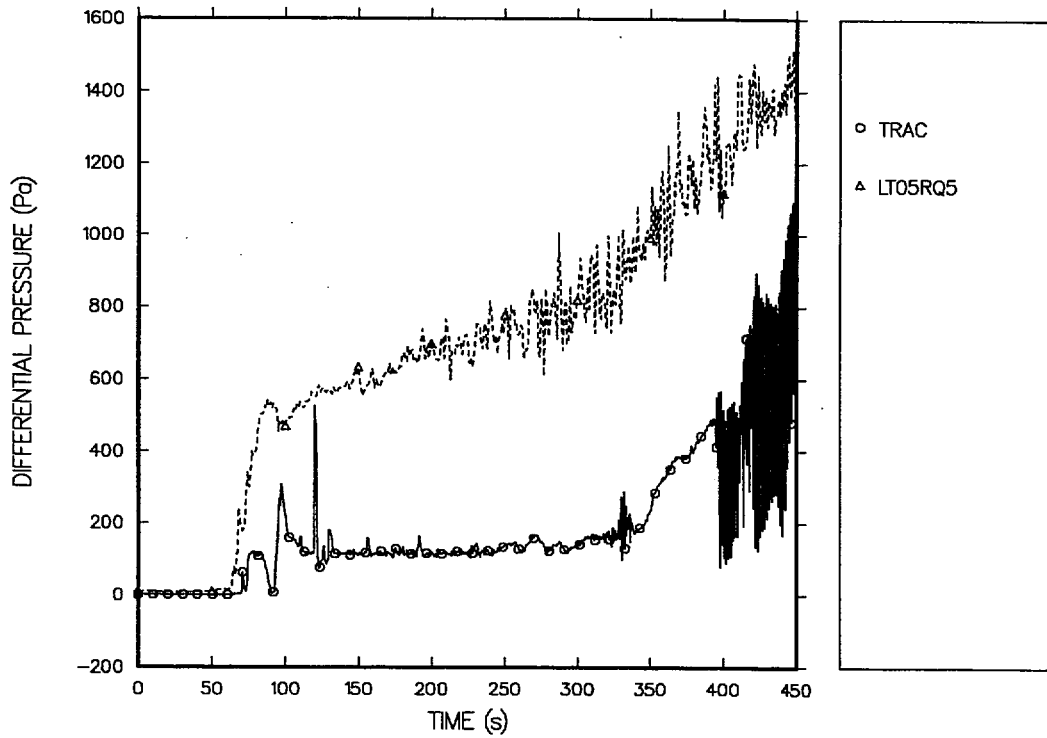


Fig. J-13. CCTF-14 run: Core ΔP history between the 1.83- and 2.44-m elevations.

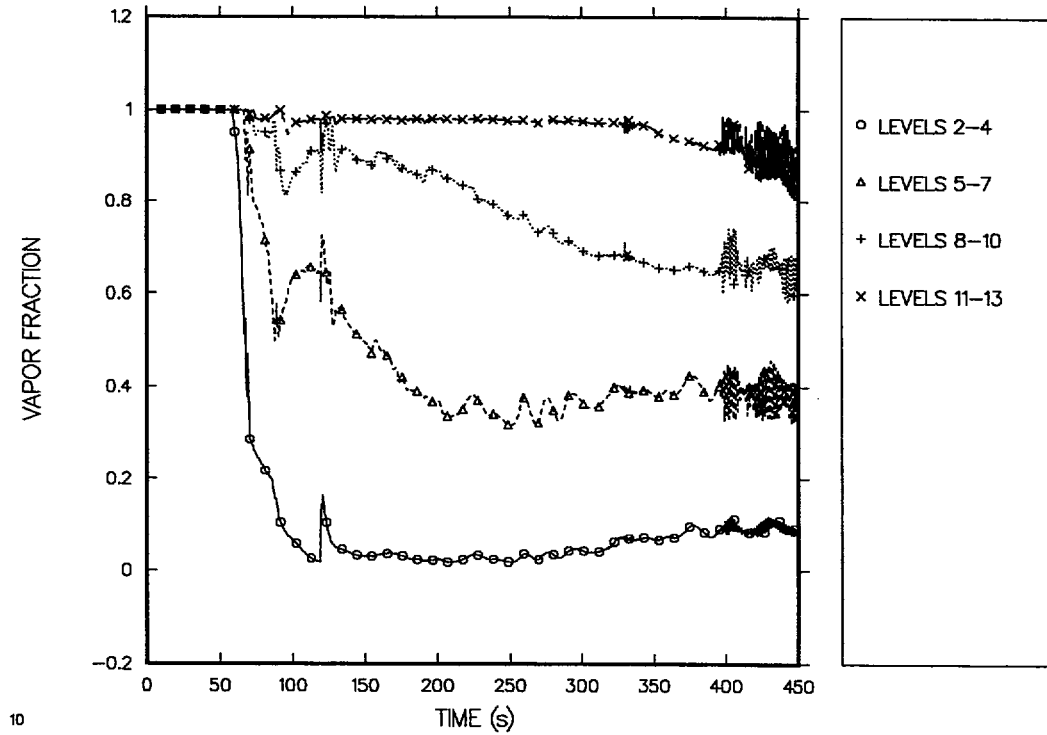
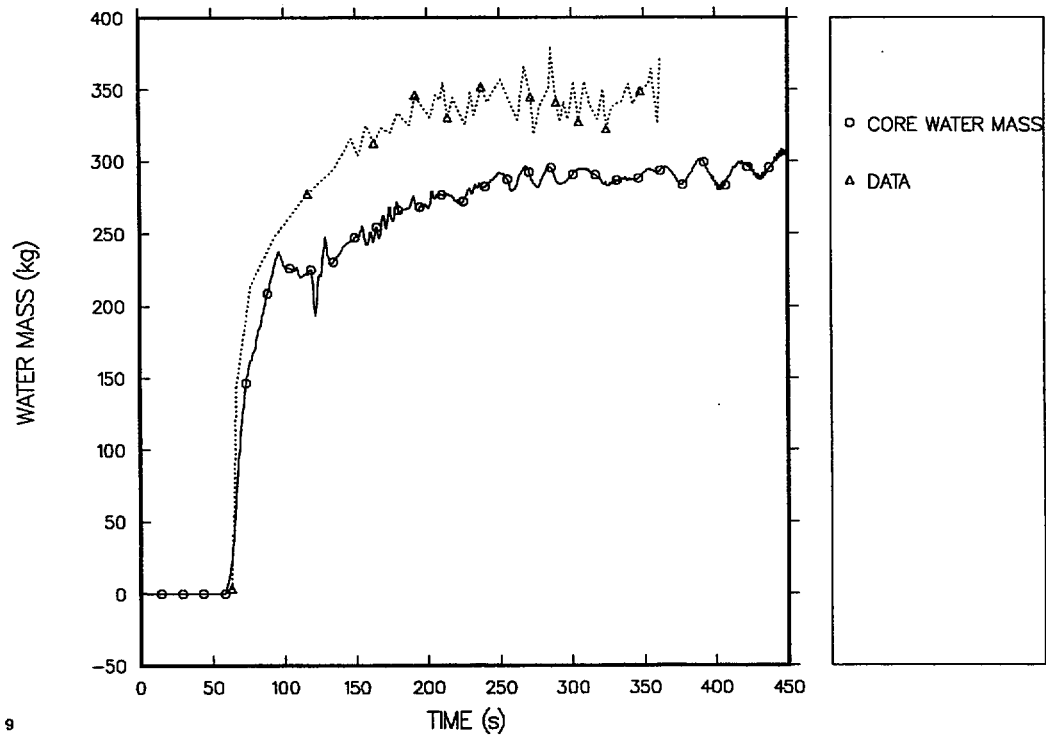


Fig. J-14. CCTF-14 run: Predicted void-fraction histories within the core.



9

Fig. J-15. CCTF-14 run: Comparison of predicted and measured core mass.

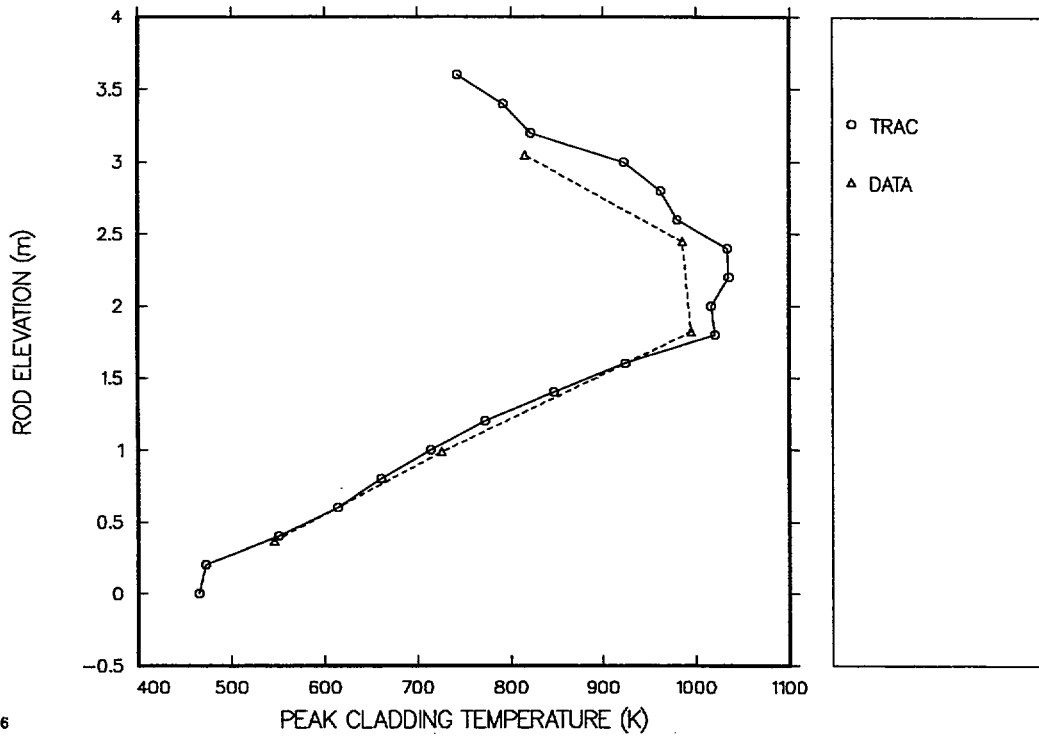


Fig. J-16. Comparison of predicted and measured PCTs with the grid-spacer model (experimental data from Ref. 4.7-7).

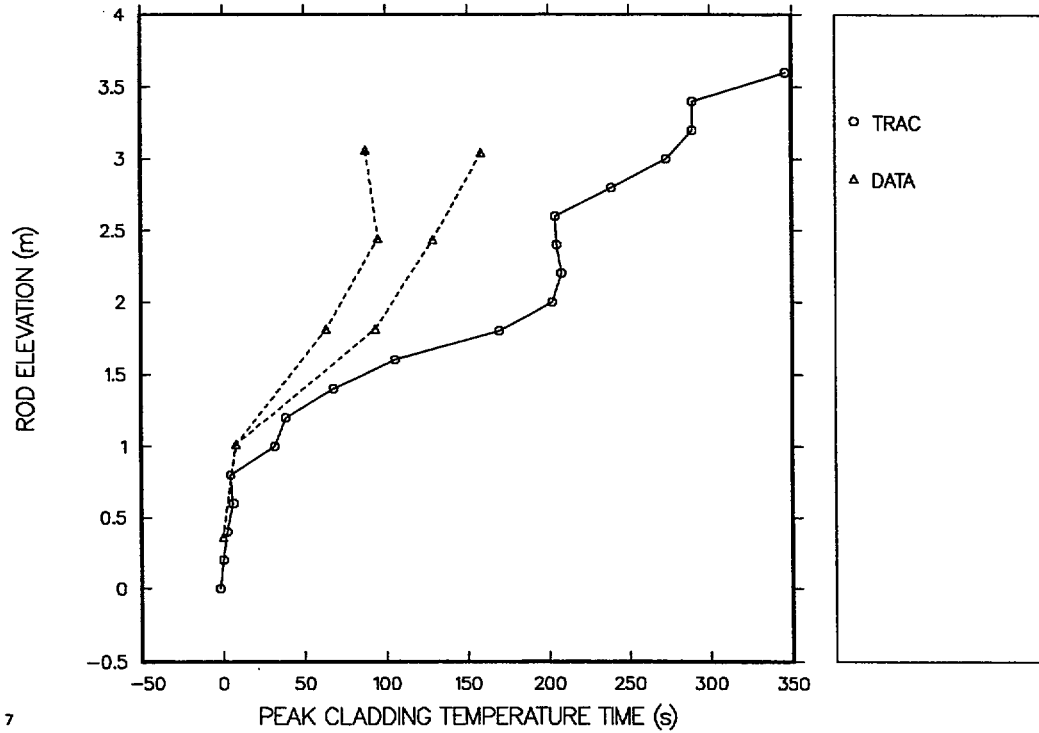


Fig. J-17. Comparison of predicted and measured PCT times with the grid-spacer model (experimental data from Ref. 4.7-7).

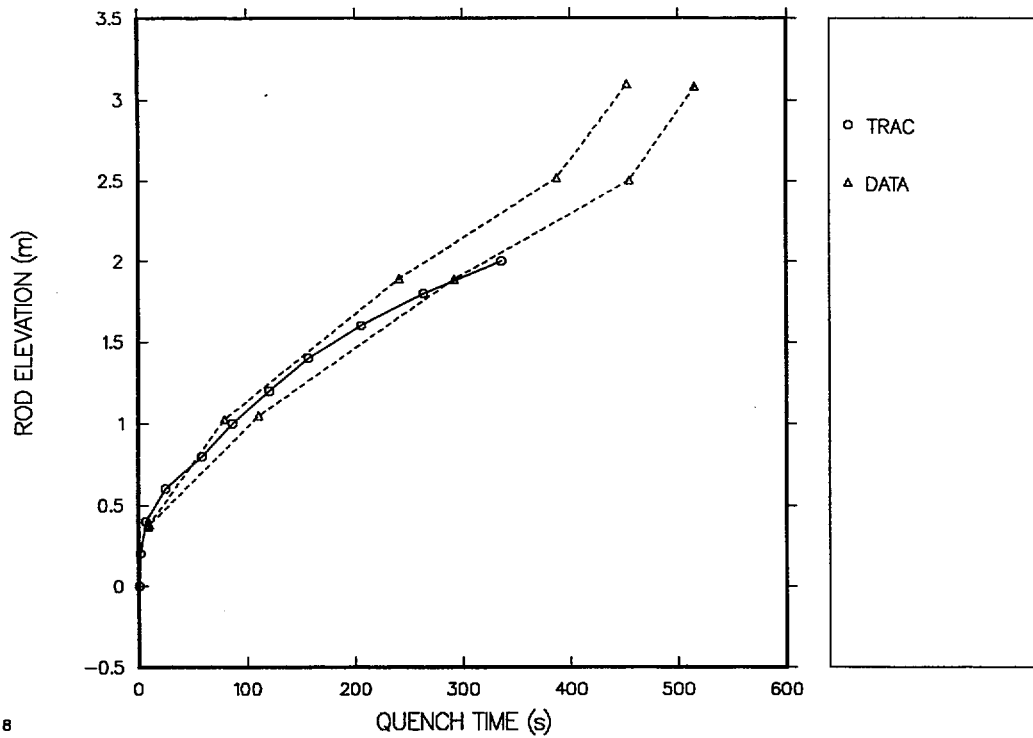


Fig. J-18. Comparison of predicted and measured quench times with the grid-spacer model (experimental data from Ref. 4.7-7).

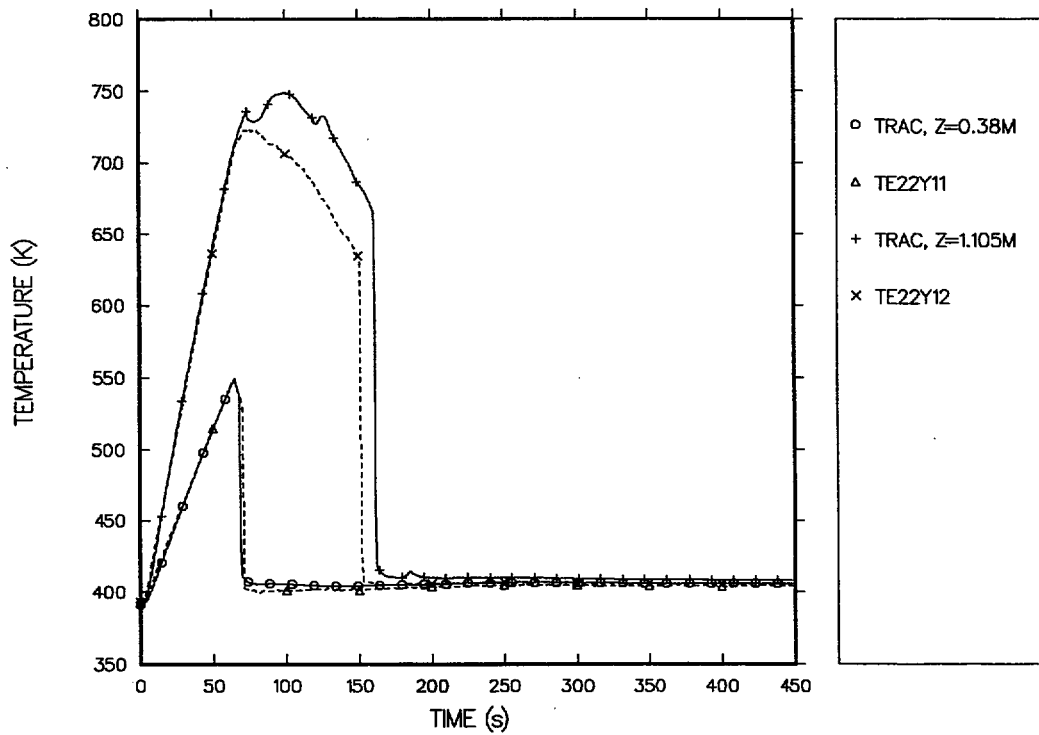


Fig. J-19. CCTF-14 run: Wall-temperature histories at 0.38- and 1.105-m elevations with the grid-spacer model.

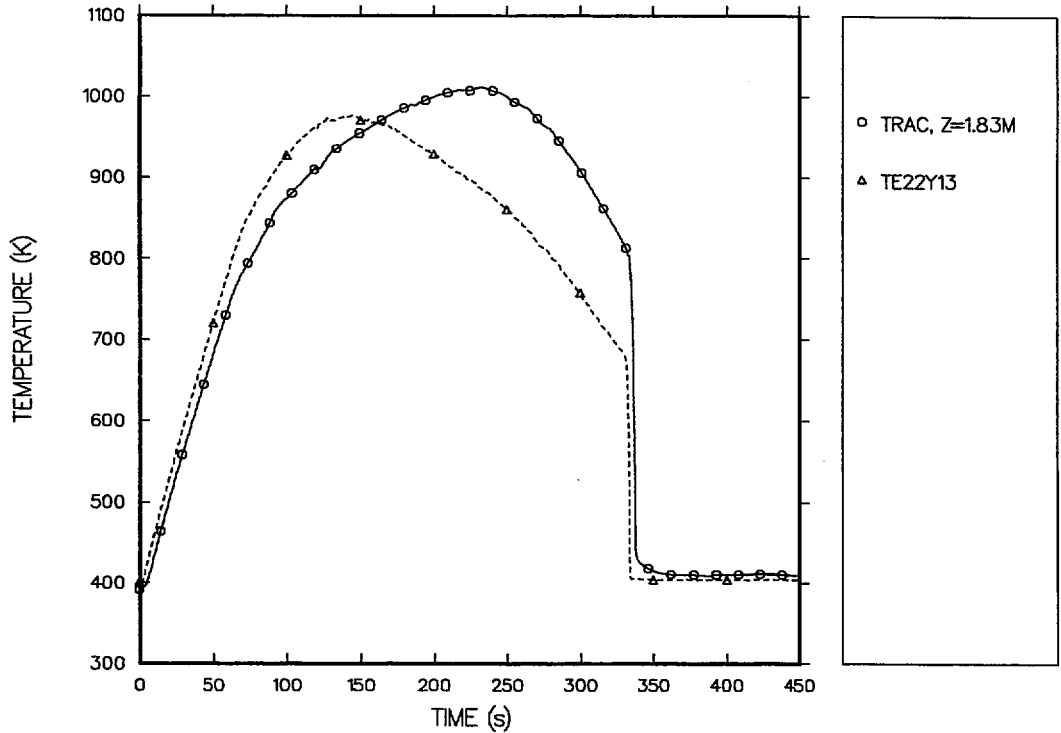


Fig. J-20. CCTF-14 run: Wall-temperature histories at 1.83-m elevations with the grid-spacer model.

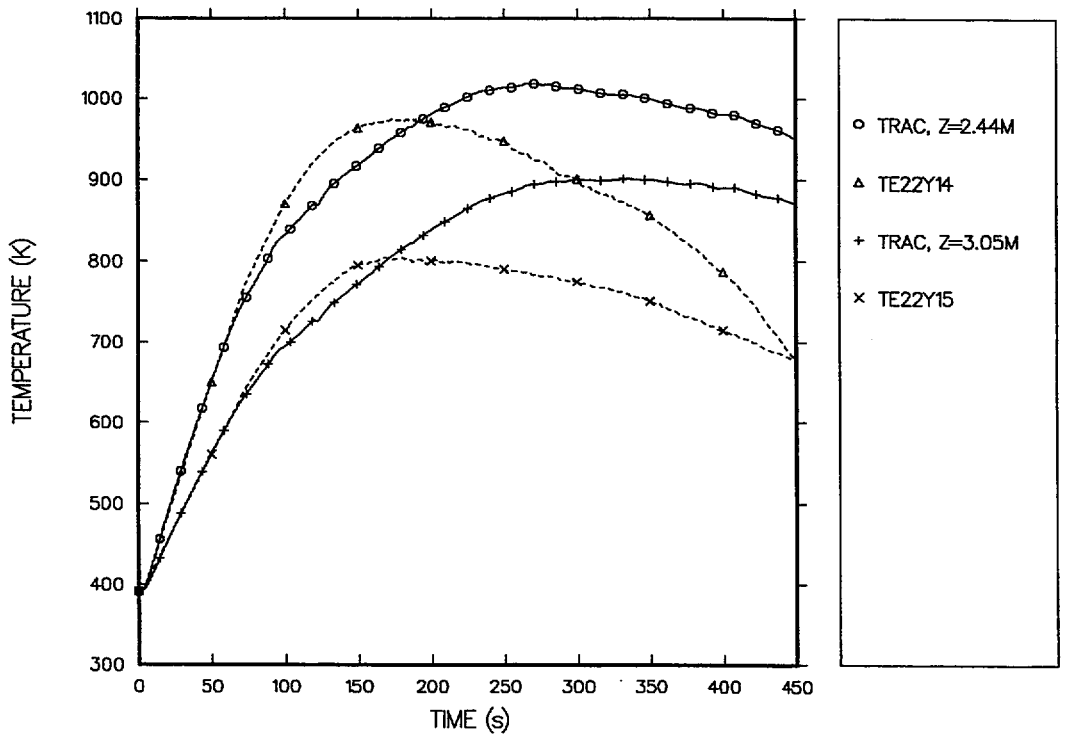


Fig. J-21. CCTF-14 run: Wall-temperature histories at 2.44- and 3.05-m elevations with the grid-spacer model.

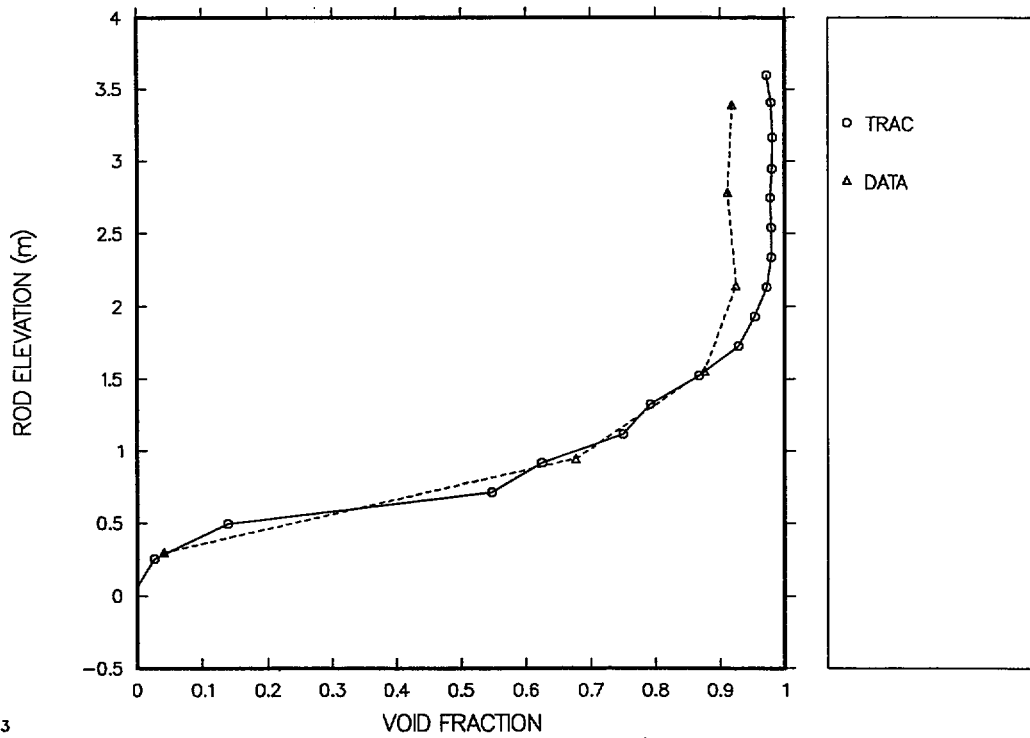


Fig. J-22. Comparison of predicted and measured core-axial void-fraction profiles at 37 s with the grid-spacer model (experimental data from Ref. 4.7-7).

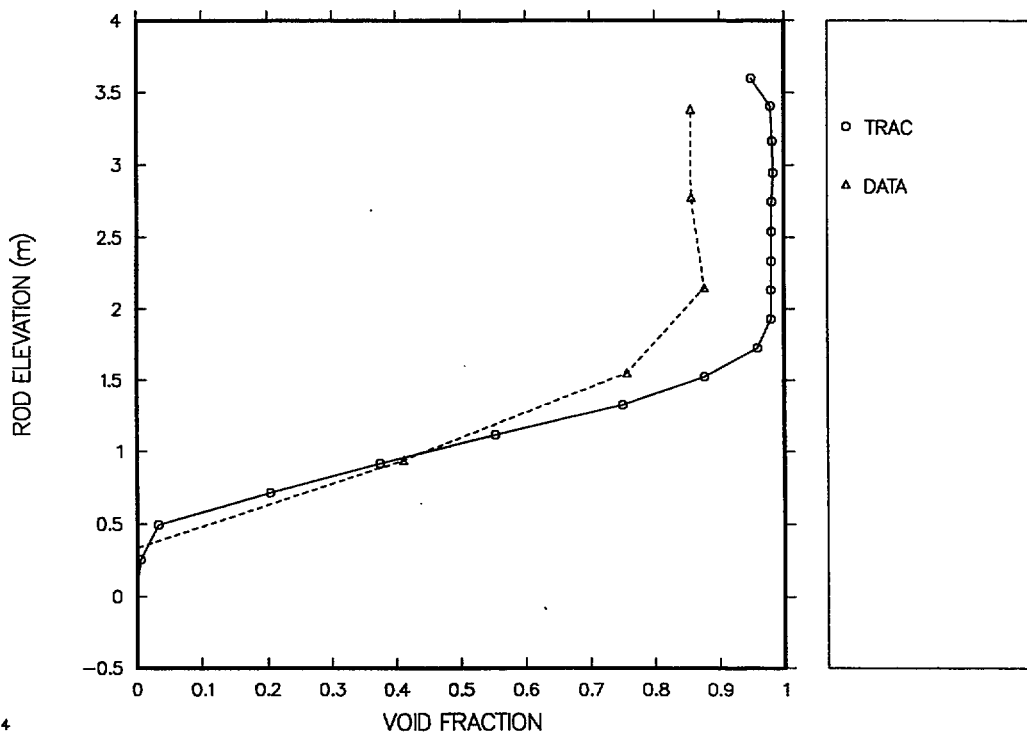


Fig. J-23. Comparison of predicted and measured core-axial void-fraction profiles at 137 s with the grid-spacer model (experimental data from Ref. 4.7-7).

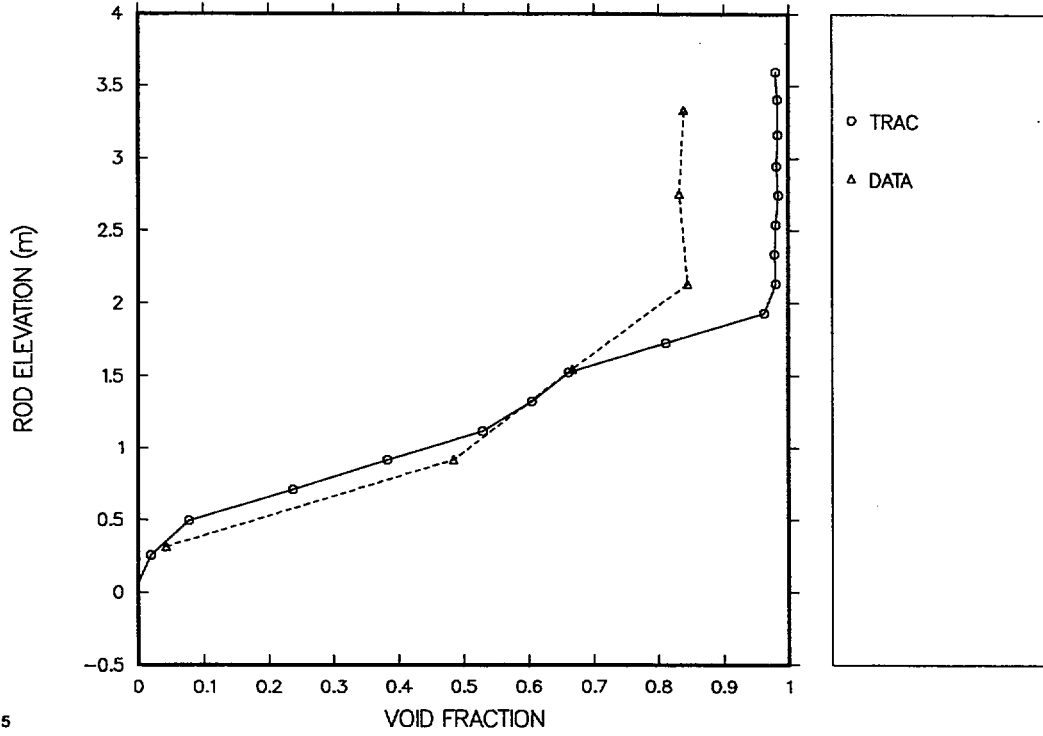


Fig. J-24. Comparison of predicted and measured core-axial void-fraction profiles at 237 s with the grid-spacer model (experimental data from Ref. 4.7-7).

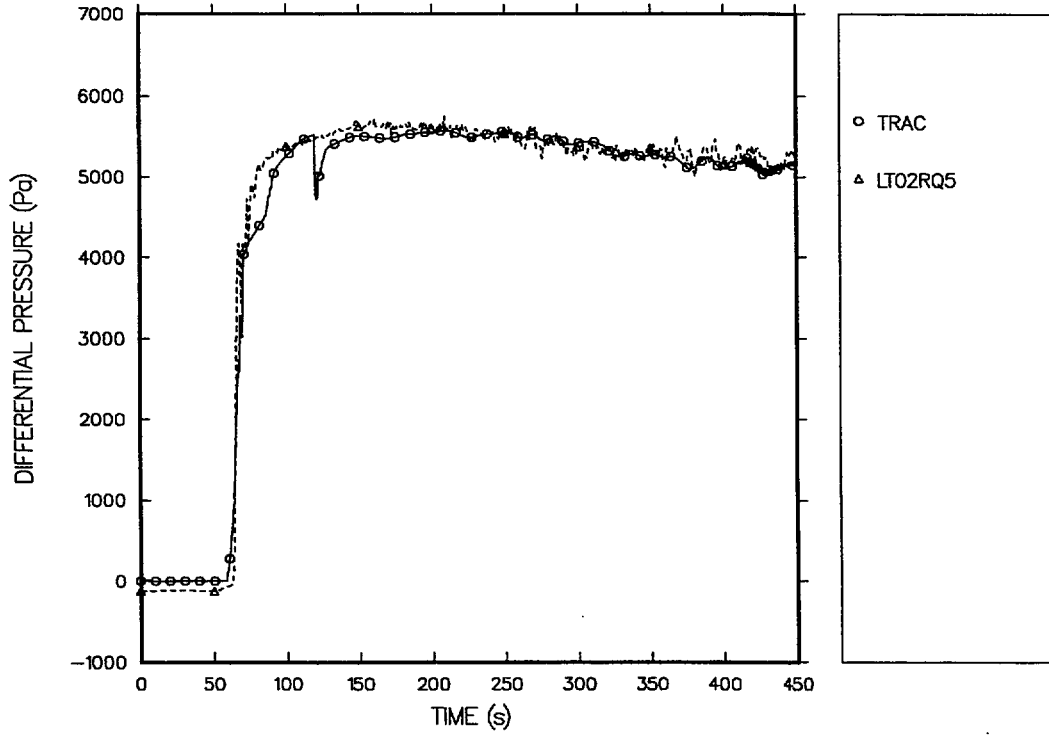


Fig. J-25. CCTF-14 run: Core- ΔP history between the 0.0- and 0.61-m elevations with the grid-spacer model.

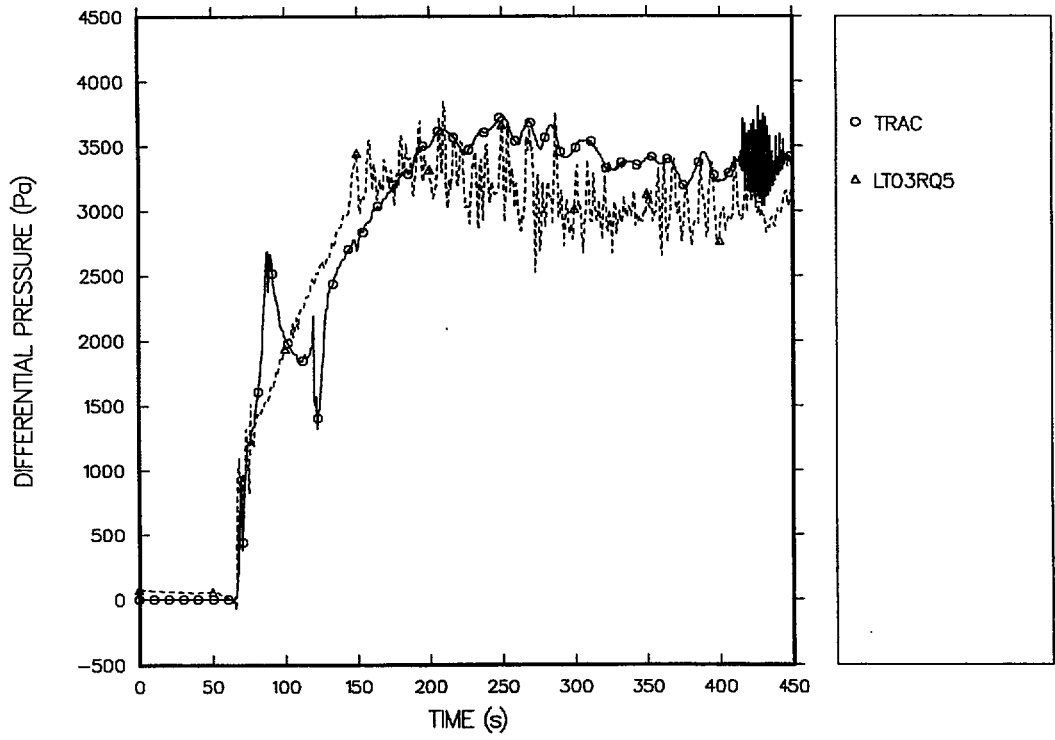


Fig. J-26. CCTF-14 run: Core- ΔP history between the 0.61- and 1.22-m elevations with the grid-spacer model.

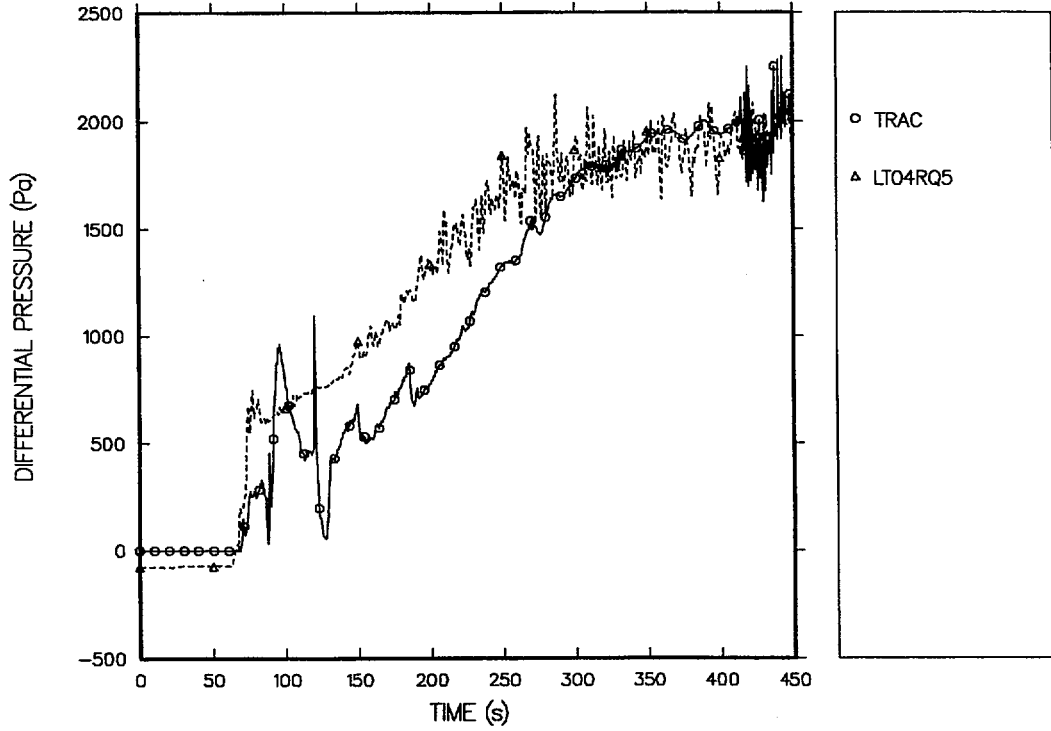


Fig. J-27. CCTF-14 run: Core- ΔP history between the 1.22- and 1.83-m elevations with the grid-spacer model.

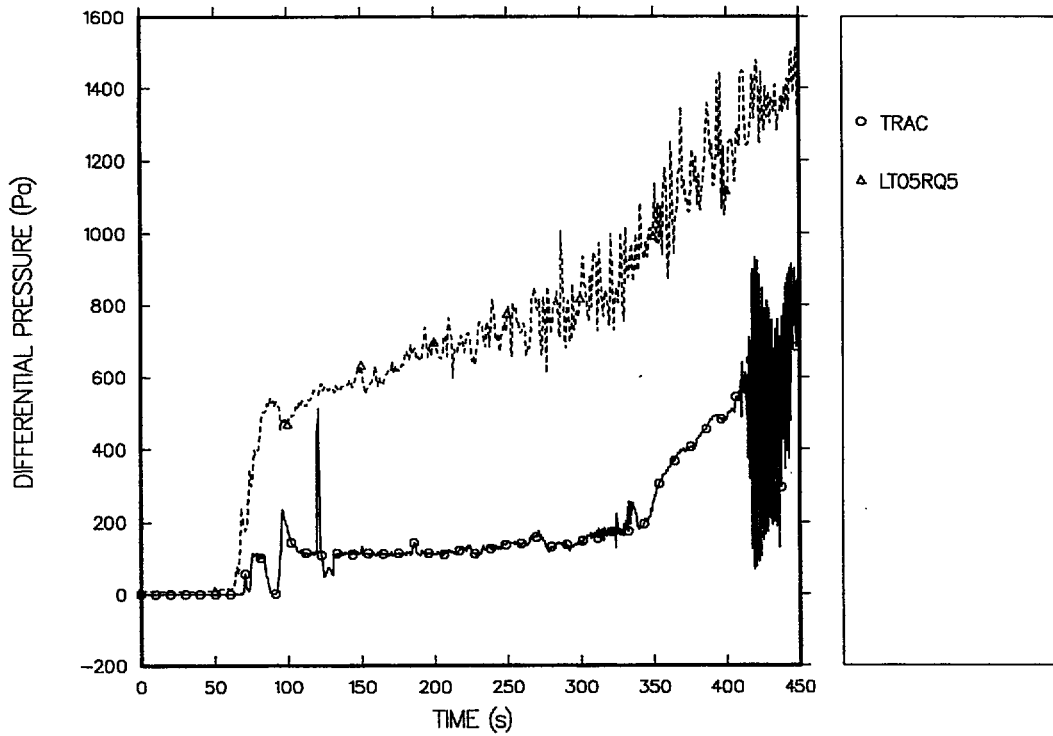


Fig. J-28. CCTF-14 run: Core- ΔP history between the 1.83- and 2.44-m elevations with the grid-spacer model.

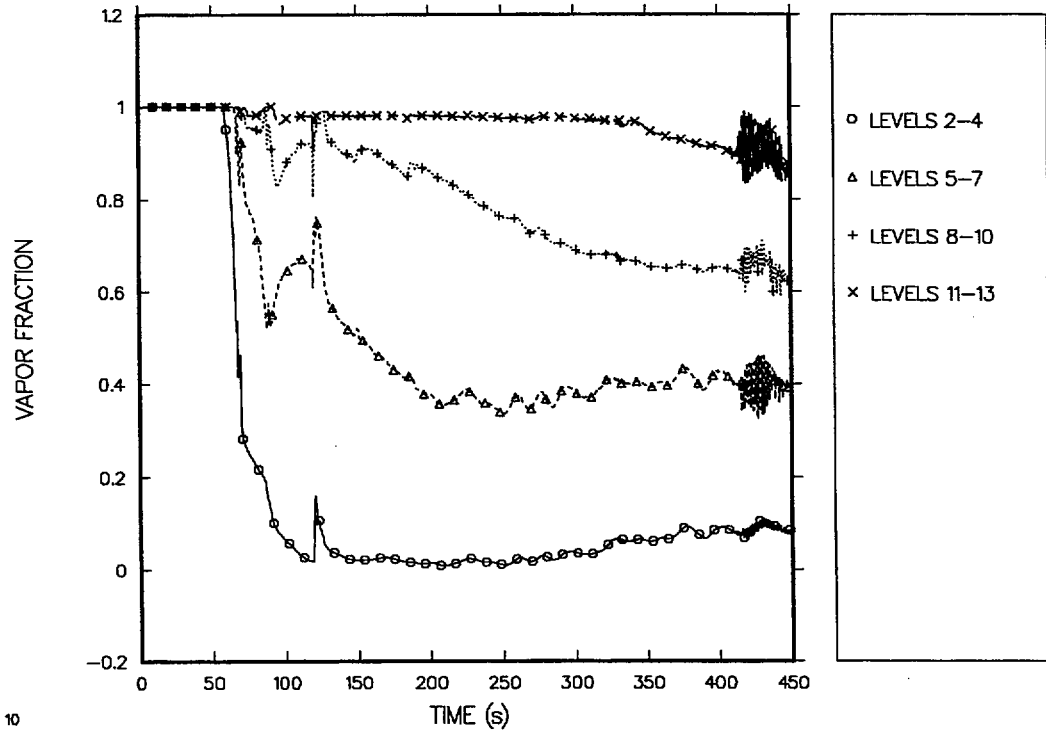


Fig. J-29. CCTF-14 run: Predicted void-fraction histories within the core with the grid-spacer model.

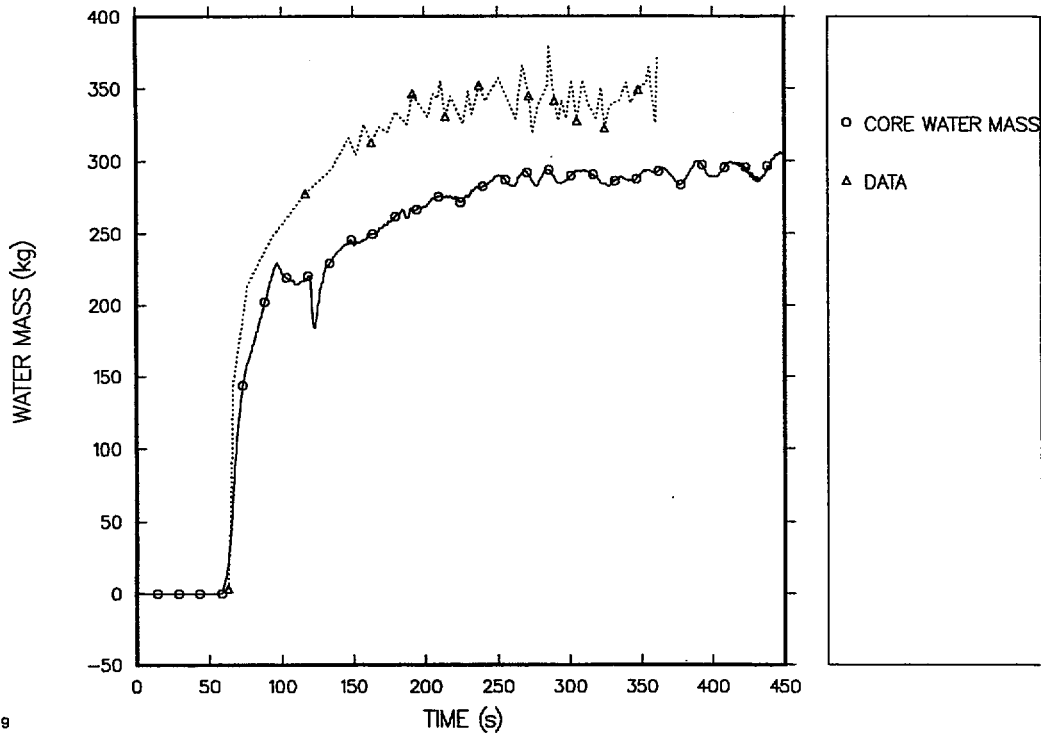


Fig. J-30. CCTF-14 run: Comparison of predicted and measured core mass with the grid-spacer model.

APPENDIX K

FLECHT SEASET FORCED REFLOOD TEST 31504 INPUT LISTING

```

1 free format
2 *
3 *      numtcr      ieos      inopt      rmat
4 *      14          0          1          0
5 flecht-seaset 161-rod unblocked bundle run no. 31504
6 07/15/81 -- run by c. p. booker
7 based on:
8 flecht-seaset 161-rod unblocked bundle test no. 4
9 (v = 1.0 in/sec  tsub = 140.0 f  trod = 1600 f)
10 (159 heater rods - rods 4g & 5g disconnected)
11 01/15/80 -- deck by r. k. fujita
12 fill component 1 subsequently modified to reflect
13 measured temperature and flow.
14 pipe component 2 liquid and vapor temperatures
15 were reversed originally.
16 vessel level 2 liquid temperature reset
17 from 400 to 370 k (line 191).
18 08/01/80 -- run by t. d. knight
19 *
20 &inopts
21 ielv=0 , ikfac=1 , newrfd=3 , nhtstr=2 , iadded=20,
22 imfr=3,
23 &end
24 *
25 *      dstep      timet
26 *      0          0.0
27 *
28 *      stdyst      transi      ncomp      njun      ipack
29 *      0          1          7          4          1
30 *
31 *      epso      epss
32 *      1.0e-04    1.0e-04
33 *
34 *      oitmax      sitmax      isolut      ncontr
35 *      10         10         0          0
36 *
37 *      ntsv      ntcb      ntcf      ntrp      ntcp
38 *      1         0         0         1         1
39 *
40 * iorder      +          +          +          +
41 *      1         2         3         4         5
42 *      6         7e
43 *
44 *****
45 *      signal variable data
46 *****
47 *
48 *      idsv      isvn      ilcn      icn1      icn2
49 *      1         0         0         0         0
50 *
51 *****
52 *      trip data
53 *****
54 *
55 *      signal      trip cntr      setpoint      dump and      trip cntr
56 *      exp trip    trip          factor        termination   time step
57 *      data sets   data sets     tables        trips         data sets
58 *
59 *      ntse      ntct      ntsf      ntqp      ntsd
60 *      1         0         0         0         0
61 *
62 *
63 *      idtp      isrt      iset      itst      idsg
64 *      1001      2         0         1         1
65 *      setp(1)    setp(2)    setp(3)    setp(4)
66 *      0.0        1.e-5
67 *      dtsp(1)    dtsp(2)    dtsp(3)    dtsp(4)
68 *      0.0        0.0
69 *      ifsp(1)    ifsp(2)    ifsp(3)    ifsp(4)
70 *      0         0
71 *
72 *****
73 *      component data
74 *****
75 *
76 *      num      id      ctitle
77 fill      1      01      $1$ test 31504 fill data
78 *      jun1      ifty      ioff
79 *      1         6         0
80 *
81 *      iftr      ifsv      nftb      nfv      nfrf
82 *      0         1         12       0         0
83 *

```

84	*	twtdold	rfmx	concin	felv	
85		0.	1.e+6	0.	0.	
86	*					
87	*	dxin	volin	alpin	vlin	tlin
88		1.524e-01	2.358e-03	0.0	0.0	326.5
89	*					
90	*	pin	pain	flowin	vvin	tvlin
91		3.1165e+05	0.	0.	0.	406.8
92	*					
93	*	vmscl	vvsc1			
94		1.	1.			
95	*					
96	*	tlsc1	tvsc1	pscl	pascl	consc1
97		1.	1.	1.	1.	1.
98	*					
99		0.	0.	1.00e-05	2.73e-02s	* vmtb
100		6.52e+00	2.69e-02	6.29e+00	2.45e-02s	* vmtb
101		8.80e+00	2.44e-02	1.28e+01	2.65e-02s	* vmtb
102		1.64e+01	2.44e-02	3.92e+01	2.42e-02s	* vmtb
103		4.07e+01	2.63e-02	5.84e+01	2.62e-02s	* vmtb
104		6.20e+01	2.46e-02	6.19e+02	2.46e-02e	* vmtb
105		0.	0.	1.00e-05	2.73e-02s	* vvttb
106		6.52e+00	2.69e-02	6.29e+00	2.45e-02s	* vvttb
107		8.80e+00	2.44e-02	1.28e+01	2.65e-02s	* vvttb
108		1.64e+01	2.44e-02	3.92e+01	2.42e-02s	* vvttb
109		4.07e+01	2.63e-02	5.84e+01	2.62e-02s	* vvttb
110		6.20e+01	2.46e-02	6.19e+02	2.46e-02e	* vvttb
111		0.	326.500	1.00e-05	326.500s	* tl1tb
112		6.52e+00	326.500	6.29e+00	326.500s	* tl1tb
113		8.80e+00	326.500	1.28e+01	326.500s	* tl1tb
114		1.64e+01	326.500	3.92e+01	326.500s	* tl1tb
115		4.07e+01	326.500	5.84e+01	326.500s	* tl1tb
116		6.20e+01	326.500	6.19e+02	326.500e	* tl1tb
117		0.	406.800	1.00e-05	406.800s	* tvttb
118		6.52e+00	406.800	6.29e+00	406.800s	* tvttb
119		8.80e+00	406.800	1.28e+01	406.800s	* tvttb
120		1.64e+01	406.800	3.92e+01	406.800s	* tvttb
121		4.07e+01	406.800	5.84e+01	406.800s	* tvttb
122		6.20e+01	406.800	6.19e+02	406.800e	* tvttb
123		0.	0.000	1.00e-05	0.000s	* alptb
124		6.52e+00	0.000	6.29e+00	0.000s	* alptb
125		8.80e+00	0.000	1.28e+01	0.000s	* alptb
126		1.64e+01	0.000	3.92e+01	0.000s	* alptb
127		4.07e+01	0.000	5.84e+01	0.000s	* alptb
128		6.20e+01	0.000	6.19e+02	0.000e	* alptb
129		0.	3.1165e+05	1.00e-05	3.1165e+05s	* ptb
130		6.52e+00	3.1165e+05	6.29e+00	3.1165e+05s	* ptb
131		8.80e+00	3.1165e+05	1.28e+01	3.1165e+05s	* ptb
132		1.64e+01	3.1165e+05	3.92e+01	3.1165e+05s	* ptb
133		4.07e+01	3.1165e+05	5.84e+01	3.1165e+05s	* ptb
134		6.20e+01	3.1165e+05	6.19e+02	3.1165e+05e	* ptb
135		0.	0.	1.00e-05	0.s	* patb
136		6.52e+00	0.	6.29e+00	0.s	* patb
137		8.80e+00	0.	1.28e+01	0.s	* patb
138		1.64e+01	0.	3.92e+01	0.s	* patb
139		4.07e+01	0.	5.84e+01	0.s	* patb
140		6.20e+01	0.	6.19e+02	0.e	* patb
141	*					
142	*	type	num	id	ctitle	
143	pipe		2	02	\$2\$ inlet	
144	*					
145	*	ncells	nodes	jun1	jun2	epsw
146		1	0	1	2	0.
147	*					
148	*	ichf	iconc	iacc	ipow	
149		0	0	0	0	
150	*					
151	*	radin	th	hout1	houtv	tout1
152		9.685e-02	5.080e-03	0.0	0.0	300.0
153	*					
154	*	toutv	powin	powoff	rpowmx	powsc1
155		300.0	0.	0.	0.	1.
156	*					
157	f	1.524e-01e	* dx			
158	f	2.358e-03e	* vol			
159	f	1.547e-02e	* fa			
160	f	0.0e	* fric			
161	f	1.0e	* grav			
162	f	1.315e-02e	* hd			
163	f	1e	* nff			
164	f	0.0e	* alp			
165	f	0.0e	* vl			
166	f	0.0e	* vv			
167	f	326.5e	* tl			
168	f	405.0e	* tv			
169	f	3.1165e+05e	* p			
170	f	0.0e	* pa			
171	*					
172	*	type	num	id	ctitle	
173	pipe		3	03	\$3\$ outlet	
174	*					
175	*	ncells	nodes	jun1	jun2	epsw

```

176      1      0      3      4      0.
177 *
178 *      ichf      iconc      iacc      ipow
179 *      0      0      0      0
180 *
181 *      radin      th      hout1      houtv      tout1
182 *      9.685e-02      5.080e-03      0.0      0.0      300.0
183 *
184 *      toutv      powin      powoff      rpowmx      powscl
185 *      300.0      0.      0.      0.      1.
186 *
187 f      1.524e-01e      * dx
188 f      2.358e-03e      * vol
189 f      1.547e-02e      * fa
190 f      0.0e      * fric
191 f      1.0e      * grav
192 f      1.315e-02e      * hd
193 *      1      -1e      * nff
194 f      1.0e      * alp
195 f      0.0e      * vl
196 f      0.0e      * vv
197 f      403.9e      * tl
198 f      403.9e      * tv
199 f      2.7745e05e      * p
200 f      0.0e      * pa
201 *
202 *      type      num      id      ctitle
203 break      4      04      $4$ pressure boundary
204 *
205 *      jun1      ibty      isat      ioff
206 *      4      0      0      0
207 *
208 *      dbcin      volin      alpin      tin      pin
209 *      1.524e-01      2.358e-02      1.0      407.55      2.7745e05
210 *
211 *      pain      concin      rbmx      poff      belv
212 *      0.      0.      0.      0.      0.
213 *
214 *      type      num      id      ctitle
215 vessel      5      05      $5$ vessel
216 *
217 *      nasx      nrsx      ntsx      nscr      ivssbf
218 *      18      1      1      2      0
219 *
220 *      idcu      idcl      idcr      icru      icrl
221 *      0      0      0      17      2
222 *
223 *      icrr      ilcsp      iucsp      iuhp      iconc
224 *      1      0      0      0      0
225 *
226 *      igeom      nvent      nvvtb      nsgrid
227 *      1      0      0      0 * 8 *
228 *
229 *      shelv      epsw
230 *      0.      1.0e-05
231 *
232 * z      +      +      +      +      +
233 *      0.1778      0.4064      0.9550      1.1379      1.3208
234 *      1.5037      1.6866      1.8694      2.0523      2.4181
235 *      2.6010      2.7838      2.9667      3.1496      3.3325
236 *      3.5154      4.0640      4.2926e
237 *
238 * rad      +      +      +      +
239 *      1.716e-01e
240 *
241 * th      +      +      +      +
242 *      1.716e-01e
243 *
244 * funh      +      +      +      +
245 *      0.2 e
246 *
247 * nhsca      +      +      +      +
248 *      6e
249 *
250 * zsgrid      +      +      +      +
251 *      .4064      .9398      1.4478      1.9812      2.5146s
252 *      3.0226      3.5560      4.0640e
253 *
254 *      lisrl      lisrc      lisrf      ljuns
255 *      1      1      -2      2
256 *      18      1      2      3
257 *
258 * level 1 (lower plenum)
259 *
260 f      0.0e      * cfzl-t
261 f      0.05 e      * cfzl-z
262 f      0.0e      * cfzl-r
263 f      0.0e      * cfzv-t
264 f      0.05 e      * cfzv-z
265 f      0.0e      * cfzv-r
266 f      5.246e-01e      * vol
267 f      0.0e      * fa-t

```

```

268 f 5.246e-01e * fa-z
269 f 0.0e * fa-r
270 f 0.0e * hd-t
271 f 1.315e-02e * hd-z
272 f 0.0e * hd-r
273 f 0.0e * alpn
274 f 0.0e * vvn-t
275 f 0.0e * vvn-z
276 f 0.0e * vvn-r
277 f 0.0e * vln-t
278 f 0.0e * vln-z
279 f 0.0e * vln-r
280 f 350.0e * tvn
281 f 323.15e * tln
282 f 2.7745e05e * pn
283 f 0.0e * pan
284 *
285 * level 2 (unheated section)
286 *
287 f 0.0e * cfzl-t
288 f 0.05 e * cfzl-z
289 f 0.0e * cfzl-r
290 f 0.0e * cfzv-t
291 f 0.05 e * cfzv-z
292 f 0.0e * cfzv-r
293 f 5.246e-01e * vol
294 f 0.0e * fa-t
295 f 5.246e-01e * fa-z
296 f 0.0e * fa-r
297 f 0.0e * hd-t
298 f 1.315e-02e * hd-z
299 f 0.0e * hd-r
300 f 0.0e * alpn
301 f 0.0e * vvn-t
302 f 0.0e * vvn-z
303 f 0.0e * vvn-r
304 f 0.0e * vln-t
305 f 0.0e * vln-z
306 f 0.0e * vln-r
307 f 400.0e * tvn
308 f 323.15e * tln
309 f 2.7745e05e * pn
310 f 0.0e * pan
311 *
312 * level 3 (first heated section)
313 *
314 f 0.0e * cfzl-t
315 f 0.05 e * cfzl-z
316 f 0.0e * cfzl-r
317 f 0.0e * cfzv-t
318 f 0.05 e * cfzv-z
319 f 0.0e * cfzv-r
320 f 5.246e-01e * vol
321 f 0.0e * fa-t
322 f 5.246e-01e * fa-z
323 f 0.0e * fa-r
324 f 0.0e * hd-t
325 f 1.315e-02e * hd-z
326 f 0.0e * hd-r
327 f 1.0e * alpn
328 f 0.0e * vvn-t
329 f 0.0e * vvn-z
330 f 0.0e * vvn-r
331 f 0.0e * vln-t
332 f 0.0e * vln-z
333 f 0.0e * vln-r
334 f 570.0e * tvn
335 f 405.0e * tln
336 f 2.7745e05e * pn
337 f 0.0e * pan
338 *
339 * level 4
340 *
341 f 0.0e * cfzl-t
342 f 0.05 e * cfzl-z
343 f 0.0e * cfzl-r
344 f 0.0e * cfzv-t
345 f 0.05 e * cfzv-z
346 f 0.0e * cfzv-r
347 f 5.246e-01e * vol
348 f 0.0e * fa-t
349 f 5.246e-01e * fa-z
350 f 0.0e * fa-r
351 f 0.0e * hd-t
352 f 1.315e-02e * hd-z
353 f 0.0e * hd-r
354 f 1.0e * alpn
355 f 0.0e * vvn-t
356 f 0.0e * vvn-z
357 f 0.0e * vvn-r
358 f 0.0e * vln-t
359 f 0.0e * vln-z

```

```

360 f          0.0e * vln-r
361 f          572.0e * tvn
362 f          405.0e * tln
363 f          2.7745e05e * pn
364 f          0.0e * pan
365 *
366 * level 5
367 *
368 f          0.0e * cfzl-t
369 f          0.05 e * cfzl-z
370 f          0.0e * cfzl-r
371 f          0.0e * cfzv-t
372 f          0.05 e * cfzv-z
373 f          0.0e * cfzv-r
374 f          5.246e-01e * vol
375 f          0.0e * fa-t
376 f          5.246e-01e * fa-z
377 f          0.0e * fa-r
378 f          0.0e * hd-t
379 f          1.315e-02e * hd-z
380 f          0.0e * hd-r
381 f          1.0e * alpn
382 f          0.0e * vvn-t
383 f          0.0e * vvn-z
384 f          0.0e * vvn-r
385 f          0.0e * vln-t
386 f          0.0e * vln-z
387 f          0.0e * vln-r
388 f          608.0e * tvn
389 f          405.0e * tln
390 f          2.7745e05e * pn
391 f          0.0e * pan
392 *
393 * level 6
394 *
395 f          0.0e * cfzl-t
396 f          0.05 e * cfzl-z
397 f          0.0e * cfzl-r
398 f          0.0e * cfzv-t
399 f          0.05 e * cfzv-z
400 f          0.0e * cfzv-r
401 f          5.246e-01e * vol
402 f          0.0e * fa-t
403 f          5.246e-01e * fa-z
404 f          0.0e * fa-r
405 f          0.0e * hd-t
406 f          1.315e-02e * hd-z
407 f          0.0e * hd-r
408 f          1.0e * alpn
409 f          0.0e * vvn-t
410 f          0.0e * vvn-z
411 f          0.0e * vvn-r
412 f          0.0e * vln-t
413 f          0.0e * vln-z
414 f          0.0e * vln-r
415 f          653.0e * tvn
416 f          405.0e * tln
417 f          2.7745e05e * pn
418 f          0.0e * pan
419 *
420 * level 7
421 *
422 f          0.0e * cfzl-t
423 f          0.05 e * cfzl-z
424 f          0.0e * cfzl-r
425 f          0.0e * cfzv-t
426 f          0.05 e * cfzv-z
427 f          0.0e * cfzv-r
428 f          5.246e-01e * vol
429 f          0.0e * fa-t
430 f          5.246e-01e * fa-z
431 f          0.0e * fa-r
432 f          0.0e * hd-t
433 f          1.315e-02e * hd-z
434 f          0.0e * hd-r
435 f          1.0e * alpn
436 f          0.0e * vvn-t
437 f          0.0e * vvn-z
438 f          0.0e * vvn-r
439 f          0.0e * vln-t
440 f          0.0e * vln-z
441 f          0.0e * vln-r
442 f          700.0e * tvn
443 f          405.0e * tln
444 f          2.7745e05e * pn
445 f          0.0e * pan
446 *
447 * level 8
448 *
449 f          0.0e * cfzl-t
450 f          0.05 e * cfzl-z
451 f          0.0e * cfzl-r

```



```

452 f          0.0e * cfzv-t
453 f          0.05 e * cfzv-z
454 f          0.0e * cfzv-r
455 f    5.246e-01e * vol
456 f          0.0e * fa-t
457 f    5.246e-01e * fa-z
458 f          0.0e * fa-r
459 f          0.0e * hd-t
460 f    1.315e-02e * hd-z
461 f          0.0e * hd-r
462 f          1.0e * alpn
463 f          0.0e * vvn-t
464 f          0.0e * vvn-z
465 f          0.0e * vvn-r
466 f          0.0e * vln-t
467 f          0.0e * vln-z
468 f          0.0e * vln-r
469 f          755.0e * tvn
470 f          405.0e * tln
471 f    2.7745e05e * pn
472 f          0.0e * pan
473 *
474 * level 9
475 *
476 f          0.0e * cfzl-t
477 f          0.05 e * cfzl-z
478 f          0.0e * cfzl-r
479 f          0.0e * cfzv-t
480 f          0.05 e * cfzv-z
481 f          0.0e * cfzv-r
482 f    5.246e-01e * vol
483 f          0.0e * fa-t
484 f    5.246e-01e * fa-z
485 f          0.0e * fa-r
486 f          0.0e * hd-t
487 f    1.315e-02e * hd-z
488 f          0.0e * hd-r
489 f          1.0e * alpn
490 f          0.0e * vvn-t
491 f          0.0e * vvn-z
492 f          0.0e * vvn-r
493 f          0.0e * vln-t
494 f          0.0e * vln-z
495 f          0.0e * vln-r
496 f          791.0e * tvn
497 f          405.0e * tln
498 f    2.7745e05e * pn
499 f          0.0e * pan
500 *
501 * level 10
502 *
503 f          0.0e * cfzl-t
504 f          0.05 e * cfzl-z
505 f          0.0e * cfzl-r
506 f          0.0e * cfzv-t
507 f          0.05 e * cfzv-z
508 f          0.0e * cfzv-r
509 f    5.246e-01e * vol
510 f          0.0e * fa-t
511 f    5.246e-01e * fa-z
512 f          0.0e * fa-r
513 f          0.0e * hd-t
514 f    1.315e-02e * hd-z
515 f          0.0e * hd-r
516 f          1.0e * alpn
517 f          0.0e * vvn-t
518 f          0.0e * vvn-z
519 f          0.0e * vvn-r
520 f          0.0e * vln-t
521 f          0.0e * vln-z
522 f          0.0e * vln-r
523 f          902.0e * tvn
524 f          405.0e * tln
525 f    2.7745e05e * pn
526 f          0.0e * pan
527 *
528 * level 11
529 *
530 f          0.0e * cfzl-t
531 f          0.05 e * cfzl-z
532 f          0.0e * cfzl-r
533 f          0.0e * cfzv-t
534 f          0.05 e * cfzv-z
535 f          0.0e * cfzv-r
536 f    5.246e-01e * vol
537 f          0.0e * fa-t
538 f    5.246e-01e * fa-z
539 f          0.0e * fa-r
540 f          0.0e * hd-t
541 f    1.315e-02e * hd-z
542 f          0.0e * hd-r
543 f          1.0e * alpn

```

```

544 f      0.0e * vvn-t
545 f      0.0e * vvn-z
546 f      0.0e * vvn-r
547 f      0.0e * vln-t
548 f      0.0e * vln-z
549 f      0.0e * vln-r
550 f      835.0e * tvn
551 f      405.0e * tln
552 f      2.7745e05e * pn
553 f      0.0e * pan
554 *
555 * level 12
556 *
557 f      0.0e * cfzl-t
558 f      0.05 e * cfzl-z
559 f      0.0e * cfzl-r
560 f      0.0e * cfzv-t
561 f      0.05 e * cfzv-z
562 f      0.0e * cfzv-r
563 f      5.246e-01e * vol
564 f      0.0e * fa-t
565 f      5.246e-01e * fa-z
566 f      0.0e * fa-r
567 f      0.0e * hd-t
568 f      1.315e-02e * hd-z
569 f      0.0e * hd-r
570 f      1.0e * alpn
571 f      0.0e * vvn-t
572 f      0.0e * vvn-z
573 f      0.0e * vvn-r
574 f      0.0e * vln-t
575 f      0.0e * vln-z
576 f      0.0e * vln-r
577 f      789.0e * tvn
578 f      405.0e * tln
579 f      2.7745e05e * pn
580 f      0.0e * pan
581 *
582 * level 13
583 *
584 f      0.0e * cfzl-t
585 f      0.05 e * cfzl-z
586 f      0.0e * cfzl-r
587 f      0.0e * cfzv-t
588 f      0.05 e * cfzv-z
589 f      0.0e * cfzv-r
590 f      5.246e-01e * vol
591 f      0.0e * fa-t
592 f      5.246e-01e * fa-z
593 f      0.0e * fa-r
594 f      0.0e * hd-t
595 f      1.315e-02e * hd-z
596 f      0.0e * hd-r
597 f      1.0e * alpn
598 f      0.0e * vvn-t
599 f      0.0e * vvn-z
600 f      0.0e * vvn-r
601 f      0.0e * vln-t
602 f      0.0e * vln-z
603 f      0.0e * vln-r
604 f      716.0e * tvn
605 f      405.0e * tln
606 f      2.7745e05e * pn
607 f      0.0e * pan
608 *
609 * level 14
610 *
611 f      0.0e * cfzl-t
612 f      0.05 e * cfzl-z
613 f      0.0e * cfzl-r
614 f      0.0e * cfzv-t
615 f      0.05 e * cfzv-z
616 f      0.0e * cfzv-r
617 f      5.246e-01e * vol
618 f      0.0e * fa-t
619 f      5.246e-01e * fa-z
620 f      0.0e * fa-r
621 f      0.0e * hd-t
622 f      1.315e-02e * hd-z
623 f      0.0e * hd-r
624 f      1.0e * alpn
625 f      0.0e * vvn-t
626 f      0.0e * vvn-z
627 f      0.0e * vvn-r
628 f      0.0e * vln-t
629 f      0.0e * vln-z
630 f      0.0e * vln-r
631 f      664.0e * tvn
632 f      405.0e * tln
633 f      2.7745e05e * pn
634 f      0.0e * pan
635 *

```

```

636 * level 15
637 *
638 f          0.0e * cfzl-t
639 f          0.05 e * cfzl-z
640 f          0.0e * cfzl-r
641 f          0.0e * cfzv-t
642 f          0.05 e * cfzv-z
643 f          0.0e * cfzv-r
644 f          5.246e-01e * vol
645 f          0.0e * fa-t
646 f          5.246e-01e * fa-z
647 f          0.0e * fa-r
648 f          0.0e * hd-t
649 f          1.315e-02e * hd-z
650 f          0.0e * hd-r
651 f          1.0e * alpn
652 f          0.0e * vvn-t
653 f          0.0e * vvn-z
654 f          0.0e * vvn-r
655 f          0.0e * vln-t
656 f          0.0e * vln-z
657 f          0.0e * vln-r
658 f          629.0e * tvn
659 f          405.0e * tln
660 f          2.7745e05e * pn
661 f          0.0e * pan
662 *
663 * level 16
664 *
665 f          0.0e * cfzl-t
666 f          0.05 e * cfzl-z
667 f          0.0e * cfzl-r
668 f          0.0e * cfzv-t
669 f          0.05 e * cfzv-z
670 f          0.0e * cfzv-r
671 f          5.246e-01e * vol
672 f          0.0e * fa-t
673 f          5.246e-01e * fa-z
674 f          0.0e * fa-r
675 f          0.0e * hd-t
676 f          1.315e-02e * hd-z
677 f          0.0e * hd-r
678 f          1.0e * alpn
679 f          0.0e * vvn-t
680 f          0.0e * vvn-z
681 f          0.0e * vvn-r
682 f          0.0e * vln-t
683 f          0.0e * vln-z
684 f          0.0e * vln-r
685 f          588.0e * tvn
686 f          405.0e * tln
687 f          2.7745e05e * pn
688 f          0.0e * pan
689 *
690 * level 17
691 *
692 f          0.0e * cfzl-t
693 f          0.05 e * cfzl-z
694 f          0.0e * cfzl-r
695 f          0.0e * cfzv-t
696 f          0.05 e * cfzv-z
697 f          0.0e * cfzv-r
698 f          5.246e-01e * vol
699 f          0.0e * fa-t
700 f          5.246e-01e * fa-z
701 f          0.0e * fa-r
702 f          0.0e * hd-t
703 f          1.315e-02e * hd-z
704 f          0.0e * hd-r
705 f          1.0e * alpn
706 f          0.0e * vvn-t
707 f          0.0e * vvn-z
708 f          0.0e * vvn-r
709 f          0.0e * vln-t
710 f          0.0e * vln-z
711 f          0.0e * vln-r
712 f          500.0e * tvn
713 f          405.0e * tln
714 f          2.7745e05e * pn
715 f          0.0e * pan
716 *
717 * level 18 (upper plenum)
718 *
719 f          0.0e * cfzl-t
720 f          0.05 e * cfzl-z
721 f          0.0e * cfzl-r
722 f          0.0e * cfzv-t
723 f          0.05 e * cfzv-z
724 f          0.0e * cfzv-r
725 f          5.246e-01e * vol
726 f          0.0e * fa-t
727 f          5.246e-01e * fa-z

```

```

728 f      0.0e * fa-r
729 f      0.0e * hd-t
730 f    1.315e-02e * hd-z
731 f      0.0e * hd-r
732 f      1.0e * alp
733 f      0.0e * vvm-t
734 f      0.0e * vvm-z
735 f      0.0e * vvm-r
736 f      0.0e * vln-t
737 f      0.0e * vln-z
738 f      0.0e * vln-r
739 f    408.65e * tvn
740 f    408.65e * tln
741 f    2.7745e05e * pn
742 f      0.0e * pan
743 *
744 *
745 *      type      num      id      ctitle
746 rod      6      6      $6$ fuel rods
747 *
748 *      ncrx      ncrz      ittc      cd 2
749 *      1      15      0
750 *
751 *      nopowr      nrldr      modez      liqlev      iaxcnd      cd 3
752 *      0      0      1      1      1
753 *
754 *      idbci      idbco      hdri      hdro      cd 4
755 *      0      2      0.0      9.4996e-3
756 *
757 *      nrods      nodes      irftr      nzmax      irftr2      cd 9
758 *      1      9      1001      250      1001
759 *
760 *      dtxht(1)      dtxht(2)      dznht      hgapo      shelv      cd 10
761 *      4.      20.      5.e-3      6.e4      0.
762 *
763 *      irpwty      ndgx      ndhx      nrts      nhist      cd 11
764 *      6      0      0      10000      0
765 *
766 *      irpwtr      irpwsv      nrpwtb      nrpwsv      nrpwrf      cd 14
767 *      0      1      25      0      0
768 *
769 *      izpwtr      izpwsv      nzpwtb      nzpwsv      nzpwrf      cd 15
770 *      0      1      1      0      0
771 *
772 *      nmwrx      nfcil      nfcil      cd 16
773 *      0      0      0
774 *
775 *      nzpwz      nzpwi      nfbpwt      cd 17
776 *      16      1      0
777 *
778 *      react      tneut      rpwoff      rrpwmx      rpwscl      cd 18
779 *      0.      0.      0.      1.e10      1.
780 *
781 *      rpowri      zpowin      zpowoff      rrpwmx      cd 19
782 *      8.045e05      0.      0.      1.e10
783 *
784 *      extsou      pldr      pdrat      fucrac      cd 20
785 *      0.      0.      1.3263      1.
786 *
787 *      nhcomo
788 f      5e
789 *
790 *      nhcelo
791 *      -3s
792 *      3s
793 *      4s
794 *      5s
795 *      6s
796 *      7s
797 *      8s
798 *      9s
799 *      10s
800 *      11s
801 *      12s
802 *      13s
803 *      14s
804 *      15s
805 *      16s
806 *      17s
807 *      18e
808 *
809 *      +      +      +      +      +
810 * dz *      .5486      .1829      .1829      .1829s
811 * dz *      .1829      .1828      .1829      .3658s
812 * dz *      .1829      .1828      .1829      .1829s
813 * dz *      .1829      .1829      .5486e
814 * grav * f      1.e
815 * rdx *      159.0e
816 *      +      +      +      +
817 * radrd *      0.0      6.0325e-04      1.2065e-03      1.7145e-03s
818 * radrd *      2.2225e-03      3.1687e-03      4.1148e-03      4.4323e-03s
819 * radrd *      4.7498e-03e

```

820	* matrd *	4	4	5	5s
821	* matrd *	4	4	8	8e
822	* nfax * r15	3e			
823	* +	+	+	+	+
824	* rftn * r 9	489.0r 9	678.0r 9	750.0r 9	843.0s
825	* rftn * r 9	934.0r 9	995.0r 9	1047.0r 9	1085.0s
826	* rftn * r 9	1105.0r 9	1070.0r 9	1017.0r 9	930.0s
827	* rftn * r 9	848.0r 9	775.0r 9	696.0r 9	576.0e
828	* rdpwr * r 2	0.0r 3	1.0r 4	0.0e	
829	* cpowr * f	1.0e			
830	* +	+	+	+	+
831	* zpwtz *	0.	.5486	.7315	.9144s
832	* zpwtz *	1.0973	1.2802	1.4630	1.6459s
833	* zpwtz *	2.0117	2.1946	2.3774	2.5603s
834	* zpwtz *	2.7432	2.9261	3.1090	3.6576e
835	* +	+	+	+	+
836	* zpwtb *	0.s			
837	* zpwtb *	0.1837	0.3343	0.4699	0.5994s
838	* zpwtb *	0.7259	0.8404	0.9308	1.0000s
839	* zpwtb *	1.0000	0.9308	0.8404	0.7259s
840	* zpwtb *	0.5994	0.4699	0.3343	0.1837e
841	* zpwtb *				
842	* +	+	+	+	+
843	* rpwtb *	0.	8.0777e+05	1.7500e+01	7.4443e+05s
844	* rpwtb *	3.5000e+01	7.0349e+05	5.2500e+01	6.7295e+05s
845	* rpwtb *	7.0000e+01	6.4958e+05	8.7500e+01	6.2645e+05s
846	* rpwtb *	1.0500e+02	6.0800e+05	1.2250e+02	5.9035e+05s
847	* rpwtb *	1.4000e+02	5.7625e+05	1.5750e+02	5.6351e+05s
848	* rpwtb *	1.7500e+02	5.5247e+05	1.9250e+02	5.4288e+05s
849	* rpwtb *	2.2000e+02	5.2773e+05	2.5500e+02	5.1234e+05s
850	* rpwtb *	2.9000e+02	4.9832e+05	3.2500e+02	4.8655e+05s
851	* rpwtb *	3.6000e+02	4.7608e+05	3.9500e+02	4.6649e+05s
852	* rpwtb *	4.3000e+02	4.5754e+05	4.6500e+02	4.4956e+05s
853	* rpwtb *	5.0000e+02	4.4287e+05	5.3500e+02	4.3570e+05s
854	* rpwtb *	5.7000e+02	4.2950e+05	6.0500e+02	4.2369e+05s
855	* rpwtb *	1.0000e+03	3.8310e+05e		
856	* +	+	+	+	+
857	* fpuo2 * f	0.0e			
858	* ftd * f	1.0e			
859	* gmix * f	0.0e			
860	* gmles * f	0.0e			
861	* pgapt * f	0.0e			
862	* plvol * f	0.0e			
863	* pslen * f	0.0e			
864	* clennc * f	0.0e			
865	* burn * f	0.0e			
866	* +	+	+	+	+
867	* type	num	id	ctitle	
868	rod	7	7	\$7\$ core section of vessel wall	
869	* +				
870	* ncrx	ncrz	ittc		cd 2
871	1	15	0		
872	* +				
873	* nopowr	nridr	modex	liqlev	iaxcnd cd 3
874	1	0	1	0	1
875	* +				
876	* idbci	idbco	hdri	hdro	cd 4
877	2	0	.1937	.20386	
878	* +				
879	* nrods	nodes	irftr	nzmax	cd 9
880	1	3	0	100	
881	* +				
882	* dtxht(1)	dtxht(2)	dznh	hgapo	shelv cd 10
883	4.	50.	5.e-3	6.e4	0.
884	* +				
885	* nhcomi				
886	f	5e			
887	* +				
888	* nhceli				
889	-3s				
890	3s				
891	4s				
892	5s				
893	6s				
894	7s				
895	8s				
896	9s				
897	10s				
898	11s				
899	12s				
900	13s				
901	14s				
902	15s				
903	16s				
904	17s				
905	18e				
906	* +	+	+	+	+
907	* dz *	.5486	.1829	.1829	.1829s
908	* dz *	.1829	.1828	.1829	.3658s
909	* dz *	.1829	.1828	.1829	.1829s
910	* dz *	.1829	.1829	.5486e	
911	* grav * f	1.e			

```

912 * rdx * 1.e
913 * radrd * il .09685 .10193e
914 * matrd * f 6e
915 * nfax * r15 3e
916 * + + + +
917 * rftn * r 3 406.0r 3 406.0r 3 415.0r 3 419.0s
918 * rftn * r 3 424.0r 3 429.0r 3 449.0r 3 474.0s
919 * rftn * r 3 484.0r 3 474.0r 3 459.0r 3 444.0s
920 * rftn * r 3 439.0r 3 430.0r 3 415.0r 3 410.0e
921 *
922 end
923 *
924 *****
925 * time step data *
926 *****
927 *
928 * dtmin dtmax tend trwfp
929 * 1.0e-06 0.005 7.0e+02 10.
930 *
931 * edint gfint dmpint sedint
932 * 5.0e+01 1.0 5.0e+01 50.0
933 * -1.0
934 * end

```