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=ricasel7.i;   revised power shapes, neutronic feedbacks
*   outlet T = 123 F = 323.71 K
*   revised core and reactivity feedback
*   D6 for hot channel
*   add orifice coefficients
*   TOP OF CORE OPEN TO POOL
*   9.29% of flow through shield cooling
*   revised duct and gate sizes
*
*
* 3x5 LEU fueled core - 14 fuel elements with center beryllium trap,
* beryllium & graphite reflector
*
* Contains heat structures and reactor kinetics with feedback including
* feedback
* for the hot channel.
*
*
*-----
*1           * options
*-----
0000100           new           transnt
*-----
0000101           run
* 0000101           inp-chk
*-----
0000102           si           si
*-----
0000105      3.0      5.0      20000.
*-----
0000120      110010000      0.0      h2o      primary
*-----
* 0000201  480.      1.0e-9      0.005      03      100      10000      20000
* 0000202  100.0      1.0e-9      0.1      03      100      10000      20000
* 0000202  50.      1.0e-9      0.010      03      200      8000      20000
0000202  500.      1.0e-9      0.010      03      200      8000      20000
0000203  550.      1.0e-9      0.005      03      20      1000      20000
0000204  2000.      1.0e-9      0.25      03      20      1000      20000
*=====
* minor edit requests
*=====
*
0000301  httemp      130101511      *
0000302  httemp      130101211      *
0000303  httemp      130100911      *
0000304  httemp      130100711      *
0000305  httemp      130100511      *
0000306  rktpow      0      * reactor power in w
0000307  rkreact      0      * total reactivity in $
0000308  httemp      130102211      *
0000309  rkgapow      0      * decay power
0000310  htrnr      130101500      * heat flux
0000311  tempf      130010000      * T(1)
0000312  tempf      130150000      * T(15)
0000313  tempf      130300000      * T(30)
0000314  mflowj      130150000      * W(hot channel)
0000315  mflowj      120150000      * W(avg channel)

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0000316 mflowj 140010000 * W(reflector)
0000317 mflowj 150010000 * W(ctl blade)
0000318 mflowj 202000000 * W(gate out)
0000319 mflowj 180050000 * W(1/2 in hole)
0000320 mflowj 211050000 * W(up duct)
0000321 tempf 211050000 * T(up duct)
0000322 mflowj 145010000 * W(Be hole)
0000323 httemp 130101811
$=====
$ trip expansion cards
20600000 expanded
*-----*
*v trip v code parameter rel v code parameter constant l timeoff
20600010 time 0 gt null 0 0.0 n *react inser
20600020 time 0 gt null 0 509. n *outlet gate
20600030 time 0 gt null 0 509. n *inlet gate
* 20600020 time 0 gt null 0 0. n *outlet gate
* 20600030 time 0 gt null 0 0. n *inlet gate
$=====
* expanded minor edits
$=====
20800001 viscf 110010000
20800002 dt 0
20800003 dtcrnt 0
20800004 flenth 110010000
20800005 flenth 115010000
20800006 flenth 115020000
20800007 hvmix 115010000
20800008 sathf 115010000
20800009 sathg 115010000
$=====
* hydrodynamic components
*=====**
*hydro component name component type
1050000 "inlet" sngljun
*-----$
*hydro from to area f loss r loss fvcchs
1050101 190200002 110010001 0. 0.0 0.0 001100
*
*hydro jun diam beta intercept slope
1050110 0.0 0.0 1.0 1.0
*
*hydro vel/flw f mass flow g mass flow j mass flow
1050201 1 0. 0. 0. * mass flow
$=====
*hydro component name component type
1100000 "inplenum" branch
*-----$
*hydro no. juns vel/flw
1100001 4 1
*
*hydro area length volume
1100101 0.0 5.0165e-1 2.4466e-1
*
*hydro horz angle vert angle delta z
1100102 0.0 -90.0 -5.0165e-1
*

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*hydro      roughness      hyd diam      pvbfe
1100103      1.5e-6      0.0      00000
*
*hydro ebt      pressure      temperature
1100200      3      1.71995e+5      318.13
*
*hydro      from      to      area      f loss      r loss      fvcchs
1101101      110010000      301000000      0.0      0.0      0.0      001100
1102101      110010000      140000000      0.0      0.0      0.0      001100
1103101      110010000      150000000      0.0      0.0      0.0      001100
1104101      110010000      145000000      0.0      0.0      0.0      001100
*
*hydro      jun diam      beta      intercept      slope
1101110      0.0      0.0      1.0      1.0
1102110      0.0      0.0      1.0      1.0
1103110      0.0      0.0      1.0      1.0
*
*hydro      f mass flow      g mass flow      j mass flow
1101201      0.0      0.      0.
1102201      0.0      0.      0.
1103201      0.0      0.      0.
1104201      0.0      0.      0.
*=====**
*hydro      component name      component type
1150000      "core in"      branch
*-----$
*hydro      no. juns      vel/flw
1150001      3      1
*
*hydro      area      length      volume
1150101      0.0      1.8415e-1      9.2223e-3
*
*hydro      horz angle      vert angle      delta z
1150102      0.0      -90.0      -1.8415e-1
*
*hydro      roughness      hyd diam      pvbfe
1150103      1.5e-6      5.6058e-2      00000
*
*hydro ebt      pressure      temperature
1150200      3      1.75638e+5      318.13
*
*hydro      from      to      area      f loss      r loss      fvcchs
1151101      115010000      120000000      0.0      0.0      0.0      001100
1152101      115010000      130000000      0.0      0.0      0.0      001100
1153101      115000000      302000000      0.0      0.0      0.0      001100
*
*hydro      jun diam      beta      intercept      slope
* 1151110      0.0      0.0      1.0      1.0
* 1152110      0.0      0.0      1.0      1.0
*
*hydro      f mass flow      g mass flow      j mass flow
1151201      0.0      0.      0.
1152201      0.0      0.      0.
1153201      0.0      0.      0.
*$=====
*hydro      component name      component type
1200000      "avg chan"      pipe

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*-----$
*hydro      no. volumes
1200001      30
*
*hydro      vol area                                vol
1200101      4.565e-2                                30
*
*hydro      length                                vol
1200301      3.8947e-2                                1
1200302      1.9897e-2                                29
1200303      3.8947e-2                                30
*
*hydro      volume                                vol
1200401      0.0                                30
*
*hydro      vert angle                                vol
1200601      -90.0                                30
*
*hydro      delta z                                vol
1200701      -3.8947e-2                                1
1200702      -1.9897e-2                                29
1200703      -3.8947e-2                                30
*
*hydro      roughness      hyd diam      vol
1200801      1.5e-6      4.47e-3      30
*
*      f loss      r loss      jun
1200901      .25      0.05      1
1200902      0.0      0.0      28
1200903      0.05      .25      29
*
*hydro      pvbfe                                vol
1201001      00200                                30
*
*hydro      fvcchs                                jun
1201101      001000                                29
*
*hydro      ebt pressure      temperature      vol
1201201      3      1.76313e+5      318.13      0.      0.      0.      1
1201202      3      1.76297e+5      318.13      0.      0.      0.      2
1201203      3      1.76286e+5      318.13      0.      0.      0.      3
1201204      3      1.76275e+5      318.13      0.      0.      0.      4
1201205      3      1.76264e+5      318.13      0.      0.      0.      5
1201206      3      1.76252e+5      318.13      0.      0.      0.      6
1201207      3      1.76241e+5      318.13      0.      0.      0.      7
1201208      3      1.76230e+5      318.13      0.      0.      0.      8
1201209      3      1.76219e+5      318.13      0.      0.      0.      9
1201210      3      1.76208e+5      318.13      0.      0.      0.      10
1201211      3      1.76197e+5      318.13      0.      0.      0.      11
1201212      3      1.76186e+5      318.13      0.      0.      0.      12
1201213      3      1.76174e+5      318.13      0.      0.      0.      13
1201214      3      1.76163e+5      318.13      0.      0.      0.      14
1201215      3      1.76152e+5      318.13      0.      0.      0.      15
1201216      3      1.76141e+5      318.13      0.      0.      0.      16
1201217      3      1.76130e+5      318.13      0.      0.      0.      17
1201218      3      1.76119e+5      318.13      0.      0.      0.      18
1201219      3      1.76108e+5      318.13      0.      0.      0.      19

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1201220	3	1.76096e+5	318.13	0.	0.	0.	20
1201221	3	1.76085e+5	318.13	0.	0.	0.	21
1201222	3	1.76074e+5	318.13	0.	0.	0.	22
1201223	3	1.76063e+5	318.13	0.	0.	0.	23
1201224	3	1.76052e+5	318.13	0.	0.	0.	24
1201225	3	1.76041e+5	318.13	0.	0.	0.	25
1201226	3	1.76030e+5	318.13	0.	0.	0.	26
1201227	3	1.76019e+5	318.13	0.	0.	0.	27
1201228	3	1.76007e+5	318.13	0.	0.	0.	28
1201229	3	1.75996e+5	318.13	0.	0.	0.	29
1201230	3	1.75980e+5	318.13	0.	0.	0.	30

*

*hydro vel/flow

1201300

1

*

*hydro f mass flow g mass flow j mass flow jun

1201301	0.00	0.	0.	1
1201302	0.00	0.	0.	2
1201303	0.00	0.	0.	3
1201304	0.00	0.	0.	4
1201305	0.00	0.	0.	5
1201306	0.00	0.	0.	6
1201307	0.00	0.	0.	7
1201308	0.00	0.	0.	8
1201309	0.00	0.	0.	9
1201310	0.00	0.	0.	10
1201311	0.00	0.	0.	11
1201312	0.00	0.	0.	12
1201313	0.00	0.	0.	13
1201314	0.00	0.	0.	14
1201315	0.00	0.	0.	15
1201316	0.00	0.	0.	16
1201317	0.00	0.	0.	17
1201318	0.00	0.	0.	18
1201319	0.00	0.	0.	19
1201320	0.00	0.	0.	20
1201321	0.00	0.	0.	21
1201322	0.00	0.	0.	22
1201323	0.00	0.	0.	23
1201324	0.00	0.	0.	24
1201325	0.00	0.	0.	25
1201326	0.00	0.	0.	26
1201327	0.00	0.	0.	27
1201328	0.00	0.	0.	28
1201329	0.00	0.	0.	29

*

*hydro jun diam beta intercept slope jun

1201401 4.3415e-3 0.0 1.0 1.0 29

*

*hydro x-shpfac x-visc y-shpfac y-visc z-shpfac z-visc vol

1202501 0.6667 0.14 1.0 0.14 1.0 0.14 30

*

*hydro a b c vol

1202601 0. 0.046 0.2 0. 0. 0. 0. 0. 30

*

*hydro pitch span vol

1203101 2.032e-3 6.7793e-2 30

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*
$=====
*hydro          component name      component type
1300000          "hot chan"          pipe
*-----
*hydro          no. volumes
1300001          30
*
*hydro          vol area                      vol
1300101          1.487e-4                      30
* minimum based on tolerances
*
*hydro          length                      vol
1300301          3.8947e-2                      1
1300302          1.9897e-2                      29
1300303          3.8947e-2                      30
*
*hydro          volume                      vol
1300401          0.0                          30
*
*hydro          vert angle                      vol
1300601          -90.0                        30
*
*hydro          delta z                      vol
1300701          -3.8947e-2                      1
1300702          -1.9897e-2                      29
1300703          -3.8947e-2                      30
*
*hydro          roughness      hyd diam      vol
1300801          1.5e-6        4.47e-3        30
* minimum based on tolerances
*
*          f loss      r loss                      jun
1300901          0.25      0.05                      1
1300902          0.0       0.0                      28
1300903          0.05      0.25                      29
*
*hydro          pvbfe                      vol
1301001          00200                      30
*
*hydro          fvcchs                      jun
1301101          001000                      29
*
*hydro ebt pressure      temperature                      vol
1301201      3  1.76438e+5  318.130      0.      0.      0.      1
1301202      3  1.76421e+5  318.130      0.      0.      0.      2
1301203      3  1.76410e+5  318.130      0.      0.      0.      3
1301204      3  1.76398e+5  318.131      0.      0.      0.      4
1301205      3  1.76387e+5  318.131      0.      0.      0.      5
1301206      3  1.76375e+5  318.131      0.      0.      0.      6
1301207      3  1.76364e+5  318.131      0.      0.      0.      7
1301208      3  1.76352e+5  318.131      0.      0.      0.      8
1301209      3  1.76341e+5  318.131      0.      0.      0.      9
1301210      3  1.76329e+5  318.132      0.      0.      0.     10
1301211      3  1.76318e+5  318.132      0.      0.      0.     11
1301212      3  1.76306e+5  318.132      0.      0.      0.     12
1301213      3  1.76295e+5  318.132      0.      0.      0.     13

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1301214	3	1.76283e+5	318.133	0.	0.	0.	14
1301215	3	1.76272e+5	318.133	0.	0.	0.	15
1301216	3	1.76261e+5	318.133	0.	0.	0.	16
1301217	3	1.76249e+5	318.134	0.	0.	0.	17
1301218	3	1.76238e+5	318.135	0.	0.	0.	18
1301219	3	1.76226e+5	318.135	0.	0.	0.	19
1301220	3	1.76215e+5	318.136	0.	0.	0.	20
1301221	3	1.76203e+5	318.137	0.	0.	0.	21
1301222	3	1.76192e+5	318.137	0.	0.	0.	22
1301223	3	1.76180e+5	318.138	0.	0.	0.	23
1301224	3	1.76169e+5	318.138	0.	0.	0.	24
1301225	3	1.76157e+5	318.139	0.	0.	0.	25
1301226	3	1.76146e+5	318.139	0.	0.	0.	26
1301227	3	1.76134e+5	318.139	0.	0.	0.	27
1301228	3	1.76123e+5	318.130	0.	0.	0.	28
1301229	3	1.76111e+5	318.130	0.	0.	0.	29
1301230	3	1.76094e+5	318.130	0.	0.	0.	30

*

*hydro vel/flow

1301300 1

*

*hydro	f mass flow	g mass flow	j mass flow	jun
1301301	0.00	0.	0.	1
1301302	0.00	0.	0.	2
1301303	0.00	0.	0.	3
1301304	0.00	0.	0.	4
1301305	0.00	0.	0.	5
1301306	0.00	0.	0.	6
1301307	0.00	0.	0.	7
1301308	0.00	0.	0.	8
1301309	0.00	0.	0.	9
1301310	0.00	0.	0.	10
1301311	0.00	0.	0.	11
1301312	0.00	0.	0.	12
1301313	0.00	0.	0.	13
1301314	0.00	0.	0.	14
1301315	0.00	0.	0.	15
1301316	0.00	0.	0.	16
1301317	0.00	0.	0.	17
1301318	0.00	0.	0.	18
1301319	0.00	0.	0.	19
1301320	0.00	0.	0.	20
1301321	0.00	0.	0.	21
1301322	0.00	0.	0.	22
1301323	0.00	0.	0.	23
1301324	0.00	0.	0.	24
1301325	0.00	0.	0.	25
1301326	0.00	0.	0.	26
1301327	0.00	0.	0.	27
1301328	0.00	0.	0.	28
1301329	0.00	0.	0.	29

*

*hydro	jun diam	beta	intercept	slope	jun
1301401	4.0415e-3	0.0	1.0	1.0	29

*

*hydro	x-shpfac	x-visc	y-shpfac	y-visc	z-shpfac	z-visc	vol
1302501	0.6667	0.14	1.0	0.14	1.0	0.14	30

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*
*hydro      a      b      c                                vol
1302601    0.    0.046  0.2  0.  0.  0.  0.  0.  0.    30
*
*hydro      pitch                                span          vol
1303101    2.0828e-3          6.7793e-2          30
*
$=====
*hydro      component name          component type
1400000          "reflectr"          pipe * graphite
*-----$
*hydro      no. volumes
1400001          8
*
*hydro      vol area                                vol
1400101          .221                                1
1400102          .00344                                2
1400103          .00518                                6
1400104          .00344                                7
1400105          .221                                8
*
*hydro      length                                vol
1400301          .12065                                1
1400302          .03175                                2
1400303          .17463                                6
1400304          .03175                                7
1400305          .12065                                8
*
*hydro      volume                                vol
1400401          0.                                8
*
*hydro      vert angle                                vol
1400601          -90.0                                8
*
*hydro      delta z                                vol
1400701          -.12065                                1
1400702          -.03175                                2
1400703          -.17463                                6
1400704          -.03175                                7
1400705          -.12065                                8
*
*hydro      roughness          hyd diam          vol
1400801          1.5e-6          .1                                1
1400802          1.5e-6          .00191                            2
1400803          1.5e-6          .00290                            6
1400804          1.5e-6          .00191                            7
1400805          1.5e-6          .1                                8
*
*          f loss          r loss          jun
1400901          0.0          0.0          1
1400902          0.6          1.0          2
1400903          0.0          0.0          5
1400904          1.0          0.6          6
1400905          0.0          0.0          7
*
*hydro      pvbfe                                vol
1401001          00200                                8

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*
*hydro          fvcahs                      jun
1401101         001000                      7
*
*hydro  ebt pressure      tempe                      vol
1401201    3  1.77316e+5    318.130      0.      0.      0.      1
1401202    3  1.73434e+5    318.130      0.      0.      0.      2
1401203    3  1.73130e+5    318.131      0.      0.      0.      3
1401204    3  1.72853e+5    318.131      0.      0.      0.      4
1401205    3  1.72575e+5    318.131      0.      0.      0.      5
1401206    3  1.72298e+5    318.132      0.      0.      0.      6
1401207    3  1.71994e+5    318.132      0.      0.      0.      7
1401208    3  1.77258e+5    318.132      0.      0.      0.      8
*
*hydro  vel/flow
1401300      1
*
*hydro  f mass flow  g mass flow  j mass flow  jun
1401301    0.00      0.      0.      1
1401302    0.00      0.      0.      2
1401303    0.00      0.      0.      3
1401304    0.00      0.      0.      4
1401305    0.00      0.      0.      5
1401306    0.00      0.      0.      6
1401307    0.00      0.      0.      7
*
*hydro  jun diam      beta      intercept      slope                      jun
1401401    0.0      0.0      1.0      1.0                      7
*
*hydro  x-shpfac  x-visc      y-shpfac  y-visc      z-shpfac  z-visc      vol
1402501  0.6667    0.14      1.0      0.14      1.0      0.14      8
*
*hydro  a      b      c                      vol
1402601  0.      0.046  0.2  0.  0.  0.  0.  0.      8
*
*hydro  pitch                      span                      vol
1403101  2.0828e-3      6.7793e-2                      8
*
$=====
*hydro          component name      component type
1450000          BeHole      pipe  * Be 1/4" hole
*-----$
*hydro          no. volumes
1450001          8
*
*hydro          vol area                      vol
1450101          .154                      1
1450102          .000507                      7
1450103          .154                      8
*
*hydro          length                      vol
1450301          .12065                      1
1450302          .127                      7
1450303          .12065                      8
*
*hydro          volume                      vol
1450401          0.                      8

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*
*hydro          vert angle          vol
1450601        -90.0                8
*
*hydro          delta z              vol
1450701        -.12065              1
1450702        -.127                7
1450703        -.12065              8
*
*hydro          roughness            hyd diam          vol
1450801        1.5e-6                .1                1
1450802        1.5e-6                .00635             7
1450805        1.5e-6                .1                8
*
*          f loss                    r loss              jun
1450901        0.0                    0.0                1
1450902        0.6                    1.0                2
1450903        0.0                    0.0                5
1450904        1.0                    0.6                6
1450905        0.0                    0.0                7
*
*hydro          pvbfe                vol
1451001        00000                8
*
*hydro          fvcchs                jun
1451101        001000                7
*
*hydro ebt pressure      tempe          vol
1451201    3  1.77316e+5    318.130      0.          0.          0.          1
1451202    3  1.73434e+5    318.130      0.          0.          0.          2
1451203    3  1.73130e+5    318.131      0.          0.          0.          3
1451204    3  1.72853e+5    318.131      0.          0.          0.          4
1451205    3  1.72575e+5    318.131      0.          0.          0.          5
1451206    3  1.72298e+5    318.132      0.          0.          0.          6
1451207    3  1.71994e+5    318.132      0.          0.          0.          7
1451208    3  1.77258e+5    318.132      0.          0.          0.          8
*
*hydro          vel/flow
1451300        1
*
*hydro          f mass flow    g mass flow    j mass flow    jun
1451301        0.00           0.            0.            1
1451302        0.00           0.            0.            2
1451303        0.00           0.            0.            3
1451304        0.00           0.            0.            4
1451305        0.00           0.            0.            5
1451306        0.00           0.            0.            6
1451307        0.00           0.            0.            7
*
*hydro          jun diam      beta      intercept      slope          jun
1451401        0.0           0.0        1.0            1.0            7
*
*hydro          x-shpfac    x-visc      y-shpfac    y-visc      z-shpfac    z-visc          vol
1452501        0.6667      0.14        1.0          0.14        1.0          0.14            8
*
*hydro          a          b          c          0.    0.    0.    0.    0.    0.          vol
1452601        0.          0.046    0.2    0.    0.    0.    0.    0.    0.            8

```

```

*
$=====
*hydro          component name      component type
1500000          "ctrblade"          pipe
*-----
*hydro          no. volumes
1500001          8
*
*hydro          vol area              vol
1500101          .01044              7
1500102          .02075              8
*
*hydro          length                vol
1500301          .139045             7
1500302          .03                 8
*
*hydro          volume                vol
1500401          0.0                 8
*
*hydro          vert angle            vol
1500601          -90.0               8
*
*hydro          delta z                vol
1500701          -.139045            7
1500702          -.03                8
*
*hydro          roughness             hyd diam      vol
1500801          1.5e-6              .009136      4
1500802          1.5e-6              .03561      8
*
*          f loss                    r loss          jun
1500901          .35                 .25          1
1500902          0.0                 0.0          3
1500903          .25                 .35          4
1500904          0.0                 0.0          7
*
*hydro          pvbfe                  vol
1501001          00000                8
*
*hydro          fvcchs                  jun
1501101          001000                7
*
*hydro ebt pressure      temperature              vol
1501201    3  1.77329e+5  318.130      0.      0.      0.      1
1501202    3  1.78799e+5  318.130      0.      0.      0.      2
1501203    3  1.79858e+5  318.130      0.      0.      0.      3
1501204    3  1.80824e+5  318.130      0.      0.      0.      4
1501205    3  1.81790e+5  318.130      0.      0.      0.      5
1501206    3  1.82756e+5  318.130      0.      0.      0.      6
1501207    3  1.83815e+5  318.130      0.      0.      0.      7
1501208    3  1.85285e+5  318.130      0.      0.      0.      8
*
*hydro          vel/flow
1501300          1
*hydro          f mass flow  g mass flow  j mass flow  jun
1501301          0.0        0.          0.          1
1501302          0.0        0.          0.          2

```

```

1501303      0.0      0.      0.      3
1501304      0.0      0.      0.      4
1501305      0.0      0.      0.      5
1501306      0.0      0.      0.      6
1501307      0.0      0.      0.      7
*
*hydro      jun diam      beta      intercept      slope      jun
1501401      1.0837e-2      0.0      1.0      1.0      1
1501402      2.3902e-2      0.0      1.0      1.0      7
*
*hydro      x-shpfac      x-visc      y-shpfac      y-visc      z-shpfac      z-visc      vol
*1502501      0.6667      0.14      1.0      0.14      1.0      0.14      8
*
*hydro      a      b      c      vol
*1502601      0.      0.046      0.2      0.      0.      0.      0.      8
*
*=====**
*hydro      component name      component type
1700000      "fuel out"      branch
*-----$
*hydro      no. juns      vel/flw
1700001      2      1
*
*hydro      area      length      volume
1700101      0.0      1.8415e-1      9.2223e-3
*
*hydro      horz angle      vert angle      delta z
1700102      0.0      -90.0      -1.8415e-1
*
*hydro      roughness      hyd diam      pvbfe
1700103      1.5e-6      5.6058e-2      00000
*
*hydro      ebt pressure      temperature
1700200      3      1.76980e+5      318.138
*
*hydro      from      to      area      f loss      r loss      fvcchs
1701101      120010000      170000000      0.0      0.0      0.0      001100
1702101      130010000      170000000      0.0      0.0      0.0      001100
*
*hydro      jun diam      beta      intercept      slope
1701110      4.3415e-3      0.0      1.0      1.0
1702110      4.0415e-3      0.0      1.0      1.0
*
*hydro      f mass flow      g mass flow      j mass flow
1701201      0.0      0.      0.
1702201      0.0      0.      0.
*
*=====**
* This volume mirrors component volume 110
*hydro      component name      component type
1800000      "outplnm"      branch
*-----$
*hydro      no. juns      vel/flw
1800001      6      1
*
*hydro      area      length      volume
1800101      0.000      5.0165e-1      3.9691e-1

```

```

*
*hydro          horz angle          vert angle          delta z
1800102          0.0          -90.0          -5.0165e-1
*
*hydro          roughness          hyd diam          pvbfe
1800103          1.5e-6          0.0          00000
*
*hydro ebt pressure      temperature
1800200      3  1.82594e+5      318.137
*
*hydro      from          to          area          f loss          r loss          fvcchs
1801101      170010000      180000000      0.0          0.0          0.0          001100
1802101      140010000      180000000      0.0          0.0          0.0          001100
1803101      150010000      180000000      .00253          1.15          1.05          001000
1804101      180000000      211010001      0.          0.          0.          001000
1805101      180010000      212010001      1.27e-4          1.64          1.64          001000
1806101      145010000      180000000      0.0          0.0          0.0          001100
*
*hydro          f mass flow          g mass flow          j mass flow
1801201          0.          0.          0.
1802201          0.          0.          0.
1803201          0.          0.          0.
1804201          0.          0.          0.
1805201          0.          0.          0.
1806201          0.          0.          0.
*
*=====**
*hydro          component name          component type
1900000          pipedn          pipe
*-----$
*hydro          no. volumes
1900001          20
*
*hydro          vol area          vol
1900101          .1142          20
*
*hydro          length          vol
1900301          .10285          20
*
*hydro          volume          vol
1900401          0.0          20
*
*hydro          vert angle          vol
1900601          -90.0          20
*
*hydro          delta z          vol
1900701          -.10285          20
*
*hydro          roughness          hyd diam          vol
1900801          1.5e-6          .253          20
*
*          f loss          r loss          jun
1900901          0.0          0.0          19
*
*hydro          pvbfe          vol
1901001          00000          20
*

```

```

*hydro          fvcahs                      jun
1901101          001000                      19
*
*hydro  ebt pressure      temperature      vol
1901201    3  1.5e5        318.13          0.      0.      0.      20
*
*hydro  vel/flow
1901300    1
*
*hydro  f mass flow  g mass flow  j mass flow  jun
1901301    0.        0.        0.        19
*
*hydro  x-shpfac  x-visc    y-shpfac  y-visc    z-shpfac  z-visc    vol
1902501  0.6667    0.14    1.0      0.14     1.0      0.14     20
*
$=====
*hydro          component name      component type
2000000          dn_loop            sngljun
*-----$
*hydro  from      to      area      f loss      r loss      fvcahs
2000101  201010002  190010001  .1142      0.0        0.0        001100
*
*hydro  vel/flw      f mass flow      g mass flow      j mass flow
2000201    1          0.        0.        0.        * mass flow
*
$=====
*hydro          component name      component type
2010000          gate_lop            snglvol
*-----$
*hydro  Ac      L      vol az an inclin dz  roughness Dh      tlpvbfe
2010101  .1142    .61    0.    0.  -90.  -.61  1.0e-6  .253  0000000
*
*hydro  ebt  p      T
2010200  003  1.4263e5  318.13
*
$=====
*hydro          component name      component type
2020000          gate_out            valve
*-----$
*hydro  from      to      area      f loss      r loss      fvcahs
2020101  201010002  203010001  .0355      1.64      1.64      001100
*
*hydro  vel/flw      f mass flow      g mass flow      j mass flow
2020201    1          0.        0.        0.        * mass flow
*
*hydro  valve type
2020300  trpvlv
*
*hydro  trip number
2020301    2
*
*=====**
*hydro          component name      component type
2030000          poolout            tmdpvol
*-----$
*hydro          area      length      volume
2030101      1.0234e-1      0.0      1.0e6

```

```

*
*hydro      horz angle  vert angle  delta z
2030102      .0        0.0        0.0
*
*hydro      roughness  hyd diam    fe
2030103      .0        .0        10
*
*hydro  ebt      trip no.      alpha vrc      numeric vrc
2030200 003
*
*hydro  time      pressure      temperature
2030201 0.      144632.7      318.13
*
$=====
*hydro      component name      component type
2040000      pump      tmdpjun
*-----$
*hydro      from      to      area
2040101      205200002      201010001      .00456
*
*hydro      vel/flw      trip no.      alpha vrc      numeric vrc
2040200      1
*
*hydro      time      f flowrate      g flowrate      j flowrate
2040201 0.0      0.      0.      0 * 0      gpm
2040202 1.0      98.6      0.      0 * 1740      gpm x
.9071
* 1740 gpm x .9071 = 98.60 KG/s
* 1580 gpm x .9071 = 89.51 KG/s
* W = 89.51 at t = 500.103 s
2040203      500.0000      98.600      0.      0.
2040204      500.2044      80.628      0.      0.
2040205      500.3544      67.436      0.      0.
2040206      500.5744      55.235      0.      0.
2040207      500.7744      44.676      0.      0.
2040208      500.9144      35.932      0.      0.
2040209      500.9144      35.932      0.      0.
2040210      501.1544      30.815      0.      0.
2040211      501.3644      22.771      0.      0.
2040212      501.7144      16.941      0.      0.
2040213      502.2144      11.323      0.      0.
2040214      502.9144      7.814      0.      0.
2040215      503.4344      5.752      0.      0.
2040216      504.0444      4.003      0.      0.
2040217      504.4544      3.182      0.      0.
2040218      505.1444      2.308      0.      0.
2040219      506.4544      1.374      0.      0.
2040220      507.9944      0.945      0.      0.
2040221      508.9544      0.599      0.      0.
2040222      509.9644      0.358      0.      0.
2040223      510.9444      0.192      0.      0.
2040224      512.9544      0.039      0.      0.
2040225      514.      0.0      0.      0.
2040226      10000.      0.0      0.      0.
*
$=====
*hydro      component name      component type

```

```

2050000          loop          pipe
*-----$
*hydro          no. volumes
2050001          20
*
*hydro          vol area          vol
* 2050101          .00456          20
* 2050101          .00912          20
2050101          .04          20
*
*hydro          length          vol
2050301          .5          20
*
*hydro          volume          vol
2050401          0.0          20
*
*hydro          vert angle          vol
2050601          0.          20
*
*hydro          delta z          vol
2050701          0.          20
*
*hydro          roughness          hyd diam          vol
* 2050801          1.5e-6          .0762          20
2050801          1.5e-6          .1524          20
2050801          1.5e-6          .30          20
*
*          f loss          r loss          jun
2050901          0.0          0.0          19
*
*hydro          pvbfe          vol
2051001          00000          20
*
*hydro          fvcchs          jun
2051101          001000          19
*
*hydro ebt pressure          temperature          vol
2051201  3  142630.          318.13          0.          0.          0.          20
*
*hydro          vel/flow
2051300          1
*
*hydro          f mass flow          g mass flow          j mass flow          jun
2051301          0.          0.          0.          19
*
*hydro          x-shpfac          x-visc          y-shpfac          y-visc          z-shpfac          z-visc          vol
2052501  1.0          0.14          1.0          0.14          1.0          0.14          20
*
$=====
*hydro          component name          component type
2060000          loop_up          sngljun
*-----$
*hydro          from          to          area          f loss          r loss          fvcchs
2060101  207010002          205010001          .00          0.0          0.0          001100
*
*hydro          vel/flw          f mass flow          g mass flow          j mass flow
2060201  1          0.          0.          0.          * mass flow

```

```

*
$=====
*hydro          component name      component type
2070000          gate2_lp            snglvol
*-----$
*hydro  Ac      L  vol az an inclin dz  roughness Dh  tlpvbf
2070101  .1142  .61  0.  0.  90.  .61  1.0e-6 .253  0000000
*
*hydro  ebt  p      T
2070200  003 1.4263e5 318.13
*
$=====
*hydro          component name      component type
2080000          gate_in            valve
*-----$
*hydro  from      to      area      f loss      r loss      fvcchs
2080101  207010001  209010001  .0355      1.64      1.64      001100
*
*hydro  vel/flw      f mass flow      g mass flow      j mass flow
2080201  1      0.      0.      0.      * mass flow
*
*hydro  valve type
2080300  trpvlv
*
*hydro  trip number
2080301  3
*
*=====**
*hydro          component name      component type
2090000          poolin            tmdpvol
*-----$
*hydro          area      length      volume
2090101          1.0234e-1      0.0      1.0e6
*
*hydro          horz angle  vert angle  delta z
2090102          .0      0.0      0.0
*
*hydro          roughness  hyd diam      fe
2090103          .0      .0      10
*
*hydro  ebt      trip no.      alpha vrc      numeric vrc
2090200  003
*
*hydro  time      pressure      temperature
2090201  0.      144632.7      318.13
*
$=====
*hydro          component name      component type
2100000          up_chnl            sngljun
*-----$
*hydro  from      to      area      f loss      r loss      fvcchs
2100101  211200002  207010001  .1142      0.0      0.0      001100
*
*hydro  vel/flw      f mass flow      g mass flow      j mass flow
2100201  1      0.      0.      0.      * mass flow
*
*=====**

```

*hydro	component name		component type				
2110000	pipeup		pipe				
-----*							
*hydro	no. volumes						
2110001	20						
*							
*hydro	vol area		vol				
2110101	.1142		20				
*							
*hydro	length		vol				
2110301	.178098		20				
*							
*hydro	volume		vol				
2110401	0.0		20				
*							
*hydro	vert angle		vol				
2110601	90.0		20				
*							
*hydro	delta z		vol				
2110701	.178098		20				
*							
*hydro	roughness	hyd diam	vol				
2110801	1.5e-6	.253	20				
*							
*hydro	f loss	r loss	jun				
2110901	0.0	0.0	19				
*							
*hydro	pvpfe		vol				
2111001	00000		20				
*							
*hydro	fvcahs		jun				
2111101	001000		19				
*							
*hydro	ebt pressure	temperature	vol				
2111201	3 1.5e5	318.13	0.	0.	0.	20	
*							
*hydro	vel/flow						
2111300	1						
*							
*hydro	f mass flow	g mass flow	j mass flow	jun			
2111301	0.	0.	0.	19			
*							
*hydro	x-shpfac	x-visc	y-shpfac	y-visc	z-shpfac	z-visc	vol
2112501	0.6667	0.14	1.0	0.14	1.0	0.14	20
*							

*hydro	component name		component type				
2120000	hole		tmdpvol				
-----*							
*hydro	area	length	volume				
2120101	1.0234e-1	0.0	1.0e6				
*							
*hydro	horz angle	vert angle	delta z				
2120102	.0	0.0	0.0				
*							
*hydro	roughness	hyd diam	fe				
2120103	.0	.0	10				

```

*
*hydro ebt      trip no.      alpha vrc      numeric vrc
2120200 003
*
*hydro time     pressure     temperature
2120201 0.      184094.5     318.13
*
*=====**
*hydro          component name      component type
3010000          poolrf              tmdpvol
*-----$
*hydro          area      length      volume
3010101          1.0      0.0      1.0e6
*
*hydro          horz angle  vert angle  delta z
3010102          .0      0.0      0.0
*
*hydro          roughness  hyd diam      fe
3010103          .0      .0      10
*
*hydro ebt      trip no.      alpha vrc      numeric vrc
3010200 003
*
*hydro time     pressure     temperature
3010201 0.      169479.7     318.13
*
*=====**
*hydro          component name      component type
3020000          poolcr              tmdpvol
*-----$
*hydro          area      length      volume
3020101          1.0      0.0      1.0e6
*
*hydro          horz angle  vert angle  delta z
3020102          .0      0.0      0.0
*
*hydro          roughness  hyd diam      fe
3020103          .0      .0      10
*
*hydro ebt      trip no.      alpha vrc      numeric vrc
3020200 003
*
*hydro time     pressure     temperature
3020201 0.      169479.7     318.13
*
*=====**
*hydro          component name      component type
4010000          poolup              pipe
*-----$
*hydro          no. volumes
4010001          20
*
*hydro          vol area                      vol
4010101          10.                      20
*
*hydro          length                      vol
4010301          .178098                  20

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```

*
*hydro          volume                      vol
4010401         0.0                        20
*
*hydro          vert angle                  vol
4010601         90.0                       20
*
*hydro          delta z                     vol
4010701         .178098                    20
*
*hydro          roughness      hyd diam      vol
4010801         1.5e-6        3.            20
*
*              f loss            r loss      jun
4010901         0.0            0.0          19
*
*hydro          pvbfe                      vol
4011001         00000                    20
*
*hydro          fvcahs                      jun
4011101         001000                    19
*
*hydro ebt pressure      temperature      vol
4011201    3  1.5e5      318.13      0.      0.      0.      20
*
*hydro vel/flow
4011300    1
*
*hydro f mass flow g mass flow j mass flow jun
4011301    0.      0.      0.      19
*
*hydro x-shpfac x-visc y-shpfac y-visc z-shpfac z-visc vol
4012501  0.6667  0.14  1.0      0.14  1.0      0.14  20
*
$=====
*hydro          component name      component type
4020000          pooljnl          sngljun
*-----$
*hydro    from      to      area      f loss      r loss      fvcahs
4020101  401010001  211010001  .01      0.0      0.0      001100
*
*hydro    vel/flw      f mass flow      g mass flow      j mass flow
4020201    1          0.      0.      0.      * mass flow
*
$=====
* heat structures
$=====
$          ht str no.  120-1          average fuel plate      $
*-----*
*htstr    ht strs    m pts    geom    init    l.coord    refl    b.vol    axl. incr
11201000    30      11      1      0      0.0
*
*htstr          mesh locn      mesh fmt
11201100          0          1
*
*htstr          intervals      rt. coord
11201101          2      3.810e-4

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```

11201102      8      6.350e-4
*
*htstr      compxn no.      interval
11201201      -2      2
11201202      1      10
*
*htstr      source      interval
11201301      0.0      2
11201302      1.0      10
*
*htstr      temp      mesh pt.
11201401      318.13      11
*
*htstr      left vol      incr      b.cond      sa code      area/factor      ht str no.
11201501      120010000      10000      102      0      0.8173      30
*
*htstr      right vol      incr      b.cond      sa code      area/factor      ht str no.
11201601      0      0      0      0      0.8173      30
*
*htstr      s. type      s. mult      left heat      right heat      ht str no.
11201701      1000      1.81575e-02      0.0      0.0      1
11201702      1000      1.54229e-02      0.0      0.0      2
11201703      1000      1.66062e-02      0.0      0.0      3
11201704      1000      1.82967e-02      0.0      0.0      4
11201705      1000      2.02954e-02      0.0      0.0      5
11201706      1000      2.25129e-02      0.0      0.0      6
11201707      1000      2.47602e-02      0.0      0.0      7
11201708      1000      2.65501e-02      0.0      0.0      8
11201709      1000      2.83300e-02      0.0      0.0      9
11201710      1000      3.04182e-02      0.0      0.0      10
11201711      1000      3.24865e-02      0.0      0.0      11
11201712      1000      3.44952e-02      0.0      0.0      12
11201713      1000      3.64442e-02      0.0      0.0      13
11201714      1000      3.82838e-02      0.0      0.0      14
11201715      1000      3.99742e-02      0.0      0.0      15
11201716      1000      4.14758e-02      0.0      0.0      16
11201717      1000      4.26988e-02      0.0      0.0      17
11201718      1000      4.36932e-02      0.0      0.0      18
11201719      1000      4.41805e-02      0.0      0.0      19
11201720      1000      4.44291e-02      0.0      0.0      20
11201721      1000      4.39418e-02      0.0      0.0      21
11201722      1000      4.32656e-02      0.0      0.0      22
11201723      1000      4.23707e-02      0.0      0.0      23
11201724      1000      4.13564e-02      0.0      0.0      24
11201725      1000      3.90196e-02      0.0      0.0      25
11201726      1000      3.66232e-02      0.0      0.0      26
11201727      1000      3.39483e-02      0.0      0.0      27
11201728      1000      3.19496e-02      0.0      0.0      28
11201729      1000      3.14524e-02      0.0      0.0      29
11201730      1000      3.09452e-02      0.0      0.0      30
*
*htstr      heat diam      h len-f      h len-r      glf      glr      k-f      k-r      f      ht str no.
11201801      4.47e-3      0.00995      0.58705      0.0      0.0      0.0      0.0      1.0      1
11201802      4.47e-3      0.02985      0.56715      0.0      0.0      0.0      0.0      1.0      2
11201803      4.47e-3      0.04975      0.54725      0.0      0.0      0.0      0.0      1.0      3
11201804      4.47e-3      0.06965      0.52735      0.0      0.0      0.0      0.0      1.0      4
11201805      4.47e-3      0.08955      0.50745      0.0      0.0      0.0      0.0      1.0      5

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11201806	4.47e-3	0.10945	0.48755	0.0	0.0	0.0	0.0	1.0	6
11201807	4.47e-3	0.12935	0.46765	0.0	0.0	0.0	0.0	1.0	7
11201808	4.47e-3	0.14925	0.44775	0.0	0.0	0.0	0.0	1.0	8
11201809	4.47e-3	0.16915	0.42785	0.0	0.0	0.0	0.0	1.0	9
11201810	4.47e-3	0.18905	0.40795	0.0	0.0	0.0	0.0	1.0	10
11201811	4.47e-3	0.20895	0.38805	0.0	0.0	0.0	0.0	1.0	11
11201812	4.47e-3	0.22885	0.36815	0.0	0.0	0.0	0.0	1.0	12
11201813	4.47e-3	0.24875	0.34825	0.0	0.0	0.0	0.0	1.0	13
11201814	4.47e-3	0.26865	0.32835	0.0	0.0	0.0	0.0	1.0	14
11201815	4.47e-3	0.28855	0.30845	0.0	0.0	0.0	0.0	1.0	15
11201816	4.47e-3	0.30845	0.28855	0.0	0.0	0.0	0.0	1.0	16
11201817	4.47e-3	0.32835	0.26865	0.0	0.0	0.0	0.0	1.0	17
11201818	4.47e-3	0.34825	0.24875	0.0	0.0	0.0	0.0	1.0	18
11201819	4.47e-3	0.36815	0.22885	0.0	0.0	0.0	0.0	1.0	19
11201820	4.47e-3	0.38805	0.20895	0.0	0.0	0.0	0.0	1.0	20
11201821	4.47e-3	0.40795	0.18905	0.0	0.0	0.0	0.0	1.0	21
11201822	4.47e-3	0.42785	0.16915	0.0	0.0	0.0	0.0	1.0	22
11201823	4.47e-3	0.44775	0.14925	0.0	0.0	0.0	0.0	1.0	23
11201824	4.47e-3	0.46765	0.12935	0.0	0.0	0.0	0.0	1.0	24
11201825	4.47e-3	0.48755	0.10945	0.0	0.0	0.0	0.0	1.0	25
11201826	4.47e-3	0.50745	0.08955	0.0	0.0	0.0	0.0	1.0	26
11201827	4.47e-3	0.52735	0.06965	0.0	0.0	0.0	0.0	1.0	27
11201828	4.47e-3	0.54725	0.04975	0.0	0.0	0.0	0.0	1.0	28
11201829	4.47e-3	0.56715	0.02985	0.0	0.0	0.0	0.0	1.0	29
11201830	4.47e-3	0.58705	0.00995	0.0	0.0	0.0	0.0	1.0	30

*

*htstr	heat	diam	h len-f	h len-r	glf	glr	k-f	k-r	f	ht	str no.
11201901	0.0		0.00995	0.58705	0.0	0.0	0.0	0.0	1.0		1
11201902	0.0		0.02985	0.56715	0.0	0.0	0.0	0.0	1.0		2
11201903	0.0		0.04975	0.54725	0.0	0.0	0.0	0.0	1.0		3
11201904	0.0		0.06965	0.52735	0.0	0.0	0.0	0.0	1.0		4
11201905	0.0		0.08955	0.50745	0.0	0.0	0.0	0.0	1.0		5
11201906	0.0		0.10945	0.48755	0.0	0.0	0.0	0.0	1.0		6
11201907	0.0		0.12935	0.46765	0.0	0.0	0.0	0.0	1.0		7
11201908	0.0		0.14925	0.44775	0.0	0.0	0.0	0.0	1.0		8
11201909	0.0		0.16915	0.42785	0.0	0.0	0.0	0.0	1.0		9
11201910	0.0		0.18905	0.40795	0.0	0.0	0.0	0.0	1.0		10
11201911	0.0		0.20895	0.38805	0.0	0.0	0.0	0.0	1.0		11
11201912	0.0		0.22885	0.36815	0.0	0.0	0.0	0.0	1.0		12
11201913	0.0		0.24875	0.34825	0.0	0.0	0.0	0.0	1.0		13
11201914	0.0		0.26865	0.32835	0.0	0.0	0.0	0.0	1.0		14
11201915	0.0		0.28855	0.30845	0.0	0.0	0.0	0.0	1.0		15
11201916	0.0		0.30845	0.28855	0.0	0.0	0.0	0.0	1.0		16
11201917	0.0		0.32835	0.26865	0.0	0.0	0.0	0.0	1.0		17
11201918	0.0		0.34825	0.24875	0.0	0.0	0.0	0.0	1.0		18
11201919	0.0		0.36815	0.22885	0.0	0.0	0.0	0.0	1.0		19
11201920	0.0		0.38805	0.20895	0.0	0.0	0.0	0.0	1.0		20
11201921	0.0		0.40795	0.18905	0.0	0.0	0.0	0.0	1.0		21
11201922	0.0		0.42785	0.16915	0.0	0.0	0.0	0.0	1.0		22
11201923	0.0		0.44775	0.14925	0.0	0.0	0.0	0.0	1.0		23
11201924	0.0		0.46765	0.12935	0.0	0.0	0.0	0.0	1.0		24
11201925	0.0		0.48755	0.10945	0.0	0.0	0.0	0.0	1.0		25
11201926	0.0		0.50745	0.08955	0.0	0.0	0.0	0.0	1.0		26
11201927	0.0		0.52735	0.06965	0.0	0.0	0.0	0.0	1.0		27
11201928	0.0		0.54725	0.04975	0.0	0.0	0.0	0.0	1.0		28
11201929	0.0		0.56715	0.02985	0.0	0.0	0.0	0.0	1.0		29
11201930	0.0		0.58705	0.00995	0.0	0.0	0.0	0.0	1.0		30

```

*
$=====
$          ht str no.  130-1          hot fuel plate          $
$-----*
*htstr  ht strs  m pts  geom  init  l.coord  refl  b.vol  axl. incr
11301000    30    11    1    0    0.0
*
*htstr          mesh locn          mesh fmt
11301100          0          1
*
*htstr          intervals          rt. coord
11301101          2          3.810e-4
11301102          8          6.350e-4
*
*htstr          compxn no.          interval
11301201          -2          2
11301202          1          10
*
*htstr          source          interval
11301301          0.0          2
11301302          1.0          10
*
*htstr          temp          mesh pt.
11301401          318.13          11          * Max. setpoint for RI
*
*htstr  left vol  incr  b.cond  sa code  area/factor  ht str no.
11301501 130010000 10000  102    0        2.662e-3        30
*
*htstr  right vol  incr  b.cond  sa code  area/factor  ht str no.
11301601 0          0      0      0        2.662e-3        30
*
*htstr  s. type    s. mult    left heat  right heat  ht str no.
11301701 1000      1.02548e-04  0.0        0.0         1
11301702 1000      8.71042e-05  0.0        0.0         2
11301703 1000      9.37872e-05  0.0        0.0         3
11301704 1000      1.03334e-04  0.0        0.0         4
11301705 1000      1.14623e-04  0.0        0.0         5
11301706 1000      1.27146e-04  0.0        0.0         6
11301707 1000      1.39838e-04  0.0        0.0         7
11301708 1000      1.49947e-04  0.0        0.0         8
11301709 1000      1.60000e-04  0.0        0.0         9
11301710 1000      1.71793e-04  0.0        0.0        10
11301711 1000      1.83475e-04  0.0        0.0        11
11301712 1000      1.94819e-04  0.0        0.0        12
11301713 1000      2.05826e-04  0.0        0.0        13
11301714 1000      2.16216e-04  0.0        0.0        14
11301715 1000      2.25763e-04  0.0        0.0        15
11301716 1000      2.34243e-04  0.0        0.0        16
11301717 1000      2.41151e-04  0.0        0.0        17
11301718 1000      2.46767e-04  0.0        0.0        18
11301719 1000      2.49519e-04  0.0        0.0        19
11301720 1000      2.50923e-04  0.0        0.0        20
11301721 1000      2.48171e-04  0.0        0.0        21
11301722 1000      2.44352e-04  0.0        0.0        22
11301723 1000      2.39298e-04  0.0        0.0        23
11301724 1000      2.33569e-04  0.0        0.0        24
11301725 1000      2.20372e-04  0.0        0.0        25

```

11301726	1000	2.06837e-04	0.0	0.0	26
11301727	1000	1.91730e-04	0.0	0.0	27
11301728	1000	1.80442e-04	0.0	0.0	28
11301729	1000	1.77634e-04	0.0	0.0	29
11301730	1000	1.74770e-04	0.0	0.0	30

*

*htstr	heat	diam	h len-f	h len-r	glf	glr	k-f	k-r	f	ht	str	no.
11301801	4.47e-3	0.00995	0.58705	0.0	0.0	0.0	0.0	1.0			1	
11301802	4.47e-3	0.02985	0.56715	0.0	0.0	0.0	0.0	1.0			2	
11301803	4.47e-3	0.04975	0.54725	0.0	0.0	0.0	0.0	1.0			3	
11301804	4.47e-3	0.06965	0.52735	0.0	0.0	0.0	0.0	1.0			4	
11301805	4.47e-3	0.08955	0.50745	0.0	0.0	0.0	0.0	1.0			5	
11301806	4.47e-3	0.10945	0.48755	0.0	0.0	0.0	0.0	1.0			6	
11301807	4.47e-3	0.12935	0.46765	0.0	0.0	0.0	0.0	1.0			7	
11301808	4.47e-3	0.14925	0.44775	0.0	0.0	0.0	0.0	1.0			8	
11301809	4.47e-3	0.16915	0.42785	0.0	0.0	0.0	0.0	1.0			9	
11301810	4.47e-3	0.18905	0.40795	0.0	0.0	0.0	0.0	1.0			10	
11301811	4.47e-3	0.20895	0.38805	0.0	0.0	0.0	0.0	1.0			11	
11301812	4.47e-3	0.22885	0.36815	0.0	0.0	0.0	0.0	1.0			12	
11301813	4.47e-3	0.24875	0.34825	0.0	0.0	0.0	0.0	1.0			13	
11301814	4.47e-3	0.26865	0.32835	0.0	0.0	0.0	0.0	1.0			14	
11301815	4.47e-3	0.28855	0.30845	0.0	0.0	0.0	0.0	1.0			15	
11301816	4.47e-3	0.30845	0.28855	0.0	0.0	0.0	0.0	1.0			16	
11301817	4.47e-3	0.32835	0.26865	0.0	0.0	0.0	0.0	1.0			17	
11301818	4.47e-3	0.34825	0.24875	0.0	0.0	0.0	0.0	1.0			18	
11301819	4.47e-3	0.36815	0.22885	0.0	0.0	0.0	0.0	1.0			19	
11301820	4.47e-3	0.38805	0.20895	0.0	0.0	0.0	0.0	1.0			20	
11301821	4.47e-3	0.40795	0.18905	0.0	0.0	0.0	0.0	1.0			21	
11301822	4.47e-3	0.42785	0.16915	0.0	0.0	0.0	0.0	1.0			22	
11301823	4.47e-3	0.44775	0.14925	0.0	0.0	0.0	0.0	1.0			23	
11301824	4.47e-3	0.46765	0.12935	0.0	0.0	0.0	0.0	1.0			24	
11301825	4.47e-3	0.48755	0.10945	0.0	0.0	0.0	0.0	1.0			25	
11301826	4.47e-3	0.50745	0.08955	0.0	0.0	0.0	0.0	1.0			26	
11301827	4.47e-3	0.52735	0.06965	0.0	0.0	0.0	0.0	1.0			27	
11301828	4.47e-3	0.54725	0.04975	0.0	0.0	0.0	0.0	1.0			28	
11301829	4.47e-3	0.56715	0.02985	0.0	0.0	0.0	0.0	1.0			29	
11301830	4.47e-3	0.58705	0.00995	0.0	0.0	0.0	0.0	1.0			30	

*

*htstr	heat	diam	h len-f	h len-r	glf	glr	k-f	k-r	f	ht	str	no.
11301901	0.0	0.00995	0.58705	0.0	0.0	0.0	0.0	1.0			1	
11301902	0.0	0.02985	0.56715	0.0	0.0	0.0	0.0	1.0			2	
11301903	0.0	0.04975	0.54725	0.0	0.0	0.0	0.0	1.0			3	
11301904	0.0	0.06965	0.52735	0.0	0.0	0.0	0.0	1.0			4	
11301905	0.0	0.08955	0.50745	0.0	0.0	0.0	0.0	1.0			5	
11301906	0.0	0.10945	0.48755	0.0	0.0	0.0	0.0	1.0			6	
11301907	0.0	0.12935	0.46765	0.0	0.0	0.0	0.0	1.0			7	
11301908	0.0	0.14925	0.44775	0.0	0.0	0.0	0.0	1.0			8	
11301909	0.0	0.16915	0.42785	0.0	0.0	0.0	0.0	1.0			9	
11301910	0.0	0.18905	0.40795	0.0	0.0	0.0	0.0	1.0			10	
11301911	0.0	0.20895	0.38805	0.0	0.0	0.0	0.0	1.0			11	
11301912	0.0	0.22885	0.36815	0.0	0.0	0.0	0.0	1.0			12	
11301913	0.0	0.24875	0.34825	0.0	0.0	0.0	0.0	1.0			13	
11301914	0.0	0.26865	0.32835	0.0	0.0	0.0	0.0	1.0			14	
11301915	0.0	0.28855	0.30845	0.0	0.0	0.0	0.0	1.0			15	
11301916	0.0	0.30845	0.28855	0.0	0.0	0.0	0.0	1.0			16	
11301917	0.0	0.32835	0.26865	0.0	0.0	0.0	0.0	1.0			17	
11301918	0.0	0.34825	0.24875	0.0	0.0	0.0	0.0	1.0			18	

11301919	0.0	0.36815	0.22885	0.0	0.0	0.0	0.0	1.0	19
11301920	0.0	0.38805	0.20895	0.0	0.0	0.0	0.0	1.0	20
11301921	0.0	0.40795	0.18905	0.0	0.0	0.0	0.0	1.0	21
11301922	0.0	0.42785	0.16915	0.0	0.0	0.0	0.0	1.0	22
11301923	0.0	0.44775	0.14925	0.0	0.0	0.0	0.0	1.0	23
11301924	0.0	0.46765	0.12935	0.0	0.0	0.0	0.0	1.0	24
11301925	0.0	0.48755	0.10945	0.0	0.0	0.0	0.0	1.0	25
11301926	0.0	0.50745	0.08955	0.0	0.0	0.0	0.0	1.0	26
11301927	0.0	0.52735	0.06965	0.0	0.0	0.0	0.0	1.0	27
11301928	0.0	0.54725	0.04975	0.0	0.0	0.0	0.0	1.0	28
11301929	0.0	0.56715	0.02985	0.0	0.0	0.0	0.0	1.0	29
11301930	0.0	0.58705	0.00995	0.0	0.0	0.0	0.0	1.0	30

*
\$=====

* hs 205-1 heat exchanger

\$=====

*
*htstr ht strs m pts geom init l.coord refl b.vol axl. incr
12051000 20 11 1 0 0.0
*
*htstr mesh locn mesh fmt
12051100 0 1
*
*htstr intervals rt. coord
12051101 2 .01
12051102 8 .1
*
*htstr compxn no. interval
12051201 3 2
12051202 3 10
*
*htstr source interval
12051301 0.0 2
12051302 1.0 10
*
*htstr temp mesh pt.
12051401 318.13 11
*
*htstr left vol incr b.cond sa code area/factor ht str no.
12051501 205010000 10000 100 0 100. 20
*
*htstr right vol incr b.cond sa code area/factor ht str no.
12051601 0 0 0 0 100. 20
*
*htstr s. type s. mult left heat right heat ht str no.
12051701 0 3.85097e-3 0.0 0.0 20
*
*htstr heat diam h len-f h len-r glf glr k-f k-r f ht str no.
12051801 0. 0.00995 0.58705 0.0 0.0 0.0 0.0 1.0 20
*
*htstr heat diam h len-f h len-r glf glr k-f k-r f ht str no.
12051901 0.0 0.00995 0.58705 0.0 0.0 0.0 0.0 1.0 20
*
\$=====

* hs 211-1 outlet duct walls

\$=====

*

```

*htstr  ht strs  m pts  geom  init  l.coord  refl  b.vol  axl. incr
12111000  20    11    1    0    0.0
*
*htstr          mesh locn      mesh fmt
12111100      0              1
*
*htstr          intervals      rt. coord
12111101      10            .009525
*
*htstr          compxn no.      interval
12111201      4              10
*
*htstr          source          interval
12111301      0.0            10
*
*htstr          temp            mesh pt.
12111401     318.13          11
*
*htstr  left vol  incr  b.cond  sa code  area/factor  ht str no.
12111501 211010000 10000  100    0      .321          20
*
*htstr  right vol  incr  b.cond  sa code  area/factor  ht str no.
12111601 401010000 10000  100    0      .321          20
*
*htstr  s. type    s. mult    left heat  right heat  ht str no.
12111701  0      3.85097e-3    0.0        0.0          20
*
*htstr  heat diam  h len-f  h len-r  glf  glr  k-f  k-r  f  ht str no.
12111801 .253      0.00995  0.58705  0.0  0.0  0.0  0.0  1.0  20
*
*htstr  heat diam  h len-f  h len-r  glf  glr  k-f  k-r  f  ht str no.
12111901  0.0      0.00995  0.58705  0.0  0.0  0.0  0.0  1.0  20
*
$=====
$  thermal properties of composition  1  -  U-Al-Si fuel meat  $
*-----
*compxn      composition      th.con flg      ht.cap flg      material
20100100      tbl/fctn          1              1      *U-Si3-Al
*
*compxn      temperature      th. cond.
20100101      273.0          59.6
20100102      300.0          59.65
20100103      350.0          59.79
20100104      400.0          59.79
20100105      500.0          59.65
20100106      600.0          59.42
20100107      700.0          59.128
20100108      800.0          58.82
20100109      900.0          58.45
20100110      933.0          58.34
20100111     1000.0          46.49
20100112     1100.0          47.1
20100113     1200.0          47.6
*
*compxn      temperature      vol. ht. cap.
20100151      273.0          2.57e+06
20100152      300.0          2.64e+06

```

20100153	400.0	2.76e+06
20100154	500.0	2.91e+06
20100155	600.0	3.04e+06
20100156	700.0	3.17e+06
20100157	800.0	3.30e+06
20100158	900.0	3.43e+06
20100159	933.0	3.47e+06
20100160	1000.0	3.47e+06
20100161	1100.0	3.52e+06
20100162	1200.0	3.56e+06

\$=====

\$ thermal properties of composition 2 - Al \$

*-----

*compxn	composition	th.con flg	ht.cap flg	material
20100200	tbl/fctn	1	1	*Al

*

*compxn	temperature	th. cond.
20100201	273.0	236.0
20100202	300.0	237.0
20100203	350.0	240.0
20100204	400.0	240.0
20100205	500.0	237.0
20100206	600.0	232.0
20100207	700.0	226.0
20100208	800.0	220.0
20100209	900.0	213.0
20100210	933.0	211.0
20100211	1000.0	93.0
20100212	1100.0	96.4
20100213	1200.0	99.4

*

*compxn	temperature	vol. ht. cap.
20100251	273.0	2.38e+06
20100252	300.0	2.45e+06
20100253	400.0	2.57e+06
20100254	500.0	2.69e+06
20100255	600.0	2.82e+06
20100256	700.0	2.94e+06
20100257	800.0	3.06e+06
20100258	900.0	3.19e+06
20100259	933.0	3.22e+06
20100260	1000.0	3.18e+06
20100261	1100.0	3.18e+06
20100262	1200.0	3.18e+06

*

\$=====

\$ thermal properties of composition 3 - heat sink \$

*-----

*compxn	composition	th.con flg	ht.cap flg	material
20100300	tbl/fctn	1	1	* heat sink

*

*compxn	temperature	th. cond.
20100301	273.0	400.0
20100302	10000.	400.0

*

*compxn	temperature	vol. ht. cap.
20100351	273.0	5.00e+12

```

20100352          10000.          5.00e+12
*
$=====
$  thermal properties of composition  4  -  stainless steel  $
*-----
*compxn      composition      th.con flg      ht.cap flg      material
20100400      tbl/fctn      1      1  * stainless steel
*
*compxn      temperature      th. cond.
20100401      290.      14.83  * Type 304 stainless steel
20100402      573.      19.37  * Type 304 staniless steel
20100403      873.      23.62  * Type 304 staniless steel
20100404      1144.      27.20  * Type 304 staniless steel
20100405      10000.      27.20  * Type 304 staniless steel
*compxn      temperature      vol. ht. cap.
20100451      290.      3.810e6* Type 304 stainless steel
20100452      573.      4.343e6* Type 304 stainless steel
20100453      873.      4.600e6* Type 304 stainless steel
20100454      1144.      4.792e6* Type 304 stainless steel
20100455      10000.      4.792e6* Type 304 stainless steel
*
$=====
* reactor point kinetics input
*   For the steady-state or transient calculation, the initial power
*   level is for a cold clean core just at the point of criticality.
*   This is ~0.1% of rated steady-state power:
*       0.1% * 2 MW = 2 kW = 2.0e3 W
$=====
30000000      point      separabl
*
*
*      power      initial react      bol      decay
30000001      gamma      2.3e6      0.0      108.8      1.0
* 30000001      gamma      1.0      0.0      111.86      1.0
*
*      mev/fis      pf-235      pf-u238      pf-pu239      groups
30000002      ans79-1      200.0      1.0      0.0      0.0      6  0  0
*
*      fraction      decay constant
30000101      0.035189      0.013337
30000102      0.181465      0.032712
30000103      0.174594      0.12075
30000104      0.383727      0.30279
30000105      0.158734      0.84966
30000106      0.066292      2.8538
*
*      power      time
30000401      2.3e6      3120.0      wk
* 30000402      2.4e6      40.      hr
* 30000401      1.0      10000.0      wk
* 30000402      1.0      40.      hr
*
$=====
*
*      control rod insertions
*
$=====

```

```

30000011      1
$=====
$              table no. 1   - control rods
$-----*


| table    | table type | trip no. | factor 1 | factor 2 |
|----------|------------|----------|----------|----------|
| 20200100 | reac-t     | 1        |          |          |


*


|            | time (sec) | reactivity (\$) |
|------------|------------|-----------------|
| * 20200101 | -1.0       | 0.0             |
| * 20200102 | 10000.     | 0.0             |
| 20200102   | 0.0        | 0.0             |
| 20200103   | 40.        | 0.10495         |
| 20200104   | 500.1      | 0.10495         |
| * 20200105 | 501.0      | -1.309          |
| * 20200106 | 10000.     | -1.309          |
| 20200105   | 501.0      | -1.22005        |
| 20200106   | 10000.     | -1.22005        |


*
$=====
* feedback tables
$=====
*
* Density Feedback for single and two-phase liquid
*


|          | density (kg/m^3) | reactivity (\$) |
|----------|------------------|-----------------|
| 30000501 | 10.              | -27.72          |
| 30000502 | 945.68           | -2.7895         |
| 30000503 | 960.50           | -2.1062         |
| 30000504 | 967.33           | -1.7600         |
| 30000505 | 973.33           | -1.4107         |
| 30000506 | 979.49           | -1.0966         |
| 30000507 | 984.73           | -.7970          |
| 30000508 | 989.40           | -.5132          |
| 30000509 | 993.36           | -.2463          |
| 30000510 | 996.54           | 0.              |


*
* Doppler Feedback (LEU Fuel)
*


|          | temperature (K) | reactivity (\$) |
|----------|-----------------|-----------------|
| 30000601 | 300.            | 0.0             |
| 30000602 | 350.            | -.1124          |
| 30000603 | 400.            | -.2445          |
| 30000604 | 500.            | -.4864          |
| 30000605 | 600.            | -.7045          |
| 30000606 | 800.            | -1.0898         |


*


|          | volume    | increment | weighting factor | coefficient |
|----------|-----------|-----------|------------------|-------------|
| 30000701 | 120010000 | 0         | 3.67116e-4       | 0.          |
| 30000702 | 120020000 | 0         | 2.04057e-3       | 0.          |
| 30000703 | 120030000 | 0         | 5.00653e-3       | 0.          |
| 30000704 | 120040000 | 0         | 9.14555e-3       | 0.          |
| 30000705 | 120050000 | 0         | 1.42867e-2       | 0.          |
| 30000706 | 120060000 | 0         | 2.02147e-2       | 0.          |
| 30000707 | 120070000 | 0         | 2.66796e-2       | 0.          |
| 30000708 | 120080000 | 0         | 3.34073e-2       | 0.          |
| 30000709 | 120090000 | 0         | 4.01114e-2       | 0.          |
| 30000710 | 120100000 | 0         | 4.65061e-2       | 0.          |
| 30000711 | 120110000 | 0         | 5.23178e-2       | 0.          |
| 30000712 | 120120000 | 0         | 5.72979e-2       | 0.          |


```

30000713	120130000	0	6.12328e-2	0.
30000714	120140000	0	6.39540e-2	0.
30000715	120150000	0	6.53446e-2	0.
30000716	120160000	0	6.53449e-2	0.
30000717	120170000	0	6.39549e-2	0.
30000718	120180000	0	6.12343e-2	0.
30000719	120190000	0	5.72998e-2	0.
30000720	120200000	0	5.25380e-2	0.
30000721	120210000	0	4.67024e-2	0.
30000722	120220000	0	4.02813e-2	0.
30000723	120230000	0	3.35493e-2	0.
30000724	120240000	0	2.67936e-2	0.
30000725	120250000	0	2.03016e-2	0.
30000726	120260000	0	1.43486e-2	0.
30000727	120270000	0	9.18568e-3	0.
30000728	120280000	0	5.02894e-3	0.
30000729	120290000	0	2.05009e-3	0.
30000730	120300000	0	3.69085e-4	0.
30000731	130010000	0	1.52832e-6	0.
30000732	130020000	0	8.49498e-6	0.
30000733	130030000	0	2.08424e-5	0.
30000734	130040000	0	3.80733e-5	0.
30000735	130050000	0	5.94759e-5	0.
30000736	130060000	0	8.41546e-5	0.
30000737	130070000	0	1.11068e-4	0.
30000738	130080000	0	1.39076e-4	0.
30000739	130090000	0	1.66986e-4	0.
30000740	130100000	0	1.93607e-4	0.
30000741	130110000	0	2.17801e-4	0.
30000742	130120000	0	2.38533e-4	0.
30000743	130130000	0	2.54915e-4	0.
30000744	130140000	0	2.66243e-4	0.
30000745	130150000	0	2.72032e-4	0.
30000746	130160000	0	2.72033e-4	0.
30000747	130170000	0	2.66247e-4	0.
30000748	130180000	0	2.54921e-4	0.
30000749	130190000	0	2.38541e-4	0.
30000750	130200000	0	2.17811e-4	0.
30000751	130210000	0	1.93618e-4	0.
30000752	130220000	0	1.66998e-4	0.
30000753	130230000	0	1.39088e-4	0.
30000754	130240000	0	1.11080e-4	0.
30000755	130250000	0	8.41660e-5	0.
30000756	130260000	0	5.94861e-5	0.
30000757	130270000	0	3.80818e-5	0.
30000758	130280000	0	2.08489e-5	0.
30000759	130290000	0	8.49923e-6	0.
30000760	130300000	0	1.53014e-6	0.

*

*	ht str	increment	weighting factor	coefficient
30000801	1201001	0	3.67116e-4	0.
30000802	1201002	0	2.04057e-3	0.
30000803	1201003	0	5.00653e-3	0.
30000804	1201004	0	9.14555e-3	0.
30000805	1201005	0	1.42867e-2	0.
30000806	1201006	0	2.02147e-2	0.
30000807	1201007	0	2.66796e-2	0.

30000808	1201008	0	3.34073e-2	0.
30000809	1201009	0	4.01114e-2	0.
30000810	1201010	0	4.65061e-2	0.
30000811	1201011	0	5.23178e-2	0.
30000812	1201012	0	5.72979e-2	0.
30000813	1201013	0	6.12328e-2	0.
30000814	1201014	0	6.39540e-2	0.
30000815	1201015	0	6.53446e-2	0.
30000816	1201016	0	6.53449e-2	0.
30000817	1201017	0	6.39549e-2	0.
30000818	1201018	0	6.12343e-2	0.
30000819	1201019	0	5.72998e-2	0.
30000820	1201020	0	5.25380e-2	0.
30000821	1201021	0	4.67024e-2	0.
30000822	1201022	0	4.02813e-2	0.
30000823	1201023	0	3.35493e-2	0.
30000824	1201024	0	2.67936e-2	0.
30000825	1201025	0	2.03016e-2	0.
30000826	1201026	0	1.43486e-2	0.
30000827	1201027	0	9.18568e-3	0.
30000828	1201028	0	5.02894e-3	0.
30000829	1201029	0	2.05009e-3	0.
30000830	1201030	0	3.69085e-4	0.
30000831	1301001	0	1.52832e-6	0.
30000832	1301002	0	8.49498e-6	0.
30000833	1301003	0	2.08424e-5	0.
30000834	1301004	0	3.80733e-5	0.
30000835	1301005	0	5.94759e-5	0.
30000836	1301006	0	8.41546e-5	0.
30000837	1301007	0	1.11068e-4	0.
30000838	1301008	0	1.39076e-4	0.
30000839	1301009	0	1.66986e-4	0.
30000840	1301010	0	1.93607e-4	0.
30000841	1301011	0	2.17801e-4	0.
30000842	1301012	0	2.38533e-4	0.
30000843	1301013	0	2.54915e-4	0.
30000844	1301014	0	2.66243e-4	0.
30000845	1301015	0	2.72032e-4	0.
30000846	1301016	0	2.72033e-4	0.
30000847	1301017	0	2.66247e-4	0.
30000848	1301018	0	2.54921e-4	0.
30000849	1301019	0	2.38541e-4	0.
30000850	1301020	0	2.17811e-4	0.
30000851	1301021	0	1.93618e-4	0.
30000852	1301022	0	1.66998e-4	0.
30000853	1301023	0	1.39088e-4	0.
30000854	1301024	0	1.11080e-4	0.
30000855	1301025	0	8.41660e-5	0.
30000856	1301026	0	5.94861e-5	0.
30000857	1301027	0	3.80818e-5	0.
30000858	1301028	0	2.08489e-5	0.
30000859	1301029	0	8.49923e-6	0.
30000860	1301030	0	1.53014e-6	0.

*
 \$===== \$
 * control variables
 \$===== \$

```

*ctlvar          cntrlvar type card
20500000          999
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500100      "Tin F"      sum      1.0      86.      1 0
*
*ctlvar          a0      coeff      variable name      parameter no.
20500101          -459.67      1.8      tempf      110010000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500200      "Tout F"      sum      1.0      86.0138 1 0
*
*ctlvar          a0      coeff      variable name      parameter no.
20500201          -459.67      1.8      tempf      180010000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500300      "Pin psia"      mult      1.45038e-4 23.24426 1 0
*
*ctlvar      variable name      parameter no.      variable name      parameter no.
20500301      p      110010000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500400      "core dp"      sum      1.45038e-4 -.733262 1 0
*
*ctlvar          a0      coeff      variable name      parameter no.
20500401          0.0      1.0      p      110010000
20500402          -1.0      p      180010000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500500      "Qtot gpm"      mult      6325.62      1730.      1 1      1.e-6
*
*ctlvar      variable name      parameter no.      variable name      parameter no.
20500501      voidfj      211010000      velfj      211010000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500600      "Qavg gpm"      mult      788.998      671.656 1 0
*
*ctlvar      variable name      parameter no.      variable name      parameter no.
20500601      voidfj      170010000      velfj      170010000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500700      "Qavg/ass"      mult      0.0041841 2.810276 1 0
*
*ctlvar      variable name      parameter no.      variable name      parameter no.
20500701      cntrlvar      6
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500800      "Qhot gpm"      mult      3.3015      2.810535 1 0
*
*ctlvar      variable name      parameter no.      variable name      parameter no.
20500801      voidfj      170020000      velfj      170020000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20500900      "Qref gpm"      mult      114.751      87.3464 1 0
*
*ctlvar      variable name      parameter no.      variable name      parameter no.
20500901      voidfj      180020000      velfj      180020000

```

```

$=====
*ctlvar      name      type      factor      init      f c      min      max
20501000    "Qbld gpm"  mult      269.445    239.555    1 0
*
*ctlvar  variable name  parameter no.      variable name  parameter no.
20501001    voidfj      180030000          velfj          180030000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20501200    "qbyp gpm"  sum        1.0        380.646    1 0
*
*ctlvar      a0      coeff      variable name  parameter no.
20501201      0.0      1.0        cntrlvar          9
20501202      1.0        cntrlvar          10
$=====
*ctlvar      name      type      factor      init      f c      min      max
20501300    "byp frac"  div        1.0        .360763    1
*
*ctlvar  variable name  parameter no.      variable name  parameter no.
20501301    cntrlvar          5          cntrlvar          12
$=====
*ctlvar      name      type      factor      init      f c      min      max
20501400    "g avg  "  mult        1.0        847.683    1 0
*
*ctlvar  variable name  parameter no.      variable name  parameter no.
20501401    rhofj      115010000          velfj          115010000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20501500    "ref avg "  div        5.924e-3    6298.9    1
*
*ctlvar  variable name  parameter no.      variable name  parameter no.
20501501    viscf      115010000          cntrlvar          14
$=====
*ctlvar      name      type      factor      init      f c      min      max
20501600    "g ref  "  mult        1.0        757.971    1 0
*
*ctlvar  variable name  parameter no.      variable name  parameter no.
20501601    rhofj      110020000          velfj          110020000
$=====
*ctlvar      name      type      factor      init      f c      min      max
20501700    "ref flow"  div        9.40e-3     8937.11    1
*
*ctlvar  variable name  parameter no.      variable name  parameter no.
20501701    viscf      115010000          cntrlvar          16
*
$=====
$
$          *****  DISCLAIMER  *****
$  This deck has NOT received final checkout.  Neither LITCO nor NRC
$  assumes any responsibility for errors in either the calcu-
$  lated results or judgments based on those results.
$          *****  DISCLAIMER  *****
$
$
$=====
*
. end of deck

```