APPENDICE A

ALTRI RISULTATI TERMOIDRAULICI OTTENUTI CON IL CODICE RELAP5/MOD3.3

A1 andamento della pressione nelle Cold Legs numero 2 - 3 - 4

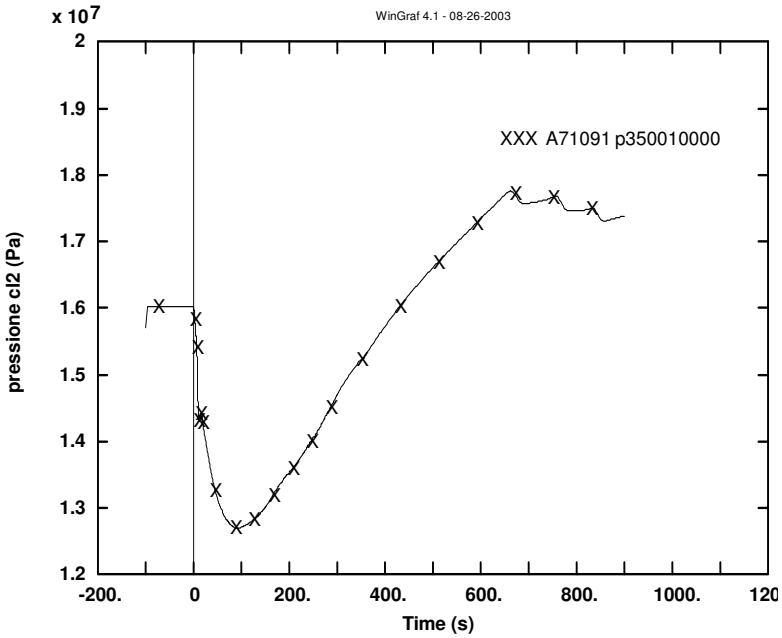

Fig. A1 andamento della pressione nella cold leg 2

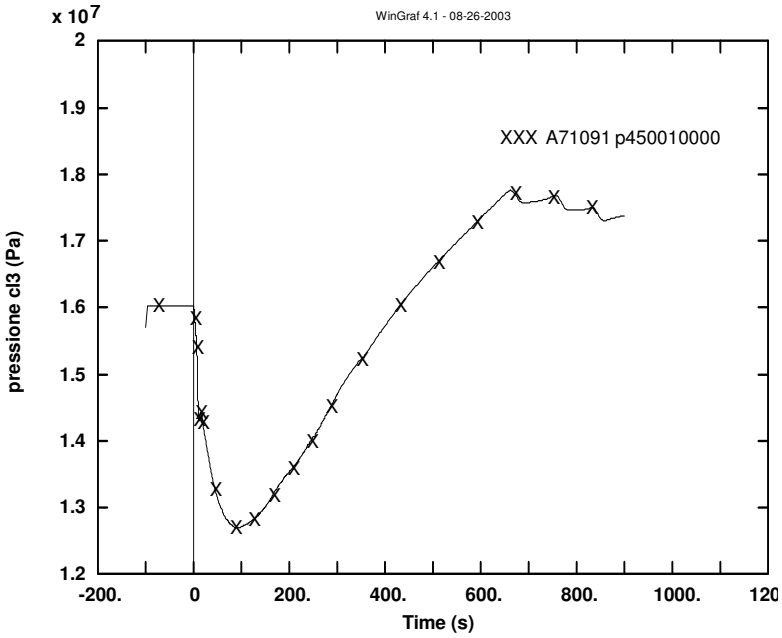

Fig.A2 andamento della pressione nella cold leg 3

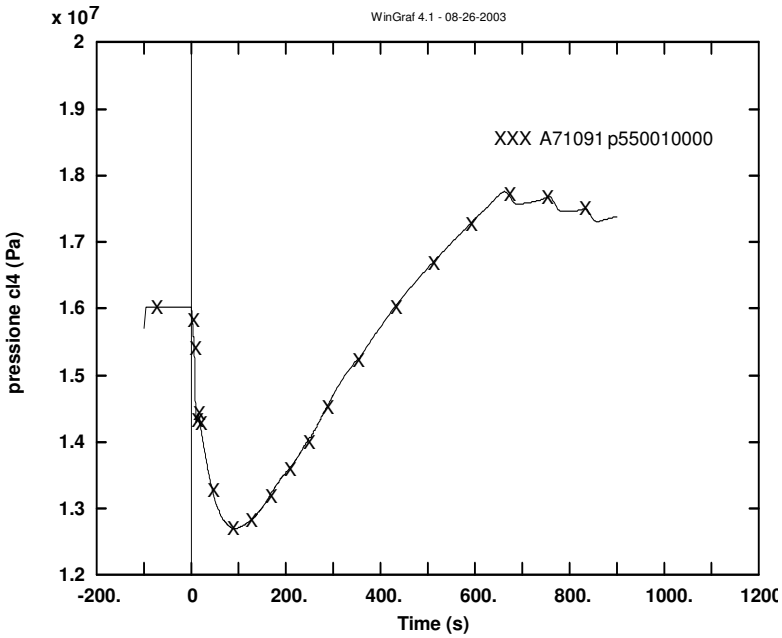

Fig A3 andamento della pressione nella cold leg 4

A2 andamento della pressione nel duomo dei generatori di vapore 3 e 4

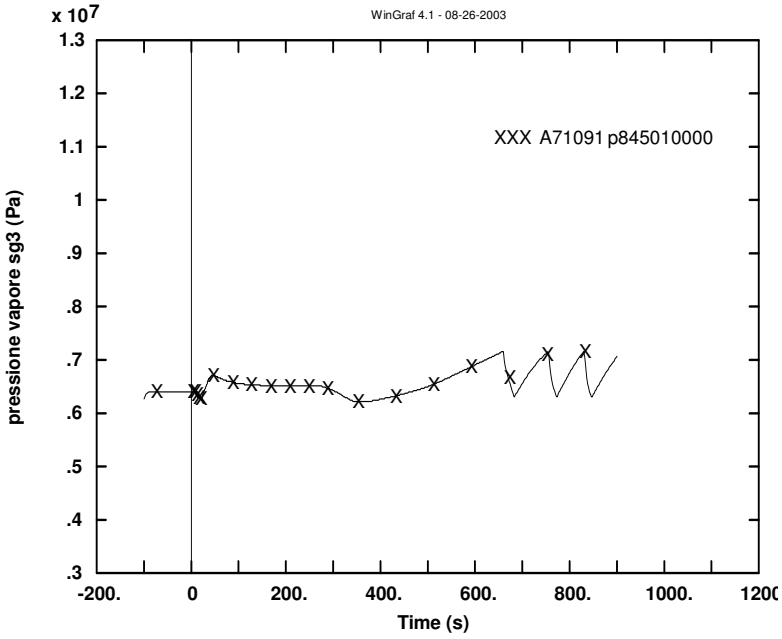

Fig. A4 andamento della pressione nel duomo del gv3

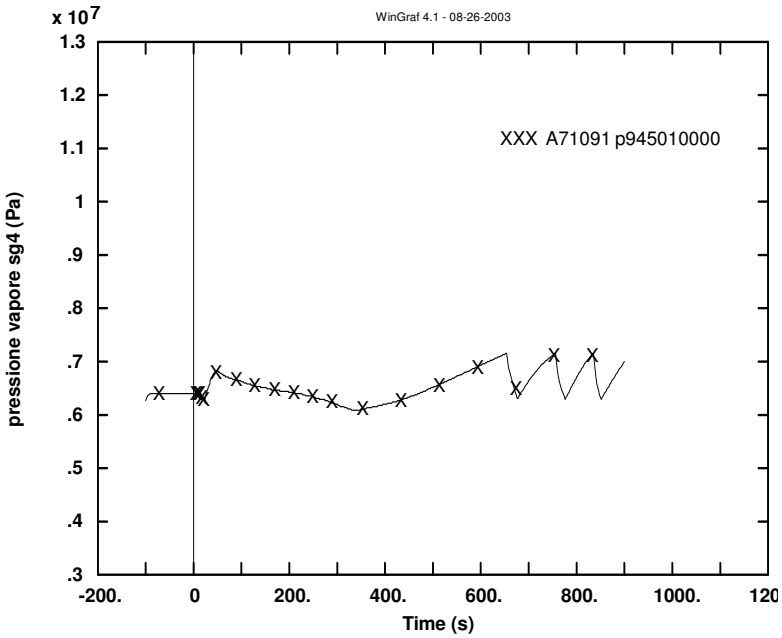

Fig.A5 andamento della pressione nel duomo del gv4

A3 Andamento della pressione in ingresso al generatore di vapore 3 e 4

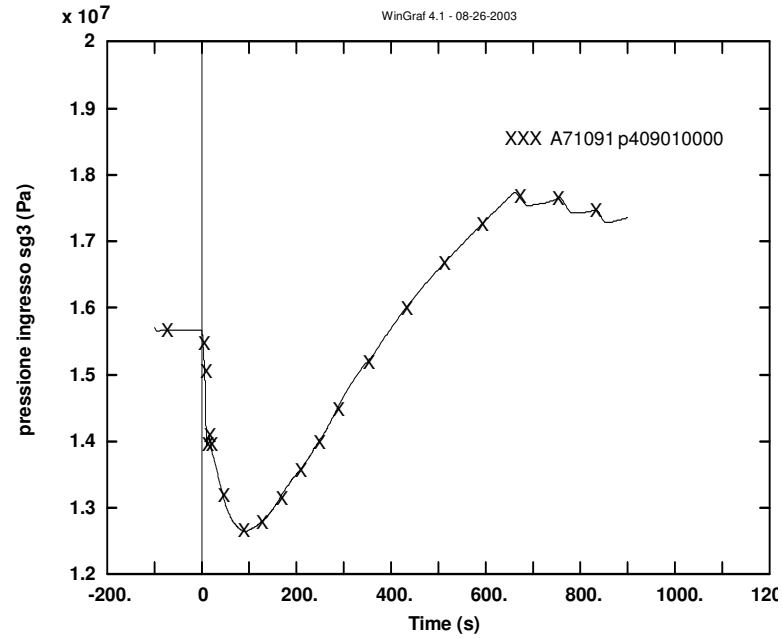

Fig.A6 andamento della pressione in ingresso al GV3

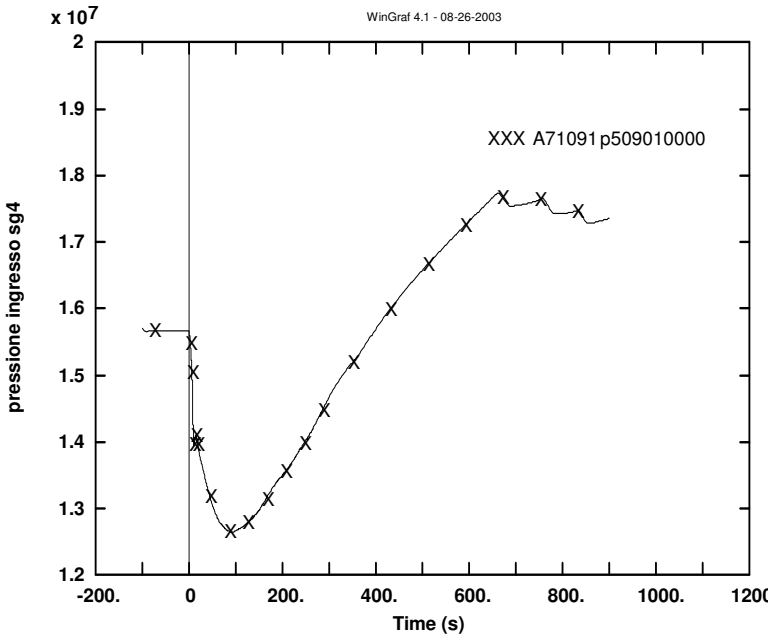

Fig.A7 andamento della pressione in ingresso al GV4

A4 andamento della pressione in uscita al generatore di vapore 3 e 4

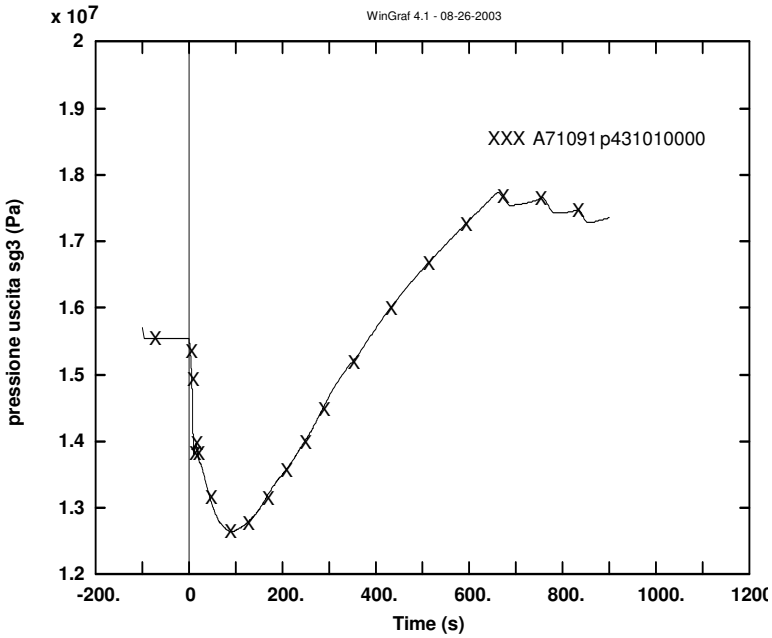

Fig.A8 andamento della pressione in uscita al GV3

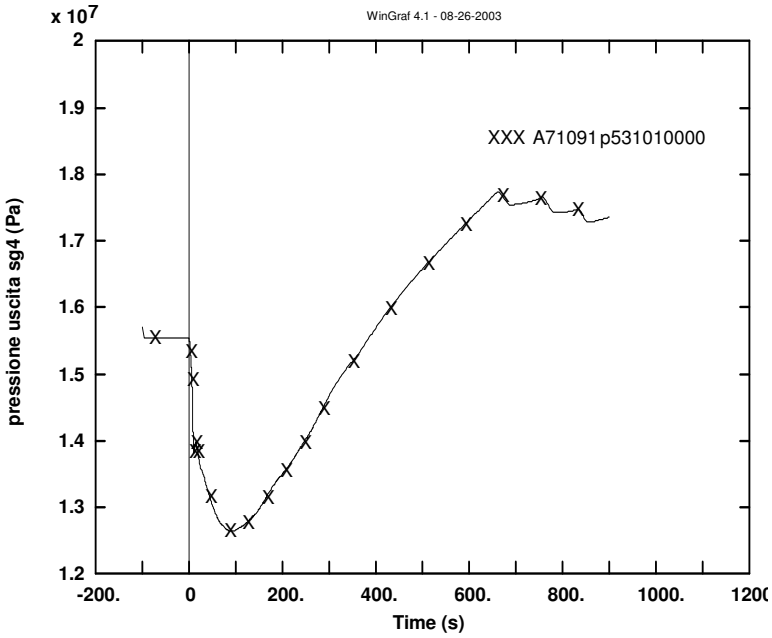

Fig. A9 andamento della pressione in uscita al GV4

A5 Andamento del grado di vuoto

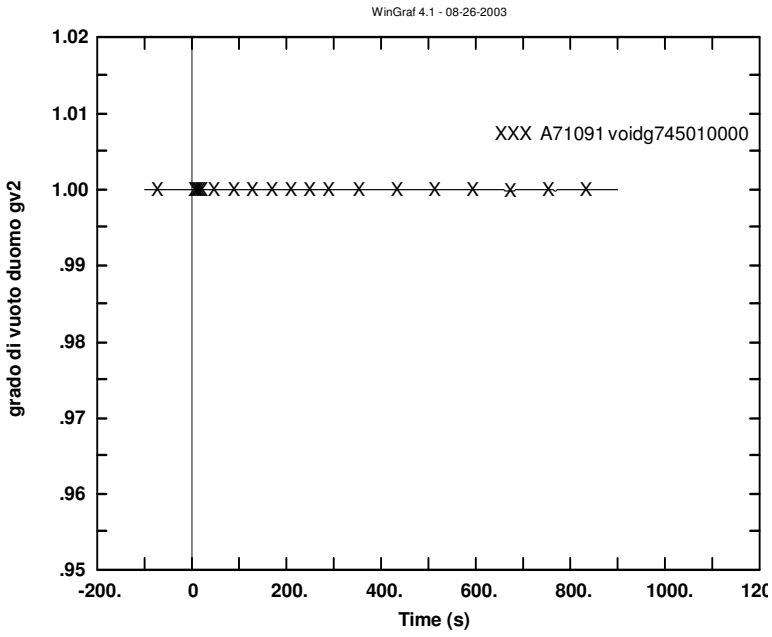

Fig. A10 andamento del grado di vuoto nel duomo del GV2

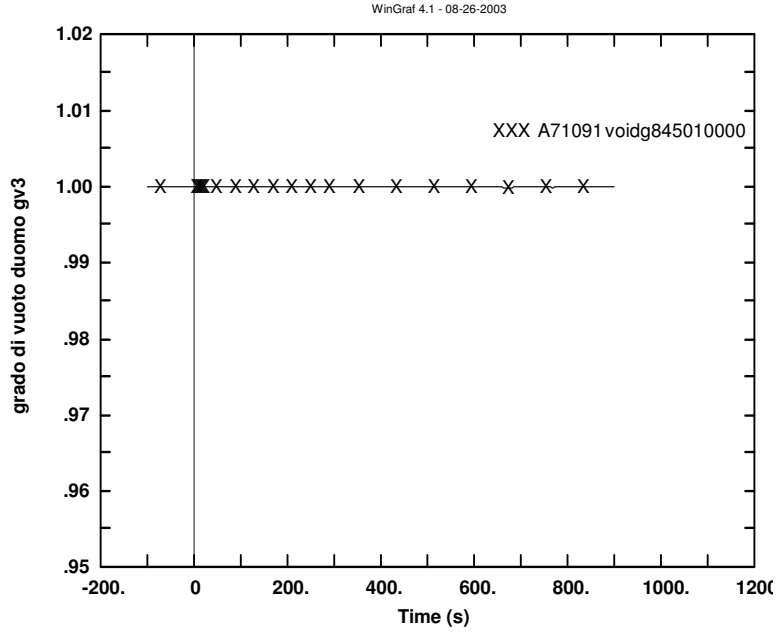

Fig.A11 andamento del grado di vuoto nel duomo del GV3

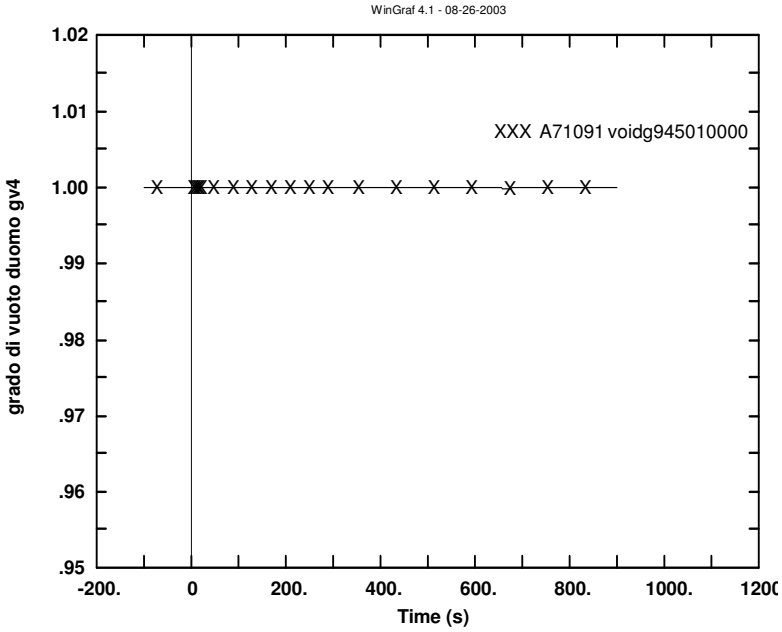

Fig.A12 andamento del grado di vuoto nel duomo del GV4

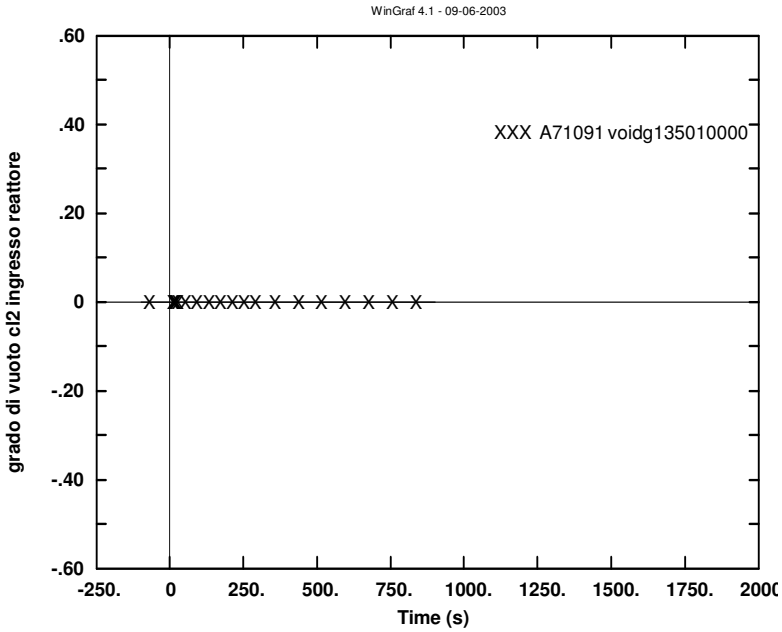

Fig.A13 andamento del grado di vuoto nella Cold Leg 2 in ingresso al downcomer

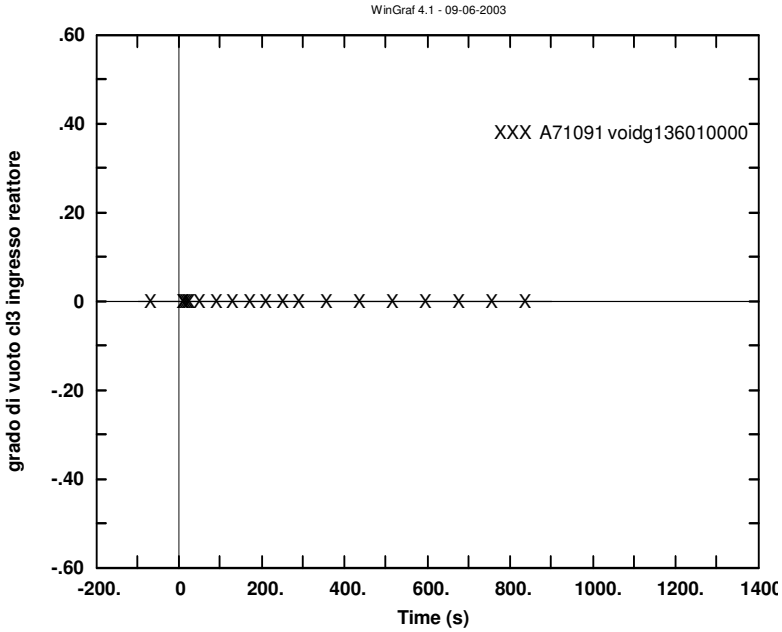

Fig. A14 andamento del grado di vuoto nella Cold Leg 3 in ingresso al downcomer

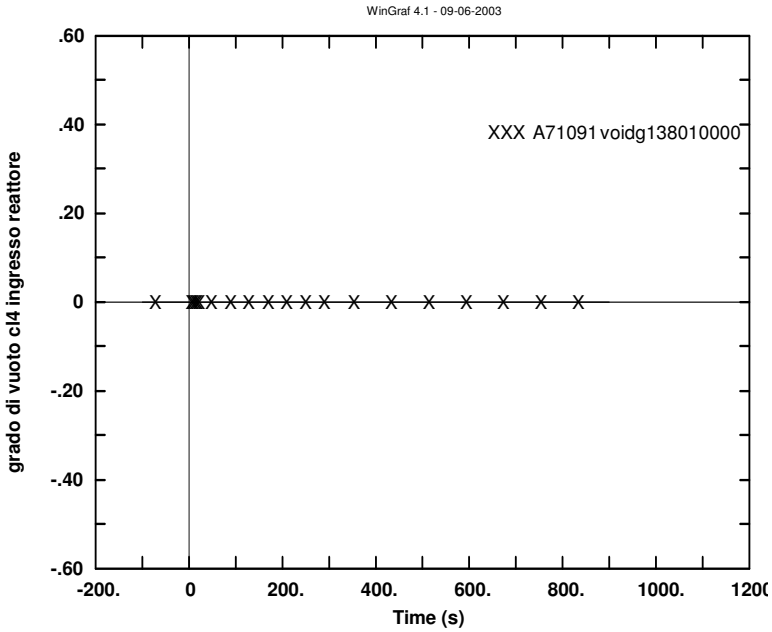

Fig. A15 andamento del grado di vuoto nella Cold Leg 4 in ingresso al downcomer

A6 Andamento della portata

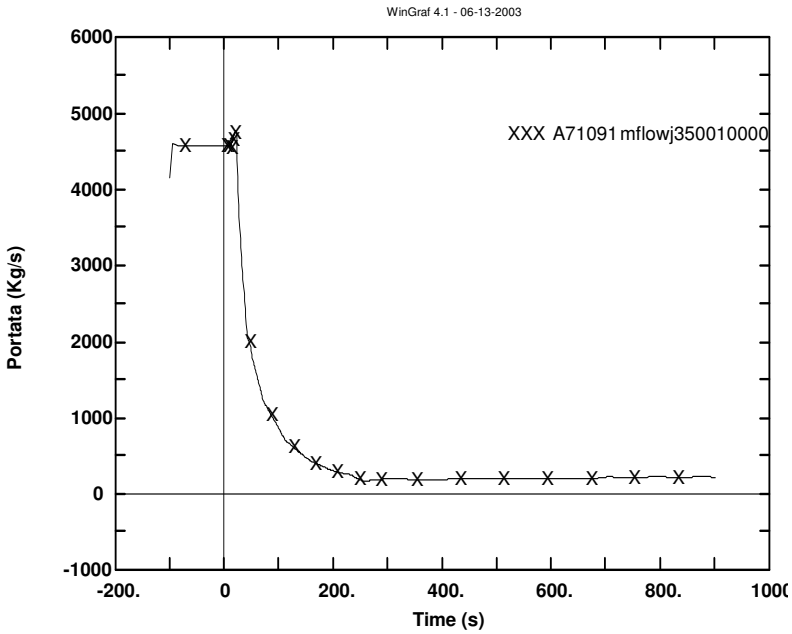

Fig.A16 Andamento della portata massica nella CL 2

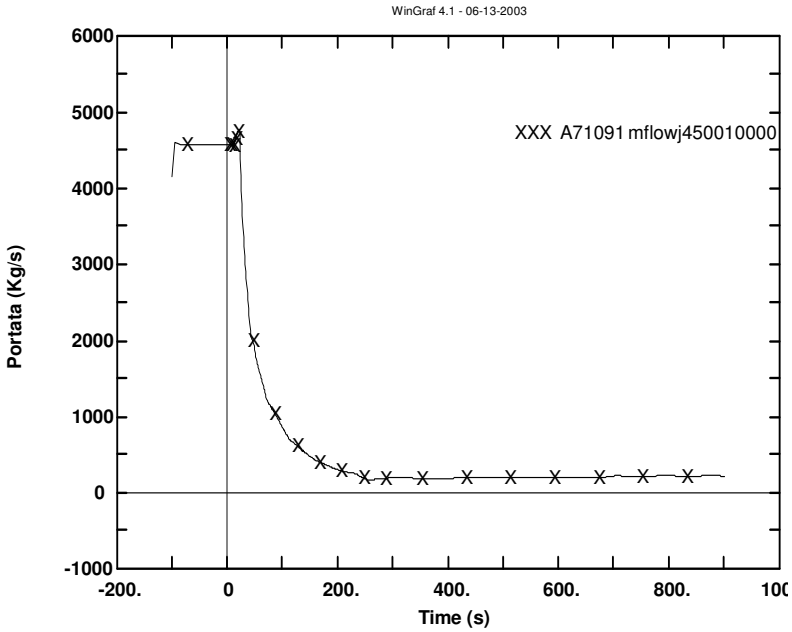

Fig.A17 Andamento della portata massica nella CL 3

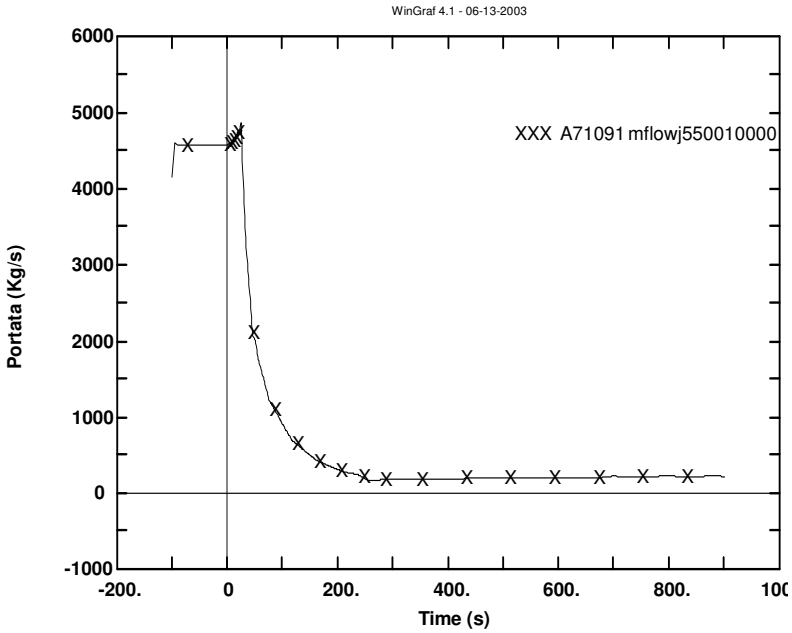

Fig.A18 Andamento della portata massica nella CL 4

A7 Andamento delle temperature superficiali negli elementi conduttivi

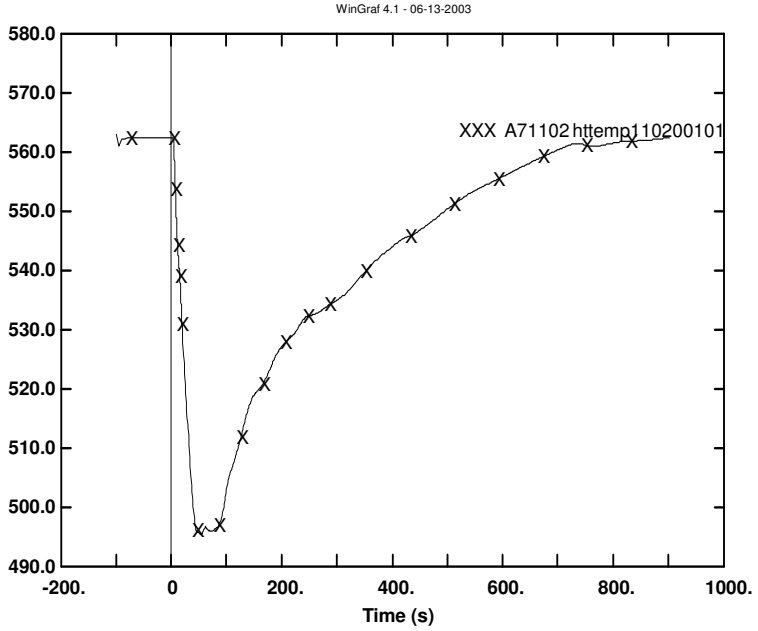

Fig .A19 Andamento della temperatura sulla superficie della struttura 1102-1

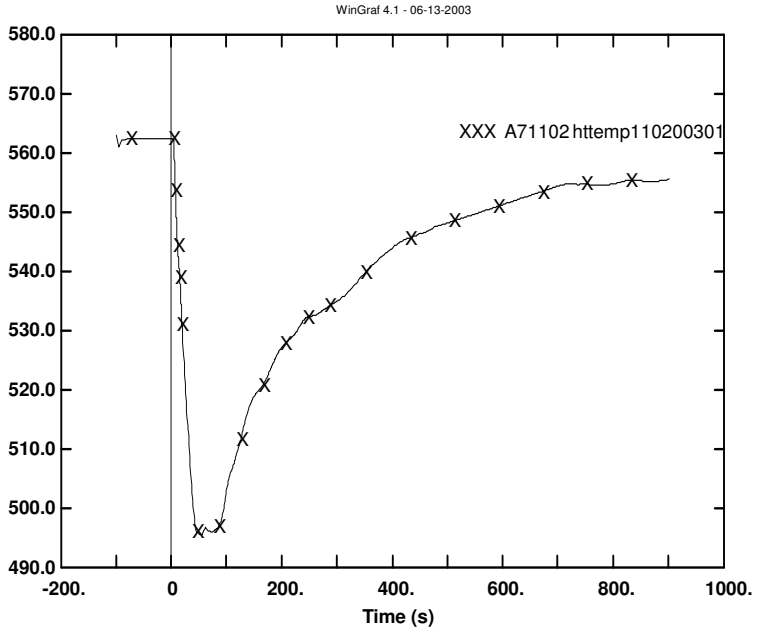

Fig.A20 Andamento della temperatura sulla superficie della struttura 1102-3

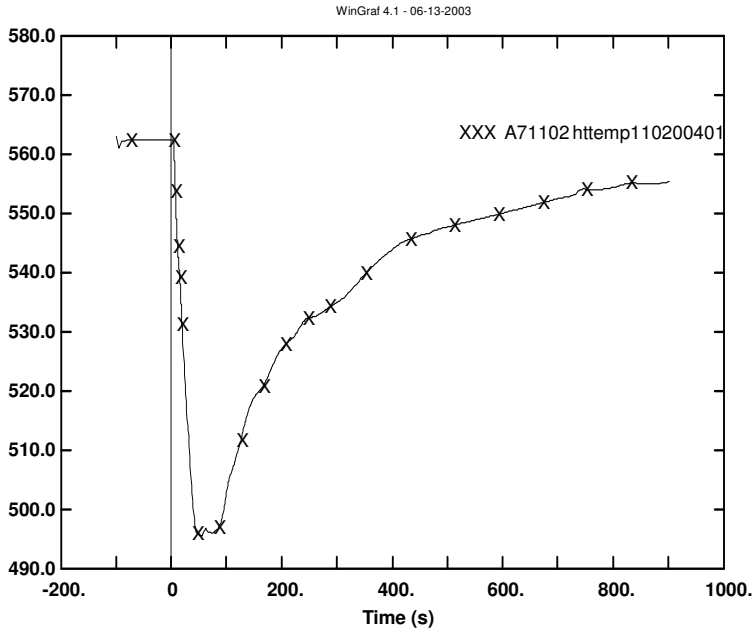

Fig.A21 Andamento della temperatura sulla superficie della struttura 1102-4

APPENDICE B

CODICE SORGENTE DEL PROGRAMMA FORTRAN TTEMP_CLAD

APPENDICE A

CODICE SORGENTE DEL PROGRAMMA FORTRAN TTEMP_CLAD

```
      PROGRAM TRANSTEMP

      implicit none

c     Programma per la costruzione dei file di input per il programma
c     di trasferimento delle temperature ed la definizione della
c     temperatura nei nodi della griglia definita per il calcolo
c     strutturale (ANSYS).
c
c     I dati d'ingresso devono essere definiti nei files:
c     - ANSCOOR.DAT, (unit 4) contenente le coordinate dei punti del
c       modello ANSYS (devono essere 4 colonne p, x1, x2, x3) ;
c     - CFDCOOR.DAT (unit 6), contenente le coordinate dei punti del
c       modello cfd (devono tre colonne pf, xf1, xf2, xf3);
c     - CFDTEMP.DAT (unit 3), contenente gli istanti e le temperature
c       calcolate nei punti del modello cfd;
c     Il programma crea il file di uscita anstemp (unit 2) contenente i
c     comandi per la definizione del campo di temperatura per il
c     modello ANSYS.
c     unit 5 puntout, file di uscita con le operazioni del programma

c     Variabili:
c     p, indice del punto del modello ANSYS
c     x1,x2,x3, coordinate del punto del modello ANSYS
c     t, temperatura calcolata per il punto del modello ANSYS
c     j, indice d'iterazione per i punti del modello ANSYS
c     jmax, valore massimo della variabile j
c     xf1,xf2,xf3, coordinate dei punti del modello CFD
c     tf, temperatura calcolate dal modello CFD
c     i, indice d'iterazione per i punti del modello CFD
c     imax, valore massimo della variabile i
c     d, matrice delle distanze dei punti del modello ANSYS dai punti
c       del modello FLUENT (d(i,j) distanza dell'i-esimo punto del
c       modello ANSYS dal j-esimo punto del modello CFD
c     n, esponente per il calcolo della media
c     Cn, matrice dei coefficienti peso (Cn(i,j) coefficienti
c       moltiplicativi delle temperature nei punti j-esimi del
c       modello CFD per il calcolo della temperatura nel i-esimo
c       punto del modello ANSYS, espressi come funzioni dell'espo-
c       nente n della media
c     time, istane del transitorio
c     m, indice d'interazione per gli istanti del transitorio
c     deltax3, valore limite della differenza nella coordimata x3 tra
c       i punti del modello cfd ed il punto del modello ansys in cui
c       è stimata la temperatura
c       nst = numero di strutture termiche del modello RELAP

      integer
i,imax1,imax2,j,jmax,nfile,nfilemax
      integer k,p,pf,pfmax,m,mmax
      integer n1,ind,npcfdmax,nst,imaxt

            real*8
ausxf2cil,ausxf3cil,x3cil,x1cil,x2cil,dx3max
            real*8
dx3min,dx3maxo,dx3mino,ausdx3,x3min,x3max,austemp
      real*8
x1,x2,x3,xf1,xf2,xf3,tfmedia,n2,tempo,ausdmax1,ausdmax2
      real*8
t,tf,ausdmin,rpfluent,rpansys,rcilmin,rcilmax
```

```
      real*8
time,tpfcfd,toll,dmin,ausxf2,ausxf3,shift,tini
t
            real*8
ausdx2,ausdx1,dx2min,dx2mino,x1min,x1m
ax,x2min,x2max
      real*8
d(50000),Cn(50000),tpf(50000),dmax(5000
0)
      real*8
diffr(50000),Cr(50000),ausxf1(50000)
            real*8
rpcfd(50000),tetapcfd(50000),zpcfd(50000)
      real*8
aust,auscn,ausd,n,ausdmax,auscr,timemin,ti
memax
            real*8
dx1min,dx1mino,dx1max,dx1maxo,dx2max
,dx2maxo,ausxf1cil
      real*8
nt,deltatime,tfile,x1orig,x2orig,x3orig,xf1cil
,xf2cil
            real*8 xf3cil,yclsup
            real*8
xf1cart,xf2cart,xf3cart,yclmax,yclmin,austi
me,yclinf
            real*8
xcfd1(500),xcfd2(500),xcfd3(500),tcfd(500)

      character*30
anscoor,anstemp,a,puntout,ft
      character*30
p1,p2,p3,p4,p5,p6,p7,p8,p9,p10
            character*30
p11,p12,p13,p14,p15,p16,p17,p18,p19,p20
            character*30
p21,p22,p23,p24,p25,p26,p27,p28,p29,p30
            character*30
p31,p32,p33,p34,p35,p36,p37,p38,p39,p40
            character*30
p41,p42,p43,p44,p45,p46,p47,p48,p49,p50
            character*30
p51,p52,p53,p54,p55,p56
      character (len = 8) : : nome
      character (len = 20) : : nome1



c      write (*,*) 'Inserire il tempo minimo'
c            read (*,*) timemin
c      write (*,*) 'Inserire il tempo massimo'
c            read (*,*) timemax

      write (*,*) 'Inserire il passo temporale
per il calcolo ANSYS'
            read (*,*) deltatime

      write (*,*) 'Inserire esponente n della
media'
            read (*,*) n

c           numero file temperature strutture
termiche modello RELAP meno 1
c     (somma di tutte strutture unitarie con
suddivisione radiale)
      nst = 72

c     numero massimo di punti in ciascuna
struttura termica del modello
c     relap, cioè di colonne relative alla
coordinata r nel file delle
c           coordinate CFDCOOR.DAT
c      imax1 per le strutture  109, 111-1, 111-
2
c      imax2 per le strutture termiche 110-
2,3,4,5,6,7,8,9
      imax1 = 50
            imax2 = 90



c     numero massimo di elementi termici del
modello RELAP in ciascun
c           file delle temperature, cioè numero
di colonne - 1 (la prima è
c           il tempo)
      imaxt = 100



c     numero massimo di istanti calcolati dal
modello RELAP, cioè di
c           righe in ciascun file delle
temperature
      mmax = 801
c      mmax = 2



c     numero massimo di punti del modello
CFD = numero massimo di punti
c     in ciascuna struttura termica del
modello relap per il numero di
```

```
c         strutture termiche uniterie
considerate
          npcfdmax = 4980



c         numero massimo di file di input per
il modello ANSYS
      nfilemax = mmax

c     tiolleranza geometrica di attribuizione
della
c     coincidenza dei punti
      toll = 1.e-6

c     spostamento verticale per attribuizione
temperature
c     sotto le penetrazioni
      shift = 0.4



c     limiti verticali variazioni geometriche e
zona cilidrica
          yclmax = 6.287 - shift
          yclmin = 5.287 - shift
          yclsup = 10.409
          yclinf = 0.

c     Costruzione dei file di input modello
ANSYS
      ft = 'cfdtime.dat'
          puntout = 'uscita.dat'
          open (unit = 5, file = puntout)
      open (unit = 7, file = ft)
```

```
c     verificare le uscite in maniera da
completare la stampa delle
c     variabili relap ed automatizzare la
definizione dei files dati

      p1  = 'tempA71111.dat'
      p2  = 'tempA71091_1.dat'
      p3  = 'tempA71091_2.dat'
      p4  = 'tempA710921_1.dat'
      p5  = 'tempA710921_2.dat'
      p6  = 'tempA710921_3.dat'
      p7  = 'tempA710922_1.dat'
      p8  = 'tempA710922_2.dat'
      p9  = 'tempA710922_3.dat'
      p10 = 'tempA710923_1.dat'
      p11 = 'tempA710923_2.dat'
      p12 = 'tempA710931_1.dat'
      p13 = 'tempA710931_2.dat'
      p14 = 'tempA710931_3.dat'
          p15 = 'tempA710932_1.dat'
      p16 = 'tempA710932_2.dat'
      p17 = 'tempA710932_3.dat'
      p18 = 'tempA710933_1.dat'
      p19 = 'tempA71094_1.dat'
      p20 = 'tempA71094_2.dat'
      p21 = 'tempA71102_1.dat'
      p22 = 'tempA71102_2.dat'
      p23 = 'tempA71102_3.dat'
      p24 = 'tempA71102_4.dat'
      p25 = 'tempA71103_1.dat'
      p26 = 'tempA71103_2.dat'
      p27 = 'tempA71103_3.dat'
      p28 = 'tempA71103_4.dat'
      p29 = 'tempA71104_1.dat'
      p30 = 'tempA71104_2.dat'
      p31 = 'tempA71104_3.dat'
      p32 = 'tempA71104_4.dat'
      p33 = 'tempA71105_1.dat'
      p34 = 'tempA71105_2.dat'
      p35 = 'tempA71105_3.dat'
      p36 = 'tempA71105_4.dat'
      p37 = 'tempA71106_1.dat'
      p38 = 'tempA71106_2.dat'
      p39 = 'tempA71106_3.dat'
      p40 = 'tempA71106_4.dat'
      p41 = 'tempA71107_1.dat'
      p42 = 'tempA71107_2.dat'
      p43 = 'tempA71107_3.dat'
      p44 = 'tempA71107_4.dat'
      p45 = 'tempA71108_1.dat'
      p46 = 'tempA71108_2.dat'
      p47 = 'tempA71108_3.dat'
      p48 = 'tempA71108_4.dat'
      p49 = 'tempA71109_1.dat'
      p50 = 'tempA71109_2.dat'
      p51 = 'tempA71109_3.dat'
      p52 = 'tempA71109_4.dat'
      p53 = 'tempA71095_1.dat'
      p54 = 'tempA71095_2.dat'
      p55 = 'tempA71095_3.dat'
      p56 = 'tempA71112.dat'

      open (unit = 11, file = p1)
      open (unit = 12, file = p2)
      open (unit = 13, file = p3)
      open (unit = 14, file = p4)
      open (unit = 15, file = p5)
```

```
open (unit = 16, file = p6)
open (unit = 17, file = p7)
open (unit = 18, file = p8)
open (unit = 19, file = p9)
open (unit = 20, file = p10)
open (unit = 21, file = p11)
open (unit = 22, file = p12)
open (unit = 23, file = p13)
open (unit = 24, file = p14)
open (unit = 25, file = p15)
open (unit = 26, file = p16)
open (unit = 27, file = p17)
open (unit = 28, file = p18)
open (unit = 29, file = p19)
open (unit = 30, file = p20)
open (unit = 31, file = p21)
open (unit = 32, file = p22)
open (unit = 33, file = p23)
open (unit = 34, file = p24)
open (unit = 35, file = p25)
open (unit = 36, file = p26)
open (unit = 37, file = p27)
open (unit = 38, file = p28)
open (unit = 39, file = p29)
open (unit = 40, file = p30)
open (unit = 41, file = p31)
open (unit = 42, file = p32)
open (unit = 43, file = p33)
open (unit = 44, file = p34)
open (unit = 45, file = p35)
open (unit = 46, file = p36)
open (unit = 47, file = p37)
    open (unit = 48, file = p38)
open (unit = 49, file = p39)
open (unit = 50, file = p40)
open (unit = 51, file = p41)
open (unit = 52, file = p42)
open (unit = 53, file = p43)
open (unit = 54, file = p44)
open (unit = 55, file = p45)
open (unit = 56, file = p46)
open (unit = 57, file = p47)
open (unit = 58, file = p48)
open (unit = 59, file = p49)
open (unit = 60, file = p50)
open (unit = 61, file = p51)
open (unit = 62, file = p52)
open (unit = 63, file = p53)
open (unit = 64, file = p54)
open (unit = 65, file = p55)
open (unit = 66, file = p56)

read (7,*)
read (11,*)
read (12,*)
read (13,*)
read (14,*)
read (15,*)
read (16,*)
read (17,*)
read (18,*)
read (19,*)
read (20,*)
read (21,*)
read (22,*)
read (23,*)
read (24,*)
read (25,*)
read (26,*)
read (27,*)
read (28,*)
read (29,*)
read (30,*)
read (31,*)
read (32,*)
read (33,*)
read (34,*)
read (35,*)
read (36,*)
read (37,*)
read (38,*)
read (39,*)
read (40,*)
read (41,*)
read (42,*)
read (43,*)
read (44,*)
read (45,*)
read (46,*)
read (47,*)
read (48,*)
read (49,*)
read (50,*)
read (51,*)
read (52,*)
read (53,*)
read (54,*)
read (55,*)
read (56,*)
read (57,*)
read (58,*)
read (59,*)
```

```
      read (60,*)
      read (61,*)
      read (62,*)
      read (63,*)
      read (64,*)
      read (65,*)
      read (66,*)




      open (unit = 6, file = 'nodicfd.dat')
c     write (*,*) 'inizio scrittura file
temporaneo coordinate'
      open (unit = 3, file = 'coorcil.out')

      read (6,*)
      do i = 1,imax1
       read (6,*) xf1,xf2,xf3
       write(3,*) xf1,xf2,xf3
c            write(*,*) 'r = ', xf1
c            write(*,*) 'teta = ',xf2
c            write(*,*) 'z = ',xf3
      end do



      do i = 1,35
       read (6,*)
(ausxf1(k),k=1,imax1),ausxf2,ausxf3
       do j = 1,imax1
        write(3,*) ausxf1(j),ausxf2,ausxf3
c            write(*,*) 'r = ', ausxf1(j)
c            write(*,*) 'teta = ',ausxf2
c            write(*,*) 'z = ',ausxf3
c         read(*,*)
       end do
      end do

      do i = 1,32
       read (6,*)
(ausxf1(k),k=1,imax2),ausxf2,ausxf3
       do j = 1,imax2
        write(3,*) ausxf1(j),ausxf2,ausxf3
c            write(*,*) 'r = ', ausxf1(j)
c            write(*,*) 'teta = ',ausxf2
c            write(*,*) 'z = ',ausxf3
c         read(*,*)
       end do
      end do

      do i = 1,5
       read (6,*)
(ausxf1(k),k=1,imax1),ausxf2,ausxf3
       do j = 1,imax1
        write(3,*) ausxf1(j),ausxf2,ausxf3
c            write(*,*) 'r = ', ausxf1(j)
c            write(*,*) 'teta = ',ausxf2
c            write(*,*) 'z = ',ausxf3
c         read(*,*)
       end do
      end do



      do i = 1,imax1
       read (6,*) xf1,xf2,xf3
       write(3,*) xf1,xf2,xf3
c            write(*,*) 'r = ', xf1
c            write(*,*) 'teta = ',xf2
c            write(*,*) 'z = ',xf3
c         read(*,*)
      end do

      close ( unit = 3 )
      close ( unit = 6 )



      open (unit = 3, file = 'coorcil.out')

c     write (*,*) 'scrittura file temporaneo
coordinate cartesiane'
      open (unit = 8, file = 'coor.out')

      do j = 1,npcfdmax
       read (3,*) xf1cil,xf2cil,xf3cil
c                write (*,*) 'x = ',xf1
c            write (*,*) 'y = ',xf2
c            write (*,*) 'z = ',xf3
       xf1 = xf1cil*cos(xf2cil)
           xf3 = xf1cil*sin(xf2cil)
       xf2 = xf3cil
c            write (*,*) 'r = ',xf1cil
c            write (*,*) 'teta = ',xf2cil
c            write (*,*) 'z = ',xf3cil
c            write (*,*) 'x = ',xf1
c            write (*,*) 'y = ',xf2
c            write (*,*) 'z = ',xf3
       write (8,*) xf1,xf2,xf3
c        read (*,*)
      end do

      close ( unit = 3 )
      close ( unit = 8 )
```

```
c     ciclo di esecuzione del programma per
ogni istante calcolato



          write (*,*) 'inserisci il primo istante'
      read (*,*) tinit
          nt = tinit/deltatime



c         nt = 0.
          tfile = nt*deltatime



          write (*,*) 'inizio ciclo tempo'

      do nfile = 1,nfilemax

c         write (*,*) ' ciclo tempo'

            read (7,*) time
            write (*,*) 'time da cfdtime.dat = ',
time
        if (time.lt.tfile) then
      read (11,*)
      read (12,*)
      read (13,*)
      read (14,*)
      read (15,*)
      read (16,*)
      read (17,*)
      read (18,*)
      read (19,*)
      read (20,*)
      read (21,*)
      read (22,*)
      read (23,*)
      read (24,*)
      read (25,*)
      read (26,*)
      read (27,*)
      read (28,*)
      read (29,*)
      read (30,*)
      read (31,*)
      read (32,*)
      read (33,*)
      read (34,*)
      read (35,*)
      read (36,*)
      read (37,*)
      read (38,*)
      read (39,*)
      read (40,*)
      read (41,*)
      read (42,*)
      read (43,*)
      read (44,*)
      read (45,*)
      read (46,*)
      read (47,*)
      read (48,*)
      read (49,*)
      read (50,*)
      read (51,*)
      read (52,*)
      read (53,*)
      read (54,*)
      read (55,*)
      read (56,*)
      read (57,*)
      read (58,*)
      read (59,*)
      read (60,*)
      read (61,*)
      read (62,*)
      read (63,*)
      read (64,*)
      read (65,*)
      read (66,*)
        end if

c           write (*,*) 'time = ', time
c           write (*,*) 'tfile = ', tfile

        if (time.ge.tfile) then
c         write (*,*) 'ok'



c           write (*,*) 'lettura dati cfd e
costruzione file temporanei'

c       costruzione del file temporaneo per le
temperature del modello cfd
c       all'istante considerato
c           write (*,*) 'inizio scrittura file
temporaneo temperature'



        open (unit = 9, file = 'ttemp.out')
```

```
 500     format (f8.2)
        write (nome,500) time
            nome1 = nome//'temp.dat'

       ind = 1
c           write (*,*) 'lettura file = ', ind
c      read(*,*)
c       write (*,*) nfile,imaxt
            read (11,*)
austime,(tpf(k),k=1,imaxt/2)
c           write (*,*) 'austime = ', austime
       do i = 1,imaxt/2
         write (9,*) (tpf(i) )
c          write (*,*) tpf(i)
       end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
       ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c      read(*,*)
       read (12,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
       if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
       end if
       do i = 1,imaxt
         write (9,*) (tpf(i) )
c          write (*,*) tpf(i)
       end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
       ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c      read(*,*)
       read (13,*)
austime,(tpf(k),k=1,imaxt/2)
c           write (*,*) 'austime = ', austime
       if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
       end if
       do i = 1,imaxt/2
         write (9,*) (tpf(i) )
c          write (*,*) tpf(i)
       end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
       ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c      read(*,*)
       read (14,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
       if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
       end if
       do i = 1,imaxt
         write (9,*) (tpf(i) )
c          write (*,*) tpf(i)
       end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
       ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c      read(*,*)
       read (15,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
       if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
       end if
       do i = 1,imaxt
         write (9,*) (tpf(i) )
c          write (*,*) tpf(i)
       end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
       ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c      read(*,*)
       read (16,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
       if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
```

```
                stop
      end if
      do i = 1,imaxt
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (17,*) austime,(tpf(k),k=1,imaxt)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
          write(*,*) 'istanti di calcolo
differenti'
                stop
      end if
      do i = 1,imaxt
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (18,*) austime,(tpf(k),k=1,imaxt)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
          write(*,*) 'istanti di calcolo
differenti'
                stop
      end if
      do i = 1,imaxt
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (19,*) austime,(tpf(k),k=1,imaxt)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
          write(*,*) 'istanti di calcolo
differenti'
                stop
      end if
      do i = 1,imaxt
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (20,*) austime,(tpf(k),k=1,imaxt)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
          write(*,*) 'istanti di calcolo
differenti'
                stop
      end if
      do i = 1,imaxt
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (21,*) austime,(tpf(k),k=1,imaxt)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
          write(*,*) 'istanti di calcolo
differenti'
                stop
      end if
      do i = 1,imaxt
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
```

```
      read (22,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (23,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (24,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (25,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (26,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (27,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
```

```
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (28,*)
austime,(tpf(k),k=1,imaxt/2)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt/2
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (29,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i))
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (30,*)
austime,(tpf(k),k=1,imaxt/2)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt/2
        write (9,*) (tpf(i))
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (31,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i))
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (32,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (33,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
```

```
      if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (34,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (35,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (36,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (37,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (38,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
             write(*,*) 'istanti di calcolo
differenti'
                    stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c          read (*,*)
```

```
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (39,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (40,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (41,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (42,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (43,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (44,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
```

```
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c        write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (45,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c        write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (46,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c        write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (47,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c        write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (48,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c        write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (49,*) austime,(tpf(k),k=1,90)
c          write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
       write (9,*) (tpf(i) )
c        write (*,*) tpf(i)
      end do
c          read (*,*)
c          write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c          write (*,*) 'lettura file = ', ind
c     read(*,*)
```

```
      read (50,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (51,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (52,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (53,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (54,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (55,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
```

```
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c         read (*,*)
c         write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c         write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (56,*) austime,(tpf(k),k=1,90)
c         write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
           write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c         read (*,*)
c         write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c         write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (57,*) austime,(tpf(k),k=1,90)
c         write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
           write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c         read (*,*)
c         write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c         write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (58,*) austime,(tpf(k),k=1,90)
c         write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
           write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c         read (*,*)
c         write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c         write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (59,*) austime,(tpf(k),k=1,90)
c         write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
           write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c         read (*,*)
c         write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c     write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (60,*) austime,(tpf(k),k=1,90)
c         write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
           write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c         write (*,*) i,tpf(i)
c           read (*,*)
      end do
c         read (*,*)
```

```
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (61,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c       write (*,*) i,tpf(i)
c           read (*,*)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (62,*) austime,(tpf(k),k=1,90)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,90
        write (9,*) (tpf(i) )
c       write (*,*) i,tpf(i)
c           read (*,*)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (63,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (64,*) austime,(tpf(k),k=1,imaxt)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt
        write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
c     read(*,*)
      read (65,*)
austime,(tpf(k),k=1,imaxt/2)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
            write(*,*) 'istanti di calcolo
differenti'
                  stop
      end if
      do i = 1,imaxt/2
        write (9,*) (tpf(i) )
c       write (*,*) tpf(i)
      end do
c           read (*,*)
c           write (*,*) 'time dal file
temperature = ', austime
      ind = ind + 1
c           write (*,*) 'lettura file = ', ind
      read (66,*)
austime,(tpf(k),k=1,imaxt/2)
c           write (*,*) 'austime = ', austime
      if
((austime.lt.time).or.(austime.gt.time)) then
```

```
            write(*,*) 'istanti di calcolo
differenti'
                  stop
       end if
       do i = 1,imaxt/2
         write (9,*) (tpf(i) )
c        write (*,*) tpf(i)
       end do
C                  write (*,*) 'T FINALE = ',
TPF(imaxt/2), TIME,AUSTIME
c      read(*,*)
       close (unit = 9)



c      write (*,*) 'fine scrittura file
temporaneo temperature'
c           write (*,*) 'inizio scrittura file input
ansys'



c      if (time.ge.tfile) then
           write (*,*) 'costruzione file input
ansys'

c      inizio costruzione de file di input per il
modello ANSYS

c         verifica lettura dati cfd
c      open (unit = 3, file = 'coorcil.out')
c      open (unit = 9, file = 'ttemp.out')
      write (5,*) 'time = ',time
c      do i = 1,npcfdmax
c       read (3,*) xf1,xf2,xf3
c       read (9,*) austemp
c       write (5,*) xf1,xf2,xf3,austemp
c         end do
c       close (unit = 3)
c       close (unit = 9)



       open (unit = 2, file = nome1)
       write (2,*) '/SOLU'
       write (2,*) 'ANTYPE,STATIC,NEW'
            write (2,200) time
       write (2,*) 'TREF,562.9'
       write (2,*) '!'


 200     Format ('TIME,',f6.1)



c      lettura punto geometrico modello
ANSYS
c     numero massimo di punti del modello
ansys, cioè di righe nel file
c         anscoor.dat (unit 4)

C        open (unit = 4, file = 'anscoor.dat')
           open (unit = 4, file = 'NODI.dat')
           read (4,*) jmax
c        write (*,*) jmax
c        read (*,*)
           do j = 1,jmax
c            write (*,*) 'lettura punto ansys'
         read (4,*) p,x1,x2,x3
c            write (*,*) 'punto ansys'
c            write (*,*) 'p = ',p,' x1 = ',x1,' x2
= ',x2,' x3 = ',x3
         x1cil = (x1**2. + x3**2.)**0.5
         x3cil = x2
         if (x1cil.gt.0.) then
           if ((x1.ge.0.).and.(x3.ge.0.)) then
             x2cil = asin(x3/x1cil)
           else if ((x1.lt.0.).and.(x3.ge.0.))
then
             x2cil = -asin(x3/x1cil) +
4.*atan(1.)
           else if ((x1.lt.0.).and.(x3.lt.0.)) then
             x2cil = -asin(x3/x1cil)-4.*atan(1.)
           else if ((x1.ge.0.).and.(x3.lt.0.))
then
             x2cil = asin(x3/x1cil)
           end if
         else
              x2cil = 0.
         end if

c        if
((((x2cil+4.*atan(1.))**2)**0.5).le.toll) then
c       x2cil = 4.*atan(1.)
c        end if

         x1orig = x1
         x2orig = x2
         x3orig = x3
         x1 = x1cil
         x2 = x2cil
         x3 = x3cil

c                write (*,*) 'punto ansys'
c          write(*,*) 'x = ',x1orig
c          write(*,*) 'y = ',x2orig
```

```
c          write(*,*) 'z = ',x3orig
c          write(*,*) 'r= ',x1
c          write(*,*) 'teta = ',x2
c          write(*,*) 'z = ',x3

          dx3max = 3.
          dx3maxo = 3.
          dx3min = -3.
          dx3mino = -3.
          dx1max = 3.
          dx1maxo = 3.
          dx1min = -3.
          dx1mino = -3.
          dx2max = 4.*atan(1.)
          dx2maxo = 4.*atan(1.)
          dx2min = -4.*atan(1.)
          dx2mino = -4.*atan(1.)

          ausdx1 = 0.
          ausdx2 = 0.
          ausdx3 = 0.



          if
(((x3.le.yclmin).and.(x3.gt.yclinf)).or.
     +
((x3.ge.yclmax).and.(x3.lt.yclsup))) then
c              write (*,*) 'punto esterno - zona
cilindrica'
c                 write (5,*) x1,x2,x3
c                      write (*,*) 'punto ansys
zona 1'

            x1min = x1
            x2min = x2
            x3min = x3
            x1max = x1
            x2max = x2
          x3max = x3



          open (unit = 3, file = 'coorcil.out')
          do i = 1,npcfdmax
            read (3,*) xf1,xf2,xf3
            if
(((xf3.le.yclmin).and.(xf3.gt.yclinf)).or.
     +
((xf3.ge.yclmax).and.(xf3.lt.yclsup))) then
                ausdx3 = xf3 - x3
                  if
(((ausdx3**2)**0.5).le.toll) then
                    ausdx3 = 0.
                      end if
c                                write (5,*)
ausdx3
              if (ausdx3.le.0.) then
                  if (ausdx3.gt.dx3min) then
                    x3min = xf3
                dx3mino = dx3min
                dx3min = ausdx3
               end if
               end if
                  if (ausdx3.ge.0.) then
                if (ausdx3.lt.dx3max) then
                  x3max = xf3
                dx3maxo = dx3max
                dx3max = ausdx3
                end if
          end if
        end if
      end do

      close (unit = 3)



                if (x3.eq.4.3985) then
          x3max = 4.195 - shift
                  x3min = 4.195 - shift
                end if

                if (x3.eq.4.111) then
          x3max = 4.195 - shift
                  x3min = 4.195 - shift
                end if



      open (unit = 3, file = 'coorcil.out')

      do i = 1,npcfdmax
        read (3,*) xf1,xf2,xf3
        if
(((xf3.le.yclmin).and.(xf3.gt.yclinf)).or.
     +
((xf3.ge.yclmax).and.(xf3.lt.yclsup))) then
              if
((xf3.le.x3max).and.(xf3.ge.x3min)) then
              ausdx1 = xf1 - x1
              if (((ausdx1**2)**0.5).le.toll)
then
                  ausdx1 = 0.
                    end if
```

```
c                                   write (5,*)
ausdx1
                if (ausdx1.le.0.) then
                  if (ausdx1.gt.dx1min) then
                    x1min = xf1
                  dx1mino = dx1min
                  dx1min = ausdx1
                  end if
                end if
                if (ausdx1.ge.0.) then
                  if (ausdx1.lt.dx1max) then
                       x1max = xf1
                  dx1maxo = dx1max
                  dx1max = ausdx1
                  end if
                end if
              end if
                          end if
          end do

          close (unit = 3)

c          write (*,*) 'x1min = ',x1min
c          write (*,*) 'x1max = ',x1max
c          write (*,*) 'x3min = ',x3min
c          write (*,*) 'x3max = ',x3max
c          read(*,*)




          open (unit = 3, file = 'coorcil.out')
          pf = 0
          do i = 1,npcfdmax
            read (3,*) xf1,xf2,xf3
                  if
(((xf3.le.yclmin).and.(xf3.gt.yclinf)).or.
     +
((xf3.ge.yclmax).and.(xf3.lt.yclsup))) then
c                           write(*,*) 'r= ',xf1
c                 write(*,*) 'teta = ',xf2
c                 write(*,*) 'z = ',xf3
c                 read (*,*)

                  if
(((xf3.le.x3max).and.(xf3.ge.x3min)).and.
     +
((xf1.le.x1max).and.(xf1.ge.x1min))) then
c           write (*,*) 'preso'
c                             write(*,*) 'r= ',xf1
c                write(*,*) 'teta = ',xf2
c                write(*,*) 'z = ',xf3
c                read (*,*)
                  pf = pf + 1
                  rpcfd(pf) = xf1
                                          zpcfd(pf) =
xf3
                end if
              end if
            end do
          pfmax = pf
            close (unit = 3)


c          write (*,*) 'pfmax = ',pfmax
c         read(*,*)


c            do pf = 1,pfmax
c              write (*,*) pf,rpcfd(pf),zpcfd(pf)
c            end do
c            read(*,*)



                        open (unit = 3, file =
'coorcil.out')

              open (unit = 9, file = 'ttemp.out')

              pf = 0
              ausdmin = 5.
                      dmin = 0.
              tpfcfd = 0.

c          write (*,*) 'costruzione distanze'

                  do i = 1,npcfdmax
                    ausd = 0.

                read (3,*) xf1,xf2,xf3
                read (9,*) tf

c                  write (*,*) 'lettura dati cfd'
c                  write (*,*) ' xf1 = ',xf1,' xf2 =
',xf2,' xf3 = ',xf3,
c     +                    ' tf = ',tf

                  if
(((xf3.le.yclmin).and.(xf3.gt.yclinf)).or.
     +
((xf3.ge.yclmax).and.(xf3.lt.yclsup))) then
                    if
(((xf3.le.x3max).and.(xf3.ge.x3min)).and.
```

```
    +
((xf1.le.x1max).and.(xf1.ge.x1min))) then
c               write (*,*) 'punto interno
intervallo'
                ausd = ((x1-xf1)**2+(x3-
xf3)**2)**0.5
                pf = pf + 1
                d(pf) = ausd
                tpf(pf) = tf
                tpf(pf) = tf

xcfd1(pf)=xf1

xcfd2(pf)=xf2

xcfd3(pf)=xf3
                                    tcfd(pf)=tf
c                   write (*,*) 'zona 1'
c               write (*,*)
pf,xcfd1(pf),xcfd2(pf),xcfd3(pf),tcfd(pf)
c               write (5,*)
pf,xcfd1(pf),xcfd2(pf),xcfd3(pf),tcfd(pf)
c                                   read(*,*)
                if (ausd.lt.ausdmin) then
                  ausdmin = ausd
                  if (ausd.le.toll) then
c                 write (*,*) 'punto coincidente'
                    tpfcfd = tf
c                   write (*,*) 'tpfcfd = ',tpfcfd
                  else
c                 write (*,*) 'punto diverso'
                  end if
                end if
              end if
                end if
                  end do

              pfmax = pf
              dmin = ausdmin

c         write (*,*) 'pfmax = ',pfmax
c         write (*,*) 'dmin = ',dmin
              close (unit = 3)
              close (unit = 9)

            else if
((x3.gt.yclmin).and.(x3.lt.yclmax)) then

c                   write (*,*) 'punto interno -
zona cilindrica'
c               write (5,*) x1,x2,x3
c                   write (*,*) 'punto ansys
zona 2'

              x1min = x1
                x2min = x2
                x3min = yclmin + toll
                x1max = x1
                x2max = x2
              x3max = yclmax - toll



                          open (unit = 3, file =
'coorcil.out')
              do i = 1,npcfdmax
                read (3,*) xf1,xf2,xf3
                if
((xf3.gt.yclmin).and.(xf3.lt.yclmax)) then
                                    ausdx3 = xf3 -
x3
                                    if
(((ausdx3**2)**0.5).le.toll) then
                        ausdx3 = 0.
                            end if
c                                   write (5,*)
ausdx3
                if (ausdx3.le.0.) then
                    if (ausdx3.gt.dx3min) then
                      x3min = xf3
                   dx3mino = dx3min
                   dx3min = ausdx3
                  end if
                  end if
                    if (ausdx3.ge.0.) then
                   if (ausdx3.lt.dx3max) then
                     x3max = xf3
                   dx3maxo = dx3max
                   dx3max = ausdx3
                   end if
                  end if
                end if
              end do

              close (unit = 3)

              open (unit = 3, file = 'coorcil.out')

              do i = 1,npcfdmax
                read (3,*) xf1,xf2,xf3
                if
((xf3.gt.yclmin).and.(xf3.lt.yclmax)) then
```

```
              if
((xf3.le.x3max).and.(xf3.ge.x3min)) then
c          write (*,*) 'pf = ',xf1,xf2,xf3
              ausdx1 = xf1 - x1
              if (((ausdx1**2)**0.5).le.toll)
then
                   ausdx1 = 0.
                        end if
c                                write (5,*)
ausdx1
               if (ausdx1.le.0.) then
                 if (ausdx1.gt.dx1min) then
                   x1min = xf1
                 dx1mino = dx1min
                 dx1min = ausdx1
                 end if
               end if
               if (ausdx1.ge.0.) then
                 if (ausdx1.lt.dx1max) then
                      x1max = xf1
                 dx1maxo = dx1max
                 dx1max = ausdx1
                 end if
               end if
             end if
                           end if
           end do

           close (unit = 3)

           open (unit = 3, file = 'coorcil.out')
           do i = 1,npcfdmax
            read (3,*) xf1,xf2,xf3
```

```
              if
((xf3.gt.yclmin).and.(xf3.lt.yclmax)) then
              if
((xf3.le.x3max).and.(xf3.ge.x3min)) then
c          write (*,*) x2,xf1,xf2,xf3
c          write (*,*) x3min,x3max
                        ausdx2 = xf2 - x2
                   if
(((ausdx2**2)**0.5).le.toll) then
                     ausdx2 = 0.
                          end if
c                                 write (5,*)
ausdx2
               if (ausdx2.le.0.) then
                    if (ausdx2.gt.dx2min) then
                      x2min = xf2
                  dx2mino = dx2min
                  dx2min = ausdx2
                 end if
                 end if
                   if (ausdx2.ge.0.) then
                  if (ausdx2.lt.dx2max) then
                    x2max = xf2
                  dx2maxo = dx2max
                  dx2max = ausdx2
                  end if
                 end if
c          write (*,*) ausdx2,x2min,x2max
c          read (*,*)
               end if
                           end if
             end do

             close (unit = 3)
```

```
c             write (*,*) 'x1min = ',x1min
c             write (*,*) 'x1max = ',x1max
c             write (*,*) 'x2min = ',x2min
c             write (*,*) 'x2max = ',x2max
c             write (*,*) 'x3min = ',x3min
c             write (*,*) 'x3max = ',x3max
c             read(*,*)


            open (unit = 3, file = 'coorcil.out')
            pf = 0
            do i = 1,npcfdmax
             read (3,*) xf1,xf2,xf3
             if
((xf3.gt.yclmin).and.(xf3.lt.yclmax)) then
               if
(((xf3.le.x3max).and.(xf3.ge.x3min)).and.
     +
((xf2.le.x2max).and.(xf2.ge.x2min)).and.
     +
((xf1.le.x1max).and.(xf1.ge.x1min))) then
                  pf = pf + 1
                  rpcfd(pf) = xf1
                                      tetapcfd(pf) =
xf2
                                      zpcfd(pf) =
xf3
               end if
              end if
             end do
            pfmax = pf
              close (unit = 3)
```

```
c                         write (*,*) 'pfmax =
',pfmax
c               read(*,*)

c                         do pf = 1,pfmax
c              write (*,*)
pf,rpcfd(pf),tetapcfd(pf),zpcfd(pf)
c             end do
c             read(*,*)



                  open (unit = 3, file =
'coorcil.out')
                  open (unit = 8, file =
'coor.out')
            open (unit = 9, file = 'ttemp.out')

            pf = 0
            ausdmin = 5.
                  dmin = 0.
            tpfcfd = 0.

c          write (*,*) 'costruzione distanze'

                do i = 1,npcfdmax
                  ausd = 0.

              read (3,*) xf1,xf2,xf3
              read (8,*) xf1cart,xf2cart,xf3cart
              read (9,*) tf

c               write (*,*) 'lettura dati cfd'
c               write (*,*) ' xf1 = ',xf1,' xf2 =
',xf2,' xf3 = ',xf3,
c     +                 ' tf = ',tf

                  if
((xf3.gt.yclmin).and.(xf3.lt.yclmax)) then
                    if
(((xf3.le.x3max).and.(xf3.ge.x3min)).and.
     +
((xf2.le.x2max).and.(xf2.ge.x2min)).and.
     +
((xf1.le.x1max).and.(xf1.ge.x1min))) then
c               write (*,*) 'punto interno
intervallo'
                  ausd = ((x1orig-
xf1cart)**2+(x2orig-xf2cart)**2
     +                +(x3orig-
xf3cart)**2)**0.5
                  pf = pf + 1
                  d(pf) = ausd
                  tpf(pf) = tf

xcfd1(pf)=xf1

xcfd2(pf)=xf2

xcfd3(pf)=xf3
                                      tcfd(pf)=tf
C                   write (*,*) 'zona 2'
c               write (*,*)
pf,xcfd1(pf),xcfd2(pf),xcfd3(pf),tcfd(pf)
c                                     read(*,*)
                  if (ausd.lt.ausdmin) then
                    ausdmin = ausd
                    if (ausd.le.toll) then
c               write (*,*) 'punto coincidente'
                      tpfcfd = tf
c                     write (*,*) 'tpfcfd = ',tpfcfd
                    else
c                   write (*,*) 'punto diverso'
                    end if
                  end if
                end if
              end if
                    end do

              pfmax = pf
              dmin = ausdmin

c           write (*,*) 'pfmax = ',pfmax
c           write (*,*) 'dmin = ',dmin

              close (unit = 3)
              close (unit = 8)
              close (unit = 9)

            else if
((x3.le.yclinf).or.(x3.ge.yclsup)) then
c                           write (*,*) 'punto
interno - fondi sferici'
c                   write (*,*) 'punto ansys
zona 1'

            x1min = x1orig
                x2min = x2orig
                x3min = x3orig
                x1max = x1orig
                x2max = x2orig
            x3max = x3orig
```

```
          open (unit = 8, file = 'coor.out')
          do i = 1,npcfdmax
            read (8,*) xf1cart,xf2cart,xf3cart
            if
((xf2cart.le.yclinf).or.(xf2cart.ge.yclsup))
then
              ausdx2 = xf2cart - x2orig
                 if
(((ausdx2**2)**0.5).le.toll) then
                   ausdx2 = 0.
                      end if
c                                  write (5,*)
ausdx2
              if (ausdx2.le.0.) then
                   if (ausdx2.gt.dx2min) then
                     x2min = xf2cart
                  dx2mino = dx2min
                  dx2min = ausdx2
                 end if
                 end if
                   if (ausdx2.ge.0.) then
                  if (ausdx2.lt.dx2max) then
                    x2max = xf2cart
                  dx2maxo = dx2max
                  dx2max = ausdx2
                  end if
                 end if
               end if
          end do

          close (unit = 8)

c           write (*,*) 'x1min = ',x1min
c           write (*,*) 'x1max = ',x1max
c           write (*,*) 'x2min = ',x2min
c           write (*,*) 'x2max = ',x2max
c           write (*,*) 'x3min = ',x3min
c           write (*,*) 'x3max = ',x3max
c           read(*,*)


          open (unit = 8, file = 'coor.out')
          pf = 0
          do i = 1,npcfdmax
            read (8,*) xf1cart,xf2cart,xf3cart
            if
((xf2cart.le.yclinf).or.(xf2cart.ge.yclsup))
then
c               write(5,*) 'fondi'
c                                  if
((xf3cart.le.x3max).and.(xf3cart.ge.x3min))
then
c                                  write(5,*) 'x3'
                                   if
((xf2cart.le.x2max).and.(xf2cart.ge.x2min))
then
c                write(5,*) 'x2'
c                                   if
((xf1cart.le.x1max).and.(xf1cart.ge.x1min))
then
c               write(5,*) 'x1'
                                   pf = pf + 1
c               rpcfd(pf) = xf1cart
c                                  tetapcfd(pf) =
xf2cart
c                                  zpcfd(pf) =
xf3cart
c                end if
                 end if
c                                      end if
             end if
           end do
         pfmax = pf
           close (unit = 8)

c                          write (*,*) 'pfmax =
',pfmax
c               read(*,*)

c                          do pf = 1,pfmax
c             write (*,*)
pf,rpcfd(pf),tetapcfd(pf),zpcfd(pf)
c           end do
c           read(*,*)


                   open (unit = 3, file =
'coorcil.out')
                   open (unit = 8, file =
'coor.out')
          open (unit = 9, file = 'ttemp.out')

          pf = 0
          ausdmin = 5.
                dmin = 0.
          tpfcfd = 0.

c         write (*,*) 'costruzione distanze'

              do i = 1,npcfdmax
                ausd = 0.
```

```
            read (3,*) xf1,xf2,xf3
            read (8,*) xf1cart,xf2cart,xf3cart
            read (9,*) tf

            if
((xf2cart.le.yclinf).or.(xf2cart.ge.yclsup))
then
c               if
((xf3cart.le.x3max).and.(xf3cart.ge.x3min))
then
c                if
((xf1cart.le.x1max).and.(xf1cart.ge.x1min))
then
                 if
((xf2cart.le.x2max).and.(xf2cart.ge.x2min))
then
c              write (*,*) 'punto interno
intervallo'
               ausd = ((x1orig-
xf1cart)**2+(x2orig-xf2cart)**2
    +                  +(x3orig-
xf3cart)**2)**0.5
               pf = pf + 1
               d(pf) = ausd
               tpf(pf) = tf

xcfd1(pf)=xf1

xcfd2(pf)=xf2

xcfd3(pf)=xf3
                                    tcfd(pf)=tf
               if (ausd.lt.ausdmin) then
                 ausdmin = ausd
                 if (ausd.le.toll) then
c              write (*,*) 'punto coincidente'
                  tpfcfd = tf
c                 write (*,*) 'tpfcfd = ',tpfcfd
                 else
c                write (*,*) 'punto diverso'
                 end if
                end if
               end if
c               end if
c                           end if
             end if
                    end do

           pfmax = pf
           dmin = ausdmin

c         write (*,*) 'pfmax = ',pfmax
c         write (*,*) 'dmin = ',dmin
            close (unit = 3)
            close (unit = 8)
            close (unit = 9)


              end if

c        costruzione della matrice dei
coefficienti e calcolo della
c        temperatura nel punto del modello
ansys
c         write (*,*) 'costruzione coefficienti'

           if (dmin.gt.toll) then
c             write (5,*) 'calcolo t punto
diverso'
           do i = 1,pfmax
            auscn = 0.
            do k = 1,pfmax
              auscn = auscn + (d(i)/d(k))**n
            end do
            Cn(i) = auscn**-1.
           end do
           aust = 0.
           do i = 1,pfmax
            aust = aust + (tpf(i)*Cn(i))
           end do
           t = aust
          else
c            write (5,*) 'attribuzione t punto
coincidente'
           t = tpfcfd
          end if



c          write(*,*) t
c          read(*,*)

  90       format ('p. ANSYS =',i4,'    dmin.
=',f6.3,'    t = ',f6.2 )

          write(2,100) p,t
c          write(*,*) p,x1,x2,x3,t
c          write(5,*) p,x1,x2,x3,t
c             read(*,*)


          write (*,*) 'punto ansys = ',p
c          do i = 1,pfmax
```

```
c                        write (5,*)
xcfd1(i),xcfd2(i),xcfd3(i),tcfd(i)
c            end do
c            write (5,*) ' '

           if (pfmax.eq.0) then
                 write (*,*) 'numero punti media
non corretto'
                              stop
               end if

c      write (*,101) time,p,pfmax,t
 101  format ('time = ', f5.1,'  p =',i6,'
pfmax =',i3,'  t = ',f6.2 )

 100        format('BF,',i6,',TEMP,',f8.3)

          end do
          write (2,*) '!'
          write (2,*) '!'

          close (unit = 2)
          close (unit = 4)
          nt = nt + 1.
               tfile = nt*deltatime
        end if



          end do

c      close (unit = 3)
       close (unit = 5)
            close (unit = 7)
       close (unit= 11 )
       close (unit= 12 )
       close (unit= 13 )
       close (unit= 14 )
       close (unit= 15 )
       close (unit= 16 )
       close (unit= 17 )
       close (unit= 18 )
       close (unit= 19 )
       close (unit= 20 )
       close (unit= 21 )
       close (unit= 22 )
       close (unit= 23 )
       close (unit= 24 )
       close (unit= 25 )
       close (unit= 26 )
       close (unit= 27 )
       close (unit= 28 )
       close (unit= 29 )
       close (unit= 30 )
       close (unit= 31 )
       close (unit= 32 )
       close (unit= 33 )
       close (unit= 34 )
       close (unit= 35 )
       close (unit= 36 )
       close (unit= 37 )
       close (unit= 38 )
       close (unit= 39 )
       close (unit= 40 )
       close (unit= 41 )
       close (unit= 42 )
       close (unit= 43 )
       close (unit= 44 )
       close (unit= 45 )
       close (unit= 46 )
       close (unit= 47 )
       close (unit= 48 )
       close (unit= 49 )
       close (unit= 50 )
       close (unit= 51 )
       close (unit= 52 )
       close (unit= 53 )
       close (unit= 54 )
       close (unit= 55 )
       close (unit= 56 )

       stop

       end
```

APPENDICE C

CODICE SORGENTE DEL PROGRAMMA FORTRAN FM_CLAD

```
Program fm_clad

      real stress (50,6),ampiezze(10),posaus,tinp,aus, vett

      real sigmax(50),sigmay(50),sigmaz(50)
      real sigmaxy(50),sigmayz(50),sigmaxz(50)
      real r(50),theta(50),zeta(50), temp(50), tm, press(50), rold(50)
      real r3(50),theta3(50),z3(50),t3(50),sx3(50),sy3(50)
      real sz3(50),sxy3(50),syz3(50),sxz3(50)
    real thetaus, zetaaus,raus,taus
      integer nnodo(50), pos(50), i, k, j, l, t, na, nt, nn, time,
     +     nc, indice,vetinp, nn3(50),naus,nn1(50), maxind



      character (len = 2) : : nome_nc
      character (len = 3) : : nome_nl
      character (len = 2) : : nome_tc
      character (len = 3) : : nome_tl
    character (len = 11) : : nome_dx1
    character (len = 15) : : nome_sn1
      character (len = 11) : : nome_dx2
    character (len = 15) : : nome_sn2
      character (len = 13) : : nome_t1
      character (len = 14) : : nome_t2
      character (len = 15) : : nomet
      character (len = 15) : : nomen
      character (len = 3) : : BF
      character (len = 7) : : cartemp



100   format(F6.2)
110   format(A26,I2)
120   format(I2,F12.2)
130   format(E12.5E2)
140   format(4I4)
200   format(I9,6E12.5E2)
201   format(I8,' ',F7.3,' ',F7.3,' ',F7.3,' ',F7.3,' ',E12.5E2,' ',
     +    E12.5E2,' ',E12.5E2,' ',E12.5E2,' ',E12.5E2,' ',E12.5E2)
500  format (I2)
510  format (I3)
600   format (A3,I6,A7,F7.3)
700   format (E8.2E2)



    write (*,*) 'inserire numero ampiezze delle cricche (na)'
      read (*,*) na
c     write (*,*) 'inserire numero di istanti (nt)'
c     read (*,*) nt
c     write (*,*) 'inserire numero di nodi (nn)'
c     read (*,*) nn

      open (unit = 6, file = 'lista_nodi.dat')
      read (6,*) nn, nc
      write (*,*) nn, nc
      aus = 0
      do i = 1,nn
        read (6,*) nn1(i),r(i),theta(i),zeta(i)
       if (nn1(i).gt. aus) then
          aus = nn1(i)
        end if
            write(*,*) aus,nn1(i),r(i),theta(i),zeta(i)
c           read(*,*)
      end do

      maxind = aus
      write(*,*) 'maxind = ',maxind
c     read (*,*)
```

```
c       do i = 1,nn
c                pos(i) = i
c          rold(i) = r(i)
c       end do

c       do j = 1,nn
c          do i = 1,nn-1
c                if (rold(i).gt.rold(i+1)) then
c                aus = rold(i)
c                rold(i) = rold(i+1)
c                rold(i+1) = aus
c
c                posaus = pos(i)
c                pos(i) = pos(i+1)
c                pos(i+1) = posaus
c                end if
c               end do



c       end do

c       do i = 1,nn
c                write(*,*) pos(i), r(i)
c       end do



        do k = 1,na
          write (*,110) 'inserire ampiezza numero ', k
          read (*,*) ampiezze(k)
        end do
        do k = 1,na
          write (*,120) k,ampiezze(k)
        end do
```

```
          open (unit = 5, file = 'tempi_press.txt')
          read (5,*) nt

          open (unit = 4, file = 'datisif.txt')
          write (4,140) na,nt,nn,nc

          do k =1,na
            write (4,130) ampiezze(k)
          end do



          do t = 1,nt
        read (5,*) vetinp, press(t)
c         write (*,*) vetinp,press(t)
c           read (*,*)
            time = vetinp
            if (time.lt.100) then
           write (nome_tc,500) time
c             write (*,*) nome_tc
              nome_t1 = nome_tc//'temp.dat'
c              write (*,*) nome_t1
                    nomet = nome_t1
c             write (*,*) nomet
            else
                  write (nome_tl,510) time
              nome_t2 = nome_tl//'temp.dat'
              nomet = nome_t2
            end if
c         write (*,*) nomet
c         read (*,*)
            open (unit = 7, file = nomet)
            read (7,*)
            read (7,*)
```

```
          read (7,*)
          read (7,*)
          read (7,*)
c        write(*,*) maxind
*        read(*,*)
          do l = 1,maxind
           read (7,600) BF, indice, cartemp, tm
c          write (*,600) BF, indice, cartemp, tm
c          read (*,*)
           do j = 1,nn
             if (indice.eq.nn1(j)) then
               temp(j) = tm
c              write(*,*) indice,tm
c              read(*,*)
             end if
           end do
          end do
          close (unit = 7)
c          read (*,*)

      if (time.lt.100) then
        write (nome_nc,500) time
           nome_dx1 = 'TensNodi0'//nome_nc
           nome_sn1 = nome_dx1//'.dat'
           nomen = nome_sn1
        else
                write (nome_nl,510) time
           nome_dx2 = 'TensNodi'//nome_nl
           nome_sn2 = nome_dx2//'.dat'
           nomen = nome_sn2
        end if
        open (unit = 3, file = nomen)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        do i = 1,(nn+1-nc)
          read (3,200) nnodo(i),sigmax(i),sigmay(i),sigmaz(i),
     +           sigmaxy(i),sigmayz(i),sigmaxz(i)
c               write (*,200) nnodo(i),sigmax(i),sigmay(i),sigmaz(i),
c    +            sigmaxy(i),sigmayz(i),sigmaxz(i)
c         read (*,*)
        end do
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        read (3,*)
        do i = (nn+1-nc+1),(nn+1)
          read (3,200) nnodo(i),sigmax(i),sigmay(i),sigmaz(i),
     +           sigmaxy(i),sigmayz(i),sigmaxz(i)
c               write (*,200) nnodo(i),sigmax(i),sigmay(i),sigmaz(i),
c    +            sigmaxy(i),sigmayz(i),sigmaxz(i)
c         read (*,*)
```

```
      end do
      close (unit = 3)



c     inizio ciclio di riordino prima del salvataggio
      do i = 1,nn+1
       do j = 1,nn
c        write (*,*) nnodo(i)
       if (nn1(j).eq.nnodo(i)) then
            nnaus = nn1(j)
            raus = r(j)
        thetaaus=theta(j)
            zetaaus=zeta(j)
        taus=temp(j)
       end if
       end do
            nn3(i) = nnaus
            r3(i) = raus
       theta3(i)=thetaaus
            z3(i)=zetaaus
       t3(i)=taus
            sx3(i)=sigmax(i)
            sy3(i)=sigmay(i)
            sz3(i)=sigmaz(i)
            sxy3(i)=sigmaxy(i)
            syz3(i)=sigmayz(i)
            sxz3(i)=sigmaxz(i)
c     write(*,*) nn3(i),r3(i),theta3(i),z3(i),t3(i)
c           write(*,*) sx3(i),sy3(i),sz3(i),sxy3(i),syz3(i),sxz3(i)
c     read(*,*)
      end do

      do i = 1,nn+1
                  pos(i) = i
               rold(i) = r3(i)
            end do

c     do i = 1,nn+1
c     write(*,*) pos(i),rold(i)
c     end do
c   read(*,*)


      do j = 1,nn+1-nc
c       write (*,*)  'j = ',j
c       do i = 1,nn+1-nc
c         write(*,*) pos(i),rold(i)
c       end do
c     read(*,*)
        do i = 1,nn+1-nc-1
c         write (*,*) 'i = ',i
c       write (*,*) rold(i),rold(i+1)
c         read (*,*)
            if (rold(i).gt.rold(i+1)) then
              aus = rold(i)
              rold(i) = rold(i+1)
              rold(i+1) = aus
c       write (*,*) 'rold(i) = ',rold(i)
c       write (*,*) 'rold(i+1) = ',rold(i+1)
c       read (*,*)
              posaus = pos(i)
              pos(i) = pos(i+1)
              pos(i+1) = posaus
            end if
c         write (*,*) rold(i),rold(i+1)
c         write (*,*) pos(i),pos(i+1)
c         read (*,*)
```

```
                end do
c           do i = 1,nn+1-nc
c                 write(*,*) pos(i), rold(i)
c           end do
c       read(*,*)
        end do

c           do i = 1,nn+1-nc
c                 write(*,*) pos(i), rold(i)
c           end do
c       read(*,*)

        do j = nn+1-nc+1,nn+1
c           write (*,*)  'j = ',j
            do i = nn+1-nc+1,nn
c             write (*,*) 'i = ',i
c           write (*,*) rold(i),rold(i+1)
c             read (*,*)
                  if (rold(i).gt.rold(i+1)) then
                    aus = rold(i)
                    rold(i) = rold(i+1)
                    rold(i+1) = aus
c           write (*,*) 'rold(i) = ',rold(i)
c           write (*,*) 'rold(i+1) = ',rold(i+1)
c           read (*,*)
                    posaus = pos(i)
                    pos(i) = pos(i+1)
                    pos(i+1) = posaus
                  end if
c             write (*,*) rold(i),rold(i+1)
c             write (*,*) pos(i),pos(i+1)
c             read (*,*)
                end do
c           do i = 1,nn+1-nc
c                 write(*,*) pos(i), r(i)
c           end do
c       read(*,*)
        end do

c           do i = nn+1-nc+1,nn+1
c                 write(*,*) pos(i), rold(i)
c           end do
c       read(*,*)

      write (4,*) vetinp
          do i = nn+1-nc+1,nn+1
                write (4,201) nn3(pos(i)),r3(pos(i)),theta3(pos(i)),
     +            z3(pos(i)),t3(pos(i)),sx3(pos(i)),
     +            sy3(pos(i)),sz3(pos(i)),
     +            sxy3(pos(i)),syz3(pos(i)),sxz3(pos(i))
          end do
          do i = 1,nn+1-nc
                write (4,201) nn3(pos(i)),r3(pos(i)),theta3(pos(i)),
     +            z3(pos(i)),t3(pos(i)),sx3(pos(i)),
     +            sy3(pos(i)),sz3(pos(i)),
     +            sxy3(pos(i)),syz3(pos(i)),sxz3(pos(i))
          end do

        end do



        do j = 1,nt
          write (4,*) press(j)
        end do
```

```
      write (4,*) 0.

            open (unit = 3, file = 'TensNodipress.txt')
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            do i = 1,(nn+1-nc)
              read (3,200) nnodo(i),sigmax(i),sigmay(i),sigmaz(i),
     +               sigmaxy(i),sigmayz(i),sigmaxz(i)
c                   write (*,200) nnodo(i),sigmax(i),sigmay(i),sigmaz(i),
c     +               sigmaxy(i),sigmayz(i),sigmaxz(i)
c           read (*,*)
            end do
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            read (3,*)
            do i = (nn+1-nc+1),(nn+1)
              read (3,200) nnodo(i),sigmax(i),sigmay(i),sigmaz(i),
     +               sigmaxy(i),sigmayz(i),sigmaxz(i)
c                   write (*,200) nnodo(i),sigmax(i),sigmay(i),sigmaz(i),
c     +               sigmaxy(i),sigmayz(i),sigmaxz(i)
c           read (*,*)
            end do
            close (unit = 3)

            do i = nn+1-nc+1,nn+1
                  write (4,201) nn3(pos(i)),r3(pos(i)),theta3(pos(i)),
     +               z3(pos(i)), 0. ,sigmax(pos(i)),
     +               sigmay(pos(i)),sigmaz(pos(i)),
     +               sigmaxy(pos(i)),sigmayz(pos(i)),sigmaxz(pos(i))
            end do
            do i = 1,nn+1-nc
                  write (4,201) nn3(pos(i)),r3(pos(i)),theta3(pos(i)),
     +               z3(pos(i)), 0. ,sigmax(pos(i)),
     +               sigmay(pos(i)),sigmaz(pos(i)),
     +               sigmaxy(pos(i)),sigmayz(pos(i)),sigmaxz(pos(i))
            end do



      close (unit = 4)

      end
```

APPENDICE D

WEIGHT FUNCTION PER LA CRICCA MONODIMENSIONALE

$$\rho(x,a) := \frac{x}{a}$$

$$\alpha(a,ri,re) := \frac{a}{re - ri}$$

$$\beta(ri,re) := \frac{ri}{re}$$

- <u>circumferential crack</u>

$\mu c := 4$

$\nu c := 3$

$$Ac := \begin{pmatrix} -13.779 & 56.546 & -83.814 & 41.688 \\ 79.931 & -397.34 & 656.81 & -339.45 \\ -211.20 & 1112.23 & -1927.36 & 1047.50 \\ 247.79 & -1325.67 & 2322.80 & -1267.64 \\ -105.96 & 565.64 & -990.34 & 537.86 \end{pmatrix}$$

$$Fc1(a,ri,re) := \frac{\alpha(a,ri,re)\cdot\pi^{0.5}}{\left(\pi^2 - 4\right)^{0.5}}\cdot\left(1 + \beta(ri,re)\right)$$

$$Fc2(a,ri,re) := \left[1.989\left(1 - \alpha(a,ri,re)\right) + \alpha(a,ri,re)\cdot\left(1 - \alpha(a,ri,re)\right)\cdot\sum_{\nu=0}^{\nu c}\sum_{\mu=0}^{\mu c} Ac_{\mu,\nu}\cdot\alpha(a,ri,re)^{\mu}\cdot\beta(ri,re)\right]$$

$$Yc(a,ri,re) := \frac{1}{\left(1 - \alpha(a,ri,re)\right)^{0.5}}\cdot(Fc1(a,ri,re) + Fc2(a,ri,re))$$

$$hc(x,a,ri,re) := \left(\frac{2}{\pi\cdot a}\right)^{0.5}\cdot\left[\frac{\rho(x,a)}{\left(1 - \rho(x,a)\right)^{0.5}} + \left[\frac{5}{4}\cdot\left(\frac{\pi}{2}\right)^{0.5}\cdot Yc(a,ri,re) - 1\right]\cdot\left(1 - \rho(x,a)\right)^{0.5} + \left[\frac{5}{12}\cdot\left(\frac{\pi}{2}\right)^{0.5}\cdot Yc(a,ri,re) - \frac{5}{3}\right]\cdot\left(1 - \rho(x,a)\right)^{\frac{3}{2}}\right]$$

- <u>axial crack</u>

$\mu a := 3$

$\nu a := 4$

$$Aa0 := \begin{pmatrix} 2.2069 & 16.933 & -126.67 & 293.43 & -123.665 \\ -0.47 & -38.366 & 276.042 & -604.97 & 239.28 \\ 0.3293 & 24.729 & -184.51 & 389.60 & -142.3 \\ -0.0765 & -5.431 & 40.716 & -83.399 & 28.584 \end{pmatrix}$$

$$Aa1 := \begin{pmatrix} 1.1902 & 8.7853 & -65.067 & 145.041 & -70.304 \\ 0.0426 & -20.829 & 140.291 & -299.00 & 138.24 \\ -0.00296 & 13.643 & -93.90 & 193.80 & -84.69 \\ 0.0065 & -3.0148 & 20.716 & -41.575 & 17.312 \end{pmatrix}$$

$$Ya0(a, ri, re) := (1 - \alpha(a, ri, re))^{\frac{-3}{2}} \cdot \sum_{\nu=0}^{\nu a} \sum_{\mu=0}^{\mu a} Aa0_{\mu,\nu} \cdot \beta(ri, re)^{-\mu} \cdot \alpha(a, ri, re)^{\nu}$$

$$Ya1(a, ri, re) := (1 - \alpha(a, ri, re))^{\frac{-3}{2}} \cdot \sum_{\nu=0}^{\nu a} \sum_{\mu=0}^{\mu a} Aa1_{\mu,\nu} \cdot \beta(ri, re)^{-\mu} \cdot \alpha(a, ri, re)^{\nu+1}$$

$$B0(a, ri, re) := \frac{-15}{4} \cdot \left(\frac{\pi}{2}\right)^{0.5} \cdot \left(Ya0(a, ri, re) - \frac{7}{2 \cdot \alpha(a, ri, re)} \cdot Ya1(a, ri, re)\right) - 9$$

$$B1(a, ri, re) := \frac{35}{4} \cdot \left(\frac{\pi}{2}\right)^{0.5} \cdot \left(Ya0(a, ri, re) - \frac{5}{2 \cdot \alpha(a, ri, re)} \cdot Ya1(a, ri, re)\right) + \frac{35}{3}$$

$$F1(x, a, ri, re) := (B0(a, ri, re)) \cdot (1 - \rho(x, a))^{0.5}$$

$$ha(x, a, ri, re) := \left(\frac{2}{\pi \cdot a}\right)^{0.5} \cdot \left[\frac{\rho(x, a)}{(1 - \rho(x, a))^{0.5}} + F1(x, a, ri, re) + B1(a, ri, re) \cdot (1 - \rho(x, a))^{\frac{3}{2}}\right]$$

APPENDICE E

FILE DI INPUT PER IL CODICE RELAP 5/MOD3.3
VESSEL CON CLADDING

```
=newwer1000
*       febbraio 2003
*       taken from slbpts1.inp- mslbpts.imp
*       WWER-1000 with neutron kinetics
*       mslb (broken sg ss isolated) - PTS
*       with new subdivision of upper
downcomer's region
*       new volumes .........
*       for pressurizer thermal shock analisys
(with SCRAM ,HPIS and TRIP 479)
*               SIT3-4 connencted at the PTS dc
volumes
* input for mod3.2
*
*                               Ver 1       Modifica
pompe e realizzazione SL 24/10/2002 WG
*                       Come MSLBR ma con
modifiche post FIL
*                       Calcolo fino a fusione
(esclusa efw)
*
*       Questo input è l'imput 34.inp di Walter
Giannotti
*       a cui sono state modificate le strutture
termiche
*       per il calcolo ansys.
*
*
0000100 new transnt
*
*101 inp-chk
*
* remaining cpu time
*104 cmpress
*105  5.   6.
*
110 nitrogen
*
*
* time steps                    min mj  re
* time steps                    min mj  re
0000201  100.  .5e-7   0.1    07003   50    500
500
0000202  120.  .5e-7   0.1    07003    1    200
200
0000203  400.  .5e-7   0.1    07003   10   5000
5000
0000204 1.e6   .5e-7   0.1    07003   20   5000
5000
*
*
```

```
*TESI STEFANO (AGGIUNTA DELLA
CLAD IN ACCIAIO INOX)
*
*Nella versione A6 abbiamo posizionato nella
zona delle cold leg (8 spezzoni)
*un totale di 89 celle radiali (90 punti) di cui 4
nella clad;i raggi interno ed
*esterno sono rimasti uguali a quelli del vessel
senza clad.
*Nelle altre zone del vessel abbiamo
conservato il numero di celle (49 celle
* - 50 punti) e gli ingombri radiali ed abbiamo
adeguato opportunamente lo spessore della
clad
*per lasciare invariata la posizione dei nodi (in
accordo col programma Fortrand per Ansys)
*MODIFICATE LE MINOR EDITS PER LA
STRUTTURA 110 AL FINE DI POTER
STRIPPARE
*TUTTE LE 90 CELLE RADIALI
*
*-----------------------------------------------------
---------------
* minor edits
*-----------------------------------------------------
---------------
*
*
* miscellaneous
301 p       030230000         * prz
302 p       645010000         * sg ss
303 mflowj  106010000         *
304 mflowj  106020000         *
305 mflowj  106030000         *
306 mflowj  106040000         *
307 cntrlvar 003              *
308 tempf   106010000         *
309 tempf   140010000
*
* miscellaneous
310 cntrlvar 011              * sg1 dc lvl
311 cntrlvar 012              * sg2 dc lvl
312 cntrlvar 013              * sg3 dc lvl
313 cntrlvar 014              * sg4 dc lvl
314 cntrlvar 801
315 cntrlvar 802
316 cntrlvar 803
*
* added variables
20800001 httemp 110200101
20800002 httemp 110200102
20800003 httemp 110200103
```

```
.....
.....
.....
.....

*
*-----------------------------------------------------
---------------
* trips
*-----------------------------------------------------
---------------
*
* prz heaters high power  off
*402 cntrlvar 005 lt null 0  357.8           n  *
*403 time 0 gt null 0    100.               n  *
*405 time 0 lt null 0    300.               n  *
*610 402 and 403                            n  *
*612 610 and 405                            n  *
*
*
* prz heaters low power   off
*404 time 0 gt null 0    100.               n  *
*406 time 0 lt null 0    300.               n  *
*611 -612 and 404                           n  *
*614  611 and 406                           n  *
*
* prz spray line opening
410 time 0 ge null 0    1.e6               1  *
control trip
*
* prz  pre control staz
415 time 0 lt null 0    100.               n  * control
trip
*
* prz  pre control   off
416 cntrlvar 005 ge null 0  357.           n  *
control trip
417 time 0 lt null 0        -1.0           n  *
613 416 and 417                            n  *
*
* prz  lvl control inj.
420 time 0 lt null 0    100.               n  * control
trip
*
*-----------------------------------------------------
-----
* fw 1-4 trip
530 cntrlvar 11 ge null 0 1.925            n  *
531 cntrlvar 12 ge null 0 1.925            n  *
532 cntrlvar 13 ge null 0 1.925            n  *
533 cntrlvar 14 ge null 0 1.925            n  *
534 time 0 ge null 0 100.                  1  *
```

```
*630 530 and 534 l
630 404 and 404 l * broken loop
631 531 and 534 l
632 532 and 534 l
633 533 and 534 l
*
*-----------------------------------------------------
------
*
* prz  lvl control extr.
425 time 0 lt null 0    100.               n
*
* lpis inlet control
*430    p   030230000 lt null 0   2.15e6        n *
old pre fil
430    time 0 gt null 0 100.                    l * trip
bloccato perchè la pressione governa
*
* hpis inlet control - not valid
431    p   030230000 lt null 0 8.980e6       n
*
* hpis inlet control valid for hpis 1, 2 and 3
*432    p   030230000 lt null 0 8.980e6         n
* old pre fil
432    time 0 gt null 0 100.                  n  *
402    cntrlvar 003 lt null 0  10.            n  *
612    432 and 402                            l  * trip
bloccato perchè la pressione governa
*
* hpis inlet control not valid
433    p   030230000 lt null 0 8.980e6      n
*
*
*-----------------------------------------------------
---
*MCP trips
501 cntrlvar 11 le null 0 0.735            n  *
502 cntrlvar 12 le null 0 0.735            n  *
503 cntrlvar 13 le null 0 0.735            n  *
504 cntrlvar 14 le null 0 0.735            n  *
505 time 0 ge null 0 1.e6                  n  * manual
stop
506 time 0 ge null 0 1.e6                  n  * manual
stop
507 time 0 ge null 0 1.e6                  n  * manual
stop
508 time 0 ge null 0 1.e6                  n  * manual
stop
601 501 or 505 n
602 502 or 506 n
603 503 or 507 n
```

```
604 504 or 508 n
605 601 or 638 n * basso livello o msiv chiusa
606 602 or 639 n *          "
607 603 or 640 n *          "
608 604 or 641 n *          "
*
621 404 and 404 l * broken loop
*621 605 and 539 l
622 606 and 539 l
623 607 and 539 l
624 608 and 539 l
*
509 time 0 le null 0 -1.                n *
*-------------------------------------------------------
------
*
* prz porv 1
446   p   030230000 ge null 0 18.1e6  n     *
447   p   030230000 ge null 0 30.2e6  l     *
448   p   030230000 lt null 0 17.0e6  n     *
prz porv clo.
610   446 xor 447                   n     * prz porv
op.
*
* prz porv 2 and 3
449   p   030230000 ge null 0 18.6e6  n     *
620   449 xor 447                   n     * prz porv
op.
*
* sit1 - sit4 control
460 p  100010000 lt null 0   6.0e6     n     *
acc
461 cntrlvar 017 ge null 0   4.8e4     n     *
acc1 low lvl
462 cntrlvar 018 ge null 0   4.8e4     n     *
acc2 low lvl
463 cntrlvar 019 ge null 0   4.8e4     n     *
acc3 low lvl
464 cntrlvar 020 ge null 0   4.8e4     n     *
acc4 low lvl
650 460 xor 461                 n     * acc1 vlv
op.
655 460 xor 462                 n     * acc2 vlv
op.
660 460 xor 463                 n     * acc3 vlv
op.
665 460 xor 464                 n     * acc4 vlv
op.
*
* scram
511  rktpow 0 ge null 0 3210.e6          n *
POW>107%
512  time 0 ge null 0 1.e6              n  *
513  p 997010000 lt null 0 5.1e6          n
514 cntrlvar 11 lt null 0 0.975          n  *
515 cntrlvar 12 lt null 0 0.975          n  *
516 cntrlvar 13 lt null 0 0.975          n  *
517 cntrlvar 14 lt null 0 0.975          n  *
518 p 141010000 gt null 0 17.658e6        n
519 cntrlvar 3 le null 0 4.              n
520 p 675010000 gt null 0 7.848e6         n
521 p 775010000 gt null 0 7.848e6         n
522 p 875010000 gt null 0 7.848e6         n
523 p 975010000 gt null 0 7.848e6         n
524 tempf 106010000 gt null 0 599.        n
525 time 0 ge null 0 100.               n
656 511 or 512 n
657 513 or 514 n
642 515 or 516 n
643 517 or 518 n
644 519 or 520 n
645 521 or 522 n
646 523 or 524 n
647 656 or 657 n
648 642 or 643 n
649 644 or 645 n
651 646 or 647 n
652 648 or 649 n
653 651 or 652 n
654 653 and 525 l
*
*-------------------------------------------------
* MSIV 1-4 trip
535 cntrlvar 11 ge null 0 1.975          n  *
536 cntrlvar 12 ge null 0 1.975          n  *
537 cntrlvar 13 ge null 0 1.975          n  *
538 cntrlvar 14 ge null 0 1.975          n  *
540 time 0 ge null 0 10.             n  * manual
stop broken loop
541 time 0 ge null 0 1.e6            n  * manual
stop
542 time 0 ge null 0 1.e6            n  * manual
stop
543 time 0 ge null 0 1.e6            n  * manual
stop
634 535 or 540 n
635 536 or 541 n
636 537 or 542 n
637 538 or 543 n
539 time 0 ge null 0 100.5              n  *
638 634 and 539 l * chiusura
639 635 and 539 l * chiusura
640 636 and 539 l * chiusura
641 637 and 539 l * chiusura
*
671 405 and 405 n * apertura
*
*671 -404 and -404 n
*671 -638 and -638 l
*672 -639 and -639 l
*673 -640 and -640 l
*674 -641 and -641 l
*
*-------------------------------------------------
* sg1 srv1&2 set point
581   p   665010000 ge null 0 8.240e6  n     *
op.
582   p   665010000 ge null 0 8.430e6  n     *
op.
583   p   665010000 lt null 0 6.860e6  n     *
clo.
*
* sg2 srv1&2 set point
584   p   765010000 ge null 0 8.240e6  n     *
op.
585   p   665010000 ge null 0 8.430e6  n     *
op.
586   p   765010000 lt null 0 6.860e6  n     *
clo.
*
* sg3 srv1&2 set point
587   p   865010000 ge null 0 8.240e6  n     *
op.
588   p   665010000 ge null 0 8.430e6  n     *
op.
589   p   865010000 lt null 0 6.860e6  n     *
clo.
*
* sg4 srv1&2 set point
590   p   965010000 ge null 0 8.240e6  n     *
op.
591   p   665010000 ge null 0 8.430e6  n     *
op.
592   p   965010000 lt null 0 6.860e6  n     *
clo.
*-------------------------------------------------
*
*BRUA set point sg1
491   p   675010000 ge null 0 7.16e6   n     *
op.
492   p   675010000 lt null 0 6.27e6   n     *
clo.
*
*BRUA set point sg2
493   p   775010000 ge null 0 7.16e6   n     *
op.
494   p   775010000 lt null 0 6.27e6   n     *
clo.
*
*BRUA set point sg3
495   p   875010000 ge null 0 7.16e6   n     *
op.
496   p   875010000 lt null 0 6.27e6   n     *
clo.
*
*BRUA set point sg4
497   p   975010000 ge null 0 7.16e6   n     *
op.
498   p   975010000 lt null 0 6.27e6   n     *
clo.
*-------------------------------------------------------
*Turbina trip
614 535 or 536  n
615 537 or 538  n
616 614 or  615   n
617 616 and 539   l * chiusura
618 405 and 405   n * apertura
*
*-------------------------------------------------------
*
* reflood start & afw start injection
478 httemp  190401312  gt null 0  723.0  l
479 time 0 ge null 0 1.e6                  l  * EFW
start in broken SG (PTS potential)
*
*  atws related trips
475 time 0 ge null 0  -1.  l  0.   *
476 time 0 gt null 0  100.  l      *
720 475 xor 476           n        * tripunit 207
721 -720 and -720         n        * tripunit 210
*
*  end program
599 time 0 ge null 0      1000.             l     *
end
600  599                                    * end
program
*
404 time 0 gt null 0 110. n
405 time 0 le null 0 100. n
*
*-------------------------------------------------------
--------------
*
* hydraulic components
*
*-------------------------------------------------------
--------------
*
```

```
*
* spray line connection  cl
0200000 spray.cl branch
0200001 2 1
0200101 0.0257   0.72    0.  0.  90. 0.72    4.e-5
0.   00000
0200200 010  15.70e6    1.262e6    2.441e6  0.
2800.e-6
0201101 541010000 020000000 0. 0. 0.
000000
0202101 020010000 022000000 0. 0. 0.
000000
0201201 0. 0. 0.
0202201 0. 0. 0.
*
* spray vlv
0210000 spra.vlv   valve
0210101 022010000 026000000 0.     0. 0.
000000
0210201 1 0. 0. 0.
0210300 trpvlv
0210301 410
*
* spray line pipe
0220000 su.li1   pipe
0220001 19
0220101 0.0257  19
0220301 1.      1
0220302 2.      5
0220303 1.78    6
0220304 2.      19
0220401 0.      19
0220601 90.     5
0220602  0.    19
0220801 4.e-5 0.  19
0220901 0.2   0.2 18
0221001 00000   19
0221101 000000  18
0221201 010  15.70e6  1.262e6    2.441e6  0.
0. 19
0221300 1
0221301 0. 0. 0.   18
0222001 2800.e-6        19
*
* prz porv nr 1
0230000 yp22s01  valve
0230101 026000000 027000000 0.00221  1. 1.
000100  1. 1.
0230201 1 0. 0. 0.
0230300 mtrvlv
0230301 610  448   1.0   0.
*
* prz porv nr 2
0240000 yp22s02  valve
0240101 026000000 028000000 0.00221  1. 1.
000100  1. 1.
0240201 1 0. 0. 0.
0240300 mtrvlv
0240301 620  448   1.0   0.
*
*
* prz porv nr 3
0250000 yp22s03  valve
0250101 026000000 029000000 0.00221  1. 1.
000100  1. 1.
0250201 1 0. 0. 0.
0250300 mtrvlv
0250301 620  448   1.0   0.
*
*
*
* spray line connection  prz
0260000 spray.pr branch
0260001 1 1
0260101 0.0257   0.5     0.  0. -90. -0.5    4.e-5
0.   00000
0260200 010  15.70e6    1.612e6    2.441e6  1.
0.
0261101 026010000 030010000 0. 2. 2.
000000
0261201 0. 0. 0.
*
* containment simulator for prz porv 1
0270000 przc1     tmdpvol
0270101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
0270200 002
0270201 0.     1.e5   1.
*
* containment simulator for prz porv 2
0280000 przc2     tmdpvol
0280101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
0280200 002
0280201 0.     1.e5   1.
*
* containment simulator for prz porv 3
0290000 przc3     tmdpvol
0290101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
0290200 002
0290201 0.     1.e5   1.
*
* prz vessel
0300000 prz.ves  pipe
0300001 23
0300101 7.07    20
0300102 4.90    21
0300103 3.14    22
0300104 0.78    23
0300301 0.27    1
0300302 0.4     2
0300303 0.5     23
0300401 0.      23
0300601 90.     23
0300801 4.e-5 0.  23
0300901 1.e-9 1.e-9  22
0301001 00000   23
0301101 000000  22
0301201 010  15.70e6  1.612e6    2.441e6  0.
0.  16
0301202 010  15.70e6  1.612e6    2.441e6  0.9
0.  17
0301203 010  15.70e6  1.612e6    2.441e6  1.
0.  23
0301300 1
0301301 0. 0. 0.   22
0302001 2800.e-6        23
*
* surge line connection  prz
0320000 surge.pr branch
0320001 2 1
0320101 0.094    0.4     0.  0.  90.  0.4    4.e-5
0.   00000
0320200 010  15.70e6    1.612e6    2.441e6  0.
2800.e-6
0321101 032010000 030000000 0. 0.5  0.5
000000
0322101 036010000 032000000 0. 0.   0.
000000
0321201 0. 0. 0.
0322201 0. 0. 0.
*
* tmdp conn valve to prez
0330000 prz.vlv  valve
0330101 026010000 034000000 0.01   0. 0.
000000
0330201 1 0. 0. 0.
0330300 trpvlv
0330301 415
*
* prz pressure control stsz
0340000 prz.vol  tmdpvol
0340101 2.38355  2.  0.  0.  90.  2.      4.e-5  0.
00
0340200 002
0340201 0.     15.70e6   1.0
0340202 1.e6   15.70e6   1.0
*
* surge line
0360000 surge.li   pipe
0360001 18
0360101 0.094   18
0360301 0.56    1
0360302 1.      6
0360303 0.93    7
0360304 1.      16
0360305 0.81   17
0360306 0.6    18
0360401 0.     18
0360601 -90.   6
0360602   0.  16
0360603  90.  18
0360801 4.e-5 0.  18
0360901 1.e-9 1.e-9  5
0360902 0.5   0.5    6
0360903 1.e-9 1.e-9  10
0360904 0.5    0.5   11
0360905 1.e-9 1.e-9  16
0360906 0.5   0.5    17
0361001 00000   18
0361101 000000  17
0361201 010  15.70e6  1.441e6    2.441e6  0.
0.  18
0361300 1
0361301 0. 0. 0.   17
0362001 2800.e-6        18
*
*
* tmdp conn valve to prez
0380000 prz.vlv  valve
0380101 026010000 039000000 0.01   0. 0.
000000
0380201 1 0. 0. 0.
0380300 trpvlv
0380301 613
*
* prz pressure control
0390000 prz.vol  tmdpvol
0390101 2.38355  2.  0.  0.  90.  2.      4.e-5  0.
00
0390200 002
0390201 0.     18.79e6   1.0
0390204 1.e6   18.59e6   1.0
*
* prez level control j inlet
0400000 prz.lec   tmdpjun
0400101 041000000 032010000 0.
0400200 1  420  cntrlvar 003
0400201 -1.      0.  0.  0.
0400202    1.   100.  0.   0.
```

```
0400203   4.0   100.   0.   0.
0400204   7.8   100.   0.   0.
0400205   8.0   100.   0.   0.
0400206   8.40   20.   0.   0.
0400208   8.47    0.   0.   0.
0400209   9.33    0.   0.   0.
0400210   11.     0.   0.   0.
*
* prez lvl control vol inlet
0410000 prz.cvvo    tmdpvol
0410101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
0410200 000
0410201 0. 16.00e6 1.612e6 2.441e6  0.
*
* prez level control j outlet
0420000 prz.lec   tmdpjun
0420101 032010000 043000000 0.
0420200 1  425  cntrlvar 003
0420201 -1.      0.   0.   0.
0420202    0.    0.    0.   0.
0420203    1.    0.   0.   0.
0420204   8.47    0.   0.   0.
0420205   8.50   20.   0.   0.
0420206   9.0   100.   0.   0.
0420207  10.5   200.   0.   0.
0420208  10.6   300.   0.   0.
*
* prez lvl control vol outlet
0430000 prz.cvvo    tmdpvol
0430101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
0430200 2
0430201 0. 15.00e6 0.
*
* sit1          vessel
0500000  sit1              accum
0500101 0.      8.8        60.0       0.        90.
8.8
0500102 4.e-5     0.        00000
0500200 6.000e+6 323. 14000.e-6
0501101 055000000 0.0078    1.   1.  000000
0502200 50.  0.  1.e-10   1.e-10  0.060  0  0. 0.
0
*
*
* lpis inlet
0510000 lpis1   tmdpjun
0510101 052000000 055010000 0.1
0510200    0       430   p 055010000
0510201   -1.      0.       0.   0.
0510202    0.1e6  69.3      0.   0.
0510203    2.1e6  23.1      0.   0.
0510204    2.5e6   0.0      0.   0.
0510205   20.0e6   0.0      0.   0.
*
* lpis control vol inlet
0520000 lptank1   tmdpvol
0520101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
0520200 000
0520201 0. 2.20e6 2.092e5 2.443e6  0.
*
*
* sit1  line
0550000 sit1l    pipe
0550001 8
0550101 0.0078  8
0550301 1.79    1
0550302 2.      2
0550303 2.21    3
0550304 2.      7
0550305 2.15    8
0550401 0.      8
0550601 -90.    2
0550602  0.     4
0550603  90.    8
0550801 4.e-5 0.  8
0550901 0.05 0.05 7
0551001 00000    8
0551101 000000   7
0551201 000  6.000e6  0.417e6    2.597e6  0.
0. 8
0551300 1
0551301 0. 0. 0.   7
*
* sit1 rpv conn
0560000 sit1.con branch
0560001 1 1
0560101 0.0078   1.0     0.  0.   0.  0.0    4.e-5
0.   00000
0560200 010  6.000e6    0.417e6    2.597e6  0.
0.
0561101 055010000 056000000 0. 0.5  0.5
000000
0561201 0. 0. 0.
*
* sit1 conn valve to up
0570000 sit1vl   valve
0570101 056010000 148010000 0.     1. 1.
000000
0570201 1 0. 0. 0.
0570300 trpvlv
0570301 650
*
* sit2          vessel
0600000  sit2              accum
0600101 0.      8.8        60.0       0.        90.
8.8
0600102 4.e-5     0.        00000
0600200 6.000e+6 323.  14000.e-6
0601101 065000000 0.0078    1.   1.  000000
0602200 50.  0.  1.e-10   1.e-10  0.060  0  0. 0.
0
*
* lpis inlet
0610000 lpis2   tmdpjun
0610101 062000000 065010000 0.1
0610200    0       430   p 065010000
0610201   -1.      0.       0.   0.
0610202    0.1e6  69.3      0.   0.
0610203    2.1e6  23.1      0.   0.
0610204    2.5e6   0.0      0.   0.
0610205   20.0e6   0.0      0.   0.
*
* lpis control vol inlet
0620000 lptank2   tmdpvol
0620101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
0620200 000
0620201 0. 2.20e6 2.092e5 2.443e6  0.
*
* sit2  line
0650000 sit2l    pipe
0650001 8
0650101 0.0078  8
0650301 1.79    1
0650302 2.      2
0650303 2.21    3
0650304 2.      7
0650305 2.15    8
0650401 0.      8
0650601 -90.    2
0650602  0.     4
0650603  90.    8
0650801 4.e-5 0.  8
0650901 0.05 0.05 7
0651001 00000    8
0651101 000000   7
0651201 000  6.000e6  0.417e6    2.597e6  0.
0. 8
0651300 1
0651301 0. 0. 0.   7
*
* sit2 rpv conn
0660000 sit2.con branch
0660001 1 1
0660101 0.0078   1.0     0.  0.   0.  0.0    4.e-5
0.   00000
0660200 000  6.000e6    0.417e6    2.597e6  0.
0661101 065010000 066000000 0. 0.5  0.5
000000
0661201 0. 0. 0.
*
* sit2 conn valve to up
0670000 sit2vl   valve
0670101 066010000 148000000 0.     1. 1.
000000
0670201 1 0. 0. 0.
0670300 trpvlv
0670301 655
*
* sit3          vessel
0700000  sit3              accum
0700101 0.      8.8        60.0       0.        90.
8.8
0700102 4.e-5     0.        00000
0700200 6.000e+6 323.  14000.e-6
0701101 075000000 0.0078    1.   1.  000000
0702200 50.  0.  1.e-10   1.e-10  0.060  0  0. 0.
0
*
* lpis inlet
0710000 lpis3   tmdpjun
0710101 072000000 075010000 0.1
0710200    0       430   p 075010000
0710201   -1.      0.       0.   0.
0710202    0.1e6  69.3      0.   0.
0710203    2.1e6  23.1      0.   0.
0710204    2.5e6   0.0      0.   0.
0710205   20.0e6   0.0      0.   0.
*
* lpis control vol inlet
0720000 lptank3   tmdpvol
0720101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
0720200 000
0720201 0. 2.20e6 2.092e5 2.443e6  0.
*
* sit3  line
0750000 sit3l    pipe
0750001 10
0750101 0.0078  10
0750301 0.9     1
0750302 1.      3
0750303 0.45    4
0750304 2.      9
0750305 0.65   10
0750401 0.     10
0750601 -90.    3
0750602  0.     9
0750603 -90.   10
0750801 4.e-5 0.  10
```

```
0750901 0.05 0.05 9
0751001 00000    10
0751101 000000   9
0751201 000  6.000e6  0.417e6    2.597e6  0.
0. 10
0751300 1
0751301 0. 0. 0.   9
*
* sit3 rpv conn
0760000 sit3.con branch
0760001 1 1
0760101 0.0078   1.0     0.  0.   0.  0.0    4.e-5
0.   00000
0760200 000  6.000e6    0.417e6    2.597e6  0.
0761101 075010000 076000000 0. 0.5  0.5
000000
0761201 0. 0. 0.
*
* sit3 conn valve to dc
0770000 sit3vl   valve
0770101 076010000 134000000 0.     1. 1.
000000
0770201 1 0. 0. 0.
0770300 trpvlv
0770301 660
*
* sit4          vessel
0800000  sit4              accum
0800101 0.      8.8       60.0       0.        90.
8.8
0800102 4.e-5     0.       00000
0800200 6.000e+6 323.  14000.e-6
0801101 085000000 0.0078    1.   1.  000000
0802200 50.  0.  1.e-10   1.e-10  0.060  0  0. 0.
0
*
* sit4  line
0850000 sit4l    pipe
0850001 10
0850101 0.0078  10
0850301 0.9     1
0850302 1.      3
0850303 0.45    4
0850304 2.      9
0850305 0.65   10
0850401 0.     10
0850601 -90.    3
0850602  0.    9
0850603 -90.   10
0850801 4.e-5 0.  10
0850901 0.05 0.05 9
0851001 00000    10
0851101 000000   9
0851201 000  6.000e6  0.417e6    2.597e6  0.
0. 10
0851300 1
0851301 0. 0. 0.   9
*
* sit4 rpv conn
0860000 sit4.con branch
0860001 1 1
0860101 0.0078   1.0     0.  0.   0.  0.0    4.e-5
0.   00000
0860200 000  6.000e6    0.417e6    2.597e6  0.
0861101 085010000 086000000 0. 0.5  0.5
000000
0861201 0. 0. 0.
*
* sit4 conn valve to dc
0870000 sit4vl   valve
0870101 086010000 137000000 0.     1. 1.
000000
0870201 1 0. 0. 0.
0870300 trpvlv
0870301 665
*
* lower plenum  1
1000000 lo.pl1 branch
1000001 2 1
1000101 4.45     0.3      0.    0.  90. 0.3      4.e-5
0.   00000
1000200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
1001101 100010000 105000000 0.      1.   1.
000000
1002101 130010000 100010000 1.69    1.   1.
000000
1001201 16252.   0.    0.
1002201 16252.   0.    0.
*
* lower plenum 2
1050000 lople2   pipe
1050001 3
1050101 4.8     3
1050301 0.4     3
1050401 0.      3
1050601 90.     3
1050801 4.e-5 0. 3
1050901 1.e-6 1.e-6 2
1051001 00000    3
1051101 000000   2
1051201 010  15.70e6  1.262e6    2.441e6   0.
0.  3
1051300 1
1051301 16252.   0.   0.  2
1052001 2800.e-6              3
*
* lower plenum  3
1060000 lo.pl3 branch
1060001 4 1
1060101 4.80     0.32     0.    0.  90.  0.32
4.e-5  0.    00000
1060200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
1061101 105010000 106000000 0.      0.5  0.5
000000
1062101 106010000 110000000 0.      1.0  1.0
000000
1063101 106010000 120000000 0.15    1.0
1.0 000000
1064101 106010000 113000000 0.      1.0  1.0
000000
1061201 16252.   0.    0.
1062201 14594.   0.    0.
1063201 1658.    0.    0.
1064201 345.5    0.    0.
*
* new bypass from downcomer to upper head
1130000  newby    pipe
1130001  33
1130101  0.0833    33
1130301  0.250     13
1130302  0.280     14
1130303  0.320     15
1130304  0.300     16
1130305  0.250     20
1130306  0.420     21
1130307  0.300     22
1130308  0.330     23
1130309  0.420     24
1130310  0.330     25
1130311  0.325     33
1130401  0.        33
1130601  90.       33
1130801  4.e-7  0.0076 33
1131001 00000    33
1131101 000000   32
1131201 010  15.70e6  1.262e6    2.441e6  0.
0. 1
1131202 010  15.70e6  1.272e6    2.441e6  0.
0. 2
1131203 010  15.70e6  1.282e6    2.441e6  0.
0. 3
1131204 010  15.70e6  1.312e6    2.441e6  0.
0. 4
1131205 010  15.70e6  1.322e6    2.441e6  0.
0. 5
1131206 010  15.70e6  1.332e6    2.441e6  0.
0. 6
1131207 010  15.70e6  1.342e6    2.441e6  0.
0. 7
1131208 010  15.70e6  1.362e6    2.441e6  0.
0. 8
1131209 010  15.70e6  1.372e6    2.441e6  0.
0. 9
1131210 010  15.70e6  1.392e6    2.441e6  0.
0. 10
1131211 010  15.70e6  1.412e6    2.441e6  0.
0. 11
1131212 010  15.70e6  1.422e6    2.441e6  0.
0. 12
1131213 010  15.70e6  1.431e6    2.441e6  0.
0. 13
1131214 010  15.70e6  1.441e6    2.441e6  0.
0. 33
1131300 1
1131301 345.5   0.   0.  32
1132001 2800.e-6              33
*
* core
1100000 core     pipe
1100001 13
1100101 4.172    13
1100301 0.25     13
1100401 0.       13
1100601 90.      13
1100801 4.e-7 0.009 13
1100901 1.e-1 1.e-1 2
1100902 0.3    0.3   3
1100903 1.e-1 1.e-1 5
1100904 0.3    0.3   6
1100905 1.e-1 1.e-1 8
1100906 0.3    0.3   9
1100907 1.e-1 1.e-1 11
1100908 0.3    0.3   12
1101001 00000    13
1101101 000000   12
1101201 010  15.70e6  1.262e6    2.441e6  0.
0. 1
1101202 010  15.70e6  1.272e6    2.441e6  0.
0. 2
1101203 010  15.70e6  1.282e6    2.441e6  0.
0. 3
1101204 010  15.70e6  1.312e6    2.441e6  0.
0. 4
1101205 010  15.70e6  1.322e6    2.441e6  0.
0. 5
```

```
1101206 010  15.70e6  1.332e6    2.441e6  0.
0. 6
1101207 010  15.70e6  1.342e6    2.441e6  0.
0. 7
1101208 010  15.70e6  1.362e6    2.441e6  0.
0. 8
1101209 010  15.70e6  1.372e6    2.441e6  0.
0. 9
1101210 010  15.70e6  1.392e6    2.441e6  0.
0. 10
1101211 010  15.70e6  1.412e6    2.441e6  0.
0. 11
1101212 010  15.70e6  1.422e6    2.441e6  0.
0. 12
1101213 010  15.70e6  1.431e6    2.441e6  0.
0. 13
1101300 1
1101301 14594.   0.   0.  12
1102001 2800.e-6              13
*
* corebypass
1200000 coby     pipe
1200001 13
1200101 0.2086  13
1200301 0.25    13
1200401 0.      13
1200601 90.     13
1200801 4.e-6 0.009  13
1200901 1.e-6 1.e-6  12
1201001 00000   13
1201101 000000  12
1201201 010  15.70e6  1.362e6    2.441e6  0.
0. 13
1201300 1
1201301 1658.    0.   0.  12
1202001 2800.e-6              13
*
* upper bypass
1210000 up.by  branch
1210001 1 1
1210101 0.2086   0.28     0.    0.  90. 0.28
4.e-5  0.    00000
1210200 010  15.70e6  1.362e6  2.441e6  0.
2800.e-6
1211101 120010000 121000000 0.      0.01
0.01 000000
1211201 1658.    0.    0.
*
* dc middle pipe
1300000 dc.mid   pipe
1300001 19
1300101 3.143   19
1300301 0.32    1
1300302 0.28    2
1300303 0.25    15
1300304 0.32    16
1300305 0.4     19
1300401 0.      19
1300601 -90.    19
1300801 4.e-6 0.52   19
1300901 1.e-6 1.e-6  18
1301001 00000   19
1301101 000000  18
1301201 010  15.70e6  1.262e6    2.441e6  0.
0. 19
1301300 1
1301301 16252.   0.   0.  18
1302001 2800.e-6              19
*
* dc upper
1390000 up.dc  branch
1390001 9 1
1390101 3.143    0.3     0.    0. -90. -0.3     4.e-5
0.    00000
1390200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
1391101 133010000 139000000 0.      0.1 0.1
000000
1392101 176010000 139000000 0.      0.1 0.1
000000
1393101 134010000 139000000 0.      0.1 0.1
000000
1394101 135010000 139000000 0.      0.1 0.1
000000
1395101 136010000 139000000 0.      0.1 0.1
000000
1396101 177010000 139000000 0.      0.1 0.1
000000
1397101 137010000 139000000 0.      0.1 0.1
000000
1398101 138010000 139000000 0.      0.1 0.1
000000
1399101 139010000 130000000 0.      0.1 0.1
000000
1391201 2482.   0.    0.
1392201 2709.   0.    0.
1393201  451.   0.    0.
1394201 2482.   0.    0.
1395201 2709.   0.    0.
1396201  451.   0.    0.
1397201 2482.   0.    0.
1398201 2482.   0.    0.
1399201 16252.  0.    0.
*
*
* dc top pipe - 1 for pts from cold leg 1
1330000 dc.pts   pipe
1330001 4
1330101 0.48018    4
1330301 0.25    4
1330401 0.      4
1330601 -90.    4
1330801 4.e-6   0.52   4  *
1330901 1.e-6 1.e-6  3
1331001 00000   4
1331101 000000  3
1331201 010  15.70e6  1.262e6    2.441e6  0.
0. 4
1331300 1
1331301 2482.   0.   0.  3
1332001 2800.e-6              4
*
* dc top pipe - 2 transition
1760000 dc.pts   pipe
1760001 4
1760101 0.48018    4
1760301 0.25    4
1760401 0.      4
1760601 -90.    4
1760801 4.e-6   0.52   4  *
1760901 1.e-6 1.e-6  3
1761001 00000   4
1761101 000000  3
1761201 010  15.70e6  1.262e6    2.441e6  0.
0. 4
1761300 1
1761301 2709.   0.   0.  3
1762001 2800.e-6              4
*
* dc top pipe - 3 for pts from sit 3
1340000 dc.pts   pipe
1340001 4
1340101 0.13096    4
1340301 0.25    4
1340401 0.      4
1340601 -90.    4
1340801 4.e-6   0.52   4  *
1340901 1.e-6 1.e-6  3
1341001 00000   4
1341101 000000  3
1341201 010  15.70e6  1.262e6    2.441e6  0.
0. 4
1341300 1
1341301  451.   0.   0.  3
1342001 2800.e-6              4
*
* dc top pipe - 4 for pts from cold leg 2
1350000 dc.pts   pipe
1350001 4
1350101 0.48018    4
1350301 0.25    4
1350401 0.      4
1350601 -90.    4
1350801 4.e-6   0.52   4  *
1350901 1.e-6 1.e-6  3
1351001 00000   4
1351101 000000  3
1351201 010  15.70e6  1.262e6    2.441e6  0.
0. 4
1351300 1
1351301 2482.   0.   0.  3
1352001 2800.e-6              4
*
* dc top pipe - 5 for pts from cold leg 3
1360000 dc.pts   pipe
1360001 4
1360101 0.48018    4
1360301 0.25    4
1360401 0.      4
1360601 -90.    4
1360801 4.e-6   0.52   4  *
1360901 1.e-6 1.e-6  3
1361001 00000   4
1361101 000000  3
1361201 010  15.70e6  1.262e6    2.441e6  0.
0. 4
1361300 1
1361301 2482.   0.   0.  3
1362001 2800.e-6              4
*
* dc top pipe - 6 transition
1770000 dc.pts   pipe
1770001 4
1770101 0.48018    4
1770301 0.25    4
1770401 0.      4
1770601 -90.    4
1770801 4.e-6   0.52   4  *
1770901 1.e-6 1.e-6  3
1771001 00000   4
1771101 000000  3
1771201 010  15.70e6  1.262e6    2.441e6  0.
0. 4
1771300 1
1771301 2709.   0.   0.  3
1772001 2800.e-6              4
*
* dc top pipe - 7 for pts from sit 4
```

```
1370000 dc.pts   pipe
1370001 4
1370101 0.13096     4
1370301 0.25    4
1370401 0.      4
1370601 -90.    4
1370801 4.e-6   0.52   4  *
1370901 1.e-6 1.e-6  3
1371001 00000   4
1371101 000000  3
1371201 010  15.70e6  1.262e6    2.441e6  0.
0. 4
1371300 1
1371301  451.    0.   0.  3
1372001 2800.e-6              4
*
* dc top pipe - 8 for pts from cold leg 4
1380000 dc.pts   pipe
1380001 4
1380101 0.48018    4
1380301 0.25    4
1380401 0.      4
1380601 -90.    4
1380801 4.e-6   0.52   4  *
1380901 1.e-6 1.e-6  3
1381001 00000   4
1381101 000000  3
1381201 010  15.70e6  1.262e6    2.441e6  0.
0. 4
1381300 1
1381301 2482.    0.   0.  3
1382001 2800.e-6              4
*
* dc top1
1310000 dc.cl  branch
1310001 9 1
1310101 3.143    0.42     0.    0.  90. 0.42    4.e-
5  0.52  00000
1310200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
1311101 133000000 131000000 0.     1.e-1
1.e-1 000000
1312101 134000000 131000000 0.     1.e-1
1.e-1 000000
1313101 176000000 131000000 0.     1.e-1
1.e-1 000000
1314101 135000000 131000000 0.     1.e-1
1.e-1 000000
1315101 136000000 131000000 0.     1.e-1
1.e-1 000000
1316101 177000000 131000000 0.     1.e-1
1.e-1 000000
1317101 137000000 131000000 0.     1.e-1
1.e-1 000000
1318101 138000000 131000000 0.     1.e-1
1.e-1 000000
1319101 131010000 132000000 0.     1.e-1
1.e-1 000000
1311201 0.    0.    0.
1312201 0.    0.    0.
1313201 0.    0.    0.
1314201 0.    0.    0.
1315201 0.    0.    0.
1316201 0.    0.    0.
1317201 0.    0.    0.
1318201 0.    0.    0.
1319201 0.    0.    0.
*
* dc top2
1320000 dc.utop  pipe
1320001 2
1320101 3.143   2
1320301 0.3     1
1320302 0.33    2
1320401 0.      2
1320601 90.     2
1320801 4.e-6 0.52   2
1320901 1.e-6 1.e-6  1
1321001 00000   2
1321101 000000  1
1321201 010  15.70e6  1.262e6    2.441e6  0.
0. 2
1321300 1
1321301 0.     0.   0.  1
1322001 2800.e-6              2
*
* upper core
1400000 up.co  branch
1400001 1 1
1400101 4.1726   0.28     0.    0.  90. 0.28
4.e-5  0.009 00000
1400200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1401101 110010000 140000000 0.     0.01
0.01 000000
1401201 14594.   0.    0.
*
* upper plenum 1
1410000 up.a   branch
1410001 4 1
1410101 7.27     0.32     0.    0.  90. 0.32     4.e-
5  0.   00000
1410200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1411101 140010000 141000000 0.     0.5  0.5
000000
1412101 121010000 141000000 0.     1.0  1.0
000000
1413101 141010000 142000000 0.     0.5  0.5
000000
1414101 190010000 141010000 0.1    10.  1.e9
000000
1411201 14594.   0.    0.
1412201 1658.    0.    0.
1413201 16501.   0.    0.
1414201 249.     0.    0.
*
* upper plenum 2
1420000 up.b   branch
1420001 1 1
1420101 7.27     0.3     0.    0.  90. 0.3     4.e-5
0.   00000
1420200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1421101 142010000 143000000 0.     0.5 0.5
000000
1421201 16501.   0.    0.
*
* upper plenum 3
1430000 up.c     pipe
1430001 4
1430101 7.27     4
1430301 0.25     4
1430401 0.       4
1430601 90.      4
1430801 4.e-6 0.     4
1430901 1.e-1 1.e-1   3
1431001 00000    4
1431101 000000   3
1431201 010  15.70e6  1.441e6    2.441e6  0.
0.  4
1431300 1
1431301 16501.   0.   0.   3
1432001 2800.e-6              4
*
* upper plenum 4
1440000 up.d   branch
1440001 3 1
1440101 7.27     0.42     0.    0.  90. 0.42     4.e-
5  0.   00000
1440200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1441101 143010000 144000000 0.     0.5 0.5
000000
1442101 144010000 145000000 0.     0.5 0.5
000000
1443101 185000000 144010000 0.1    1.0  1.e9
000000
1441201 16501.   0.    0.
1442201 16750.   0.    0.
1443201 249.     0.    0.
*
* upper plenum 5
1450000 up.e   branch
1450001 1 1
1450101 7.27     0.3     0.    0.  90. 0.3     4.e-5
0.   00000
1450200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1451101 145010000 146000000 0.     0.5 0.5
000000
1451201 16750.   0.    0.
*
* upper plenum 6
1460000 up.f   branch
1460001 2 1
1460101 7.27     0.33     0.    0.  90. 0.33     4.e-
5  0.   00000
1460200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1461101 146010000 147000000 0.     0.5 0.5
000000
1462101 132010000 146010000 0.01   10.  50.
000000
1461201 17082.   0.    0.
1462201 332.     0.    0.
*
* upper plenum 7
1470000 up.g   branch
1470001 1 1
1470101 7.27     0.42     0.    0.  90. 0.42     4.e-
5  0.   00000
1470200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1471101 147010000 148000000 0.     0.5 0.5
000000
1471201 17082.   0.    0.
*
* upper plenum - hls connection
1480000 up.hls branch
1480001 6 1
1480101 7.27     0.33     0.    0.  90. 0.33     4.e-
5  0.   00000
1480200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1481101 150010000 148010000 0.01   1.e9 10.
000000
```

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1482101 148010000 170000000 0.06   10.
1.e9 000000
1483101 148010000 200000000 0.     1.5  1.5
000000
1484101 148010000 300000000 0.     1.5  1.5
000000
1485101 148010000 400000000 0.     1.5  1.5
000000
1486101 148010000 500000000 0.     1.5  1.5
000000
1481201 166.     0.    0.
1482201 664.     0.    0.
1483201 4146.    0.    0.
1484201 4146.    0.    0.
1485201 4146.    0.    0.
1486201 4146.    0.    0.
*
* upper head 1
1500000 uh.a     pipe
1500001 8
1500101 7.27     8
1500301 0.325    8
1500401 0.       8
1500601 -90.     8
1500801 4.e-6 0.      8
1500901 1.e-6 1.e-6   7
1501001 00000    8
1501101 000000   7
1501201 010  15.70e6  1.441e6    2.441e6  0.
0.  8
1501300 1
1501301 166.     0.   0.   7
1502001 2800.e-6               8
*
* upper head 2
1550000 uh.b   branch
1550001 4 1
1550101 6.54     0.325    0.    0. -90. -0.325
4.e-5  0.    00000
1550200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1551101 160010000 155000000 0.     0.5  0.5
000000
1552101 155010000 150000000 0.     0.5  0.5
000000
1553101 155010000 180000000 1.55   0.9  0.9
000000
1554101 155010000 113010000 0.     1.0  1.0
000000
1551201 581.     0.    0.
1552201 83.      0.    0.
1553201 498.     0.    0.
1554201 345.5    0.    0.
*
* upper head 3
1560000 uh.c   branch
1560001 3 1
1560101 0.73     0.325    0.    0.  90.  0.325
4.e-5  0.    00000
1560200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1561101 156010000 161000000 0.     0.01
0.01 000000
1562101 156000000 150000000 0.     20.  20.
000000
1563101 170010000 156000000 0.1    10.  10.
000000
1561201 581.     0.    0.
1562201 83.      0.    0.
1563201 664.     0.    0.
*
* upper head 4
1600000 uh.d     pipe
1600001 2
1600101 6.54     2
1600301 0.325    2
1600401 0.       2
1600601 -90.     2
1600801 4.e-6 0.      2
1600901 1.e-6 1.e-6   1
1601001 00000    2
1601101 000000   1
1601201 010  15.70e6  1.441e6    2.441e6  0.
0.  2
1601300 1
1601301 581.     0.   0.   1
1602001 2800.e-6               2
*
* upper head 5
1610000 uh.e     pipe
1610001 2
1610101 0.73     2
1610301 0.325    2
1610401 0.       2
1610601 90.      2
1610801 4.e-6 0.      2
1610901 1.e-6 1.e-6   1
1611001 00000    2
1611101 000000   1
1611201 010  15.70e6  1.441e6    2.441e6  0.
0.  2
1611300 1
1611301 581.     0.   0.   1
1612001 2800.e-6               2
*
* upper head 6
1620000 uh.f   branch
1620001 2 1
1620101 7.27     0.325    0.    0.  90. 0.325
4.e-5  0.      00
1620200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1621101 161010000 162000000 0.     0.1  0.1
000000
1622101 162000000 160000000 0.     0.1  0.1
000000
1621201 581.     0.    0.
1622201 581.     0.    0.
*
* up annulus
1700000 up.ann   pipe
1700001 8
1700101 2.5      6
1700102 0.5      8
1700301 0.325    8
1700401 0.       8
1700601 90.      8
1700801 4.e-5 0.52   8
1700901 1.e-6 1.e-6  5
1700902 10.   10.    6
1700903 1.e-6 1.e-6  7
1701001 00000    8
1701101 000000   7
1701201 010  15.70e6  1.441e6    2.441e6  0.
0. 8
1701300 1
1701301 664.     0.   0.   7
1702001 2800.e-6               8
*
* cr guide tube top
1800000 crguid   pipe
1800001 12
1800101 1.55     12
1800301 0.325    8
1800302 0.33     9
1800303 0.42     10
1800304 0.33     11
1800305 0.3      12
1800401 0.       12
1800601 -90.     12
1800801 4.e-5 0.05   12
1800901 1.e-2 1.e-2  11
1801001 00000    12
1801101 000000   11
1801201 010  15.70e6  1.441e6    2.441e6  0.
0. 12
1801300 1
1801301 498.     0.   0.   11
1802001 2800.e-6               12
*
* guide tube br
1850000 gui.tbr  branch
1850001 2 1
1850101 1.55     0.42     0.    0. -90. -0.42    4.e-
5  0.      00
1850200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
1851101 180010000 185000000 0.       0.1  0.1
000000
1852101 185010000 190000000 0.       0.1  0.1
000000
1851201 249.     0.    0.
1852201 249.     0.    0.
*
* cr guide tube bot
1900000 crguibo  pipe
1900001 5
1900101 1.55     5
1900301 0.25     4
1900302 0.3      5
1900401 0.       5
1900601 -90.     5
1900801 4.e-5 0.05    5
1900901 1.e-2 1.e-2  4
1901001 00000    5
1901101 000000   4
1901201 010  15.70e6  1.441e6    2.441e6  0.
0. 5
1901300 1
1901301 249.     0.   0.   4
1902001 2800.e-6               5
*
* hot  leg  conn loop1
2000000 hlloop1   branch
2000001 1  1
2000101 0.567    0.4      0.  0.    0.  0.       4.e-5
0.     00000
2000200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
2001101 200010000 201000000 0.     0.    0.
000000
2001201 4146.    0.    0.
*
* hl int tub loop1
2010000 hlaloop1 pipe
2010001 4
2010101 0.567    4
2010301 0.75     4
```

```
2010401 0.     4
2010601 0.     4
2010801 4.e-5 0.    4
2010901 1.e-6 1.e-6  3
2011001 00000   4
2011101 000000  3
2011201 010  15.70e6  1.441e6    2.441e6  0.
0. 4
2011300 1
2011301 4146.   0.  0.  3
2012001 2800.e-6              4
*
* hot  leg  intb loop1
2030000 ibloop1   branch
2030001 2  1
2030101 0.567    0.4      0. 0.    0.  0.       4.e-5
0.    00000
2030200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
2031101 201010000 203000000 0.     0.    0.
000000
2032101 203010000 205000000 0.     0.    0.
000000
2031201 4146.   0.   0.
2032201 4146.   0.   0.
*
* hl end tub loop1
2050000 hetloop1 pipe
2050001 7
2050101 0.567   7
2050301 0.75    2
2050302 0.72    3
2050303 0.6     6
2050304 0.34    7
2050401 0.      7
2050601 0.      3
2050602 90.     7
2050801 4.e-5 0.    7
2050901 1.e-6 1.e-6  6
2051001 00000   7
2051101 000000  6
2051201 010  15.70e6  1.441e6    2.441e6  0.
0. 7
2051300 1
2051301 4146.   0.  0.  6
2052001 2800.e-6              7
*
* hot  leg  sgconn loop1
2090000 hsgoop1   branch
2090001 2  1
2090101 0.567    0.5      0. 0.   90.  0.5     4.e-
5  0.    00000
2090200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
2091101 205010000 209000000 0.     0.    0.
000000
2092101 209010000 210000000 0.     0.    0.
000000
2091201 4146.   0.   0.
2092201 4146.   0.   0.
*
* sg loop1 hot coll part0
2100000 hcaoop1   branch
2100001 1  1
2100101 0.587    0.15     0. 0.   90.  0.15
4.e-5  0.    00000
2100200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
2101101 210010000 212000000 0.5    0.2
0.2  000000
2101201 4146.   0.   0.
*
* sg loop1 hot coll part1
2120000 hcaoop1   branch
2120001 2  1
2120101 0.587    0.31     0. 0.   90.  0.31
4.e-5  0.    00000
2120200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
2121101 212010000 214000000 0.     0.    0.
000000
2122101 212010000 213000000 0.     0.5   0.5
000002
2121201 3455.   0.   0.
2122201 691.    0.   0.
*
* sg hor tub loop1 part 1  (1833 tubes)
2130000 hoaloop1 pipe
2130001 18
2130101 0.243   18
2130301 0.2     1
2130302 0.3     3
2130303 0.4     6
2130304 0.5     9
2130305 0.6     10
2130306 0.7     11
2130307 0.75    13
2130308 0.8     14
2130309 1.0     18
2130401 0.      18
2130601 0.      18
2130801 4.e-6 0.013  18
2130901 1.e-6 1.e-6  17
2131001 0001000  18
2131101 000000 17
2131201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
2131202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
2131203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
2131300 1
2131301 691.    0.   0.  17
2132001 2800.e-6              18
*
* sg loop1 hot coll part2
2140000 hcboop1   branch
2140001 2  1
2140101 0.587    0.29     0. 0.   90.  0.29
4.e-5  0.    00000
2140200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
2141101 214010000 216000000 0.     0.    0.
000000
2142101 214010000 215000000 0.     0.5   0.5
000002
2141201 2764.   0.   0.
2142201 691.    0.   0.
*
* sg hor tub loop1 part 2  (1833 tubes)
2150000 hobloop1 pipe
2150001 18
2150101 0.243   18
2150301 0.2     1
2150302 0.3     3
2150303 0.4     6
2150304 0.5     9
2150305 0.6     10
2150306 0.7     11
2150307 0.75    13
2150308 0.8     14
2150309 1.0     18
2150401 0.      18
2150601 0.      18
2150801 4.e-6 0.013  18
2150901 1.e-6 1.e-6  17
2151001 0001000  18
2151101 000000 17
2151201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
2151202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
2151203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
2151300 1
2151301 691.    0.   0.  17
2152001 2800.e-6              18
*
* sg loop1 hot coll part3
2160000 hccoop1   branch
2160001 2  1
2160101 0.587    0.29     0. 0.   90.  0.29
4.e-5  0.    00000
2160200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
2161101 216010000 218000000 0.     0.    0.
000000
2162101 216010000 217000000 0.     0.5   0.5
000002
2161201 2073.   0.   0.
2162201 691.    0.   0.
*
* sg hor tub loop1 part 3  (1833 tubes)
2170000 hocloop1 pipe
2170001 18
2170101 0.243   18
2170301 0.2     1
2170302 0.3     3
2170303 0.4     6
2170304 0.5     9
2170305 0.6     10
2170306 0.7     11
2170307 0.75    13
2170308 0.8     14
2170309 1.0     18
2170401 0.      18
2170601 0.      18
2170801 4.e-6 0.013  18
2170901 1.e-6 1.e-6  17
2171001 0001000  18
2171101 000000  17
2171201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
2171202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
2171203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
2171300 1
2171301 691.    0.   0.  17
2172001 2800.e-6              18
*
* sg loop1 hot coll part4
2180000 hdloop1   branch
2180001 2  1
2180101 0.587    0.29     0. 0.   90.  0.29
4.e-5  0.    00000
2180200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
```

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2181101 218010000 220000000 0.     0.    0.
000000
2182101 218010000 219000000 0.     0.5   0.5
000002
2181201 1382.    0.    0.
2182201 691.     0.    0.
*
* sg hor tub loop1 part 4  (1833 tubes)
2190000 hodloop1 pipe
2190001 18
2190101 0.243   18
2190301 0.2     1
2190302 0.3     3
2190303 0.4     6
2190304 0.5     9
2190305 0.6     10
2190306 0.7     11
2190307 0.75    13
2190308 0.8     14
2190309 1.0     18
2190401 0.      18
2190601 0.      18
2190801 4.e-6 0.013  18
2190901 1.e-6 1.e-6  17
2191001 0001000  18
2191101 000000 17
2191201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
2191202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
2191203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
2191300 1
2191301 691.     0.   0.  17
2192001 2800.e-6              18
*
* sg loop1 hot coll part5
2200000 heloop1   branch
2200001 2  1
2200101 0.587    0.29     0.  0.   90.   0.29
4.e-5  0.     00000
2200200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
2201101 220010000 222000000 0.     0.    0.
000000
2202101 220010000 221000000 0.     0.5   0.5
000002
2201201 691.     0.    0.
2202201 691.     0.    0.
*
* sg hor tub loop1 part 5  (1833 tubes)
2210000 hoeloop1 pipe
2210001 18
2210101 0.243   18
2210301 0.2     1
2210302 0.3     3
2210303 0.4     6
2210304 0.5     9
2210305 0.6     10
2210306 0.7     11
2210307 0.75    13
2210308 0.8     14
2210309 1.0     18
2210401 0.      18
2210601 0.      18
2210801 4.e-6 0.013  18
2210901 1.e-6 1.e-6  17
2211001 0001000  18
2211101 000000 17
2211201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
2211202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
2211203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
2211300 1
2211301 691.     0.   0.  17
2212001 2800.e-6              18
*
* sg loop1 hot coll part6
2220000 hfloop1   branch
2220001 2  1
2220101 0.587    0.29     0.  0.   90.   0.29
4.e-5  0.     00000
2220200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
2221101 222010000 224000000 0.     0.    0.
000000
2222101 222010000 223000000 0.     0.5   0.5
000002
2221201 0.       0.    0.
2222201 691.     0.    0.
*
* sg hor tub loop1 part 6  (1833 tubes)
2230000 hofloop1 pipe
2230001 18
2230101 0.243   18
2230301 0.2     1
2230302 0.3     3
2230303 0.4     6
2230304 0.5     9
2230305 0.6     10
2230306 0.7     11
2230307 0.75    13
2230308 0.8     14
2230309 1.0     18
2230401 0.      18
2230601 0.      18
2230801 4.e-6 0.013  18
2230901 1.e-6 1.e-6  17
2231001 0001000  18
2231101 000000 17
2231201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
2231202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
2231203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
2231300 1
2231301 691.     0.   0.  17
2232001 2800.e-6              18
*
* sg coll top loop 1
2240000 sgctoop1 pipe
2240001 4
2240101 0.587   4
2240301 0.25    2
2240302 0.61    3
2240303 0.7     4
2240401 0.      4
2240601 90.     4
2240801 4.e-6 0.      4
2240901 1.e-6 1.e-6   3
2241001 00000   4
2241101 000000  3
2241201 010  15.70e6  1.220e6    2.441e6  0.
0. 4
2241300 1
2241301 0.       0.   0.  3
2242001 2800.e-6              4
*
* cold leg  sgconn loop1
2310000 csgoop1   branch
2310001 2  1
2310101 0.567    0.5      0.  0.  -90.  -0.5      4.e-
5  0.     00000
2310200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2311101 260010000 231000000 0.     0.    0.
000000
2312101 231010000 233000000 0.     0.    0.
000000
2311201 4146.    0.    0.
2312201 4146.    0.    0.
*
* cold leg up to pump loop1
2330000 cl.poop1 pipe
2330001 17
2330101 0.567   17
2330301 0.6     2
2330302 1.      8
2330303 0.79    14
2330304 1.      16
2330305 0.76    17
2330401 0.      17
2330601 -90.    8
2330602   0.    14
2330603  90.    17
2330801 4.e-6 0.      17
2330901 1.e-6 1.e-6   7
2330902 0.3   0.3     8
2330903 1.e-6 1.e-6   12
2330904 0.3   0.3     13
2330905 1.e-6 1.e-6   16
2331001 00000   17
2331101 000000  16
2331201 010  15.70e6  1.262e6    2.441e6  0.
0. 17
2331300 1
2331301 4146.    0.   0.  16
2332001 2800.e-6              17
*
* reactor coolant pump loop1
2390000 puloop1 pump
2390101 0. 0.5      2.01     0.  90.  0.5      00
2390108 233010000  0.        0.1   0.1   000100
2390109 241000000  0.        0.1   0.1   000100
2390200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2390201 1  4146.    0.    0.
2390202 1  4146.    0.    0.
2390301 0    0   0    -1   0   509   1
2390302 104.1986 1.   5.5555 82.90   47500.
7600.    0.0
2390303 0.       0.0      400.0      0.0       0.
*
2391100     1     1
*          indep  dependent
2391101     0.0    1.56   0.179  1.47   0.304
1.42
2391102     0.431  1.39   0.582  1.35   0.86
1.18
2391103     0.966  1.08   1.0    1.0
2391200     1      2
2391201     0.0    -1.4   0.161  -1.1   0.247  -
0.93
2391202     0.315  -.78   0.424  -.54   0.5    -.35
2391203     0.556  -.21   0.61   -.08   0.673  0.1
```

```
2391204    0.736  0.26   0.815  0.45   0.904
0.73
2391205    1.0    1.00
2391300     1     3
2391301    -1.0   4.00   -.823  2.3    -.770  2.13
2391302    -.720  2.13   -.5710 2.07   -.4500
1.92
2391303    -.12   1.70   0.0    1.56
2391400     1     4
2391401    -1.0   4.00   -.767  2.94   -.5000 2.5
2391402     0.0   1.76
2391500     1     5
2391501    0.0    0.0    0.077  0.08   0.110
0.11
2391502    0.15   0.15   0.208  0.21   0.25
0.25
2391503    0.286  0.29   0.333  0.330  0.381
0.38
2391504    0.73   0.73   0.80   0.8    1.0    1.0
2391600     1     6
2391601     0.0   1.76   0.041  1.70   0.2111
1.53
2391602    0.324  1.41   0.3804 1.34   0.473
1.25
2391603    0.611  1.11   0.8652 1.01   1.0
1.0
2391700     1     7
2391701    -1.0   -2.78  -.913  -2.54  -.839  -
2.33
2391702    -.659  -1.830 -.570  -1.58  -.5260 -
1.46
2391703    -.475  -1.32  -.410  -1.14  -.327  -
0.91
2391704    -.210  -.58   -.119  -.33   -.0600 -
.17
2391705    0.0    0.0
2391800     1     8
2391801     -1.0  -2.78  -.881  -2.62  -.730  -
2.41
2391802    -.453  -2.03  -.368  -1.91  0.0    -1.4
*          Single phase torque curve
2391900     2     1
2391901    0.0    0.8    0.084  0.80   0.294
0.82
2391902    0.406  0.83   0.575  0.880  0.920
0.98
2391903    1.0    1.0
2392000     2     2
2392002    0.0    -.81   0.111  -.590  0.185  -
.440
2392003    0.240  -.33   0.308  -.20   0.340  -
.140
2392004    0.378  -.06   0.418  0.03   0.483
0.17
2392005    0.530  0.230  0.574  0.30   0.633
0.39
2392006    0.694  0.500  0.790  0.63   0.97
0.95
2392007    1.0    1.0
2392100     2     3
2392101    -1.0   2.46   -.969  2.340  -.930
2.19
2392102    -.796  1.68   -.615  1.37   -.476
1.09
2392103    -.359  0.98   -.307  0.930  -.088
0.81
2392104    0.0    0.8
2392200     2     4
2392201    -1.0   2.460  -.950  2.40   -.86
2.280
2392202    -.702  2.120  -.440  1.86   0.0    1.5
2392300     2     5
2392301    0.0    -1.3   0.091  -1.10  0.194  -
.880
2392302    0.313  -.70   0.4650 -.38   0.754
0.190
2392303    0.876  0.43   1.0    0.67
2392400     2     6
2392401    0.0    1.5    0.067  1.45   0.113
1.410
2392402    0.239  1.33   0.565  1.06   0.681
0.96
2392403    0.956  0.710  1.0    0.670
2392500     2     7
2392501    -1.0   -3.97  0.0    -1.3
2392600     2     8
2392601    -1.0   -3.97  -.833  -3.440 -.60   -
2.7
2392602    -.333  -1.860 -.186  -1.4   -.075  -
1.05
2392603    0.0    -.810
2393000    0      0.0    0.0    0.07   0.0    0.08
0.74
2393001           0.165  1.0    0.9    1.0    1.0
0.0
2393100    0      0.0    0.0    1.00   0.0
2394100  1  1     0.0    0.0    0.10   0.83   0.20
1.09
2394101           0.5    1.02   0.7    1.01   0.90
0.94
2394102           1.00   1.00
2394200  1  2     0.0    0.0    0.10   -0.04  0.20
0.00
2394201           0.3    0.10   0.4    0.21   0.80
0.67
2394202           0.90   0.80   1.00   1.00
2394300  1  3     -1.00  -1.16  -0.90  -1.24  -
0.80   -1.77
2394301           -0.70  -2.36  -0.60  -2.79  -0.50
-2.91
2394302           -0.40  -2.67  -0.25  -1.69  -0.10
-0.50
2394303           0.00   0.00
2394400  1  4     -1.00  -1.16  -0.90  -0.78  -
0.80   -0.50
2394401           -0.70  -0.31  -0.60  -0.17  -0.50
-0.08
2394402           -0.35  0.00   -0.20  0.05   -0.10
0.08
2394403           0.00   0.11
2394500  1  5     0.00   0.00   0.20   -0.34
0.40   -0.65
2394501           0.60   -0.95  0.80   -1.19  1.00
-1.47
2394600  1  6     0.00   0.11   0.10   0.13
0.25   0.15
2394601           0.40   0.13   0.50   0.07   0.60
-0.04
2394602           0.70   -0.23  0.80   -0.51  0.90
-0.91
2394603           1.00   -1.47
2394700  1  7     -1.00  0.00   0.00   0.00
2394800  1  8     -1.00  0.00   0.00   0.00
2394900  2  1     0.00   0.00   1.00   0.00
2395000  2  2     0.00   0.00   1.00   0.00
2395100  2  3     -1.00  0.00   0.00   0.00
2395200  2  4     -1.00  0.00   0.00   0.00
2395300  2  5     0.00   0.00   1.00   0.00
2395400  2  6     0.00   0.00   1.00   0.00
2395500  2  7     -1.00  0.00   0.00   0.00
2395600  2  8     -1.00  0.00   0.00   0.00
*
2396100    621
2396101     -1.   104.1964
2396102     0.    104.1964
2396103     0.5   103.46
2396104     1.    98.44
2396105     1.5   96.03
2396106     2.    93.72
2396107     2.5   91.42
2396108     3.0   89.33
2396109     3.5   87.23
2396110     4.0   85.14
2396111     5.0   81.68
2396112     7.0   74.98
2396113    10.    67.02
2396114    15.0   56.76
2396115    20.0   45.87
2396116    25.0   43.77
2396117    30.0   39.06
2396118    50.0   26.91
2396119    90.0   15.71
2396120   135.0    9.42
2396121   180.0    5.76
2396122   210.    3.98
2396123   232.    0.
2396124   10000.  0.
2396125   10.+6   0.*
*
* cl leg loop1 part 1
2410000 cl1oop1   branch
2410001 1  1
2410101 0.567    0.9     0.  0.    0.  0.      4.e-5
0.    00000
2410200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2411101 241010000 243000000 0.     0.    0.
000000
2411201 4146.    0.    0.
*
* cl leg loop1 part 2
2430000 cl2oop1  pipe
2430001 5
2430101 0.567   5
2430301 1.      5
2430401 0.      5
2430601 0.      5
2430801 4.e-6 0.      5
2430901 1.e-6 1.e-6   4
2431001 00000   5
2431101 000000  4
2431201 010  15.70e6  1.262e6    2.441e6  0.
0. 5
2431300 1
2431301 4146.    0.  0.  4
2432001 2800.e-6              5
*
* cl leg loop1 part 3
2450000 cl3.oop1  branch
2450001 2  1
2450101 0.567    1.     0.  0.    0.  0.      4.e-5
0.    00000
2450200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2451101 243010000 245000000 0.     0.    0.
000000
```

```
2452101 245010000 247000000 0.     0.    0.
000000
2451201 4146.    0.    0.
2452201 4146.    0.    0.
*
*
* cl leg loop1 part 4
2470000 cl4.oop1 pipe
2470001 3
2470101 0.567   3
2470301 1.      2
2470302 0.6     3
2470401 0.      3
2470601 0.      3
2470801 4.e-6 0.      3
2470901 1.e-6 1.e-6   2
2471001 00000   3
2471101 000000  2
2471201 010  15.70e6  1.262e6    2.441e6  0.
0. 3
2471300 1
2471301 4146.    0.  0.  2
2472001 2800.e-6              3
*
* cl leg loop1 part 5
2500000 cl5.lp1   branch
2500001 2  1
2500101 0.567     0.4     0.  0.    0.  0.       4.e-5
0.     00000
2500200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2501101 247010000 250000000 0.     0.    0.
000000
2502101 250010000 133000000 0.     0.4   0.1
000000
2501201 4146.    0.    0.
2502201 4146.    0.    0.
*
* sg loop1 cold     part1
2600000 hcaoop1   branch
2600001 1  1
2600101 0.587    0.15     0.  0.  -90.  -0.15
4.e-5  0.     00000
2600200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2601101 262010000 260000000 0.5    0.2   0.2
000000
2601201 4146.    0.    0.
*
* sg loop1 cld coll part6
2620000 cfhoop1   branch
2620001 2  1
2620101 0.587    0.31     0.  0.  -90.  -0.31
4.e-5  0.     00000
2620200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2621101 264010000 262000000 0.     0.    0.
000000
2622101 213010000 262000000 0.     0.5   0.5
000001
2621201 3455.    0.    0.
2622201 691.     0.    0.
*
* sg loop1 cld coll part5
2640000 cfgoop1   branch
2640001 2  1
2640101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
2640200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2641101 266010000 264000000 0.     0.    0.
000000
2642101 215010000 264000000 0.     0.5   0.5
000001
2641201 2764.    0.    0.
2642201 691.     0.    0.
*
* sg loop1 cld coll part4
2660000 cfloop1   branch
2660001 2  1
2660101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
2660200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2661101 268010000 266000000 0.     0.    0.
000000
2662101 217010000 266000000 0.     0.5   0.5
000001
2661201 2073.    0.    0.
2662201 691.     0.    0.
*
* sg loop1 cld coll part3
2680000 cfloop1   branch
2680001 2  1
2680101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
2680200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2681101 270010000 268000000 0.     0.    0.
000000
2682101 219010000 268000000 0.     0.5   0.5
000001
2681201 1382.    0.    0.
2682201 691.     0.    0.
*
* sg loop1 cld coll part2
2700000 cfloop1   branch
2700001 2  1
2700101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
2700200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2701101 272010000 270000000 0.     0.    0.
000000
2702101 221010000 270000000 0.     0.5   0.5
000001
2701201 691.     0.    0.
2702201 691.     0.    0.
*
* sg loop1 cld coll part1
2720000 cfloop1   branch
2720001 2  1
2720101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
2720200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
2721101 274010000 272000000 0.     0.    0.
000000
2722101 223010000 272000000 0.     0.5   0.5
000001
2721201 0.       0.    0.
2722201 691.     0.    0.
*
* sg cold coll loop1
2740000 sgttoop1 pipe
2740001 4
2740101 0.587   4
2740301 0.7     1
2740302 0.61    2
2740303 0.25    4
2740401 0.      4
2740601 -90.    4
2740801 4.e-6 0.      4
2740901 1.e-6 1.e-6   3
2741001 00000   4
2741101 000000  3
2741201 010  15.70e6  1.220e6    2.441e6  0.
0. 4
2741300 1
2741301 0.       0.  0.  3
2742001 2800.e-6              4
*
* hot  leg  conn loop2
3000000 hlloop2   branch
3000001 1  1
3000101 0.567    0.4      0.  0.    0.  0.       4.e-5
0.     00000
3000200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
3001101 300010000 301000000 0.     0.    0.
000000
3001201 4146.    0.    0.
*
* hl int tub loop2
3010000 hlaloop2 pipe
3010001 4
3010101 0.567   4
3010301 0.75    4
3010401 0.      4
3010601 0.      4
3010801 4.e-5 0.     4
3010901 1.e-6 1.e-6  3
3011001 00000   4
3011101 000000  3
3011201 010  15.70e6  1.441e6    2.441e6  0.
0. 4
3011300 1
3011301 4146.    0.  0.  3
3012001 2800.e-6              4
*
* hot  leg  intb loop2
3030000 ibloop2   branch
3030001 2  1
3030101 0.567    0.4      0.  0.    0.  0.       4.e-5
0.     00000
3030200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
3031101 301010000 303000000 0.     0.    0.
000000
3032101 303010000 305000000 0.     0.    0.
000000
3031201 4146.    0.    0.
3032201 4146.    0.    0.
*
* hl end tub loop2
3050000 hetloop2 pipe
3050001 7
3050101 0.567   7
3050301 0.75    2
3050302 0.72    3
3050303 0.6     6
3050304 0.34    7
3050401 0.      7
3050601 0.      3
3050602 90.     7
3050801 4.e-5 0.     7
3050901 1.e-6 1.e-6  6
```

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3051001 00000   7
3051101 000000  6
3051201 010  15.70e6  1.441e6   2.441e6  0.
0. 7
3051300 1
3051301 4146.   0.  0.  6
3052001 2800.e-6              7
*
* hot  leg  sgconn loop2
3090000 hsgoop2   branch
3090001 2  1
3090101 0.567   0.5     0.  0.   90.  0.5     4.e-
5  0.    00000
3090200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
3091101 305010000 309000000 0.    0.   0.
000000
3092101 309010000 310000000 0.    0.   0.
000000
3091201 4146.   0.   0.
3092201 4146.   0.   0.
*
* sg loop2 hot coll part0
3100000 hcaoop2   branch
3100001 1  1
3100101 0.587   0.15    0.  0.   90.  0.15
4.e-5  0.    00000
3100200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
3101101 310010000 312000000 0.5   0.2   0.2
000000
3101201 4146.   0.   0.
*
* sg loop2 hot coll part1
3120000 hcaoop2   branch
3120001 2  1
3120101 0.587   0.31    0.  0.   90.  0.31
4.e-5  0.    00000
3120200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
3121101 312010000 314000000 0.    0.   0.
000000
3122101 312010000 313000000 0.    0.5   0.5
000002
3121201 3455.   0.   0.
3122201 691.    0.   0.
*
* sg hor tub loop2 part 1  (1833 tubes)
3130000 hoaloop2 pipe
3130001 18
3130101 0.243   18
3130301 0.2     1
3130302 0.3     3
3130303 0.4     6
3130304 0.5     9
3130305 0.6    10
3130306 0.7    11
3130307 0.75   13
3130308 0.8    14
3130309 1.0    18
3130401 0.     18
3130601 0.     18
3130801 4.e-6 0.013  18
3130901 1.e-6 1.e-6  17
3131001 0001000  18
3131101 000000 17
3131201 010  15.70e6  1.401e6   2.441e6  0.
0. 5
3131202 010  15.70e6  1.301e6   2.441e6  0.
0. 13
3131203 010  15.70e6  1.280e6   2.441e6  0.
0. 18
3131300 1
3131301 691.    0.  0.  17
3132001 2800.e-6              18
*
* sg loop2 hot coll part3
3140000 hcboop2   branch
3140001 2  1
3140101 0.587   0.29    0.  0.   90.  0.29
4.e-5  0.    00000
3140200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
3141101 314010000 316000000 0.    0.   0.
000000
3142101 314010000 315000000 0.    0.5   0.5
000002
3141201 2764.   0.   0.
3142201 691.    0.   0.
*
* sg hor tub loop2 part 3  (1833 tubes)
3150000 hobloop2 pipe
3150001 18
3150101 0.243   18
3150301 0.2     1
3150302 0.3     3
3150303 0.4     6
3150304 0.5     9
3150305 0.6    10
3150306 0.7    11
3150307 0.75   13
3150308 0.8    14
3150309 1.0    18
3150401 0.     18
3150601 0.     18
3150801 4.e-6 0.013  18
3150901 1.e-6 1.e-6  17
3151001 0001000  18
3151101 000000 17
3151201 010  15.70e6  1.401e6   2.441e6  0.
0. 5
3151202 010  15.70e6  1.301e6   2.441e6  0.
0. 13
3151203 010  15.70e6  1.280e6   2.441e6  0.
0. 18
3151300 1
3151301 691.    0.  0.  17
3152001 2800.e-6              18
*
* sg loop2 hot coll part3
3160000 hccoop2   branch
3160001 2  1
3160101 0.587   0.29    0.  0.   90.  0.29
4.e-5  0.    00000
3160200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
3161101 316010000 318000000 0.    0.   0.
000000
3162101 316010000 317000000 0.    0.5   0.5
000002
3161201 2073.   0.   0.
3162201 691.    0.   0.
*
* sg hor tub loop2 part 3  (1833 tubes)
3170000 hocloop2 pipe
3170001 18
3170101 0.243   18
3170301 0.2     1
3170302 0.3     3
3170303 0.4     6
3170304 0.5     9
3170305 0.6    10
3170306 0.7    11
3170307 0.75   13
3170308 0.8    14
3170309 1.0    18
3170401 0.     18
3170601 0.     18
3170801 4.e-6 0.013  18
3170901 1.e-6 1.e-6  17
3171001 0001000  18
3171101 000000  17
3171201 010  15.70e6  1.401e6   2.441e6  0.
0. 5
3171202 010  15.70e6  1.301e6   2.441e6  0.
0. 13
3171203 010  15.70e6  1.280e6   2.441e6  0.
0. 18
3171300 1
3171301 691.    0.  0.  17
3172001 2800.e-6              18
*
* sg loop2 hot coll part4
3180000 hdloop2   branch
3180001 2  1
3180101 0.587   0.29    0.  0.   90.  0.29
4.e-5  0.    00000
3180200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
3181101 318010000 320000000 0.    0.   0.
000000
3182101 318010000 319000000 0.    0.5   0.5
000002
3181201 1382.   0.   0.
3182201 691.    0.   0.
*
* sg hor tub loop2 part 4  (1833 tubes)
3190000 hodloop2 pipe
3190001 18
3190101 0.243   18
3190301 0.2     1
3190302 0.3     3
3190303 0.4     6
3190304 0.5     9
3190305 0.6    10
3190306 0.7    11
3190307 0.75   13
3190308 0.8    14
3190309 1.0    18
3190401 0.     18
3190601 0.     18
3190801 4.e-6 0.013  18
3190901 1.e-6 1.e-6  17
3191001 0001000  18
3191101 000000 17
3191201 010  15.70e6  1.401e6   2.441e6  0.
0. 5
3191202 010  15.70e6  1.301e6   2.441e6  0.
0. 13
3191203 010  15.70e6  1.280e6   2.441e6  0.
0. 18
3191300 1
3191301 691.    0.  0.  17
3192001 2800.e-6              18
*
* sg loop2 hot coll part5
3200000 heloop2   branch
3200001 2  1
```

```
3200101 0.587    0.29     0. 0.   90.   0.29
4.e-5  0.     00000
3200200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
3201101 320010000 322000000 0.     0.    0.
000000
3202101 320010000 321000000 0.     0.5   0.5
000002
3201201 691.     0.    0.
3202201 691.     0.    0.
*
* sg hor tub loop2 part 5  (1833 tubes)
3210000 hoeloop2 pipe
3210001 18
3210101 0.243   18
3210301 0.2     1
3210302 0.3     3
3210303 0.4     6
3210304 0.5     9
3210305 0.6    10
3210306 0.7    11
3210307 0.75   13
3210308 0.8    14
3210309 1.0    18
3210401 0.     18
3210601 0.     18
3210801 4.e-6 0.013  18
3210901 1.e-6 1.e-6  17
3211001 0001000  18
3211101 000000 17
3211201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
3211202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
3211203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
3211300 1
3211301 691.     0.   0.  17
3212001 2800.e-6              18
*
* sg loop2 hot coll part6
3220000 hfloop2   branch
3220001 2  1
3220101 0.587    0.29     0. 0.   90.   0.29
4.e-5  0.     00000
3220200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
3221101 322010000 324000000 0.     0.    0.
000000
3222101 322010000 323000000 0.     0.5   0.5
000002
3221201 0.       0.    0.
3222201 691.     0.    0.
*
* sg hor tub loop2 part 6  (1833 tubes)
3230000 hofloop2 pipe
3230001 18
3230101 0.243   18
3230301 0.2     1
3230302 0.3     3
3230303 0.4     6
3230304 0.5     9
3230305 0.6    10
3230306 0.7    11
3230307 0.75   13
3230308 0.8    14
3230309 1.0    18
3230401 0.     18
3230601 0.     18
3230801 4.e-6 0.013  18
3230901 1.e-6 1.e-6  17
3231001 0001000  18
3231101 000000 17
3231201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
3231202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
3231203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
3231300 1
3231301 691.     0.   0.  17
3232001 2800.e-6              18
*
* sg coll top loop 1
3240000 sgctoop2 pipe
3240001 4
3240101 0.587   4
3240301 0.25    2
3240302 0.61    3
3240303 0.7     4
3240401 0.      4
3240601 90.     4
3240801 4.e-6 0.      4
3240901 1.e-6 1.e-6   3
3241001 00000   4
3241101 000000  3
3241201 010  15.70e6  1.220e6    2.441e6  0.
0. 4
3241300 1
3241301 0.       0.   0.  3
3242001 2800.e-6              4
*
* cold leg  sgconn loop2
3310000 csgoop2   branch
3310001 2  1
3310101 0.567    0.5      0.  0.  -90.  -0.5      4.e-
5  0.     00000
3310200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3311101 360010000 331000000 0.     0.    0.
000000
3312101 331010000 333000000 0.     0.    0.
000000
3311201 4146.    0.    0.
3312201 4146.    0.    0.
*
* cold leg up to pump loop2
3330000 cl.poop2 pipe
3330001 17
3330101 0.567   17
3330301 0.6     2
3330302 1.      8
3330303 0.79    14
3330304 1.      16
3330305 0.76    17
3330401 0.      17
3330601 -90.    8
3330602   0.    14
3330603  90.    17
3330801 4.e-6 0.      17
3330901 1.e-6 1.e-6   7
3330902 0.3    0.3     8
3330903 1.e-6 1.e-6   12
3330904 0.3    0.3     13
3330905 1.e-6 1.e-6   16
3331001 00000   17
3331101 000000  16
3331201 010  15.70e6  1.262e6    2.441e6  0.
0. 17
3331300 1
3331301 4146.    0.   0.  16
3332001 2800.e-6              17
*
* reactor coolant pump loop2
3390000 puloop2 pump
3390101 0. 0.5      2.01     0.  90.  0.5      00
3390108 333010000  0.       0.1   0.1   000100
3390109 341000000  0.       0.1   0.1   000100
3390200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3390201 1  4146.    0.    0.
3390202 1  4146.    0.    0.
3390301 239  239 239  -1   0   509   1
3390302 104.1986 1.   5.5555 82.90   47500.
7600.    0.0
3390303 0.       0.0      400.0       0.0       0.
*
* rcp b time-velocity table *
3396100    622
3396101       -1.   104.1964
3396102     0.     104.1964
3396103     0.5     103.46
3396104     1.      98.44
3396105     1.5     96.03
3396106     2.      93.72
3396107     2.5     91.42
3396108     3.0     89.33
3396109     3.5     87.23
3396110     4.0     85.14
3396111     5.0     81.68
3396112     7.0     74.98
3396113     10.     67.02
3396114     15.0    56.76
3396115     20.0    45.87
3396116     25.0    43.77
3396117     30.0    39.06
3396118     50.0    26.91
3396119     90.0    15.71
3396120     135.0    9.42
3396121     180.0    5.76
3396122     210.     3.98
3396123     232.     0.
3396124     10000.   0.
3396125     10.+6    0.*
*
* cl leg loop2 part 1
3410000 cl1oop2   branch
3410001 1  1
3410101 0.567    0.9      0.  0.    0.  0.       4.e-5
0.     00000
3410200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3411101 341010000 343000000 0.     0.    0.
000000
3411201 4146.    0.    0.
*
* cl leg loop2 part 3
3430000 cl2oop2  pipe
3430001 5
3430101 0.567   5
3430301 1.      5
3430401 0.      5
3430601 0.      5
3430801 4.e-6 0.      5
3430901 1.e-6 1.e-6   4
3431001 00000   5
3431101 000000  4
```

```
3431201 010  15.70e6  1.262e6    2.441e6  0.
0. 5
3431300 1
3431301 4146.    0.  0.  4
3432001 2800.e-6              5
*
*
* cl leg loop2 part 3
3450000 cl3.oop2  branch
3450001 2  1
3450101 0.567     1.      0. 0.    0.  0.       4.e-5
0.     00000
3450200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3451101 343010000 345000000 0.     0.    0.
000000
3452101 345010000 347000000 0.     0.    0.
000000
3451201 4146.    0.    0.
3452201 4146.    0.    0.
*
* hpis inlet
3460000 hpis2   tmdpjun
3460101 348000000 345000000 0.1
3460200    1       612 p  345010000
3460201   -1.      0.        0.  0.
3460202    0.1e6  23.1       0.  0.
3460203    9.0e6  13.9       0.  0.
3460204    11.e6   0.0       0.  0.
3460205    12.e6   0.0       0.  0.
3460206    20.e6   0.0       0.  0.
*
* hpis control vol inlet
3480000 hptank1   tmdpvol
3480101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
3480200 000
3480201 0. 13.0e6 1.543e5 2.426e6  0.
*
* cl leg loop2 part 4
3470000 cl4.oop2 pipe
3470001 3
3470101 0.567   3
3470301 1.      2
3470302 0.6     3
3470401 0.      3
3470601 0.      3
3470801 4.e-6 0.      3
3470901 1.e-6 1.e-6   2
3471001 00000   3
3471101 000000  2
3471201 010  15.70e6  1.262e6    2.441e6  0.
0. 3
3471300 1
3471301 4146.    0.  0.  2
3472001 2800.e-6              3
*
*
* cl leg loop2 part 5
3500000 cl5.lp1   branch
3500001 2  1
3500101 0.567     0.4     0. 0.    0.  0.       4.e-5
0.     00000
3500200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3501101 347010000 350000000 0.     0.    0.
000000
3502101 350010000 135000000 0.     0.4  0.1
000000
3501201 4146.    0.    0.
3502201 4146.    0.    0.
*
*
* sg loop2 cold     part1
3600000 hcaoop2   branch
3600001 1  1
3600101 0.587    0.15     0.  0.  -90.  -0.15
4.e-5  0.     00000
3600200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3601101 362010000 360000000 0.5    0.2   0.2
000000
3601201 4146.    0.    0.
*
* sg loop2 cld coll part6
3620000 cfhoop2   branch
3620001 2  1
3620101 0.587    0.31     0.  0.  -90.  -0.31
4.e-5  0.     00000
3620200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3621101 364010000 362000000 0.     0.    0.
000000
3622101 313010000 362000000 0.     0.5   0.5
000001
3621201 3455.    0.    0.
3622201 691.     0.    0.
*
* sg loop2 cld coll part5
3640000 cfgoop2   branch
3640001 2  1
3640101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
3640200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3641101 366010000 364000000 0.     0.    0.
000000
3642101 315010000 364000000 0.     0.5   0.5
000001
3641201 2764.    0.    0.
3642201 691.     0.    0.
*
* sg loop2 cld coll part4
3660000 cfloop2   branch
3660001 2  1
3660101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
3660200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3661101 368010000 366000000 0.     0.    0.
000000
3662101 317010000 366000000 0.     0.5   0.5
000001
3661201 2073.    0.    0.
3662201 691.     0.    0.
*
* sg loop2 cld coll part3
3680000 cfloop2   branch
3680001 2  1
3680101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
3680200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3681101 370010000 368000000 0.     0.    0.
000000
3682101 319010000 368000000 0.     0.5   0.5
000001
3681201 1382.    0.    0.
3682201 691.     0.    0.
*
* sg loop2 cld coll part3
3700000 cfloop2   branch
3700001 2  1
3700101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
3700200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3701101 372010000 370000000 0.     0.    0.
000000
3702101 321010000 370000000 0.     0.5   0.5
000001
3701201 691.     0.    0.
3702201 691.     0.    0.
*
* sg loop2 cld coll part1
3720000 cfloop2   branch
3720001 2  1
3720101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
3720200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
3721101 374010000 372000000 0.     0.    0.
000000
3722101 323010000 372000000 0.     0.5   0.5
000001
3721201 0.       0.    0.
3722201 691.     0.    0.
*
* sg cold coll loop2
3740000 sgttoop2 pipe
3740001 4
3740101 0.587   4
3740301 0.7     1
3740302 0.61    2
3740303 0.25    4
3740401 0.      4
3740601 -90.    4
3740801 4.e-6 0.      4
3740901 1.e-6 1.e-6   3
3741001 00000   4
3741101 000000  3
3741201 010  15.70e6  1.220e6    2.441e6  0.
0. 4
3741300 1
3741301 0.       0.  0.  3
3742001 2800.e-6              4
*
* hot  leg  conn loop3
4000000 hlloop3   branch
4000001 1  1
4000101 0.567    0.4      0. 0.    0.  0.       4.e-5
0.     00000
4000200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
4001101 400010000 401000000 0.     0.    0.
000000
4001201 4146.    0.    0.
*
* hl int tub loop3
4010000 hlaloop3 pipe
4010001 4
4010101 0.567   4
4010301 0.75    4
4010401 0.      4
4010601 0.      4
4010801 4.e-5 0.     4
4010901 1.e-6 1.e-6  3
4011001 00000   4
4011101 000000  3
```

```
4011201 010  15.70e6  1.441e6    2.441e6  0.
0. 4
4011300 1
4011301 4146.    0.  0.  3
4012001 2800.e-6              4
*
* hot  leg  intb loop3
4030000 ibloop3   branch
4030001 2  1
4030101 0.567    0.4      0. 0.    0.  0.       4.e-5
0.     00000
4030200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
4031101 401010000 403000000 0.     0.    0.
000000
4032101 403010000 405000000 0.     0.    0.
000000
4031201 4146.    0.    0.
4032201 4146.    0.    0.
*
* hl end tub loop3
4050000 hetloop3 pipe
4050001 7
4050101 0.567   7
4050301 0.75    2
4050302 0.72    3
4050303 0.6     6
4050304 0.34    7
4050401 0.      7
4050601 0.      3
4050602 90.     7
4050801 4.e-5 0.     7
4050901 1.e-6 1.e-6  6
4051001 00000   7
4051101 000000  6
4051201 010  15.70e6  1.441e6    2.441e6  0.
0. 7
4051300 1
4051301 4146.    0.  0.  6
4052001 2800.e-6              7
*
* hot  leg  sgconn loop3
4090000 hsgoop3   branch
4090001 2  1
4090101 0.567    0.5      0. 0.   90.  0.5     4.e-
5  0.     00000
4090200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
4091101 405010000 409000000 0.     0.    0.
000000
4092101 409010000 410000000 0.     0.    0.
000000
4091201 4146.    0.    0.
4092201 4146.    0.    0.
*
* sg loop3 hot coll part0
4100000 hcaoop3   branch
4100001 1  1
4100101 0.587    0.15     0. 0.   90.  0.15
4.e-5  0.     00000
4100200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
4101101 410010000 412000000 0.5    0.2   0.2
000000
4101201 4146.    0.    0.
*
* sg loop3 hot coll part1
4120000 hcaoop3   branch
4120001 2  1
4120101 0.587    0.31     0. 0.   90.  0.31
4.e-5  0.     00000
4120200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
4121101 412010000 414000000 0.     0.    0.
000000
4122101 412010000 413000000 0.     0.5   0.5
000002
4121201 3455.    0.    0.
4122201 691.     0.    0.
*
* sg hor tub loop3 part 1  (1843 tubes)
4130000 hoaloop3 pipe
4130001 18
4130101 0.243   18
4130301 0.2     1
4130302 0.3     3
4130303 0.4     6
4130304 0.5     9
4130305 0.6    10
4130306 0.7    11
4130307 0.75   13
4130308 0.8    14
4130309 1.0    18
4130401 0.     18
4130601 0.     18
4130801 4.e-6 0.013  18
4130901 1.e-6 1.e-6  17
4131001 0001000  18
4131101 000000 17
4131201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
4131202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
4131203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
4131300 1
4131301 691.     0.  0.  17
4132001 2800.e-6              18
*
* sg loop3 hot coll part4
4140000 hcboop3   branch
4140001 2  1
4140101 0.587    0.29     0. 0.   90.  0.29
4.e-5  0.     00000
4140200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
4141101 414010000 416000000 0.     0.    0.
000000
4142101 414010000 415000000 0.     0.5   0.5
000002
4141201 2764.    0.    0.
4142201 691.     0.    0.
*
* sg hor tub loop3 part 4  (1833 tubes)
4150000 hobloop3 pipe
4150001 18
4150101 0.243   18
4150301 0.2     1
4150302 0.3     3
4150303 0.4     6
4150304 0.5     9
4150305 0.6    10
4150306 0.7    11
4150307 0.75   13
4150308 0.8    14
4150309 1.0    18
4150401 0.     18
4150601 0.     18
4150801 4.e-6 0.013  18
4150901 1.e-6 1.e-6  17
4151001 0001000  18
4151101 000000 17
4151201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
4151202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
4151203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
4151300 1
4151301 691.     0.  0.  17
4152001 2800.e-6              18
*
* sg loop3 hot coll part4
4160000 hccoop3   branch
4160001 2  1
4160101 0.587    0.29     0. 0.   90.  0.29
4.e-5  0.     00000
4160200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
4161101 416010000 418000000 0.     0.    0.
000000
4162101 416010000 417000000 0.     0.5   0.5
000002
4161201 2073.    0.    0.
4162201 691.     0.    0.
*
* sg hor tub loop3 part 4  (1833 tubes)
4170000 hocloop3 pipe
4170001 18
4170101 0.243   18
4170301 0.2     1
4170302 0.3     3
4170303 0.4     6
4170304 0.5     9
4170305 0.6    10
4170306 0.7    11
4170307 0.75   13
4170308 0.8    14
4170309 1.0    18
4170401 0.     18
4170601 0.     18
4170801 4.e-6 0.013  18
4170901 1.e-6 1.e-6  17
4171001 0001000  18
4171101 000000  17
4171201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
4171202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
4171203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
4171300 1
4171301 691.     0.  0.  17
4172001 2800.e-6              18
*
* sg loop3 hot coll part4
4180000 hdloop3   branch
4180001 2  1
4180101 0.587    0.29     0. 0.   90.  0.29
4.e-5  0.     00000
4180200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
4181101 418010000 420000000 0.     0.    0.
000000
4182101 418010000 419000000 0.     0.5   0.5
000002
4181201 1382.    0.    0.
```

```
4182201 691.    0.   0.
*
* sg hor tub loop3 part 4  (1843 tubes)
4190000 hodloop3 pipe
4190001 18
4190101 0.243   18
4190301 0.2     1
4190302 0.3     3
4190303 0.4     6
4190304 0.5     9
4190305 0.6    10
4190306 0.7    11
4190307 0.75   13
4190308 0.8    14
4190309 1.0    18
4190401 0.     18
4190601 0.     18
4190801 4.e-6 0.013  18
4190901 1.e-6 1.e-6  17
4191001 0001000  18
4191101 000000 17
4191201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
4191202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
4191203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
4191300 1
4191301 691.    0.  0.  17
4192001 2800.e-6              18
*
* sg loop3 hot coll part5
4200000 heloop3   branch
4200001 2  1
4200101 0.587    0.29     0.  0.   90.   0.29
4.e-5  0.    00000
4200200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
4201101 420010000 422000000 0.     0.   0.
000000
4202101 420010000 421000000 0.     0.5   0.5
000002
4201201 691.    0.   0.
4202201 691.    0.   0.
*
* sg hor tub loop3 part 5  (1843 tubes)
4210000 hoeloop3 pipe
4210001 18
4210101 0.243   18
4210301 0.2     1
4210302 0.3     3
4210303 0.4     6
4210304 0.5     9
4210305 0.6    10
4210306 0.7    11
4210307 0.75   13
4210308 0.8    14
4210309 1.0    18
4210401 0.     18
4210601 0.     18
4210801 4.e-6 0.013  18
4210901 1.e-6 1.e-6  17
4211001 0001000  18
4211101 000000 17
4211201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
4211202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
4211203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
4211300 1
4211301 691.    0.  0.  17
4212001 2800.e-6              18
*
* sg loop3 hot coll part6
4220000 hfloop3   branch
4220001 2  1
4220101 0.587    0.29     0.  0.   90.   0.29
4.e-5  0.    00000
4220200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
4221101 422010000 424000000 0.     0.   0.
000000
4222101 422010000 423000000 0.     0.5   0.5
000002
4221201 0.      0.   0.
4222201 691.    0.   0.
*
* sg hor tub loop3 part 6  (1843 tubes)
4230000 hofloop3 pipe
4230001 18
4230101 0.243   18
4230301 0.2     1
4230302 0.3     3
4230303 0.4     6
4230304 0.5     9
4230305 0.6    10
4230306 0.7    11
4230307 0.75   13
4230308 0.8    14
4230309 1.0    18
4230401 0.     18
4230601 0.     18
4230801 4.e-6 0.013  18
4230901 1.e-6 1.e-6  17
4231001 0001000  18
4231101 000000 17
4231201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
4231202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
4231203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
4231300 1
4231301 691.    0.  0.  17
4232001 2800.e-6              18
*
* sg coll top loop 1
4240000 sgctoop3 pipe
4240001 4
4240101 0.587   4
4240301 0.25    2
4240302 0.61    3
4240303 0.7     4
4240401 0.      4
4240601 90.     4
4240801 4.e-6 0.     4
4240901 1.e-6 1.e-6   3
4241001 00000   4
4241101 000000  3
4241201 010  15.70e6  1.220e6    2.441e6  0.
0. 4
4241300 1
4241301 0.      0.  0.  3
4242001 2800.e-6              4
*
* cold leg  sgconn loop3
4310000 csgoop3   branch
4310001 2  1
4310101 0.567    0.5      0.  0.  -90.  -0.5      4.e-
5  0.    00000
4310200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4311101 460010000 431000000 0.     0.   0.
000000
4312101 431010000 433000000 0.     0.   0.
000000
4311201 4146.   0.   0.
4312201 4146.   0.   0.
*
* cold leg up to pump loop3
4330000 cl.poop3 pipe
4330001 17
4330101 0.567   17
4330301 0.6     2
4330302 1.      8
4330303 0.79    14
4330304 1.      16
4330305 0.76    17
4330401 0.      17
4330601 -90.    8
4330602   0.    14
4330603  90.    17
4330801 4.e-6 0.     17
4330901 1.e-6 1.e-6   7
4330902 0.3   0.3     8
4330903 1.e-6 1.e-6   12
4330904 0.3   0.3     13
4330905 1.e-6 1.e-6   16
4331001 00000   17
4331101 000000  16
4331201 010  15.70e6  1.262e6    2.441e6  0.
0. 17
4331300 1
4331301 4146.   0.  0.  16
4332001 2800.e-6              17
*
* reactor coolant pump loop3
4390000 puloop3 pump
4390101 0. 0.5      2.01     0.  90.  0.5      00
4390108 433010000  0.        0.1   0.1   000100
4390109 441000000  0.        0.1   0.1   000100
4390200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4390201 1  4146.    0.    0.
4390202 1  4146.    0.    0.
4390301 239  239 239  -1   0   509   1
4390302 104.1986 1.   5.5555 82.90   47500.
7600.   0.0
4390303 0.        0.0      400.0       0.0       0.
*
* rcp c time-velocity table *
4396100    623
4396101       -1.   104.1964
4396102     0.     104.1964
4396103     0.5     103.46
4396104     1.      98.44
4396105     1.5     96.03
4396106     2.      93.72
4396107     2.5     91.42
4396108     3.0     89.33
4396109     3.5     87.23
4396110     4.0     85.14
4396111     5.0     81.68
4396112     7.0     74.98
4396113    10.      67.02
4396114    15.0     56.76
4396115    20.0     45.87
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4396116   25.0    43.77
4396117   30.0    39.06
4396118   50.0    26.91
4396119   90.0    15.71
4396120   135.0   9.42
4396121   180.0   5.76
4396122   210.    3.98
4396123   232.    0.
4396124   10000.  0.
4396125   10.+6   0.*
*
* cl leg loop3 part 1
4410000 cl1oop3  branch
4410001 1  1
4410101 0.567   0.9     0.  0.   0.  0.      4.e-5
0.    00000
4410200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4411101 441010000 443000000 0.    0.   0.
000000
4411201 4146.   0.   0.
*
* cl leg loop3 part 4
4430000 cl2oop3  pipe
4430001 5
4430101 0.567   5
4430301 1.      5
4430401 0.      5
4430601 0.      5
4430801 4.e-6 0.      5
4430901 1.e-6 1.e-6   4
4431001 00000   5
4431101 000000  4
4431201 010  15.70e6  1.262e6    2.441e6  0.
0. 5
4431300 1
4431301 4146.   0.  0.  4
4432001 2800.e-6              5
*
* cl leg loop3 part 4
4450000 cl3.oop3  branch
4450001 2  1
4450101 0.567    1.     0.  0.   0.  0.      4.e-5
0.    00000
4450200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4451101 443010000 445000000 0.    0.   0.
000000
4452101 445010000 447000000 0.    0.   0.
000000
4451201 4146.   0.   0.
4452201 4146.   0.   0.
*
* hpis inlet
4460000 hpis3   tmdpjun
4460101 448000000 445000000 0.1
4460200   1      612 p  445010000
4460201   -1.     0.       0.  0.
4460202   0.1e6  23.1      0.  0.
4460203   9.0e6  13.9      0.  0.
4460204   11.e6  0.0       0.  0.
4460205   12.e6  0.0       0.  0.
4460206   20.e6  0.0       0.  0.
*
* hpis control vol inlet
4480000 hptank2   tmdpvol
4480101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
4480200 000
4480201 0. 13.0e6 1.543e5 2.426e6  0.
*
* cl leg loop3 part 4
4470000 cl4.oop3 pipe
4470001 3
4470101 0.567   3
4470301 1.      2
4470302 0.6     3
4470401 0.      3
4470601 0.      3
4470801 4.e-6 0.      3
4470901 1.e-6 1.e-6   2
4471001 00000   3
4471101 000000  2
4471201 010  15.70e6  1.262e6    2.441e6  0.
0. 3
4471300 1
4471301 4146.   0.  0.  2
4472001 2800.e-6              3
*
* cl leg loop3 part 5
4500000 cl5.lp1   branch
4500001 2  1
4500101 0.567    0.4    0.  0.   0.  0.      4.e-5
0.    00000
4500200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4501101 447010000 450000000 0.    0.   0.
000000
4502101 450010000 136000000 0.    0.4   0.1
000000
4501201 4146.   0.   0.
4502201 4146.   0.   0.
*
* sg loop3 cold     part1
4600000 hcaoop3   branch
4600001 1  1
4600101 0.587    0.15     0.  0.  -90.  -0.15
4.e-5  0.     00000
4600200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4601101 462010000 460000000 0.5    0.2   0.2
000000
4601201 4146.   0.   0.
*
* sg loop3 cld coll part6
4620000 cfhoop3   branch
4620001 2  1
4620101 0.587    0.31     0.  0.  -90.  -0.31
4.e-5  0.     00000
4620200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4621101 464010000 462000000 0.    0.   0.
000000
4622101 413010000 462000000 0.    0.5   0.5
000001
4621201 3455.   0.   0.
4622201 691.    0.   0.
*
* sg loop3 cld coll part5
4640000 cfgoop3   branch
4640001 2  1
4640101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
4640200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4641101 466010000 464000000 0.    0.   0.
000000
4642101 415010000 464000000 0.    0.5   0.5
000001
4641201 2764.   0.   0.
4642201 691.    0.   0.
*
* sg loop3 cld coll part4
4660000 cfloop3   branch
4660001 2  1
4660101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
4660200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4661101 468010000 466000000 0.    0.   0.
000000
4662101 417010000 466000000 0.    0.5   0.5
000001
4661201 2073.   0.   0.
4662201 691.    0.   0.
*
* sg loop3 cld coll part4
4680000 cfloop3   branch
4680001 2  1
4680101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
4680200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4681101 470010000 468000000 0.    0.   0.
000000
4682101 419010000 468000000 0.    0.5   0.5
000001
4681201 1382.   0.   0.
4682201 691.    0.   0.
*
* sg loop3 cld coll part4
4700000 cfloop3   branch
4700001 2  1
4700101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
4700200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4701101 472010000 470000000 0.    0.   0.
000000
4702101 421010000 470000000 0.    0.5   0.5
000001
4701201 691.    0.   0.
4702201 691.    0.   0.
*
* sg loop3 cld coll part1
4720000 cfloop3   branch
4720001 2  1
4720101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
4720200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
4721101 474010000 472000000 0.    0.   0.
000000
4722101 423010000 472000000 0.    0.5   0.5
000001
4721201 0.      0.   0.
4722201 691.    0.   0.
*
* sg cold coll loop3
4740000 sgttoop3 pipe
4740001 4
4740101 0.587   4
4740301 0.7     1
4740302 0.61    2
4740303 0.25    4
4740401 0.      4
4740601 -90.    4
4740801 4.e-6 0.      4
4740901 1.e-6 1.e-6   3
```

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4741001 00000   4
4741101 000000  3
4741201 010  15.70e6  1.220e6    2.441e6  0.
0. 4
4741300 1
4741301 0.      0.  0.  3
4742001 2800.e-6              4
*
* hot  leg  conn loop4
5000000 hlloop4   branch
5000001 1  1
5000101 0.567    0.4     0. 0.    0.  0.      4.e-5
0.     00000
5000200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
5001101 500010000 501000000 0.     0.    0.
000000
5001201 4146.    0.    0.
*
* hl int tub loop4
5010000 hlaloop4 pipe
5010001 4
5010101 0.567   4
5010301 0.75    4
5010401 0.      4
5010601 0.      4
5010801 4.e-5 0.     4
5010901 1.e-6 1.e-6  3
5011001 00000   4
5011101 000000  3
5011201 010  15.70e6  1.441e6    2.441e6  0.
0. 4
5011300 1
5011301 4146.    0.  0.  3
5012001 2800.e-6              4
*
* hot  leg  intb loop4
5030000 ibloop4   branch
5030001 3  1
5030101 0.567    0.4     0. 0.    0.  0.      4.e-5
0.     00000
5030200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
5031101 501010000 503000000 0.     0.    0.
000000
5032101 503010000 505000000 0.     0.    0.
000000
5033101 503000000 036000000 0.     1.    1.
000000
5031201 4146.    0.    0.
5032201 4146.    0.    0.
5033201 0.       0.    0.
*
* hl end tub loop4
5050000 hetloop4 pipe
5050001 7
5050101 0.567   7
5050301 0.75    2
5050302 0.72    3
5050303 0.6     6
5050304 0.34    7
5050401 0.      7
5050601 0.      3
5050602 90.     7
5050801 4.e-5 0.     7
5050901 1.e-6 1.e-6  6
5051001 00000   7
5051101 000000  6
5051201 010  15.70e6  1.441e6    2.441e6  0.
0. 7
5051300 1
5051301 4146.    0.  0.  6
5052001 2800.e-6              7
*
* hot  leg  sgconn loop4
5090000 hsgoop4   branch
5090001 2  1
5090101 0.567    0.5     0. 0.   90.  0.5     4.e-
5  0.     00000
5090200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
5091101 505010000 509000000 0.     0.    0.
000000
5092101 509010000 510000000 0.     0.    0.
000000
5091201 4146.    0.    0.
5092201 4146.    0.    0.
*
* sg loop4 hot coll part0
5100000 hcaoop4   branch
5100001 1  1
5100101 0.587    0.15    0. 0.   90.  0.15
4.e-5  0.     00000
5100200 010  15.70e6  1.441e6  2.441e6  0.
2800.e-6
5101101 510010000 512000000 0.5    0.2   0.2
000000
5101201 4146.    0.    0.
*
* sg loop4 hot coll part1
5120000 hcaoop4   branch
5120001 2  1
5120101 0.587    0.31    0. 0.   90.  0.31
4.e-5  0.     00000
5120200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
5121101 512010000 514000000 0.     0.    0.
000000
5122101 512010000 513000000 0.     0.5   0.5
000002
5121201 3455.    0.    0.
5122201 691.     0.    0.
*
* sg hor tub loop4 part 1  (1853 tubes)
5130000 hoaloop4 pipe
5130001 18
5130101 0.243   18
5130301 0.2     1
5130302 0.3     3
5130303 0.4     6
5130304 0.5     9
5130305 0.6    10
5130306 0.7    11
5130307 0.75   13
5130308 0.8    14
5130309 1.0    18
5130401 0.     18
5130601 0.     18
5130801 4.e-6 0.013  18
5130901 1.e-6 1.e-6  17
5131001 0001000  18
5131101 000000 17
5131201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
5131202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
5131203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
5131300 1
5131301 691.     0.  0.  17
5132001 2800.e-6              18
*
* sg loop4 hot coll part5
5140000 hcboop4   branch
5140001 2  1
5140101 0.587    0.29    0. 0.   90.  0.29
4.e-5  0.     00000
5140200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
5141101 514010000 516000000 0.     0.    0.
000000
5142101 514010000 515000000 0.     0.5   0.5
000002
5141201 2764.    0.    0.
5142201 691.     0.    0.
*
* sg hor tub loop4 part 5  (1833 tubes)
5150000 hobloop4 pipe
5150001 18
5150101 0.243   18
5150301 0.2     1
5150302 0.3     3
5150303 0.4     6
5150304 0.5     9
5150305 0.6    10
5150306 0.7    11
5150307 0.75   13
5150308 0.8    14
5150309 1.0    18
5150401 0.     18
5150601 0.     18
5150801 4.e-6 0.013  18
5150901 1.e-6 1.e-6  17
5151001 0001000  18
5151101 000000 17
5151201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
5151202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
5151203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
5151300 1
5151301 691.     0.  0.  17
5152001 2800.e-6              18
*
* sg loop4 hot coll part5
5160000 hccoop4   branch
5160001 2  1
5160101 0.587    0.29    0. 0.   90.  0.29
4.e-5  0.     00000
5160200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
5161101 516010000 518000000 0.     0.    0.
000000
5162101 516010000 517000000 0.     0.5   0.5
000002
5161201 2073.    0.    0.
5162201 691.     0.    0.
*
* sg hor tub loop4 part 5  (1833 tubes)
5170000 hocloop4 pipe
5170001 18
5170101 0.243   18
5170301 0.2     1
5170302 0.3     3
5170303 0.4     6
5170304 0.5     9
5170305 0.6    10
```

```
5170306 0.7    11
5170307 0.75   13
5170308 0.8    14
5170309 1.0    18
5170401 0.     18
5170601 0.     18
5170801 4.e-6 0.013  18
5170901 1.e-6 1.e-6  17
5171001 0001000   18
5171101 000000  17
5171201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
5171202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
5171203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
5171300 1
5171301 691.    0.  0.  17
5172001 2800.e-6              18
*
* sg loop4 hot coll part5
5180000 hdloop4   branch
5180001 2  1
5180101 0.587    0.29     0. 0.   90.   0.29
4.e-5  0.     00000
5180200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
5181101 518010000 520000000 0.     0.    0.
000000
5182101 518010000 519000000 0.     0.5   0.5
000002
5181201 1382.    0.    0.
5182201 691.    0.    0.
*
* sg hor tub loop4 part 5  (1843 tubes)
5190000 hodloop4 pipe
5190001 18
5190101 0.243   18
5190301 0.2     1
5190302 0.3     3
5190303 0.4     6
5190304 0.5     9
5190305 0.6     10
5190306 0.7     11
5190307 0.75   13
5190308 0.8    14
5190309 1.0    18
5190401 0.     18
5190601 0.     18
5190801 4.e-6 0.013  18
5190901 1.e-6 1.e-6  17
5191001 0001000  18
5191101 000000 17
5191201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
5191202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
5191203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
5191300 1
5191301 691.    0.  0.  17
5192001 2800.e-6              18
*
* sg loop4 hot coll part5
5200000 heloop4   branch
5200001 2  1
5200101 0.587    0.29     0. 0.   90.   0.29
4.e-5  0.     00000
5200200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
5201101 520010000 522000000 0.     0.    0.
000000
5202101 520010000 521000000 0.     0.5   0.5
000002
5201201 691.    0.    0.
5202201 691.    0.    0.
*
* sg hor tub loop4 part 5  (1853 tubes)
5210000 hoeloop4 pipe
5210001 18
5210101 0.243   18
5210301 0.2     1
5210302 0.3     3
5210303 0.4     6
5210304 0.5     9
5210305 0.6     10
5210306 0.7     11
5210307 0.75   13
5210308 0.8    14
5210309 1.0    18
5210401 0.     18
5210601 0.     18
5210801 4.e-6 0.013  18
5210901 1.e-6 1.e-6  17
5211001 0001000  18
5211101 000000 17
5211201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
5211202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
5211203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
5211300 1
5211301 691.    0.  0.  17
5212001 2800.e-6              18
*
* sg loop4 hot coll part6
5220000 hfloop4   branch
5220001 2  1
5220101 0.587    0.29     0. 0.   90.   0.29
4.e-5  0.     00000
5220200 010  15.70e6  1.421e6  2.441e6  0.
2800.e-6
5221101 522010000 524000000 0.     0.    0.
000000
5222101 522010000 523000000 0.     0.5   0.5
000002
5221201 0.      0.    0.
5222201 691.    0.    0.
*
* sg hor tub loop4 part 6  (1853 tubes)
5230000 hofloop4 pipe
5230001 18
5230101 0.243   18
5230301 0.2     1
5230302 0.3     3
5230303 0.4     6
5230304 0.5     9
5230305 0.6     10
5230306 0.7     11
5230307 0.75   13
5230308 0.8    14
5230309 1.0    18
5230401 0.     18
5230601 0.     18
5230801 4.e-6 0.013  18
5230901 1.e-6 1.e-6  17
5231001 0001000  18
5231101 000000 17
5231201 010  15.70e6  1.401e6    2.441e6  0.
0. 5
5231202 010  15.70e6  1.301e6    2.441e6  0.
0. 13
5231203 010  15.70e6  1.280e6    2.441e6  0.
0. 18
5231300 1
5231301 691.    0.  0.  17
5232001 2800.e-6              18
*
* sg coll top loop 1
5240000 sgctoop4 pipe
5240001 4
5240101 0.587   4
5240301 0.25    2
5240302 0.61    3
5240303 0.7     4
5240401 0.      4
5240601 90.     4
5240801 4.e-6 0.      4
5240901 1.e-6 1.e-6   3
5241001 00000   4
5241101 000000  3
5241201 010  15.70e6  1.220e6    2.441e6  0.
0. 4
5241300 1
5241301 0.      0.  0.  3
5242001 2800.e-6              4
*
* cold leg  sgconn loop4
5310000 csgoop4   branch
5310001 2  1
5310101 0.567    0.5      0.  0.  -90.  -0.5      4.e-
5  0.     00000
5310200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5311101 560010000 531000000 0.     0.    0.
000000
5312101 531010000 533000000 0.     0.    0.
000000
5311201 4146.    0.    0.
5312201 4146.    0.    0.
*
* cold leg up to pump loop4
5330000 cl.poop4 pipe
5330001 17
5330101 0.567   17
5330301 0.6     2
5330302 1.      8
5330303 0.79    14
5330304 1.      16
5330305 0.76    17
5330401 0.      17
5330601 -90.    8
5330602   0.    14
5330603  90.    17
5330801 4.e-6 0.      17
5330901 1.e-6 1.e-6   7
5330902 0.3   0.3     8
5330903 1.e-6 1.e-6   12
5330904 0.3   0.3     13
5330905 1.e-6 1.e-6   16
5331001 00000   17
5331101 000000  16
5331201 010  15.70e6  1.262e6    2.441e6  0.
0. 17
5331300 1
5331301 4146.    0.  0.  16
5332001 2800.e-6              17
```

```
*
* reactor coolant pump loop4
5390000 puloop4 pump
5390101 0. 0.5      2.01     0.  90.  0.5      00
5390108 533010000  0.       0.1   0.1   000100
5390109 541000000  0.       0.1   0.1   000100
5390200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5390201 1  4146.     0.    0.
5390202 1  4146.     0.    0.
5390301 239  239 239  -1   0   509   1
5390302 104.1986 1.   5.5555 82.90   47500.
7600.    0.0
5390303 0.        0.0      400.0       0.0       0.
*
* rcp d time-velocity table *
5396100    624
5396101       -1.   104.1964
5396102     0.     104.1964
5396103    0.5     103.46
5396104    1.      98.44
5396105    1.5     96.03
5396106    2.      93.72
5396107    2.5     91.42
5396108    3.0     89.33
5396109    3.5     87.23
5396110    4.0     85.14
5396111    5.0     81.68
5396112    7.0     74.98
5396113    10.     67.02
5396114    15.0    56.76
5396115    20.0    45.87
5396116    25.0    43.77
5396117    30.0    39.06
5396118    50.0    26.91
5396119    90.0    15.71
5396120    135.0   9.42
5396121    180.0   5.76
5396122    210.    3.98
5396123    232.    0.
5396124    10000.  0.
5396125    10.+6   0.*
*
* cl leg loop4 part 1
5410000 cl1oop4   branch
5410001 2  1
5410101 0.567    0.9      0.  0.    0.   0.       4.e-5
0.     00000
5410200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5411101 541010000 543000000 0.     0.    0.
000000
5412101 541010000 020000000 0.     3.    3.
000000
5411201 4146.    0.    0.
5412201  0.      0.    0.
*
* cl leg loop4 part 5
5430000 cl2oop4  pipe
5430001 5
5430101 0.567   5
5430301 1.      5
5430401 0.      5
5430601 0.      5
5430801 4.e-6 0.      5
5430901 1.e-6 1.e-6   4
5431001 00000   5
5431101 000000  4
5431201 010  15.70e6  1.262e6    2.441e6  0.
0. 5
5431300 1
5431301 4146.   0.   0.  4
5432001 2800.e-6              5
*
* cl leg loop4 part 5
5450000 cl3.oop4  branch
5450001 2  1
5450101 0.567     1.      0.  0.    0.   0.       4.e-5
0.     00000
5450200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5451101 543010000 545000000 0.     0.    0.
000000
5452101 545010000 547000000 0.     0.    0.
000000
5451201 4146.    0.    0.
5452201 4146.    0.    0.
*
* hpis inlet
5460000 hpis4   tmdpjun
5460101 548000000 545000000 0.1
5460200    1       612 p  545010000
5460201   -1.      0.       0.   0.
5460202    0.1e6  23.1       0.   0.
5460203    9.0e6  13.9       0.   0.
5460204    11.e6  0.0        0.   0.
5460205    12.e6  0.0        0.   0.
5460206    20.e6  0.0        0.   0.
*
* hpis control vol inlet
5480000 hptank3   tmdpvol
5480101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
5480200 000
5480201 0. 13.0e6 1.543e5 2.426e6  0.
*
* lpis inlet
*5460000 lpis1   tmdpjun
*5460101 548000000 545000000 0.1
*5460200    0       430   cntrlvar 007
*5460201   -1.      0.       0.   0.
*5460202    0.      0.69444   0.   0.
*5460203    20.0e5  1.94444   0.   0.
*
* lpis control vol inlet
*5480000 hptank1   tmdpvol
*5480101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
*5480200 000
*5480201 0. 2.20e6 2.092e5 2.443e6  0.
*
* cl leg loop4 part 5
5470000 cl4.oop4 pipe
5470001 3
5470101 0.567   3
5470301 1.      2
5470302 0.6     3
5470401 0.      3
5470601 0.      3
5470801 4.e-6 0.      3
5470901 1.e-6 1.e-6   2
5471001 00000   3
5471101 000000  2
5471201 010  15.70e6  1.262e6    2.441e6  0.
0. 3
5471300 1
5471301 4146.   0.   0.  2
5472001 2800.e-6              3
*
* cl leg loop4 part 5
5500000 cl5.lp1   branch
5500001 2  1
5500101 0.567     0.4      0.  0.    0.   0.       4.e-5
0.     00000
5500200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5501101 547010000 550000000 0.     0.    0.
000000
5502101 550010000 138000000 0.     0.4   0.1
000000
5501201 4146.    0.    0.
5502201 4146.    0.    0.
*
* sg loop4 cold     part1
5600000 hcaoop4   branch
5600001 1  1
5600101 0.587    0.15     0.  0.  -90.  -0.15
4.e-5  0.     00000
5600200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5601101 562010000 560000000 0.5    0.2   0.2
000000
5601201 4146.    0.    0.
*
* sg loop4 cld coll part6
5620000 cfhoop4   branch
5620001 2  1
5620101 0.587    0.31     0.  0.  -90.  -0.31
4.e-5  0.     00000
5620200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5621101 564010000 562000000 0.     0.    0.
000000
5622101 513010000 562000000 0.     0.5   0.5
000001
5621201 3455.    0.    0.
5622201 691.     0.    0.
*
* sg loop4 cld coll part5
5640000 cfgoop4   branch
5640001 2  1
5640101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
5640200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5641101 566010000 564000000 0.     0.    0.
000000
5642101 515010000 564000000 0.     0.5   0.5
000001
5641201 2764.    0.    0.
5642201 691.     0.    0.
*
* sg loop4 cld coll part5
5660000 cfloop4   branch
5660001 2  1
5660101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.     00000
5660200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5661101 568010000 566000000 0.     0.    0.
000000
5662101 517010000 566000000 0.     0.5   0.5
000001
5661201 2073.    0.    0.
5662201 691.     0.    0.
*
* sg loop4 cld coll part5
5680000 cfloop4   branch
5680001 2  1
```

```
5680101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.    00000
5680200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5681101 570010000 568000000 0.     0.    0.
000000
5682101 519010000 568000000 0.     0.5   0.5
000001
5681201 1382.    0.    0.
5682201 691.     0.    0.
*
* sg loop4 cld coll part5
5700000 cfloop4   branch
5700001 2  1
5700101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.    00000
5700200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5701101 572010000 570000000 0.     0.    0.
000000
5702101 521010000 570000000 0.     0.5   0.5
000001
5701201 691.     0.    0.
5702201 691.     0.    0.
*
* sg loop4 cld coll part1
5720000 cfloop4   branch
5720001 2  1
5720101 0.587    0.29     0.  0.  -90.  -0.29
4.e-5  0.    00000
5720200 010  15.70e6  1.262e6  2.441e6  0.
2800.e-6
5721101 574010000 572000000 0.     0.    0.
000000
5722101 523010000 572000000 0.     0.5   0.5
000001
5721201 0.       0.    0.
5722201 691.     0.    0.
*
* sg cold coll loop4
5740000 sgttoop4 pipe
5740001 4
5740101 0.587   4
5740301 0.7     1
5740302 0.61    2
5740303 0.25    4
5740401 0.      4
5740601 -90.    4
5740801 4.e-6 0.      4
5740901 1.e-6 1.e-6   3
5741001 00000   4
5741101 000000  3
5741201 010  15.70e6  1.220e6    2.441e6  0.
0. 4
5741300 1
5741301 0.       0.  0.  3
5742001 2800.e-6              4
*
* sgss loop1 ri bot
6000000 ssrhoop1  branch
6000001 2  1
6000101 14.5     0.15     0.  0.   90.   0.15
4.e-5  0.5    00000
6000200 000  6.270e6  1.120e6  2.588e6  0.
6001101 600010000 620000000   0.    5.    5.
000000
6002101 600010000 630000000   0.    5.    5.
000000
6001201 2000.    0.    0.
6002201 1000.    0.    0.
*
* sgss loop1 dc bot
6010000 ssdcoop1  branch
6010001 2  1
6010101 3.0      0.15     0.  0.  -90.  -0.15     4.e-
5  0.1    00000
6010200 000  6.270e6  1.120e6  2.588e6  0.
6011101 610010000 601000000 0.     0.    0.
000000
6012101 601010000 600000000 0.     0.1   0.1
000000
6011201 3000.    0.    0.
6012201 3000.    0.    0.
*
* loop1 fw inlet in cold and hot package
6040000 loop1cfw    tmdpvol
6040101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
6040200 000
6040201    0. 10.00e6 9.354e5 2.588e6  0.
6040202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop1 fw line to cold and hot package
6050000 loop1fwm  tmdpjun
6050101 604000000 600000000 0.
6050200     1    630
6050201   -1.0   163.20   0.   0.
6050202    0.0   163.20   0.   0.
6050203    30.   0.      0.   0.
6050204   1.e6   0.      0.   0.
*
* loop1 emergency fw inlet in cold and hot
package
6060000 loop1efw    tmdpvol
6060101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
6060200 000
6060201    0. 10.00e6 8.387e4 2.403e6  0.
6060202  1.e6 10.00e6 8.387e4 2.403e6  0.
*
* loop1 emergency fw line to cold and hot
package
6070000 loop1ewm  tmdpjun
6070101 606000000 600000000 0.
6070200     1    479
6070201   -1.0   0.0        0.   0.
6070202    0.0   0.0        0.   0.
6070203    0.1    200.     0.   0.     * 81.6
6070204   1.e6    200.     0.   0.     * 81.6
*
* sg loop1 dc
6100000 ssdcoop1 pipe
6100001 6
6100101 8.0     2
6100102 7.06    4
6100103 3.75    6
6100301 0.29    5
6100302 0.31    6
6100401 0.      6
6100601 -90.    6
6100801 4.e-6 0.2     6
6100901 1.e-6 1.e-6   5
6101001 00000   6
6101101 000000  5
6101201 000  6.270e6  1.120e6    2.588e6  0.
0.  6
6101300 1
6101301 3000.    0.   0.  5
*
* sgss loop1 ri top1
6110000 srtcoop1  branch
6110001 2  1
6110101 6.76     0.25     0.  0.  -90.  -0.25
4.e-5  0.1    00000
6110200 000  6.270e6  1.120e6  2.588e6  0.
6111101 611010000 610000000 0.     0.1   0.1
000000
6112101 612010000 611000000 0.     0.1   0.1
000000
6111201 3917.    0.    0.
6112201 3917.    0.    0.
*
* sgss loop1 ri top2
6120000 srucoop1  branch
6120001 1  1
6120101 8.12     0.25     0.  0.  -90.  -0.25
4.e-5  0.1    00000
6120200 000  6.270e6  1.120e6  2.588e6  0.
6121101 612010000 635000000  0.  0.1  0.1
000000
6121201 0.    0.    0.
*
* loop1 fw inlet in dc
6140000 loop1afw    tmdpvol
6140101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
6140200 000
6140201    0. 10.00e6 9.354e5 2.588e6  0.
6140202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop1 fw line to dc
6150000 loop1fwl  tmdpjun
6150101 614000000 610030003 0.
6150200     1    630
6150201   -1.0   163.20   0.   0.
6150202    0.0   163.20   0.   0.
6150203    30.   0.      0.   0.
6150204   1.e6   0.      0.   0.
*
* sg loop1 riser hot package
6200000 ssrhoop1 pipe
6200001 6
6200101 10.0    4
6200102 12.0    6
6200301 0.31    1
6200302 0.29    6
6200401 0.      6
6200601  90.    6
6200801 4.e-6 0.004   6
6200901 1.    1.      5
6201001 00000   6
6201101 000000  5
6201201 000  6.270e6  1.120e6    2.588e6  0.
0.   1
6201202 000  6.270e6  1.220e6    2.588e6  0.2
0.   3
6201203 000  6.270e6  1.220e6    2.588e6  0.5
0.   6
6201300 1
6201301 2361.    0.   0.  1
6201302 2211.  150.   0.  3
6201303 2061.  300.   0.  5
*
* sgss loop1 ri top1
6210000 srttoop1  branch
6210001 2  1
6210101 15.0     0.25     0.  0.   90.   0.25
4.e-5  0.1    00000
6210200 000  6.270e6  1.220e6  2.588e6  0.8
6211101 620010000 621000000 0.     0.1   0.1
000000
```

```
6212101 621010000 635000000 0.     0.1  0.1
000000
6211201 2144.  300.    0.
6212201 2144.  300.    0.
*
* loop1 fw inlet in hc
6240000 loop1bfw    tmdpvol
6240101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
6240200 000
6240201    0. 10.00e6 9.354e5 2.588e6  0.
6240202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop1 fw line to dc
6250000 loop1fwm  tmdpjun
6250101 624000000 620050003 0.
6250200     1    630
6250201   -1.0    81.6    0.   0.
6250202    0.0    81.6    0.   0.
6250203    30.    0.      0.   0.
6250204   1.e6    0.      0.   0.
*
* sg loop1 riser cold package
6300000 ssrcoop1 pipe
6300001 6
6300101 10.0    4
6300102 12.0    6
6300301 0.31    1
6300302 0.29    6
6300401 0.      6
6300601  90.    6
6300801 4.e-6 0.004   6
6300901 1.    1.      5
6301001 00000   6
6301101 000000  5
6301201 000  6.270e6  1.120e6    2.588e6  0.
0.    1
6301202 000  6.270e6  1.220e6    2.588e6  0.2
0.    2
6301203 000  6.270e6  1.220e6    2.588e6  0.5
0.    6
6301300 1
6301301 1881.   0.   0.  1
6301302 1831.   50.   0.  3
6301303 1723.  108.   0.  5
*
* sgss loop1 ri top cold  package
6310000 srttoop1  branch
6310001 2  1
6310101 15.0     0.25     0.  0.   90.   0.25
4.e-5  0.1    00000
6310200 000  6.270e6  1.220e6  2.588e6  0.8
6311101 630010000 631000000 0.     0.01
0.01  000000
6312101 631010000 635000000 0.     0.01
0.01  000000
6311201 1723.  108.    0.
6312201 1723.  108.    0.
*
* sgss loop1 ri top plenum
6350000 spleoop1  branch
6350001 0  1
6350101 38.0    0.25     0.  0.   90.   0.25    4.e-
5  0.1    00000
6350200 000  6.270e6  1.220e6  2.588e6  0.8
*
* sgss loop1 sepa
6400000 sgaoop1   separatr
6400001 3 1
6400101 44.1     0.61   0. 0.  90. 0.61  4.e-5
.020  00
6400200 000  6.270e6  1.220e6  2.588e6
0.930
6401101 640010000 645000000 0. 10.  10.
000000 0.5
6402101 640000000 612000000 0. 10.  10.
000000 0.15
6403101 635010000 640000000 0.  0.   0.
000000
6401201    0.  408.    0.
6402201 3917.    0.    0.
6403201 3917.  408.    0.
*
* sgss loop1 steam dome
6450000 sssdoop1  branch
6450001 3  1
6450101 28.81    0.98     0.  0.   90.   0.98
4.e-5  0.1    00000
6450200 000  6.270e6  1.220e6  2.588e6  1.0
6451101 645010000 650000000 0.     0.1  0.1
000000
6452101 645010000 655000000 0.     0.1  0.1
000000
6453101 645010000 660000000 0.     0.1  0.1
000000
6451201 0.     136.    0.
6452201 0.     136.    0.
6453201 0.     136.    0.
*
* sg loop1 ext tubes
6500000 ssepoop1 pipe
6500001 2
6500101 0.16    2
6500301 1.4     2
6500401 0.      2
6500601  90.    2
6500801 4.e-6  0.2    2
6500901 0.3   0.3     1
6501001 00000   2
6501101 000000  1
6501201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
6501300 1
6501301 0.   136.     0.  1
*
* sg loop1 ext tubes
6550000 ssgpoop1 pipe
6550001 2
6550101 0.16    2
6550301 1.4     2
6550401 0.      2
6550601  90.    2
6550801 4.e-6  0.2    2
6550901 0.3   0.3     1
6551001 00000   2
6551101 000000  1
6551201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
6551300 1
6551301 0.   136.     0.  1
*
* sg loop1 ext tubes
6600000 ssfpoop1 pipe
6600001 2
6600101 0.16    2
6600301 1.4     2
6600401 0.      2
6600601  90.    2
6600801 4.e-6  0.2    2
6600901 0.3   0.3     1
6601001 00000   2
6601101 000000  1
6601201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
6601300 1
6601301 0.   136.     0.  1
*
* sgss loop1 steam coll
6650000 scoloop1  branch
6650001 2  1
6650101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
6650200 000  6.270e6  1.220e6  2.588e6  1.0
6651101 650010000 665000000 0.     0.5  0.5
000000
6652101 665010000 670010000 0.     0.1  0.1
000000
6651201 0.     136.    0.
6652201 0.     136.    0.
*
* sgss loop1 steam coll
6700000 scomoop1  branch
6700001 2  1
6700101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
6700200 000  6.270e6  1.220e6  2.588e6  1.0
6701101 655010000 670000000 0.     0.5  0.5
000000
6702101 670010000 675010000 0.     0.1  0.1
000000
6701201 0.     136.    0.
6702201 0.     272.    0.
*
* sg1 srv1
6720000 sg1srv1 valve
6720101 682010000 673000000 0.112   1. 1.
000100  1. 1.
6720201 1 0. 0. 0.
6720300 mtrvlv
6720301 581  583   1.0   0.
*
* containment simulator for sg loop1
6730000 sgconta1    tmdpvol
6730101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
6730200 002
6730201 0.     1.e5   1.
*
* sgss loop1 steam coll
6750000 sconoop1  branch
6750001 2  1
6750101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
6750200 000  6.270e6  1.220e6  2.588e6  1.0
6751101 660010000 675000000 0.     0.5  0.5
000000
6752101 675010000 680000000 0.     0.5  0.5
000000
6751201 0.     136.    0.
6752201 0.     408.    0.
*
* msiv sg loop1
6760000 msiloop1 valve
6760101 688010000 997000000  0.2827   1. 1.
000100
6760201 1 0. 638. 0.
6760300 mtrvlv
6760301 671  638   1.0   1.0
```

```
*
* sg1 sl1
6800000 sg1sl1 pipe
6800001 22
6800101 0.3827   22
6800301 1.0    22
6800401 0.0    22
6800601 0.0    22
6800801 4.e-6  0.0   22
6800901 0.01   0.01  21
6801001 0000000 22
6801101 000000  21
6801201 000  6.270e6  1.220e6   2.588e6  1.
0.   22
6801300 1
6801301 0.   408.    0.  21
*
* sg1 sl2
6820000 sg1sl2  branch
6820001 1  1
6820101 0.2827  2.0    0.  0.   0.   0.0   4.e-5
0.0   00000
6820200 000  6.270e6  1.220e6  2.588e6  1.0
6821101 680010000 682000000 0.    0.01
0.01  000000
6821201 0.    408.   0.
*
* rott sg loop1 lato sg
6830000 rottsg valve
6830101 686010000 685000000  0.2827   10.
10. 000000
6830201 1 0. 638. 0.
6830300 trpvlv
6830301 430
*
* sg1 sl3
6840000 sg1sl3  branch
6840001 1  1
6840101 0.2827   2.0    0.  0.   0.   0.0   4.e-5
0.0   00000
6840200 000  6.270e6  1.220e6  2.588e6  1.0
6841101 682010000 684000000 0.    0.01
0.01  000000
6841201 0.    408.   0.
*
* containment simulator for break
6850000 sgconta1    tmdpvol
6850101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
6850200 002
6850201 0.    1.e5   1.
*
* sg1 sl4
6860000 sg1sl4  branch
6860001 1  1
6860101 0.2827   2.0    0.  0.   0.   0.0   4.e-5
0.0   00000
6860200 000  6.270e6  1.220e6  2.588e6  1.0
6861101 684010000 686000000 0.    0.01
0.01  000000
6861201 0.    408.   0.
*
* rott sg loop1 lato turb
6870000 rotttur valve
6870101 688000000 689000000  0.2827   10.
10. 000000
6870201 1 0. 638. 0.
6870300 trpvlv
6870301 430
*
* sg1 sl5
6880000 sg1sl5 pipe
6880001 6
6880101 0.3827  6
6880301 1.0    6
6880401 0.0    6
6880601 0.0    6
6880801 4.e-6  0.0   6
6880901 0.01   0.01  5
6881001 0000000 6
6881101 000000  5
6881201 000  6.270e6  1.220e6   2.588e6  1.
0.   6
6881300 1
6881301 0.   408.    0.  5
*
* containment simulator for brak
6890000 sgconta1    tmdpvol
6890101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
6890200 002
6890201 0.    1.e5   1.
*
* valve rottura DEB
6910000 msiloop1 valve
6910101 686010000 688000000  0.   1. 1.
000000
6910201 1 0. 638. 0.
6910300 trpvlv
6910301 425
*
*
*
* sg1 srv2
6940000 sg1srv2 valve
6940101 684010000 696000000 0.112   1. 1.
000100  1. 1.
6940201 1 0. 0. 0.
6940300 mtrvlv
6940301 582  583   1.0   0.
*
* containment simulator for sg loop1
6960000 sgconta1    tmdpvol
6960101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
6960200 002
6960201 0.    1.e5   1.
*
* sg1 brua
6900000 sg1brua valve
6900101 686000000 692000000 0.112   1. 1.
000100  1. 1.
6900201 1 0. 0. 0.
6900300 mtrvlv
6900301 491  492   1.0  0.
*
* environment simulator for sg loop1
6920000 sgconta1    tmdpvol
6920101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
6920200 002
6920201 0.    1.e5   1.
*
*
* sgss loop2 ri bot
7000000 ssrhoop2  branch
7000001 2  1
7000101 14.5    0.15    0.  0.   90.   0.15
4.e-5  0.5    00000
7000200 000  6.270e6  1.120e6  2.588e6  0.
7001101 700010000 720000000   0.    5.   5.
000000
7002101 700010000 730000000   0.    5.   5.
000000
7001201 2000.   0.   0.
7002201 1000.   0.   0.
*
* sgss loop2 dc bot
7010000 ssdcoop2  branch
7010001 2  1
7010101 3.0    0.15    0.  0.  -90.  -0.15    4.e-
5  0.1    00000
7010200 000  6.270e6  1.120e6  2.588e6  0.
7011101 710010000 701000000 0.    0.   0.
000000
7012101 701010000 700000000 0.    0.1  0.1
000000
7011201 3000.   0.   0.
7012201 3000.   0.   0.
*
* loop2 fw inlet in cold and hot package
7040000 loop2cfw    tmdpvol
7040101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
7040200 000
7040201    0. 10.00e6 9.354e5 2.588e6  0.
7040202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop2 fw line to cold and hot package
7050000 loop2fwm  tmdpjun
7050101 704000000 700000000 0.
7050200    1    631
7050201   -1.0   163.20   0.   0.
7050202    0.0   163.20   0.   0.
7050203    30.   0.     0.   0.
7050204   1.e6   0.     0.   0.
*
* loop2 emergency fw inlet in cold and hot
package
7060000 loop2efw    tmdpvol
7060101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
7060200 000
7060201    0. 10.00e6 8.387e4 2.403e6  0.
7060202  1.e6 10.00e6 8.387e4 2.403e6  0.
*
* loop2 emergency fw line to cold and hot
package
7070000 loop2ewm  tmdpjun
7070101 706000000 700000000 0.
7070200    1    479
7070201   -1.0   0.0     0.   0.
7070202    0.0   0.0     0.   0.
7070203    0.1   81.6    0.   0.
7070204   1.e6   81.6    0.   0.
*
*
*
* sg loop2 dc
7100000 ssdcoop2 pipe
7100001 6
7100101 8.0    2
7100102 7.06   4
7100103 3.75   6
7100301 0.29   5
7100302 0.31   6
7100401 0.     6
7100601 -90.   6
7100801 4.e-6 0.2    6
7100901 1.e-6 1.e-6   5
7101001 00000   6
7101101 000000  5
```

```
7101201 000  6.270e6  1.120e6    2.588e6  0.
0.  6
7101300 1
7101301 3000.    0.  0.  5
*
* sgss loop2 ri top1
7110000 srtcoop2  branch
7110001 2  1
7110101 6.76     0.25     0.  0.  -90.  -0.25
4.e-5  0.1    00000
7110200 000  6.270e6  1.120e6  2.588e6  0.
7111101 711010000 710000000 0.     0.1  0.1
000000
7112101 712010000 711000000 0.     0.1  0.1
000000
7111201 3917.    0.    0.
7112201 3917.    0.    0.
*
* sgss loop2 ri top2
7120000 srucoop2  branch
7120001 1  1
7120101 8.12     0.25     0.  0.  -90.  -0.25
4.e-5  0.1    00000
7120200 000  6.270e6  1.120e6  2.588e6  0.
7121101 712010000 735000000  0.  0.1  0.1
000000
7121201 0.    0.    0.
*
* loop2 fw inlet in dc
7140000 loop2afw    tmdpvol
7140101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
7140200 000
7140201    0. 10.00e6 9.354e5 2.588e6  0.
7140202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop2 fw line to dc
7150000 loop2fwl  tmdpjun
7150101 714000000 710030003 0.
7150200     1    631
7150201   -1.0   163.20   0.   0.
7150202    0.0   163.20   0.   0.
7150203    30.    0.      0.   0.
7150204   1.e6    0.      0.   0.
*
* sg loop2 riser hot package
7200000 ssrhoop2 pipe
7200001 6
7200101 10.0    4
7200102 12.0    6
7200301 0.31    1
7200302 0.29    6
7200401 0.      6
7200601  90.    6
7200801 4.e-6 0.004   6
7200901 1.    1.      5
7201001 00000   6
7201101 000000  5
7201201 000  6.270e6  1.120e6    2.588e6  0.
0.    1
7201202 000  6.270e6  1.220e6    2.588e6  0.2
0.    3
7201203 000  6.270e6  1.220e6    2.588e6  0.5
0.    6
7201300 1
7201301 2361.    0.   0.  1
7201302 2211.  150.   0.  3
7201303 2061.  300.   0.  5
*
* sgss loop2 ri top1
7210000 srttoop2  branch
7210001 2  1
7210101 15.0     0.25     0.  0.   90.   0.25
4.e-5  0.1    00000
7210200 000  6.270e6  1.220e6  2.588e6  0.8
7211101 720010000 721000000 0.     0.1  0.1
000000
7212101 721010000 735000000 0.     0.1  0.1
000000
7211201 2144.  300.    0.
7212201 2144.  300.    0.
*
* loop2 fw inlet in hc
7240000 loop2bfw    tmdpvol
7240101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
7240200 000
7240201    0. 10.00e6 9.354e5 2.588e6  0.
7240202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop2 fw line to dc
7250000 loop2fwm  tmdpjun
7250101 724000000 720050003 0.
7250200     1    631
7250201   -1.0    81.6    0.   0.
7250202    0.0    81.6    0.   0.
7250203    30.    0.      0.   0.
7250204   1.e6    0.      0.   0.
*
* sg loop2 riser cold package
7300000 ssrcoop2 pipe
7300001 6
7300101 10.0    4
7300102 12.0    6
7300301 0.31    1
7300302 0.29    6
7300401 0.      6
7300601  90.    6
7300801 4.e-6 0.004   6
7300901 1.    1.      5
7301001 00000   6
7301101 000000  5
7301201 000  6.270e6  1.120e6    2.588e6  0.
0.    1
7301202 000  6.270e6  1.220e6    2.588e6  0.2
0.    2
7301203 000  6.270e6  1.220e6    2.588e6  0.5
0.    6
7301300 1
7301301 1881.    0.   0.  1
7301302 1831.   50.   0.  3
7301303 1723.  108.   0.  5
*
* sgss loop2 ri top cold  package
7310000 srttoop2  branch
7310001 2  1
7310101 15.0     0.25     0.  0.   90.   0.25
4.e-5  0.1    00000
7310200 000  6.270e6  1.220e6  2.588e6  0.8
7311101 730010000 731000000 0.     0.01
0.01  000000
7312101 731010000 735000000 0.     0.01
0.01  000000
7311201 1723.  108.    0.
7312201 1723.  108.    0.
*
* sgss loop2 ri top plenum
7350000 spleoop2  branch
7350001 0  1
7350101 38.0    0.25     0.  0.   90.   0.25     4.e-
5  0.1    00000
7350200 000  6.270e6  1.220e6  2.588e6  0.8
*
* sgss loop2 sepa
7400000 sgaoop2   separatr
7400001 3 1
7400101 44.1     0.61   0. 0.  90. 0.61  4.e-5
.020  00
7400200 000  6.270e6  1.220e6  2.588e6
0.930
7401101 740010000 745000000 0. 10.  10.
000000 0.5
7402101 740000000 712000000 0. 10.  10.
000000 0.15
7403101 735010000 740000000 0.  0.   0.
000000
7401201    0.  408.    0.
7402201 3917.    0.    0.
7403201 3917.  408.    0.
*
* sgss loop2 steam dome
7450000 sssdoop2  branch
7450001 3  1
7450101 28.81    0.98     0.  0.   90.   0.70
4.e-5  0.1    00000
7450200 000  6.270e6  1.220e6  2.588e6  1.0
7451101 745010000 750000000 0.     0.1  0.1
000000
7452101 745010000 755000000 0.     0.1  0.1
000000
7453101 745010000 760000000 0.     0.1  0.1
000000
7451201 0.     136.    0.
7452201 0.     136.    0.
7453201 0.     136.    0.
*
* sg loop2 ext tubes
7500000 ssepoop2 pipe
7500001 2
7500101 0.16    2
7500301 1.4     2
7500401 0.      2
7500601  90.    2
7500801 4.e-6  0.2    2
7500901 0.3   0.3     1
7501001 00000   2
7501101 000000  1
7501201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
7501300 1
7501301 0.   136.     0.  1
*
* sg loop2 ext tubes
7550000 ssgpoop2 pipe
7550001 2
7550101 0.16    2
7550301 1.4     2
7550401 0.      2
7550601  90.    2
7550801 4.e-6  0.2    2
7550901 0.3   0.3     1
7551001 00000   2
7551101 000000  1
7551201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
7551300 1
7551301 0.   136.     0.  1
*
* sg loop2 ext tubes
7600000 ssfpoop2 pipe
```

```
7600001 2
7600101 0.16    2
7600301 1.4     2
7600401 0.      2
7600601  90.   2
7600801 4.e-6  0.2    2
7600901 0.3   0.3     1
7601001 00000   2
7601101 000000  1
7601201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
7601300 1
7601301 0.   136.     0.  1
*
* sgss loop2 steam coll
7650000 scoloop2  branch
7650001 2  1
7650101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
7650200 000  6.270e6  1.220e6  2.588e6  1.0
7651101 750010000 765000000 0.     0.5  0.5
000000
7652101 765010000 770010000 0.     0.1  0.1
000000
7651201 0.     136.    0.
7652201 0.     136.    0.
*
* sgss loop2 steam coll
7700000 scomoop2  branch
7700001 2  1
7700101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
7700200 000  6.270e6  1.220e6  2.588e6  1.0
7701101 755010000 770000000 0.     0.5  0.5
000000
7702101 770010000 775010000 0.     0.1  0.1
000000
7701201 0.     136.    0.
7702201 0.     272.    0.
*
*
* sgss loop1 steam coll
7750000 sconoop1  branch
7750001 2  1
7750101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
7750200 000  6.270e6  1.220e6  2.588e6  1.0
7751101 760010000 775000000 0.     0.5  0.5
000000
7752101 775010000 780000000 0.     0.5  0.5
000000
7751201 0.     136.    0.
7752201 0.     408.    0.
*
*
* sg1 sl1
7800000 sg1sl1 pipe
7800001 22
7800101 0.2827  22
7800301 1.0     22
7800401 0.0     22
7800601 0.0     22
7800801 4.e-6   0.0    22
7800901 0.01    0.01   21
7801001 0000000 22
7801101 000000  21
7801201 000  6.270e6  1.220e6    2.588e6  1.
0.    22
7801300 1
7801301 0.   408.     0.  21
*
* sg1 sl2
7820000 sg1sl2  branch
7820001 1  1
7820101 0.2827  2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
7820200 000  6.270e6  1.220e6  2.588e6  1.0
7821101 780010000 782000000 0.     0.01
0.01  000000
7821201 0.     408.    0.
*
* sg1 sl3
7840000 sg1sl3  branch
7840001 1  1
7840101 0.2827   2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
7840200 000  6.270e6  1.220e6  2.588e6  1.0
7841101 782010000 784000000 0.     0.01
0.01  000000
7841201 0.     408.    0.
*
* sg1 sl4
7860000 sg1sl4  branch
7860001 2  1
7860101 0.2827   2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
7860200 000  6.270e6  1.220e6  2.588e6  1.0
7861101 784010000 786000000 0.     0.01
0.01  000000
7862101 786010000 788000000 0.     0.01
0.01  000000
7861201 0.     408.    0.
7862201 0.     408.    0.
*
* sg1 sl5
7880000 sg1sl5 pipe
7880001 6
7880101 0.2827  6
7880301 1.0     6
7880401 0.0     6
7880601 0.0     6
7880801 4.e-6   0.0    6
7880901 0.01    0.01   5
7881001 0000000 6
7881101 000000  5
7881201 000  6.270e6  1.220e6    2.588e6  1.
0.    6
7881300 1
7881301 0.   408.     0.  5
*
* msiv sg loop2
7760000 msiloop1 valve
7760101 788010000 997000000  0.2827   1. 1.
000100
7760201 1 0. 408. 0.
7760300 mtrvlv
7760301 671  639   1.0   1.0
*
* sg2 srv1
7720000 sg2srv1 valve
7720101 782010000 773000000 0.112   1. 1.
000100  1. 1.
7720201 1 0. 0. 0.
7720300 mtrvlv
7720301 584  586   1.0   0.
*
* containment simulator for sg loop2
7730000 sgconta1    tmdpvol
7730101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
7730200 002
7730201 0.     1.e5   1.
*
* sg2 srv2
7940000 sg2srv2 valve
7940101 784010000 796000000 0.112   1. 1.
000100  1. 1.
7940201 1 0. 0. 0.
7940300 mtrvlv
7940301 585  586   1.0   0.
*
* containment simulator for sg loop1
7960000 sgconta1    tmdpvol
7960101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
7960200 002
7960201 0.     1.e5   1.
*
* sg2 brua
7900000 sg2brua valve
7900101 786010000 792000000 0.112   1. 1.
000100  1. 1.
7900201 1 0. 0. 0.
7900300 mtrvlv
7900301 493  494   1.0   0.
*
* environment simulator for sg loop2
7920000 sgconta2    tmdpvol
7920101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
7920200 002
7920201 0.     1.e5   1.
*
* sgss loop3 ri bot
8000000 ssrhoop3  branch
8000001 2  1
8000101 14.5     0.15     0.  0.   90.   0.15
4.e-5  0.5    00000
8000200 000  6.270e6  1.120e6  2.588e6  0.
8001101 800010000 820000000   0.     5.   5.
000000
8002101 800010000 830000000   0.     5.   5.
000000
8001201 2000.    0.    0.
8002201 1000.    0.    0.
*
* sgss loop3 dc bot
8010000 ssdcoop3  branch
8010001 2  1
8010101 3.0     0.15     0.  0.  -90.  -0.15     4.e-
5  0.1    00000
8010200 000  6.270e6  1.120e6  2.588e6  0.
8011101 810010000 801000000 0.     0.   0.
000000
8012101 801010000 800000000 0.     0.1  0.1
000000
8011201 3000.    0.    0.
8012201 3000.    0.    0.
*
* loop3 fw inlet in cold and hot package
8040000 loop3cfw    tmdpvol
8040101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
8040200 000
8040201    0. 10.00e6 9.354e5 2.588e6  0.
8040202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop3 fw line to cold and hot package
8050000 loop3fwm  tmdpjun
8050101 804000000 800000000 0.
8050200     1    632
8050201   -1.0   163.20   0.   0.
```

```
8050202    0.0   163.20   0.   0.
8050203    30.   0.      0.   0.
8050204   1.e6    0.      0.   0.
*
* loop3 emergency fw inlet in cold and hot
package
8060000 loop3efw    tmdpvol
8060101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
8060200 000
8060201    0. 10.00e6 8.387e4 2.403e6  0.
8060202  1.e6 10.00e6 8.387e4 2.403e6  0.
*
* loop3 emergency fw line to cold and hot
package
8070000 loop3ewm  tmdpjun
8070101 806000000 800000000 0.
8070200     1    479
8070201   -1.0   0.0       0.   0.
8070202    0.0   0.0       0.   0.
8070203    0.1   81.6      0.   0.
8070204   1.e6   81.6      0.   0.
*
*
*
*
* sg loop3 dc
8100000 ssdcoop3 pipe
8100001 6
8100101 8.0     2
8100102 7.06    4
8100103 3.75    6
8100301 0.29    5
8100302 0.31    6
8100401 0.      6
8100601 -90.    6
8100801 4.e-6 0.2     6
8100901 1.e-6 1.e-6   5
8101001 00000   6
8101101 000000  5
8101201 000  6.270e6  1.120e6    2.588e6  0.
0.  6
8101300 1
8101301 3000.    0.  0.  5
*
* sgss loop3 ri top1
8110000 srtcoop3  branch
8110001 2  1
8110101 6.76     0.25     0.  0.  -90.  -0.25
4.e-5  0.1    00000
8110200 000  6.270e6  1.120e6  2.588e6  0.
8111101 811010000 810000000 0.     0.1  0.1
000000
8112101 812010000 811000000 0.     0.1  0.1
000000
8111201 3917.    0.    0.
8112201 3917.    0.    0.
*
* sgss loop3 ri top2
8120000 srucoop3  branch
8120001 1  1
8120101 8.12     0.25     0.  0.  -90.  -0.25
4.e-5  0.1    00000
8120200 000  6.270e6  1.120e6  2.588e6  0.
8121101 812010000 835000000  0.  0.1  0.1
000000
8121201 0.    0.    0.
*
* loop3 fw inlet in dc
8140000 loop3afw    tmdpvol
8140101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
8140200 000
8140201    0. 10.00e6 9.354e5 2.588e6  0.
8140202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop3 fw line to dc
8150000 loop3fwl  tmdpjun
8150101 814000000 810030003 0.
8150200     1    632
8150201   -1.0   163.20   0.   0.
8150202    0.0   163.20   0.   0.
8150203    30.   0.      0.   0.
8150204   1.e6    0.      0.   0.
*
* sg loop3 riser hot package
8200000 ssrhoop3 pipe
8200001 6
8200101 10.0    4
8200102 12.0    6
8200301 0.31    1
8200302 0.29    6
8200401 0.      6
8200601  90.   6
8200801 4.e-6 0.004   6
8200901 1.    1.      5
8201001 00000   6
8201101 000000  5
8201201 000  6.270e6  1.120e6    2.588e6  0.
0.    1
8201202 000  6.270e6  1.220e6    2.588e6  0.2
0.    3
8201203 000  6.270e6  1.220e6    2.588e6  0.5
0.    6
8201300 1
8201301 2361.    0.   0.  1
8201302 2211.  150.   0.  3
8201303 2061.  300.   0.  5
*
* sgss loop3 ri top1
8210000 srttoop3  branch
8210001 2  1
8210101 15.0     0.25     0.  0.   90.   0.25
4.e-5  0.1    00000
8210200 000  6.270e6  1.220e6  2.588e6  0.8
8211101 820010000 821000000 0.     0.1  0.1
000000
8212101 821010000 835000000 0.     0.1  0.1
000000
8211201 2144.  300.    0.
8212201 2144.  300.    0.
*
* loop3 fw inlet in hc
8240000 loop3bfw    tmdpvol
8240101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
8240200 000
8240201    0. 10.00e6 9.354e5 2.588e6  0.
8240202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop3 fw line to dc
8250000 loop3fwm  tmdpjun
8250101 824000000 820050003 0.
8250200     1    632
8250201   -1.0    81.6    0.   0.
8250202    0.0    81.6    0.   0.
8250203    30.    0.      0.   0.
8250204   1.e6    0.      0.   0.
*
* sg loop3 riser cold package
8300000 ssrcoop3 pipe
8300001 6
8300101 10.0    4
8300102 12.0    6
8300301 0.31    1
8300302 0.29    6
8300401 0.      6
8300601  90.   6
8300801 4.e-6 0.004   6
8300901 1.    1.      5
8301001 00000   6
8301101 000000  5
8301201 000  6.270e6  1.120e6    2.588e6  0.
0.    1
8301202 000  6.270e6  1.220e6    2.588e6  0.2
0.    2
8301203 000  6.270e6  1.220e6    2.588e6  0.5
0.    6
8301300 1
8301301 1881.    0.   0.  1
8301302 1831.   50.   0.  3
8301303 1723.  108.   0.  5
*
* sgss loop3 ri top cold  package
8310000 srttoop3  branch
8310001 2  1
8310101 15.0     0.25     0.  0.   90.   0.25
4.e-5  0.1    00000
8310200 000  6.270e6  1.220e6  2.588e6  0.8
8311101 830010000 831000000 0.     0.01
0.01  000000
8312101 831010000 835000000 0.     0.01
0.01  000000
8311201 1723.  108.    0.
8312201 1723.  108.    0.
*
* sgss loop3 ri top plenum
8350000 spleoop3  branch
8350001 0  1
8350101 38.0    0.25     0.  0.   90.   0.25     4.e-
5  0.1    00000
8350200 000  6.270e6  1.220e6  2.588e6  0.8
*
* sgss loop3 sepa
8400000 sgaoop3   separatr
8400001 3 1
8400101 44.1     0.61   0. 0.  90. 0.61  4.e-5
.020  00
8400200 000  6.270e6  1.220e6  2.588e6
0.930
8401101 840010000 845000000 0. 10.  10.
000000 0.5
8402101 840000000 812000000 0. 10.  10.
000000 0.15
8403101 835010000 840000000 0.  0.   0.
000000
8401201    0.  408.    0.
8402201 3917.    0.    0.
8403201 3917.  408.    0.
*
* sgss loop3 steam dome
8450000 sssdoop3  branch
8450001 3  1
8450101 28.81    0.98     0.  0.   90.   0.70
4.e-5  0.1    00000
8450200 000  6.270e6  1.220e6  2.588e6  1.0
8451101 845010000 850000000 0.     0.1  0.1
000000
8452101 845010000 855000000 0.     0.1  0.1
000000
```

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8453101 845010000 860000000 0.     0.1  0.1
000000
8451201 0.     136.    0.
8452201 0.     136.    0.
8453201 0.     136.    0.
*
* sg loop3 ext tubes
8500000 ssepoop3 pipe
8500001 2
8500101 0.16    2
8500301 1.4     2
8500401 0.      2
8500601  90.    2
8500801 4.e-6  0.2    2
8500901 0.3   0.3     1
8501001 00000   2
8501101 000000  1
8501201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
8501300 1
8501301 0.   136.     0.  1
*
* sg loop3 ext tubes
8550000 ssgpoop3 pipe
8550001 2
8550101 0.16    2
8550301 1.4     2
8550401 0.      2
8550601  90.    2
8550801 4.e-6  0.2    2
8550901 0.3   0.3     1
8551001 00000   2
8551101 000000  1
8551201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
8551300 1
8551301 0.   136.     0.  1
*
* sg loop3 ext tubes
8600000 ssfpoop3 pipe
8600001 2
8600101 0.16    2
8600301 1.4     2
8600401 0.      2
8600601  90.    2
8600801 4.e-6  0.2    2
8600901 0.3   0.3     1
8601001 00000   2
8601101 000000  1
8601201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
8601300 1
8601301 0.   136.     0.  1
*
* sgss loop3 steam coll
8650000 scoloop3  branch
8650001 2  1
8650101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
8650200 000  6.270e6  1.220e6  2.588e6  1.0
8651101 850010000 865000000 0.     0.5  0.5
000000
8652101 865010000 870010000 0.     0.1  0.1
000000
8651201 0.     136.    0.
8652201 0.     136.    0.
*
* sgss loop3 steam coll
8700000 scomoop3  branch
8700001 2  1
8700101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
8700200 000  6.270e6  1.220e6  2.588e6  1.0
8701101 855010000 870000000 0.     0.5  0.5
000000
8702101 870010000 875010000 0.     0.1  0.1
000000
8701201 0.     136.    0.
8702201 0.     272.    0.
*
*
* sgss loop1 steam coll
8750000 sconoop1  branch
8750001 2  1
8750101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
8750200 000  6.270e6  1.220e6  2.588e6  1.0
8751101 860010000 875000000 0.     0.5  0.5
000000
8752101 875010000 880000000 0.     0.5  0.5
000000
8751201 0.     136.    0.
8752201 0.     408.    0.
*
*
* sg1 sl1
8800000 sg1sl1 pipe
8800001 22
8800101 0.2827    22
8800301 1.0     22
8800401 0.0     22
8800601 0.0     22
8800801 4.e-6   0.0    22
8800901 0.01    0.01   21
8801001 0000000 22
8801101 000000  21
8801201 000  6.270e6  1.220e6    2.588e6  1.
0.    22
8801300 1
8801301 0.   408.     0.  21
*
* sg1 sl2
8820000 sg1sl2  branch
8820001 1  1
8820101 0.2827  2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
8820200 000  6.270e6  1.220e6  2.588e6  1.0
8821101 880010000 882000000 0.     0.01
0.01  000000
8821201 0.     408.    0.
*
* sg1 sl3
8840000 sg1sl3  branch
8840001 1  1
8840101 0.2827   2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
8840200 000  6.270e6  1.220e6  2.588e6  1.0
8841101 882010000 884000000 0.     0.01
0.01  000000
8841201 0.     408.    0.
*
* sg1 sl4
8860000 sg1sl4  branch
8860001 2  1
8860101 0.2827   2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
8860200 000  6.270e6  1.220e6  2.588e6  1.0
8861101 884010000 886000000 0.     0.01
0.01  000000
8862101 886010000 888000000 0.     0.01
0.01  000000
8861201 0.     408.    0.
8862201 0.     408.    0.
*
* sg1 sl5
8880000 sg1sl5 pipe
8880001 6
8880101 0.2827  6
8880301 1.0     6
8880401 0.0     6
8880601 0.0     6
8880801 4.e-6   0.0    6
8880901 0.01    0.01   5
8881001 0000000 6
8881101 000000  5
8881201 000  6.270e6  1.220e6    2.588e6  1.
0.    6
8881300 1
8881301 0.   408.     0.  5
*
* msiv sg loop3
8760000 msiloop3 valve
8760101 888010000 997000000  0.2827   1. 1.
000100
8760201 1 0. 408. 0.
8760300 mtrvlv
8760301 671  640   1.0   1.0
*
* sg3 srv3
8720000 sg3srv1 valve
8720101 882010000 873000000 0.112   1. 1.
000100  1. 1.
8720201 1 0. 0. 0.
8720300 mtrvlv
8720301 587  589   1.0   0.
*
* containment simulator for sg loop1
8730000 sgconta1    tmdpvol
8730101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
8730200 002
8730201 0.     1.e5   1.
*
* sg3 srv2
8940000 sg3srv2 valve
8940101 884010000 896000000 0.112   1. 1.
000100  1. 1.
8940201 1 0. 0. 0.
8940300 mtrvlv
8940301 588  589   1.0   0.
*
* containment simulator for sg loop1
8960000 sgconta1    tmdpvol
8960101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
8960200 002
8960201 0.     1.e5   1.
*
* sg3 brua
8900000 sg3brua valve
8900101 886010000 892000000 0.112   1. 1.
000100  1. 1.
8900201 1 0. 0. 0.
8900300 mtrvlv
8900301 495  496   1.0   0.
*
* environment simulator for sg loop1
8920000 sgconta1    tmdpvol
8920101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
```

```
8920200 002
8920201 0.    1.e5   1.
*
*
* sgss loop4 ri bot
9000000 ssrhoop4  branch
9000001 2  1
9000101 14.5    0.15    0.  0.  90.  0.15
4.e-5  0.5    00000
9000200 000  6.270e6  1.120e6  2.588e6  0.
9001101 900010000 920000000   0.    5.   5.
000000
9002101 900010000 930000000   0.    5.   5.
000000
9001201 2000.    0.    0.
9002201 1000.    0.    0.
*
* sgss loop4 dc bot
9010000 ssdcoop4  branch
9010001 2  1
9010101 3.0    0.15    0.  0.  -90.  -0.15    4.e-
5  0.1    00000
9010200 000  6.270e6  1.120e6  2.588e6  0.
9011101 910010000 901000000 0.    0.   0.
000000
9012101 901010000 900000000 0.    0.1  0.1
000000
9011201 3000.    0.    0.
9012201 3000.    0.    0.
*
* loop1 fw inlet in cold and hot package
9040000 loop4cfw    tmdpvol
9040101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
9040200 000
9040201    0. 10.00e6 9.354e5 2.588e6  0.
9040202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop4 fw line to cold and hot package
9050000 loop4fwm  tmdpjun
9050101 904000000 900000000 0.
9050200     1    633
9050201   -1.0   163.20   0.   0.
9050202    0.0   163.20   0.   0.
9050203    30.   0.     0.   0.
9050204   1.e6   0.     0.   0.
*
* loop4 emergency fw inlet in cold and hot
package
9060000 loop4efw    tmdpvol
9060101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
9060200 000
9060201    0. 10.00e6 8.387e4 2.403e6  0.
9060202  1.e6 10.00e6 8.387e4 2.403e6  0.
*
* loop4 emergency fw line to cold and hot
package
9070000 loop4ewm  tmdpjun
9070101 906000000 900000000 0.
9070200     1    479
9070201   -1.0   0.0      0.   0.
9070202    0.0   0.0      0.   0.
9070203    0.1   81.6     0.   0.
9070204   1.e6   81.6     0.   0.
*
*
*
* sg loop4 dc
9100000 ssdcoop4 pipe
9100001 6
9100101 8.0     2
9100102 7.06    4
9100103 3.75    6
9100301 0.29    5
9100302 0.31    6
9100401 0.      6
9100601 -90.    6
9100801 4.e-6 0.2     6
9100901 1.e-6 1.e-6   5
9101001 00000   6
9101101 000000  5
9101201 000  6.270e6  1.120e6    2.588e6  0.
0.  6
9101300 1
9101301 3000.    0.   0.  5
*
* sgss loop4 ri top1
9110000 srtcoop4  branch
9110001 2  1
9110101 6.76     0.25     0.  0.  -90.  -0.25
4.e-5  0.1    00000
9110200 000  6.270e6  1.120e6  2.588e6  0.
9111101 911010000 910000000 0.     0.1  0.1
000000
9112101 912010000 911000000 0.     0.1  0.1
000000
9111201 3917.    0.    0.
9112201 3917.    0.    0.
*
* sgss loop4 ri top2
9120000 srucoop4  branch
9120001 1  1
9120101 8.12     0.25     0.  0.  -90.  -0.25
4.e-5  0.1    00000
9120200 000  6.270e6  1.120e6  2.588e6  0.
9121101 912010000 935000000  0.  0.1  0.1
000000
9121201 0.    0.    0.
*
* loop4 fw inlet in dc
9140000 loop4afw    tmdpvol
9140101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
9140200 000
9140201    0. 10.00e6 9.354e5 2.588e6  0.
9140202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop4 fw line to dc
9150000 loop4fwl  tmdpjun
9150101 914000000 910030003 0.
9150200     1    633
9150201   -1.0   163.20   0.   0.
9150202    0.0   163.20   0.   0.
9150203    30.   0.     0.   0.
9150204   1.e6   0.     0.   0.
*
* sg loop4 riser hot package
9200000 ssrhoop4 pipe
9200001 6
9200101 10.0    4
9200102 12.0    6
9200301 0.31    1
9200302 0.29    6
9200401 0.      6
9200601  90.    6
9200801 4.e-6 0.004   6
9200901 1.    1.      5
9201001 00000   6
9201101 000000  5
9201201 000  6.270e6  1.120e6    2.588e6  0.
0.    1
9201202 000  6.270e6  1.220e6    2.588e6  0.2
0.    3
9201203 000  6.270e6  1.220e6    2.588e6  0.5
0.    6
9201300 1
9201301 2361.    0.   0.  1
9201302 2211.  150.   0.  3
9201303 2061.  300.   0.  5
*
* sgss loop4 ri top1
9210000 srttoop4  branch
9210001 2  1
9210101 15.0     0.25     0.  0.  90.   0.25
4.e-5  0.1    00000
9210200 000  6.270e6  1.220e6  2.588e6  0.8
9211101 920010000 921000000 0.     0.1  0.1
000000
9212101 921010000 935000000 0.     0.1  0.1
000000
9211201 2144.  300.    0.
9212201 2144.  300.    0.
*
* loop4 fw inlet in hc
9240000 loop4bfw    tmdpvol
9240101 0. 10. 10. 0. 90. 10. 4.e-5 0. 00
9240200 000
9240201    0. 10.00e6 9.354e5 2.588e6  0.
9240202  1.e6 10.00e6 9.354e5 2.588e6  0.
*
* loop4 fw line to dc
9250000 loop4fwm  tmdpjun
9250101 924000000 920050003 0.
9250200     1    633
9250201   -1.0    81.6    0.   0.
9250202    0.0    81.6    0.   0.
9250203    30.    0.      0.   0.
9250204   1.e6    0.      0.   0.
*
* sg loop4 riser cold package
9300000 ssrcoop4 pipe
9300001 6
9300101 10.0    4
9300102 12.0    6
9300301 0.31    1
9300302 0.29    6
9300401 0.      6
9300601  90.    6
9300801 4.e-6 0.004   6
9300901 1.    1.      5
9301001 00000   6
9301101 000000  5
9301201 000  6.270e6  1.120e6    2.588e6  0.
0.    1
9301202 000  6.270e6  1.220e6    2.588e6  0.2
0.    2
9301203 000  6.270e6  1.220e6    2.588e6  0.5
0.    6
9301300 1
9301301 1881.    0.   0.  1
9301302 1831.   50.   0.  3
9301303 1723.  108.   0.  5
*
* sgss loop4 ri top cold  package
9310000 srttoop4  branch
9310001 2  1
9310101 15.0     0.25     0.  0.  90.   0.25
4.e-5  0.1    00000
9310200 000  6.270e6  1.220e6  2.588e6  0.8
```

```
9311101 930010000 931000000 0.     0.01
0.01  000000
9312101 931010000 935000000 0.     0.01
0.01  000000
9311201 1723.  108.    0.
9312201 1723.  108.    0.
*
* sgss loop4 ri top plenum
9350000 spleoop4  branch
9350001 0  1
9350101 38.0    0.25     0.  0.   90.   0.25     4.e-
5  0.1    00000
9350200 000  6.270e6  1.220e6  2.588e6  0.8
*
* sgss loop4 sepa
9400000 sgaoop4   separatr
9400001 3 1
9400101 44.1     0.61   0. 0.  90. 0.61  4.e-5
.020  00
9400200 000  6.270e6  1.220e6  2.588e6
0.930
9401101 940010000 945000000 0. 10.  10.
000000 0.5
9402101 940000000 912000000 0. 10.  10.
000000 0.15
9403101 935010000 940000000 0.  0.   0.
000000
9401201    0.  408.    0.
9402201 3917.    0.    0.
9403201 3917.  408.    0.
*
* sgss loop4 steam dome
9450000 sssdoop4  branch
9450001 3  1
9450101 28.81    0.98     0.  0.   90.   0.70
4.e-5  0.1    00000
9450200 000  6.270e6  1.220e6  2.588e6  1.0
9451101 945010000 950000000 0.     0.1  0.1
000000
9452101 945010000 955000000 0.     0.1  0.1
000000
9453101 945010000 960000000 0.     0.1  0.1
000000
9451201 0.     136.    0.
9452201 0.     136.    0.
9453201 0.     136.    0.
*
* sg loop4 ext tubes
9500000 ssepoop4 pipe
9500001 2
9500101 0.16    2
9500301 1.4     2
9500401 0.      2
9500601  90.    2
9500801 4.e-6  0.2    2
9500901 0.3   0.3     1
9501001 00000   2
9501101 000000  1
9501201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
9501300 1
9501301 0.   136.     0.  1
*
* sg loop4 ext tubes
9550000 ssgpoop4 pipe
9550001 2
9550101 0.16    2
9550301 1.4     2
9550401 0.      2
9550601  90.    2
9550801 4.e-6  0.2    2
9550901 0.3   0.3     1
9551001 00000   2
9551101 000000  1
9551201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
9551300 1
9551301 0.   136.     0.  1
*
* sg loop4 ext tubes
9600000 ssfpoop4 pipe
9600001 2
9600101 0.16    2
9600301 1.4     2
9600401 0.      2
9600601  90.    2
9600801 4.e-6  0.2    2
9600901 0.3   0.3     1
9601001 00000   2
9601101 000000  1
9601201 000  6.270e6  1.220e6    2.588e6  1.
0.    2
9601300 1
9601301 0.   136.     0.  1
*
* sgss loop4 steam coll
9650000 scoloop4  branch
9650001 2  1
9650101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
9650200 000  6.270e6  1.220e6  2.588e6  1.0
9651101 950010000 965000000 0.     0.5  0.5
000000
9652101 965010000 970010000 0.     0.1  0.1
000000
9651201 0.     136.    0.
9652201 0.     136.    0.
*
* sgss loop4 steam coll
9700000 scomoop4  branch
9700001 2  1
9700101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
9700200 000  6.270e6  1.220e6  2.588e6  1.0
9701101 955010000 970000000 0.     0.5  0.5
000000
9702101 970010000 975010000 0.     0.1  0.1
000001
9701201 0.     136.    0.
9702201 0.     272.    0.
*
*
* sgss loop1 steam coll
9750000 sconoop1  branch
9750001 2  1
9750101 2.05     0.56     0.  0.   90.   0.56
4.e-5  0.1    00000
9750200 000  6.270e6  1.220e6  2.588e6  1.0
9751101 960010000 975000000 0.     0.5  0.5
000000
9752101 975010000 980000000 0.     0.5  0.5
000000
9751201 0.     136.    0.
9752201 0.     408.    0.
*
*
* sg1 sl1
9800000 sg1sl1 pipe
9800001 22
9800101 0.2827    22
9800301 1.0     22
9800401 0.0     22
9800601 0.0     22
9800801 4.e-6   0.0    22
9800901 0.01    0.01   21
9801001 0000000 22
9801101 000000  21
9801201 000  6.270e6  1.220e6    2.588e6  1.
0.    22
9801300 1
9801301 0.   408.     0.  21
*
* sg1 sl2
9820000 sg1sl2  branch
9820001 1  1
9820101 0.2827  2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
9820200 000  6.270e6  1.220e6  2.588e6  1.0
9821101 980010000 982000000 0.     0.01
0.01  000000
9821201 0.     408.    0.
*
* sg1 sl3
9840000 sg1sl3  branch
9840001 1  1
9840101 0.2827   2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
9840200 000  6.270e6  1.220e6  2.588e6  1.0
9841101 982010000 984000000 0.     0.01
0.01  000000
9841201 0.     408.    0.
*
* sg1 sl4
9860000 sg1sl4  branch
9860001 2  1
9860101 0.2827   2.0     0.  0.   0.   0.0    4.e-5
0.0    00000
9860200 000  6.270e6  1.220e6  2.588e6  1.0
9861101 984010000 986000000 0.     0.01
0.01  000000
9862101 986010000 988000000 0.     0.01
0.01  000000
9861201 0.     408.    0.
9862201 0.     408.    0.
*
* sg1 sl5
9880000 sg1sl5 pipe
9880001 6
9880101 0.2827  6
9880301 1.0     6
9880401 0.0     6
9880601 0.0     6
9880801 4.e-6   0.0    6
9880901 0.01    0.01   5
9881001 0000000 6
9881101 000000  5
9881201 000  6.270e6  1.220e6    2.588e6  1.
0.    6
9881300 1
9881301 0.   408.     0.  5
*
* msiv sg loop4
9760000 msiloop4 valve
9760101 988010000 997000000  0.2827   1. 1.
000100
9760201 1 0. 408. 0.
9760300 mtrvlv
```

```
9760301 671  641   1.0   1.0
*
* sg4 srv1
9720000 sg4srv1 valve
9720101 982010000 973000000 0.112   1. 1.
000100  1. 1.
9720201 1 0. 0. 0.
9720300 mtrvlv
9720301 590  592   1.0   0.
*
* containment simulator for sg loop4
9730000 sgconta1    tmdpvol
9730101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
9730200 002
9730201 0.     1.e5   1.
*
* sg4 srv2
9940000 sg4srv2 valve
9940101 984010000 996000000 0.112   1. 1.
000100  1. 1.
9940201 1 0. 0. 0.
9940300 mtrvlv
9940301 591  592   1.0   0.
*
* containment simulator for sg loop1
9960000 sgconta1    tmdpvol
9960101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
9960200 002
9960201 0. 1.e5   1.
*
* sg4 brua
9900000 sg4brua valve
9900101 986010000 992000000 0.112   1. 1.
000100  1. 1.
9900201 1 0. 0. 0.
9900300 mtrvlv
9900301 497  498   1.0   0.
*
* environment simulator for sg loop4
9920000 sgconta1    tmdpvol
9920101 0. 10. 10. 0. 90. 10. 4.e-5 0.    00
9920200 002
9920201 0.     1.e5   1.
*
*
* sgs common collector loop 1-4
9970000 sgscol  branch
9970001 1  1
9970101 10.      0.56     0.  0.    0.  0.       4.e-5
0.     00000
9970200 000  6.270e6  1.220e6  2.588e6  1.0
9971101 997010000 995000000 0.     0.5  0.5
000000
9971201 0.    1632.    0.
*
* sgs steam line common collector
9950000 sgcoll   pipe
9950001 10
9950101 5.      10
9950301 3.      10
9950401 0.      10
9950601   0.    10
9950801 4.e-6  0.6    10
9950901 1.e-6  1.e-6  9
9951001 00000   10
9951101 000000  9
9951201 000  6.270e6  1.220e6    2.588e6  1.
0.    10
9951300 1
9951301 0.  1632.     0.  9
*
*
* loop 1-4 exit steam
9980000 turb  valve
9980101 995010000 999000000  2.3 2. 2.
000100
9980201 1 0. 1632. 0.
9980300 mtrvlv
9980301 618  617   1.0   0.0
*
*
* steam line and node
9990000 turb.vol  tmdpvol
9990101 2.38355  8.  0.  0.  90.  2.       4.e-5  0.
00
9990200 002
9990201   0.    6.27e6  1.0
9990202   1.e6  6.27e6  1.0
*
*
*----------------------------------------------------
----------*
*                                                    *
*       heat structures
*
*                                                    *
*----------------------------------------------------
----------*
*    1. pressure vessel
*
*----------------------------------------------------
----------*
*
* surge line
11001000 19 5 2 1 0.173
11001100 0 1
11001101 4 0.213
11001201 1  4
11001301 0. 4
11001400 0
11001401 567. 5
11001501 036010000 0            1 1 0.56   1
11001502 036020000 10000          1 1 0.95
18
11001503 032010000 0            1 1 0.4    19
11001601 000000000 0            0 1 0.56   1
11001602 000000000 0            0 1 0.95   18
11001603 000000000 0            0 1 0.4    19
11001701 0 0. 0. 0. 19
11001801 0. 100. 100. 0. 0. 0. 0. 1. 19
*
* spray line
11002000 21 5 2 1 0.0905
11002100 0 1
11002101 4 0.1095
11002201 1  4
11002301 0. 4
11002400 0
11002401 567. 5
11002501 020010000 0            1 1 0.72   1
11002502 022010000 0            1 1 1.0    2
11002503 022020000 10000          1 1 1.95
20
11002504 026010000 00000          1 1 0.5    21
11002601 000000000 0            0 1 0.72   1
11002602 000000000 0            0 1 1.0    2
11002603 000000000 0            0 1 1.95   20
11002604 000000000 0            0 1 0.5    21
11002701 0 0. 0. 0. 21
11002801 0. 100. 100. 0. 0. 0. 0. 1. 21
*
* prz walls
11012000 23 5 2 1 1.5000
11012100 0 1
11012101 4 1.65
11012201 1  4
11012301 0. 4
11012400 0
11012401 567. 5
11012501 030010000 0            1 1 0.17   1
11012502 030020000 10000          1 1 0.5    23
11012601 000000000 0            0 1 0.17   1
11012602 000000000 0            0 1 0.5    23
11012701 0 0. 0. 0. 23
11012801 0. 100. 100. 0. 0. 0. 0. 1. 23
*
* prz bot & top plates
11013000 2 5  1 1 0.
11013100 0 1
11013101 4 0.15
11013201 1  4
11013301 0. 4
11013400 0
11013401 567. 5
11013501 030010000 0 1 1 9.0    1
11013502 030230000 0 1 1 9.0    2
11013601 000000000 0 0 1 9.0    2
11013701 0 0. 0. 0. 2
11013801 0. 100. 100. 0. 0. 0. 0. 1. 2
*
* prz internal heaters high power off
*11014000 4    5   2  1  0.
*11014100  0    1
*11014104  4    0.0115
*11014201  3    4
*11014301  1.   4
*11014401  561.0   5
*11014501  000000000  0      0        1
6000.00   4
*11014601  030010000  10000  1        1
6000.00   4
*11014701  910       0.25     0.0      0.0    4
*11014901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* prz internal heaters low power off
*11015000 4    5   2  1  0.
*11015100  0    1
*11015104  4    0.0115
*11015201  3    4
*11015301  1.   4
*11015401  561.0   5
*11015501  000000000  0      0        1
6000.00   4
*11015601  030010000  10000  1        1
6000.00   4
*11015701  911       0.25     0.0      0.0    4
*11015901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* vessel parte1
11091000  3    50  2  1  2.068
11091100  0    1
11091101  1    2.07298
11091102  48   2.312
11091201  2    1
11091202  1    49
11091301  0.   49
```

```
11091400 0
11091401 567.  50
11091501 100010000 0    1       1       0.3
1
11091502 130190000 0    1       1       0.4
2
11091503 130180000 0    1       1       0.267
3
11091601 000000000 0    0       1       0.3
1
11091602 000000000 0    0       1       0.4
2
11091603 000000000 0    0       1       0.267
3
11091701 0      0.    0.      0.   3
11091801 0. 100. 100. 0. 0. 0. 0. 1.   3
*
* vessel parte2
11092000 16  50  2  1  2.068
11092100 0   1
11092101 2   2.07614
11092102 47  2.2675
11092201 2   2
11092202 1   49
11092301 0.  49
11092400 0
11092401 567.  50
11092501 130180000 0    1       1
0.033 1
11092502 130170000 -10000 1       1
0.32  3
11092503 130150000 0    1       1       0.25
4
11092504 130140000 -10000 1       1
0.28  15
11092505 130030000 0    1       1
0.192 16
11092601 000000000 0    0       1
0.033 1
11092602 000000000 0    0       1       0.32
3
11092603 000000000 0    0       1       0.25
4
11092604 000000000 0    0       1       0.28
15
11092605 000000000 0    0       1
0.192 16
11092701 0      0.    0.      0.   16
11092801 0. 100. 100. 0. 0. 0. 0. 1. 16
*
* vessel parte3
11093000 13  50  2  1  1.993
11093100 0   1
11093101 1   1.99896
11093102 48  2.285
11093201 2   1
11093202 1   49
11093301 0.  49
11093400 0
11093401 567.  50
11093501 130030000 0    1       1
0.192 1
11093502 130020000 0    1       1       0.28
2
11093503 130010000 0    1       1       0.32
3
11093504 139010000 0    1       1       0.3
4
11093505 131010000 0    1       1       0.42
5
11093506 132010000 0    1       1       0.3
6
11093507 132020000 0    1       1       0.33
7
11093508 170010000 10000  1       1
0.325 12
11093509 170060000 0    1       1
0.312 13
11093601 000000000 0    0       1
0.192 1
11093602 000000000 0    0       1       0.28
2
11093603 000000000 0    0       1       0.32
3
11093604 000000000 0    0       1       0.3
4
11093605 000000000 0    0       1       0.42
5
11093606 000000000 0    0       1       0.3
6
11093607 000000000 0    0       1       0.33
7
11093608 000000000 0    0       1
0.325 12
11093609 000000000 0    0       1
0.312 13
11093701 0      0.    0.      0.   13
11093801 0. 100. 100. 0. 0. 0. 0. 1. 13
*
* vessel parte4
11094000 3   50  2  1  1.820
11094100 0   1
11094101 1   1.82949
11094102 48  2.285
11094201 2   1
11094202 1   49
11094301 0.  49
11094400 0
11094401 567.  50
11094501 170060000 0    1       1
0.013 1
11094502 170070000 0    1       1
0.325 2
11094503 170080000 0    1       1
0.158 3
11094601 000000000 0    0       1
0.013 1
11094602 000000000 0    0       1
0.325 2
11094603 000000000 0    0       1
0.158 3
11094701 0      0.    0.      0.   3
11094801 0. 100. 100. 0. 0. 0. 0. 1. 3
*
* vessel parte5
11095000 5   50  2  1  1.698
11095100 0   1
11095101 1   1.70998
11095102 48  2.285
11095201 2   1
11095202 1   49
11095301 0.  49
11095400 0
11095401 567.  50
11095501 170080000 0    1       1
0.167 1
11095502 155010000 0    1       1
0.325 2
11095503 160010000 0    1       1
0.325 3
11095504 160020000 0    1       1
0.325 4
11095505 162010000 0    1       1
0.325 5
11095601 000000000 0    0       1
0.167 1
11095602 000000000 0    0       1
0.325 2
11095603 000000000 0    0       1
0.325 3
11095604 000000000 0    0       1
0.325 4
11095605 000000000 0    0       1
0.325 5
11095701 0      0.    0.      0.   5
11095801 0. 100. 100. 0. 0. 0. 0. 1. 5
*
*
*
*
*  VECCHIO VESSEL
*rpv walls
*11101000 36 10 2 1 2.068
*11101100 0 1
*11101101 9 2.267
*11101201 1  9
*11101301 0. 9
*11101400 0
*11101401 567. 10
*11101501 100010000 0           1 1 0.3   1
*11101502 130190000 -10000      1 1 0.4   4
*11101503 130160000 0           1 1 0.32  5
*11101504 130150000 -10000      1 1 0.25
18
*11101505 130020000  0          1 1 0.28  19
*11101506 130010000  0          1 1 0.32  20
*11101507 139010000  00000      1 1 0.30
21
*11101508 131010000  00000      1 1 0.42
22
*11101509 132010000  10000      1 1 0.31
24
*11101510 170010000  10000      1 1 0.325
32
*11101511 155010000  00000      1 1 0.325
33
*11101512 160020000 -10000      1 1 0.325
35
*11101513 162010000  00000      1 1 0.325
36
*11101601 000000000 0           0 1 0.3   1
*11101602 000000000 0           0 1 0.4   4
*11101603 000000000 0           0 1 0.32  5
*11101604 000000000 0           0 1 0.25  18
*11101605 000000000 0           0 1 0.28  19
*11101606 000000000 0           0 1 0.32  20
*11101607 000000000 0           0 1 0.30  21
*11101608 000000000 0           0 1 0.42  22
*11101609 000000000 0           0 1 0.31  24
*11101610 000000000 0           0 1 0.325 32
*11101611 000000000 0           0 1 0.325 33
*11101612 000000000 0           0 1 0.325 35
*11101613 000000000 0           0 1 0.325 36
*11101701 0 0. 0. 0. 36
*11101801 0. 100. 100. 0. 0. 0. 0. 1. 36
*
* rpv part - 1 for pts cl 1
*11102000 4 30 2 1 2.068
```

```
*11102100 0 1
*11102101 29 2.267
*11102201 1  29
*11102301 0. 29
*11102400 0
*11102401 567. 30
*11102501 133010000 10000          1 1 0.016
4
*11102601 000000000 0              0 1 0.016  4
*11102701 0 0. 0. 0. 4
*11102801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 1 for pts cl 1
11102000 4 90 1 1 1.993
11102100 0 1
11102101  4    2.0
11102102  85   2.285
11102201  2    4
11102202  1    89
11102301 0. 89
11102400 0
11102401 567. 90
11102501 133010000 10000          1 1 0.4963
4
11102601 000000000 0              0 1 0.4963  4
11102701 0 0. 0. 0. 4
11102801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 2 for pts transition zone
*11103000 4 30 2 1 2.068
*11103100 0 1
*11103101 29 2.267
*11103201 1  29
*11103301 0. 29
*11103400 0
*11103401 567. 30
*11103501 176010000 10000          1 1 0.016
4
*11103601 000000000 0              0 1 0.016  4
*11103701 0 0. 0. 0. 4
*11103801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 2 for pts transition zone
11103000 4 90 1 1 1.993
11103100 0 1
11103101  4    2.0
11103102  85   2.285
11103201  2    4
11103202  1    89
11103301 0. 89
11103400 0
11103401 567. 90
11103501 176010000 10000          1 1 0.4963
4
11103601 000000000 0              0 1 0.4963  4
11103701 0 0. 0. 0. 4
11103801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 3 for pts sit 3
*11104000 4 30 2 1 2.068
*11104100 0 1
*11104101 29 2.267
*11104201 1  29
*11104301 0. 29
*11104400 0
*11104401 567. 30
*11104501 134010000 10000          1 1 0.016
4
*11104601 000000000 0              0 1 0.016  4
*11104701 0 0. 0. 0. 4
*11104801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 3 for pts sit 3
11104000 4 90 1 1 1.993
11104100 0 1
11104101 4    2.0
11104102 85   2.285
11104201 2    4
11104202 1    89
11104301 0. 89
11104400 0
11104401 567. 90
11104501 134010000 10000          1 1 0.1353
4
11104601 000000000 0              0 1 0.1353  4
11104701 0 0. 0. 0. 4
11104801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 4 for pts cl 2
*11105000 4 30 2 1 2.068
*11105100 0 1
*11105101 29 2.267
*11105201 1  29
*11105301 0. 29
*11105400 0
*11105401 567. 30
*11105501 135010000 10000          1 1 0.016
4
*11105601 000000000 0              0 1 0.016  4
*11105701 0 0. 0. 0. 4
*11105801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 4 for pts cl 2
11105000 4 90 2 1 1.993
11105100 0 1
11105101  4    2.0
11105102  85   2.285
11105201  2    4
11105202  1    89
11105301 0. 89
11105400 0
11105401 567. 90
11105501 135010000 10000          1 1 0.4963
4
11105601 000000000 0              0 1 0.4963  4
11105701 0 0. 0. 0. 4
11105801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 5 for pts cl 3
*11106000 4 30 2 1 2.068
*11106100 0 1
*11106101 29 2.267
*11106201 1  29
*11106301 0. 29
*11106400 0
*11106401 567. 30
*11106501 136010000 10000          1 1 0.016
4
*11106601 000000000 0              0 1 0.016  4
*11106701 0 0. 0. 0. 4
*11106801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 5 for pts cl 3
11106000 4 90 1 1 1.993
11106100 0 1
11106101  4    2.0
11106102  85   2.285
11106201  2    4
11106202  1    89
11106301 0. 89
11106400 0
11106401 567. 90
11106501 136010000 10000          1 1 0.4963
4
11106601 000000000 0              0 1 0.4963  4
11106701 0 0. 0. 0. 4
11106801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 6 for pts transition zone
*11107000 4 30 2 1 2.068
*11107100 0 1
*11107101 29 2.267
*11107201 1  29
*11107301 0. 29
*11107400 0
*11107401 567. 30
*11107501 177010000 10000          1 1 0.016
4
*11107601 000000000 0              0 1 0.016  4
*11107701 0 0. 0. 0. 4
*11107801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 6 for pts transition zone
11107000 4 90 1 1 1.993
11107100 0 1
11107101  4    2.0
11107102  85   2.285
11107201  2    4
11107202  1    89
11107301 0. 89
11107400 0
11107401 567. 90
11107501 177010000 10000          1 1 0.4963
4
11107601 000000000 0              0 1 0.4963  4
11107701 0 0. 0. 0. 4
11107801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 7 for pts sit 4
*11108000 4 30 2 1 2.068
*11108100 0 1
*11108101 29 2.267
*11108201 1  29
*11108301 0. 29
*11108400 0
*11108401 567. 30
*11108501 137010000 10000          1 1 0.016
4
*11108601 000000000 0              0 1 0.016  4
*11108701 0 0. 0. 0. 4
*11108801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 7 for pts sit 4
11108000 4 90 1 1 1.993
11108100 0 1
11108101  4    2.0
11108102  85   2.285
11108201  2    4
11108202  1    89
11108301 0. 89
11108400 0
11108401 567. 90
```

```
11108501 137010000 10000          1 1 0.1353
4
11108601 000000000 0              0 1 0.1353  4
11108701 0 0. 0. 0. 4
11108801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 8 for pts cl 4
*11109000 4 30 2 1 2.068
*11109100 0 1
*11109101 29 2.267
*11109201 1  29
*11109301 0. 29
*11109400 0
*11109401 567. 30
*11109501 138010000 10000         1 1 0.016
4
*11109601 000000000 0             0 1 0.016  4
*11109701 0 0. 0. 0. 4
*11109801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 8 for pts cl 4
11109000 4 90 1 1 1.993
11109100 0 1
11109101  4    2.0
11109102  85   2.285
11109201  2    4
11109202  1    89
11109301 0. 89
11109400 0
11109401 567. 90
11109501 138010000 10000          1 1 0.4963
4
11109601 000000000 0              0 1 0.4963  4
11109701 0 0. 0. 0. 4
11109801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
*
* rpv bot & top plates
*11113000 2 5  1 1 0.
*11113100 0 1
*11113101 4 0.24
*11113201 1  4
*11113301 0. 4
*11113400 0
*11113401 567. 5
*11113501 100010000 0 1 1 15.    1
*11113502 162010000 0 1 1 15.    2
*11113601 000000000 0 0 1 15.    2
*11113701 0 0. 0. 0. 2
*11113801 0. 100. 100. 0. 0. 0. 0. 1. 2
*
*
* rpv bot plate
11111000 1 50 1 1 0.
11111100 0 1
11111101 1 0.004979
11111102 48 0.244
11111201 2  1
11111202 1  49
11111301 0. 49
11111400 0
11111401 567. 50
11111501 100010000 0 1 1 15.    1
11111601 000000000 0 0 1 15.    1
11111701 0 0. 0. 0. 1
11111801 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* rpv top plate
11112000 1 50 1 1 0.
11112100 0 1
11112101 1 0.005959
11112102 48 0.292
11112201 2  1
11112202 1  49
11112301 0. 49
11112400 0
11112401 567. 50
11112501 162010000 0 1 1 15.    1
11112601 000000000 0 0 1 15.    1
11112701 0 0. 0. 0. 1
11112801 0. 100. 100. 0. 0. 0. 0. 1. 1
*
*
* core barrel shell
11202000 31  5  2 1 1.75
11202100 0 1
11202101 4 1.81
11202201 1  4
11202301 0. 4
11202400 0
11202401 567. 5
11202501 105010000 10000        1 1 0.4    3
11202502 106010000 0            1 1 0.32   4
11202503 120010000 10000        1 1 0.25   17
11202504 121010000 0            1 1 0.28   18
11202505 141010000 0            1 1 0.32   19
11202506 142010000 0            1 1 0.30   20
11202507 144010000 0            1 1 0.42   21
11202508 145010000 0            1 1 0.3    22
11202509 146010000 0            1 1 0.33   23
11202510 150080000 -10000       1 1 0.325  31
11202601 130190000 -10000       1 1 0.4    3
11202602 130160000 0            1 1 0.32   4
11202603 130150000 -10000       1 1 0.25   17
11202604 130020000 0            1 1 0.28   18
11202605 130010000 00000        1 1 0.32   19
11202606 139010000 0            1 1 0.30   20
11202607 131010000 0            1 1 0.42   21
11202608 132010000 0            1 1 0.3    22
11202609 132020000 00000        1 1 0.33   23
11202610 170010000 10000        1 1 0.325  31
11202701 0 0. 0. 0. 31
11202801 0. 100. 100. 0. 0. 0. 0. 1. 31
11202901 0. 100. 100. 0. 0. 0. 0. 1. 31
*
* up barrel
11203000 19  5  2 1 1.6
11203100 0 1
11203101 4 1.65
11203201 1  4
11203301 0. 4
11203400 0
11203401 567. 5
11203501 141010000 0            1 1 0.32   1
11203502 142010000 0            1 1 0.30   2
11203503 143010000 10000        1 1 0.25   6
11203504 144010000 0            1 1 0.42   7
11203505 145010000 0            1 1 0.3    8
11203506 146010000 0            1 1 0.33   9
11203507 147010000 0            1 1 0.42   10
11203508 148010000 0            1 1 0.33   11
11203509 150010000 10000        1 1 0.325  19
11203601 000000000 0            0 1 0.32   1
11203602 000000000 0            0 1 0.30   2
11203603 000000000 0            0 1 0.25   6
11203604 000000000 0            0 1 0.42   7
11203605 000000000 0            0 1 0.3    8
11203606 000000000 0            0 1 0.33   9
11203607 000000000 0            0 1 0.42   10
11203608 000000000 0            0 1 0.33   11
11203609 000000000 0            0 1 0.325  19
11203701 0 0. 0. 0. 19
11203801 0. 100. 100. 0. 0. 0. 0. 1. 19
*
* core barrel part - 1 (pts cl 1)
11192000 4  10  1 1 1.75
11192100 0 1
11192101 9 1.81
11192201 1  9
11192301 0. 9
11192400 0
11192401 567. 10
11192501 143010000  10000        1 1 0.4272
4
11192601 133040000 -10000        1 1 0.4272
4
11192701 0 0. 0. 0. 4
11192801 0. 100. 100. 0. 0. 0. 0. 1. 4
11192901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 2 (pts transition zone)
11193000 4  10  1 1 1.75
11193100 0 1
11193101 9 1.81
11193201 1  9
11193301 0. 9
11193400 0
11193401 567. 10
11193501 143010000  10000        1 1 0.4272
4
11193601 176040000 -10000        1 1 0.4272
4
11193701 0 0. 0. 0. 4
11193801 0. 100. 100. 0. 0. 0. 0. 1. 4
11193901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 3 (pts sit 3)
11194000 4  10  1 1 1.75
11194100 0 1
11194101 9 1.81
11194201 1  9
11194301 0. 9
11194400 0
11194401 567. 10
11194501 143010000  10000        1 1 0.0777
4
11194601 134040000 -10000        1 1 0.0777
4
11194701 0 0. 0. 0. 4
11194801 0. 100. 100. 0. 0. 0. 0. 1. 4
11194901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 4 (pts cl2)
11195000 4  10  1 1 1.75
11195100 0 1
11195101 9 1.81
11195201 1  9
11195301 0. 9
11195400 0
11195401 567. 10
11195501 143010000  10000        1 1 0.4272
4
11195601 135040000 -10000        1 1 0.4272
4
11195701 0 0. 0. 0. 4
11195801 0. 100. 100. 0. 0. 0. 0. 1. 4
```

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11195901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 5 (pts cl3)
11196000 4  10  1 1 1.75
11196100 0 1
11196101 9 1.81
11196201 1  9
11196301 0. 9
11196400 0
11196401 567. 10
11196501 143010000  10000        1 1 0.4272
4
11196601 136040000 -10000        1 1 0.4272
4
11196701 0 0. 0. 0. 4
11196801 0. 100. 100. 0. 0. 0. 0. 1. 4
11196901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 6 (pts transition zone)
11197000 4  10  1 1 1.75
11197100 0 1
11197101 9 1.81
11197201 1  9
11197301 0. 9
11197400 0
11197401 567. 10
11197501 143010000  10000        1 1 0.4272
4
11197601 177040000 -10000        1 1 0.4272
4
11197701 0 0. 0. 0. 4
11197801 0. 100. 100. 0. 0. 0. 0. 1. 4
11197901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 7 (pts sit 4)
11198000 4  10  1 1 1.75
11198100 0 1
11198101 9 1.81
11198201 1  9
11198301 0. 9
11198400 0
11198401 567. 10
11198501 143010000  10000        1 1 0.0777
4
11198601 137040000 -10000        1 1 0.0777
4
11198701 0 0. 0. 0. 4
11198801 0. 100. 100. 0. 0. 0. 0. 1. 4
11198901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 8 (pts cl4)
11199000 4  10  1 1 1.75
11199100 0 1
11199101 9 1.81
11199201 1  9
11199301 0. 9
11199400 0
11199401 567. 10
11199501 143010000  10000        1 1 0.4272
4
11199601 138040000 -10000        1 1 0.4272
4
11199701 0 0. 0. 0. 4
11199801 0. 100. 100. 0. 0. 0. 0. 1. 4
11199901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 1 (pts cl 1)
*11192000 4  10  2 1 1.75
*11192100 0 1
*11192101 9 1.81
*11192201 1  9
*11192301 0. 9
*11192400 0
*11192401 567. 10
*11192501 143010000  10000        1 1 0.046
4
*11192601 133040000 -10000        1 1 0.046
4
*11192701 0 0. 0. 0. 4
*11192801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11192901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 2 (pts transition zone)
*11193000 4  10  2 1 1.75
*11193100 0 1
*11193101 9 1.81
*11193201 1  9
*11193301 0. 9
*11193400 0
*11193401 567. 10
*11193501 143010000  10000        1 1 0.046
4
*11193601 176040000 -10000        1 1 0.046
4
*11193701 0 0. 0. 0. 4
*11193801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11193901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 3 (pts sit 3)
*11194000 4  10  2 1 1.75
*11194100 0 1
*11194101 9 1.81
*11194201 1  9
*11194301 0. 9
*11194400 0
*11194401 567. 10
*11194501 143010000  10000        1 1 0.046
4
*11194601 134040000 -10000        1 1 0.046
4
*11194701 0 0. 0. 0. 4
*11194801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11194901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 4 (pts cl2)
*11195000 4  10  2 1 1.75
*11195100 0 1
*11195101 9 1.81
*11195201 1  9
*11195301 0. 9
*11195400 0
*11195401 567. 10
*11195501 143010000  10000        1 1 0.046
4
*11195601 135040000 -10000        1 1 0.046
4
*11195701 0 0. 0. 0. 4
*11195801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11195901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 5 (pts cl3)
*11196000 4  10  2 1 1.75
*11196100 0 1
*11196101 9 1.81
*11196201 1  9
*11196301 0. 9
*11196400 0
*11196401 567. 10
*11196501 143010000  10000        1 1 0.046
4
*11196601 136040000 -10000        1 1 0.046
4
*11196701 0 0. 0. 0. 4
*11196801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11196901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 6 (pts transition zone)
*11197000 4  10  2 1 1.75
*11197100 0 1
*11197101 9 1.81
*11197201 1  9
*11197301 0. 9
*11197400 0
*11197401 567. 10
*11197501 143010000  10000        1 1 0.046
4
*11197601 177040000 -10000        1 1 0.046
4
*11197701 0 0. 0. 0. 4
*11197801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11197901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 7 (pts sit 4)
*11198000 4  10  2 1 1.75
*11198100 0 1
*11198101 9 1.81
*11198201 1  9
*11198301 0. 9
*11198400 0
*11198401 567. 10
*11198501 143010000  10000        1 1 0.046
4
*11198601 137040000 -10000        1 1 0.046
4
*11198701 0 0. 0. 0. 4
*11198801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11198901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 8 (pts cl4)
*11199000 4  10  2 1 1.75
*11199100 0 1
*11199101 9 1.81
*11199201 1  9
*11199301 0. 9
*11199400 0
*11199401 567. 10
*11199501 143010000  10000        1 1 0.046
4
*11199601 138040000 -10000        1 1 0.046
4
*11199701 0 0. 0. 0. 4
*11199801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11199901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* up barrel top plates
11211000 2 5  1 1 0.
11211100 0 1
11211101 4 0.12
11211201 1  4
11211301 0. 4
11211400 0
11211401 567. 5
11211501 150010000 0 1 1 4.7    1
11211502 148010000 0 1 1 4.7    2
11211601 155010000 0 1 1 4.7    1
11211602 150080000 0 1 1 4.7    2
11211701 0 0. 0. 0. 2
```

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11211801 0. 100. 100. 0. 0. 0. 0. 1. 2
11211901 0. 100. 100. 0. 0. 0. 0. 1. 2
*
* core bottom support plate
11212000 1 5  1 1 0.
11212100 0 1
11212101 4 0.10
11212201 1  4
11212301 0. 4
11212400 0
11212401 567. 5
11212501 106010000 0 1 1 4.5    1
11212601 110010000 0 1 1 4.5    1
11212701 0 0. 0. 0. 1
11212801 0. 100. 100. 0. 0. 0. 0. 1. 1
11212901 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* core top plate
11213000 1 5  1 1 0.
11213100 0 1
11213101 4 0.10
11213201 1  4
11213301 0. 4
11213400 0
11213401 567. 5
11213501 141010000 0 1 1 4.5    1
11213601 142010000 0 1 1 4.5    1
11213701 0 0. 0. 0. 1
11213801 0. 100. 100. 0. 0. 0. 0. 1. 1
11213901 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* guide tube walls
11251000 18  5  2 1 0.09
11251100 0 1
11251101 4 0.097
11251201 1  4
11251301 0. 4
11251400 0
11251401 567. 5
11251501 180010000 10000       1 1 19.8   8
11251502 180090000 0           1 1 20.1   9
11251503 180100000 0           1 1 25.6   10
11251504 180110000 10000       1 1 18.3   12
11251505 185010000 0           1 1 25.6   13
11251506 190010000 10000       1 1 20.1   18
11251601 150010000 10000       1 1 19.8   8
11251602 148010000 0           1 1 20.1   9
11251603 147010000 0           1 1 25.6   10
11251604 146010000 0           1 1 18.3   11
11251605 145010000 0           1 1 18.3   12
11251606 144010000 0           1 1 25.6   13
11251607 143040000 -10000      1 1 20.1   17
11251608 142010000 0           1 1 20.1   18
11251701 0 0. 0. 0. 18
11251801 0. 100. 100. 0. 0. 0. 0. 1. 18
11251901 0. 100. 100. 0. 0. 0. 0. 1. 18
*
* guide tube bot
11303000 4   5  2 1 0.10
11303100 0 1
11303101 4 0.112
11303201 1  4
11303301 0. 4
11303400 0
11303401 567. 5
11303501 105010000 10000       1 1 128.   3
11303502 106010000 0           1 1 128.   4
11303601 000000000 0           0 1 128.   4
11303701 0 0. 0. 0. 4
11303801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* fuel bundle central - active zone   1/3  of 2
11901000 14 12 2 1 0.0  *  744 1 32
11901100 0 2
11901101 0.00035 2 6.1300e-4 7 6.75e-5 9
3.2500e-4 11
11901201 5   2
11901202 4   7
11901203 5   9
11901204 6   11
11901301 0.  2
11901302 1.  7
11901303 0.  11
11901400 0
11901401 600. 12
11901501 0             0      0  1 4237.75     13
11901502 0             0      0  1 4746.28     14
11901601 110010000  10000       1  1 4237.75
13
11901602 140010000       0       1  1 4746.28
14
11901701 1000  1.1398655e-2        0. 0.  1
11901702 1000  2.4297133e-2        0. 0.  2
11901703 1000  2.5696968e-2        0. 0.  3
11901704 1000  2.8596626e-2        0. 0.  4
11901705 1000  3.2896118e-2        0. 0.  5
11901706 1000  3.7095623e-2        0. 0.  6
11901707 1000  3.9995281e-2        0. 0.  7
11901708 1000  3.9995281e-2        0. 0.  8
11901709 1000  3.7095623e-2        0. 0.  9
11901710 1000  3.2896118e-2        0. 0.  10
11901711 1000  2.8596626e-2        0. 0.  11
11901712 1000  2.5696968e-2        0. 0.  12
11901713 1000  2.4297133e-2        0. 0.  13
11901714 1000  1.1398655e-2        0. 0.  14
11901901 0. 100. 100. 0. 0. 0.1   0.1  1. 14
*
* fuel bundle middle  - active zone  1/3 of core
(+ hot rod power)
11902000 14 12 2 1 0.0  *  744 1 32
11902100 0 2
11902101 0.00035 2 6.1300e-4 7 6.75e-5 9
3.2500e-4 11
11902201 5   2
11902202 4   7
11902203 5   9
11902204 6   11
11902301 0.  2
11902302 1.  7
11902303 0.  11
11902400 0
11902401 600. 12
11902501 0             0      0  1 4238.0     13
11902502 0             0      0  1 4746.56    14
11902601 110010000  10000       1  1 4238.0
13
11902602 140010000       0       1  1 4746.56
14
11902701 1000  0.008401       0. 0.  1
11902702 1000  0.020001       0. 0.  2
11902703 1000  0.021401       0. 0.  3
11902704 1000  0.023601       0. 0.  4
11902705 1000  0.027101       0. 0.  5
11902706 1000  0.030701       0. 0.  6
11902707 1000  0.032901       0. 0.  7
11902708 1000  0.032901       0. 0.  8
11902709 1000  0.030701       0. 0.  9
11902710 1000  0.027101       0. 0.  10
11902711 1000  0.023601       0. 0.  11
11902712 1000  0.021401       0. 0.  12
11902713 1000  0.020001       0. 0.  13
11902714 1000  0.008401       0. 0.  14
11902901 0. 100. 100. 0. 0. 0.05  0.05 1. 14
*
* fuel bundle periph. - active zone  1/3 of core
11903000 14 12 2 1 0.0  *   744 1 32
11903100 0 2
11903101 0.00035 2 6.1300e-4 7 6.75e-5 9
3.2500e-4 11
11903201 5   2
11903202 4   7
11903203 5   9
11903204 6   11
11903301 0.  2
11903302 1.  7
11903303 0.  11
11903400 0
11903401 600. 12
11903501 0             0      0  1 4238.0     13
11903502 0             0      0  1 4746.56    14
11903601 110010000  10000       1  1 4238.0
13
11903602 140010000       0       1  1 4746.56
14
11903701 1000  0.0079       0. 0.  1
11903702 1000  0.0164       0. 0.  2
11903703 1000  0.0172       0. 0.  3
11903704 1000  0.0193       0. 0.  4
11903705 1000  0.0221       0. 0.  5
11903706 1000  0.0250       0. 0.  6
11903707 1000  0.0271       0. 0.  7
11903708 1000  0.0271       0. 0.  8
11903709 1000  0.0250       0. 0.  9
11903710 1000  0.0221       0. 0.  10
11903711 1000  0.0193       0. 0.  11
11903712 1000  0.0172       0. 0.  12
11903713 1000  0.0164       0. 0.  13
11903714 1000  0.0079       0. 0.  14
11903901 0. 100. 100. 0. 0. 0.05  0.05 1. 14
*
* hot rod (attention hot rod power fraction -
1.e-6)
11904000 14 12 2 1 0.0  *  744 1 32
11904100 0 2
11904101 0.00035 2 6.1300e-4 7 6.75e-5 9
3.2500e-4 11
11904201 5   2
11904202 4   7
11904203 5   9
11904204 6   11
11904301 0.  2
11904302 1.  7
11904303 0.  11
11904400 0
11904401 600. 12
11904501 0             0      0  1 0.25       13
11904502 0             0      0  1 0.28       14
11904601 110010000  10000       1  1 0.25
13
11904602 140010000       0       1  1 0.28
14
11904701 1000  0.345e-6       0. 0.  1
11904702 1000  1.867e-6       0. 0.  2
11904703 1000  2.032e-6       0. 0.  3
11904704 1000  2.374e-6       0. 0.  4
11904705 1000  2.882e-6       0. 0.  5
11904706 1000  3.377e-6       0. 0.  6
11904707 1000  3.719e-6       0. 0.  7
```

```
11904708 1000  3.719e-6       0. 0.  8
11904709 1000  3.377e-6       0. 0.  9
11904710 1000  2.882e-6       0. 0.  10
11904711 1000  2.374e-6       0. 0.  11
11904712 1000  2.032e-6       0. 0.  12
11904713 1000  1.867e-6       0. 0.  13
11904714 1000  0.345e-6       0. 0.  14
11904901 0. 100. 100. 0. 0. 0.1   0.1  1. 14
*
* new bypass heat structure
11131000 33  5  2 1 0.0038
11131100 0 1
11131101 4 0.0041
11131201 1  4
11131301 0. 4
11131400 0                              *qui
11131401 567.  5
11131501 113010000 10000       1 1 459.00
13
11131502 113140000 0          1 1 514.08   14
11131503 113150000 10000       1 1 587.52
16
11131504 113170000 0          1 1 449.82   17
11131505 113180000 0          1 1 449.82   18
11131506 113190000 0          1 1 449.82   19
11131507 113200000 0          1 1 449.82   20
11131508 113210000 0          1 1 771.12   21
11131509 113220000 0          1 1 550.80   22
11131510 113230000 0          1 1 605.88   23
11131511 113240000 0          1 1 771.12   24
11131512 113250000 0          1 1 605.88   25
11131513 113260000 10000       1 1 596.70
33
11131601 110010000 10000       1 1 459.00
13
11131602 140010000 0          1 1 514.08   14
11131603 141010000 0          1 1 587.52   15
11131604 142010000 0          1 1 587.52   16
11131605 143010000 0          1 1 449.82   17
11131606 143020000 0          1 1 449.82   18
11131607 143030000 0          1 1 449.82   19
11131608 143040000 0          1 1 449.82   20
11131609 144010000 0          1 1 771.12   21
11131610 145010000 0          1 1 550.80   22
11131611 146010000 0          1 1 605.88   23
11131612 147010000 0          1 1 771.12   24
11131613 148010000 0          1 1 605.88   25
11131614 150080000 -10000      1 1 596.70
33
11131701 0  0. 0. 0. 33
11131801 0. 100. 100. 0. 0. 0. 0. 1. 33
11131901 0. 100. 100. 0. 0. 0. 0. 1. 33
*
*----------------------------------------------------
----------*
*       primary coolant loop1
*
*----------------------------------------------------
----------*
*
* loop1  hl&cl
12001000 43 5 2 1 0.425
12001100 0 1
12001101 4 0.575
12001201 1  4
12001301 0. 4
12001400 0
12001401 567. 5
12001501 200010000 0            1 1 0.4    1
12001502 201010000 10000        1 1 0.75   5
12001503 203010000 00000        1 1 0.8    6
12001504 205010000 10000        1 1 0.75   9
12001505 205050000 10000        1 1 0.6    12
12001506 205070000 00000        1 1 0.34
13
12001507 209010000 22000000       1 1 0.5
15
12001508 233010000 10000        1 1 0.6    17
12001509 233030000 10000        1 1 1.0    23
12001510 233090000 10000        1 1 0.79
29
12001511 233150000 10000        1 1 1.0    31
12001512 233170000 00000        1 1 0.76
32
12001513 241010000 00000        1 1 0.9    33
12001514 243010000 10000        1 1 1.0    38
12001515 245010000 00000        1 1 1.0    39
12001516 247010000 10000        1 1 1.0    41
12001517 247010000 00000        1 1 0.6    42
12001518 250010000 00000        1 1 0.4    43
12001601 000000000 0            0 1 0.4    1
12001602 000000000 00000        0 1 0.75   5
12001603 000000000 00000        0 1 0.8    6
12001604 000000000 00000        0 1 0.75   9
12001605 000000000 00000        0 1 0.6    12
12001606 000000000 00000        0 1 0.34
13
12001607 000000000 00000000       0 1 0.5
15
12001608 000000000 00000        0 1 0.6    17
12001609 000000000 00000        0 1 1.0    23
12001610 000000000 00000        0 1 0.79
29
12001611 000000000 00000        0 1 1.0    31
12001612 000000000 00000        0 1 0.76
32
12001613 000000000 00000        0 1 0.9    33
12001614 000000000 00000        0 1 1.0    38
12001615 000000000 00000        0 1 1.0    39
12001616 000000000 00000        0 1 1.0    41
12001617 000000000 00000        0 1 0.6    42
12001618 000000000 00000        0 1 0.4    43
12001701 0 0. 0. 0. 43
12001801 0. 100. 100. 0. 0. 0. 0. 1. 43
*
* loop1 pu.
12002000 1  5 2 1 1.5000
12002100 0 1
12002101 4 1.65
12002201 1  4
12002301 0. 4
12002400 0
12002401 567. 5
12002501 239010000 0            1 1 1.0    1
12002601 000000000 0            0 1 1.0    1
12002701 0 0. 0. 0. 1
12002801 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* loop1  h & c collectors
12101000 22  5  2 1 0.425
12101100 0 1
12101101 4 0.545
12101201 2  4
12101301 0. 4
12101400 0
12101401 567. 5
12101501 210010000 00000       1 1 0.15   1
12101502 212010000 00000       1 1 0.31   2
12101503 214010000 2000000      1 1 0.29   7
12101504 224010000 10000       1 1 0.25   9
12101505 224030000 10000       1 1 0.65   11
12101506 260010000 0          1 1 0.15   12
12101507 262010000 00000       1 1 0.31   13
12101508 264010000 2000000      1 1 0.29
18
12101509 274040000 -10000      1 1 0.25   20
12101510 274020000 -10000      1 1 0.65   22
12101601 600010000 000000      1 1 0.15   1
12101602 620010000 0          1 1 0.31   2
12101603 620020000 10000       1 1 0.29   7
12101604 621010000 0          1 1 0.25   8
12101605 635010000 000000      1 1 0.25   9
12101606 640010000 0          1 1 0.65   10
12101607 645010000 00000       1 1 0.65   11
12101608 600010000 0          1 1 0.15   12
12101609 630010000 0          1 1 0.31   13
12101610 630020000 0          1 1 0.29   14
12101611 630030000 00000       1 1 0.29   15
12101612 630040000 00000       1 1 0.29   16
12101613 630050000 00000       1 1 0.29   17
12101614 630060000 00000       1 1 0.29   18
12101615 631010000 00000       1 1 0.25   19
12101616 635010000 00000       1 1 0.25   20
12101617 640010000 00000       1 1 0.65   21
12101618 645010000 00000       1 1 0.65   22
12101701 0 0. 0. 0. 22
12101801 0. 100. 100. 0. 0. 0. 0. 1. 22
12101901 0. 100. 100. 0. 0. 0. 0. 1. 22
*
* loop1  sg hor tubes hot package  (1/6 of
11000 = 1833.33 tubes)
12201000 72  5  2 1 0.0065
12201100 0 1
12201101 4 0.0080
12201201 2  4
12201301 0. 4
12201400 0
12201401 567. 5
12201501 213010000 2000000     1 1 366.6  6
12201502 213020000 2000000     1 1 549.9
12
12201503 213030000 2000000     1 1 549.9
18
12201504 213040000 2000000     1 1 733.2
24
12201505 213050000 2000000     1 1 733.2
30
12201506 213060000 2000000     1 1 733.2
36
12201507 213070000 2000000     1 1 916.5
42
12201508 213080000 2000000     1 1 916.5
48
12201509 213090000 2000000     1 1 916.5
54
12201510 213100000 2000000     1 1 1099.8
60
12201511 213110000 2000000     1 1 1283.1
66
12201512 213120000 2000000     1 1 1374.8
72
12201601 620010000 10000       1 1 366.6  6
12201602 620010000 10000       1 1 549.9  12
12201603 620010000 10000       1 1 549.9  18
12201604 620010000 10000       1 1 733.2  24
12201605 620010000 10000       1 1 733.2  30
12201606 620010000 10000       1 1 733.2  36
12201607 620010000 10000       1 1 916.5  42
```

```
12201608 620010000 10000       1 1 916.5  48
12201609 620010000 10000       1 1 916.5  54
12201610 620010000 10000       1 1 1099.8
60
12201611 620010000 10000       1 1 1283.1
66
12201612 620010000 10000       1 1 1374.8
72
12201701 0 0. 0. 0. 72
12201801 0. 100. 100. 0. 0. 0. 0. 1. 72
12201901 0. 100. 100. 0. 0. 0. 0. 1. 72
*
* loop1  sg hor tubes col package  (1/6 of
11000 = 1833.33 tubes)
12202000 36  5  2 1 0.0065
12202100 0 1
12202101 4 0.0080
12202201 2  4
12202301 0. 4
12202400 0
12202401 567. 5
12202501 213130000 2000000     1 1 1374.8
6
12202502 213140000 2000000     1 1 1466.4
12
12202503 213150000 2000000     1 1 1833.0
18
12202504 213160000 2000000     1 1 1833.0
24
12202505 213170000 2000000     1 1 1833.0
30
12202506 213180000 2000000     1 1 1833.0
36
12202601 630010000 10000       1 1 1374.8 6
12202602 630010000 10000       1 1 1466.4
12
12202603 630010000 10000       1 1 1833.  18
12202604 630010000 10000       1 1 1833.  24
12202605 630010000 10000       1 1 1833.  30
12202606 630010000 10000       1 1 1833.  36
12202701 0 0. 0. 0. 36
12202801 0. 100. 100. 0. 0. 0. 0. 1. 36
12202901 0. 100. 100. 0. 0. 0. 0. 1. 36
*
* loop1 sg ss walls
12301000 13 5 2 1 2.0000
12301100 0 1
12301101 4 2.148
12301201 2  4
12301301 0. 4
12301400 0
12301401 567. 5
12301501 601010000 0           1 1 1.18   1
12301502 600010000 00000       1 1 1.30   2
12301503 600010000 00000       1 1 1.30   3
12301504 611010000 00000       1 1 0.6    4
12301505 612010000 00000       1 1 0.6    5
12301506 640010000 00000       1 1 1.56   6
12301507 645010000 00000       1 1 3.67   7
12301508 610010000 10000       1 1 0.555
13
12301601 000000000 0           0 1 1.18   1
12301602 000000000 0           0 1 1.30   2
12301603 000000000 0           0 1 1.30   3
12301604 000000000 0           0 1 0.6    4
12301605 000000000 0           0 1 0.6    5
12301606 000000000 0           0 1 1.56   6
12301607 000000000 0           0 1 3.67   7
12301608 000000000 0           0 1 0.555  13
12301701 0 0. 0. 0. 13
12301801 0. 100. 100. 0. 0. 0. 0. 1. 13
*
* loop1 sg ss main steam line pipes
12401000 6  5 2 1 0.1095
12401100 0 1
12401101 4 0.126
12401201 2  4
12401301 0. 4
12401400 0
12401401 567. 5
12401501 650010000 10000       1 1 4.67   2
12401502 655010000 10000       1 1 4.67   4
12401503 660010000 10000       1 1 4.67   6
12401601 000000000 0           0 1 4.67   2
12401602 000000000 0           0 1 4.67   4
12401603 000000000 0           0 1 4.67   6
12401701 0 0. 0. 0. 6
12401801 0. 100. 100. 0. 0. 0. 0. 1. 6
*
* loop1 sg ss collectors
12501000 3  5 2 1 0.315
12501100 0 1
12501101 4 0.341
12501201 2  4
12501301 0. 4
12501400 0
12501401 567. 5
12501501 665010000 00000       1 1 3.72   1
12501502 670010000 00000       1 1 3.72   2
12501503 675010000 00000       1 1 3.72   3
12501601 000000000 0           0 1 3.72   1
12501602 000000000 0           0 1 3.72   2
12501603 000000000 0           0 1 3.72   3
12501701 0 0. 0. 0. 3
12501801 0. 100. 100. 0. 0. 0. 0. 1. 3
*
* perforated plate
12601000 1 5  1 1 0.
12601100 0 1
12601101 4 0.12
12601201 1  4
12601301 0. 4
12601400 0
12601401 567. 5
12601501 635010000 0 1 1 44.    1
12601601 000000000 0 0 1 44.    1
12601701 0 0. 0. 0. 1
12601801 0. 100. 100. 0. 0. 0. 0. 1. 1
12601901 0. 100. 100. 0. 0. 0. 0. 1. 1
*
*-------------------------------------------------------
---------------*
*       primary coolant loop2
*
*-------------------------------------------------------
---------------*
*
* loop2  hl&cl
13001000 43 5 2 1 0.425
13001100 0 1
13001101 4 0.575
13001201 1  4
13001301 0. 4
13001400 0
13001401 567. 5
13001501 300010000 0           1 1 0.4    1
13001502 301010000 10000       1 1 0.75   5
13001503 303010000 00000       1 1 0.8    6
13001504 305010000 10000       1 1 0.75   9
13001505 305050000 10000       1 1 0.6    12
13001506 305070000 00000       1 1 0.34
13
13001507 309010000 22000000      1 1 0.5
15
13001508 333010000 10000       1 1 0.6    17
13001509 333030000 10000       1 1 1.0    23
13001510 333090000 10000       1 1 0.79
29
13001511 333150000 10000       1 1 1.0    31
13001512 333170000 00000       1 1 0.76
32
13001513 341010000 00000       1 1 0.9    33
13001514 343010000 10000       1 1 1.0    38
13001515 345010000 00000       1 1 1.0    39
13001516 347010000 10000       1 1 1.0    41
13001517 347010000 00000       1 1 0.6    42
13001518 350010000 00000       1 1 0.4    43
13001601 000000000 0           0 1 0.4    1
13001602 000000000 00000       0 1 0.75   5
13001603 000000000 00000       0 1 0.8    6
13001604 000000000 00000       0 1 0.75   9
13001605 000000000 00000       0 1 0.6    12
13001606 000000000 00000       0 1 0.34
13
13001607 000000000 00000000      0 1 0.5
15
13001608 000000000 00000       0 1 0.6    17
13001609 000000000 00000       0 1 1.0    23
13001610 000000000 00000       0 1 0.79
29
13001611 000000000 00000       0 1 1.0    31
13001612 000000000 00000       0 1 0.76
32
13001613 000000000 00000       0 1 0.9    33
13001614 000000000 00000       0 1 1.0    38
13001615 000000000 00000       0 1 1.0    39
13001616 000000000 00000       0 1 1.0    41
13001617 000000000 00000       0 1 0.6    42
13001618 000000000 00000       0 1 0.4    43
13001701 0 0. 0. 0. 43
13001801 0. 100. 100. 0. 0. 0. 0. 1. 43
*
* loop2 pu.
13002000 1  5 2 1 1.5000
13002100 0 1
13002101 4 1.65
13002201 1  4
13002301 0. 4
13002400 0
13002401 567. 5
13002501 339010000 0           1 1 1.0    1
13002601 000000000 0           0 1 1.0    1
13002701 0 0. 0. 0. 1
13002801 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* loop2  h & c collectors
13101000 22  5  2 1 0.425
13101100 0 1
13101101 4 0.545
13101201 2  4
13101301 0. 4
13101400 0
13101401 567. 5
13101501 310010000 00000       1 1 0.15   1
13101502 312010000 00000       1 1 0.31   2
13101503 314010000 2000000     1 1 0.29   7
13101504 324010000 10000       1 1 0.25   9
13101505 324030000 10000       1 1 0.65   11
```

```
13101506 360010000 0          1 1 0.15   12
13101507 362010000 00000      1 1 0.31   13
13101508 364010000 2000000    1 1 0.29
18
13101509 374040000 -10000     1 1 0.25   20
13101510 374020000 -10000     1 1 0.65   22
13101601 700010000 000000     1 1 0.15   1
13101602 720010000 0          1 1 0.31   2
13101603 720020000 10000      1 1 0.29   7
13101604 721010000 0          1 1 0.25   8
13101605 735010000 000000     1 1 0.25   9
13101606 740010000 0          1 1 0.65   10
13101607 745010000 00000      1 1 0.65   11
13101608 700010000 0          1 1 0.15   12
13101609 730010000 0          1 1 0.31   13
13101610 730020000 0          1 1 0.29   14
13101611 730030000 00000      1 1 0.29   15
13101612 730040000 00000      1 1 0.29   16
13101613 730050000 00000      1 1 0.29   17
13101614 730060000 00000      1 1 0.29   18
13101615 731010000 00000      1 1 0.25   19
13101616 735010000 00000      1 1 0.25   20
13101617 740010000 00000      1 1 0.65   21
13101618 745010000 00000      1 1 0.65   22
13101701 0 0. 0. 0. 22
13101801 0. 100. 100. 0. 0. 0. 0. 1. 22
13101901 0. 100. 100. 0. 0. 0. 0. 1. 22
*
* loop2  sg hor tubes hot package  (1/6 of
11000 = 1833.33 tubes)
13201000 72  5  2 1 0.0065
13201100 0 1
13201101 4 0.0080
13201201 2  4
13201301 0. 4
13201400 0
13201401 567. 5
13201501 313010000 2000000    1 1 366.6  6
13201502 313020000 2000000    1 1 549.9
12
13201503 313030000 2000000    1 1 549.9
18
13201504 313040000 2000000    1 1 733.2
24
13201505 313050000 2000000    1 1 733.2
30
13201506 313060000 2000000    1 1 733.2
36
13201507 313070000 2000000    1 1 916.5
42
13201508 313080000 2000000    1 1 916.5
48
13201509 313090000 2000000    1 1 916.5
54
13201510 313100000 2000000    1 1 1099.8
60
13201511 313110000 2000000    1 1 1283.1
66
13201512 313120000 2000000    1 1 1374.8
72
13201601 720010000 10000      1 1 366.6  6
13201602 720010000 10000      1 1 549.9  12
13201603 720010000 10000      1 1 549.9  18
13201604 720010000 10000      1 1 733.2  24
13201605 720010000 10000      1 1 733.2  30
13201606 720010000 10000      1 1 733.2  36
13201607 720010000 10000      1 1 916.5  42
13201608 720010000 10000      1 1 916.5  48
13201609 720010000 10000      1 1 916.5  54
13201610 720010000 10000      1 1 1099.8
60
13201611 720010000 10000      1 1 1283.1
66
13201612 720010000 10000      1 1 1374.8
72
13201701 0 0. 0. 0. 72
13201801 0. 100. 100. 0. 0. 0. 0. 1. 72
13201901 0. 100. 100. 0. 0. 0. 0. 1. 72
*
* loop2  sg hor tubes col package  (1/6 of
11000 = 1833.33 tubes)
13202000 36  5  2 1 0.0065
13202100 0 1
13202101 4 0.0080
13202201 2  4
13202301 0. 4
13202400 0
13202401 567. 5
13202501 313130000 2000000    1 1 1374.8
6
13202502 313140000 2000000    1 1 1466.4
12
13202503 313150000 2000000    1 1 1833.0
18
13202504 313160000 2000000    1 1 1833.0
24
13202505 313170000 2000000    1 1 1833.0
30
13202506 313180000 2000000    1 1 1833.0
36
13202601 730010000 10000      1 1 1374.8 6
13202602 730010000 10000      1 1 1466.4
12
13202603 730010000 10000      1 1 1833.  18
13202604 730010000 10000      1 1 1833.  24
13202605 730010000 10000      1 1 1833.  30
13202606 730010000 10000      1 1 1833.  36
13202701 0 0. 0. 0. 36
13202801 0. 100. 100. 0. 0. 0. 0. 1. 36
13202901 0. 100. 100. 0. 0. 0. 0. 1. 36
*
* loop2 sg ss walls
13301000 13 5 2 1 2.0000
13301100 0 1
13301101 4 2.148
13301201 2  4
13301301 0. 4
13301400 0
13301401 567. 5
13301501 701010000 0          1 1 1.18   1
13301502 700010000 00000      1 1 1.30   2
13301503 700010000 00000      1 1 1.30   3
13301504 711010000 00000      1 1 0.6    4
13301505 712010000 00000      1 1 0.6    5
13301506 740010000 00000      1 1 1.56   6
13301507 745010000 00000      1 1 3.67   7
13301508 710010000 10000      1 1 0.555
13
13301601 000000000 0          0 1 1.18   1
13301602 000000000 0          0 1 1.30   2
13301603 000000000 0          0 1 1.30   3
13301604 000000000 0          0 1 0.6    4
13301605 000000000 0          0 1 0.6    5
13301606 000000000 0          0 1 1.56   6
13301607 000000000 0          0 1 3.67   7
13301608 000000000 0          0 1 0.555  13
13301701 0 0. 0. 0. 13
13301801 0. 100. 100. 0. 0. 0. 0. 1. 13
*
* loop2 sg ss main steam line pipes
13401000 6  5 2 1 0.1095
13401100 0 1
13401101 4 0.126
13401201 2  4
13401301 0. 4
13401400 0
13401401 567. 5
13401501 750010000 10000      1 1 4.67   2
13401502 755010000 10000      1 1 4.67   4
13401503 760010000 10000      1 1 4.67   6
13401601 000000000 0          0 1 4.67   2
13401602 000000000 0          0 1 4.67   4
13401603 000000000 0          0 1 4.67   6
13401701 0 0. 0. 0. 6
13401801 0. 100. 100. 0. 0. 0. 0. 1. 6
*
* loop2 sg ss collectors
13501000 3  5 2 1 0.315
13501100 0 1
13501101 4 0.341
13501201 2  4
13501301 0. 4
13501400 0
13501401 567. 5
13501501 765010000 00000      1 1 3.72   1
13501502 770010000 00000      1 1 3.72   2
13501503 775010000 00000      1 1 3.72   3
13501601 000000000 0          0 1 3.72   1
13501602 000000000 0          0 1 3.72   2
13501603 000000000 0          0 1 3.72   3
13501701 0 0. 0. 0. 3
13501801 0. 100. 100. 0. 0. 0. 0. 1. 3
*
* perforated plate
13601000 1 5  1 1 0.
13601100 0 1
13601101 4 0.12
13601201 1  4
13601301 0. 4
13601400 0
13601401 567. 5
13601501 735010000 0 1 1 44.    1
13601601 000000000 0 0 1 44.    1
13601701 0 0. 0. 0. 1
13601801 0. 100. 100. 0. 0. 0. 0. 1. 1
13601901 0. 100. 100. 0. 0. 0. 0. 1. 1
*
*-------------------------------------------------------
---------------*
*       primary coolant loop3
*
*-------------------------------------------------------
---------------*
*
* loop3  hl&cl
14001000 43 5 2 1 0.425
14001100 0 1
14001101 4 0.575
14001201 1  4
14001301 0. 4
14001400 0
14001401 567. 5
14001501 400010000 0          1 1 0.4    1
14001502 401010000 10000      1 1 0.75   5
14001503 403010000 00000      1 1 0.8    6
14001504 405010000 10000      1 1 0.75   9
14001505 405050000 10000      1 1 0.6    12
```

```
14001506 405070000 00000         1 1 0.34
13
14001507 409010000 22000000      1 1 0.5
15
14001508 433010000 10000         1 1 0.6   17
14001509 433030000 10000         1 1 1.0   23
14001510 433090000 10000         1 1 0.79
29
14001511 433150000 10000         1 1 1.0   31
14001512 433170000 00000         1 1 0.76
32
14001513 441010000 00000         1 1 0.9   33
14001514 443010000 10000         1 1 1.0   38
14001515 445010000 00000         1 1 1.0   39
14001516 447010000 10000         1 1 1.0   41
14001517 447010000 00000         1 1 0.6   42
14001518 450010000 00000         1 1 0.4   43
14001601 000000000 0             0 1 0.4   1
14001602 000000000 00000         0 1 0.75  5
14001603 000000000 00000         0 1 0.8   6
14001604 000000000 00000         0 1 0.75  9
14001605 000000000 00000         0 1 0.6   12
14001606 000000000 00000         0 1 0.34
13
14001607 000000000 00000000      0 1 0.5
15
14001608 000000000 00000         0 1 0.6   17
14001609 000000000 00000         0 1 1.0   23
14001610 000000000 00000         0 1 0.79
29
14001611 000000000 00000         0 1 1.0   31
14001612 000000000 00000         0 1 0.76
32
14001613 000000000 00000         0 1 0.9   33
14001614 000000000 00000         0 1 1.0   38
14001615 000000000 00000         0 1 1.0   39
14001616 000000000 00000         0 1 1.0   41
14001617 000000000 00000         0 1 0.6   42
14001618 000000000 00000         0 1 0.4   43
14001701 0 0. 0. 0. 43
14001801 0. 100. 100. 0. 0. 0. 0. 1. 43
*
* loop3 pu.
14002000 1  5 2 1 1.5000
14002100 0 1
14002101 4 1.65
14002201 1  4
14002301 0. 4
14002400 0
14002401 567. 5
14002501 439010000 0             1 1 1.0   1
14002601 000000000 0             0 1 1.0   1
14002701 0 0. 0. 0. 1
14002801 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* loop3  h & c collectors
14101000 22  5  2 1 0.425
14101100 0 1
14101101 4 0.545
14101201 2  4
14101301 0. 4
14101400 0
14101401 567. 5
14101501 410010000 00000         1 1 0.15  1
14101502 412010000 00000         1 1 0.31  2
14101503 414010000 2000000       1 1 0.29  7
14101504 424010000 10000         1 1 0.25  9
14101505 424030000 10000         1 1 0.65  11
14101506 460010000 0             1 1 0.15  12
14101507 462010000 00000         1 1 0.31  13
14101508 464010000 2000000       1 1 0.29
18
14101509 474040000 -10000        1 1 0.25  20
14101510 474020000 -10000        1 1 0.65  22
14101601 800010000 000000        1 1 0.15  1
14101602 820010000 0             1 1 0.31  2
14101603 820020000 10000         1 1 0.29  7
14101604 821010000 0             1 1 0.25  8
14101605 835010000 000000        1 1 0.25  9
14101606 840010000 0             1 1 0.65  10
14101607 845010000 00000         1 1 0.65  11
14101608 800010000 0             1 1 0.15  12
14101609 830010000 0             1 1 0.31  13
14101610 830020000 0             1 1 0.29  14
14101611 830030000 00000         1 1 0.29  15
14101612 830040000 00000         1 1 0.29  16
14101613 830050000 00000         1 1 0.29  17
14101614 830060000 00000         1 1 0.29  18
14101615 831010000 00000         1 1 0.25  19
14101616 835010000 00000         1 1 0.25  20
14101617 840010000 00000         1 1 0.65  21
14101618 845010000 00000         1 1 0.65  22
14101701 0 0. 0. 0. 22
14101801 0. 100. 100. 0. 0. 0. 0. 1. 22
14101901 0. 100. 100. 0. 0. 0. 0. 1. 22
*
* loop3  sg hor tubes hot package  (1/6 of
11000 = 1833.33 tubes)
14201000 72  5  2 1 0.0065
14201100 0 1
14201101 4 0.0080
14201201 2  4
14201301 0. 4
14201400 0
14201401 567. 5
14201501 413010000 2000000       1 1 366.6  6
14201502 413020000 2000000       1 1 549.9
12
14201503 413030000 2000000       1 1 549.9
18
14201504 413040000 2000000       1 1 733.2
24
14201505 413050000 2000000       1 1 733.2
30
14201506 413060000 2000000       1 1 733.2
36
14201507 413070000 2000000       1 1 916.5
42
14201508 413080000 2000000       1 1 916.5
48
14201509 413090000 2000000       1 1 916.5
54
14201510 413100000 2000000       1 1 1099.8
60
14201511 413110000 2000000       1 1 1283.1
66
14201512 413120000 2000000       1 1 1374.8
72
14201601 820010000 10000         1 1 366.6  6
14201602 820010000 10000         1 1 549.9  12
14201603 820010000 10000         1 1 549.9  18
14201604 820010000 10000         1 1 733.2  24
14201605 820010000 10000         1 1 733.2  30
14201606 820010000 10000         1 1 733.2  36
14201607 820010000 10000         1 1 916.5  42
14201608 820010000 10000         1 1 916.5  48
14201609 820010000 10000         1 1 916.5  54
14201610 820010000 10000         1 1 1099.8
60
14201611 820010000 10000         1 1 1283.1
66
14201612 820010000 10000         1 1 1374.8
72
14201701 0 0. 0. 0. 72
14201801 0. 100. 100. 0. 0. 0. 0. 1. 72
14201901 0. 100. 100. 0. 0. 0. 0. 1. 72
*
* loop3  sg hor tubes col package  (1/6 of
11000 = 1833.33 tubes)
14202000 36  5  2 1 0.0065
14202100 0 1
14202101 4 0.0080
14202201 2  4
14202301 0. 4
14202400 0
14202401 567. 5
14202501 413130000 2000000       1 1 1374.8
6
14202502 413140000 2000000       1 1 1466.4
12
14202503 413150000 2000000       1 1 1833.0
18
14202504 413160000 2000000       1 1 1833.0
24
14202505 413170000 2000000       1 1 1833.0
30
14202506 413180000 2000000       1 1 1833.0
36
14202601 830010000 10000         1 1 1374.8 6
14202602 830010000 10000         1 1 1466.4
12
14202603 830010000 10000         1 1 1833.  18
14202604 830010000 10000         1 1 1833.  24
14202605 830010000 10000         1 1 1833.  30
14202606 830010000 10000         1 1 1833.  36
14202701 0 0. 0. 0. 36
14202801 0. 100. 100. 0. 0. 0. 0. 1. 36
14202901 0. 100. 100. 0. 0. 0. 0. 1. 36
*
* loop3 sg ss walls
14301000 13 5 2 1 2.0000
14301100 0 1
14301101 4 2.148
14301201 2  4
14301301 0. 4
14301400 0
14301401 567. 5
14301501 801010000 0             1 1 1.18  1
14301502 800010000 00000         1 1 1.30  2
14301503 800010000 00000         1 1 1.30  3
14301504 811010000 00000         1 1 0.6   4
14301505 812010000 00000         1 1 0.6   5
14301506 840010000 00000         1 1 1.56  6
14301507 845010000 00000         1 1 3.67  7
14301508 810010000 10000         1 1 0.555
13
14301601 000000000 0             0 1 1.18  1
14301602 000000000 0             0 1 1.30  2
14301603 000000000 0             0 1 1.30  3
14301604 000000000 0             0 1 0.6   4
14301605 000000000 0             0 1 0.6   5
14301606 000000000 0             0 1 1.56  6
14301607 000000000 0             0 1 3.67  7
14301608 000000000 0             0 1 0.555 13
14301701 0 0. 0. 0. 13
14301801 0. 100. 100. 0. 0. 0. 0. 1. 13
*
* loop3 sg ss main steam line pipes
```

```
14401000 6  5 2 1 0.1095
14401100 0 1
14401101 4 0.126
14401201 2  4
14401301 0. 4
14401400 0
14401401 567. 5
14401501 850010000 10000        1 1 4.67   2
14401502 855010000 10000        1 1 4.67   4
14401503 860010000 10000        1 1 4.67   6
14401601 000000000 0            0 1 4.67   2
14401602 000000000 0            0 1 4.67   4
14401603 000000000 0            0 1 4.67   6
14401701 0 0. 0. 0. 6
14401801 0. 100. 100. 0. 0. 0. 0. 1. 6
*
* loop3 sg ss collectors
14501000 3  5 2 1 0.315
14501100 0 1
14501101 4 0.341
14501201 2  4
14501301 0. 4
14501400 0
14501401 567. 5
14501501 865010000 00000        1 1 3.72   1
14501502 870010000 00000        1 1 3.72   2
14501503 875010000 00000        1 1 3.72   3
14501601 000000000 0            0 1 3.72   1
14501602 000000000 0            0 1 3.72   2
14501603 000000000 0            0 1 3.72   3
14501701 0 0. 0. 0. 3
14501801 0. 100. 100. 0. 0. 0. 0. 1. 3
*
* perforated plate
14601000 1 5  1 1 0.
14601100 0 1
14601101 4 0.12
14601201 1  4
14601301 0. 4
14601400 0
14601401 567. 5
14601501 835010000 0 1 1 44.    1
14601601 000000000 0 0 1 44.    1
14601701 0 0. 0. 0. 1
14601801 0. 100. 100. 0. 0. 0. 0. 1. 1
14601901 0. 100. 100. 0. 0. 0. 0. 1. 1
*
*-------------------------------------------------------
----------*
*       primary coolant loop4
*
*-------------------------------------------------------
----------*
*
* loop4  hl&cl
15001000 43 5 2 1 0.425
15001100 0 1
15001101 4 0.575
15001201 1  4
15001301 0. 4
15001400 0
15001401 567. 5
15001501 500010000 0            1 1 0.4    1
15001502 501010000 10000        1 1 0.75   5
15001503 503010000 00000        1 1 0.8    6
15001504 505010000 10000        1 1 0.75   9
15001505 505050000 10000        1 1 0.6    12
15001506 505070000 00000        1 1 0.34
13
15001507 509010000 22000000     1 1 0.5
15
15001508 533010000 10000        1 1 0.6    17
15001509 533030000 10000        1 1 1.0    23
15001510 533090000 10000        1 1 0.79
29
15001511 533150000 10000        1 1 1.0    31
15001512 533170000 00000        1 1 0.76
32
15001513 541010000 00000        1 1 0.9    33
15001514 543010000 10000        1 1 1.0    38
15001515 545010000 00000        1 1 1.0    39
15001516 547010000 10000        1 1 1.0    41
15001517 547010000 00000        1 1 0.6    42
15001518 550010000 00000        1 1 0.4    43
15001601 000000000 0            0 1 0.4    1
15001602 000000000 00000        0 1 0.75   5
15001603 000000000 00000        0 1 0.8    6
15001604 000000000 00000        0 1 0.75   9
15001605 000000000 00000        0 1 0.6    12
15001606 000000000 00000        0 1 0.34
13
15001607 000000000 00000000     0 1 0.5
15
15001608 000000000 00000        0 1 0.6    17
15001609 000000000 00000        0 1 1.0    23
15001610 000000000 00000        0 1 0.79
29
15001611 000000000 00000        0 1 1.0    31
15001612 000000000 00000        0 1 0.76
32
15001613 000000000 00000        0 1 0.9    33
15001614 000000000 00000        0 1 1.0    38
15001615 000000000 00000        0 1 1.0    39
15001616 000000000 00000        0 1 1.0    41
15001617 000000000 00000        0 1 0.6    42
15001618 000000000 00000        0 1 0.4    43
15001701 0 0. 0. 0. 43
15001801 0. 100. 100. 0. 0. 0. 0. 1. 43
*
* loop4 pu.
15002000 1  5 2 1 1.5000
15002100 0 1
15002101 4 1.65
15002201 1  4
15002301 0. 4
15002400 0
15002401 567. 5
15002501 539010000 0            1 1 1.0    1
15002601 000000000 0            0 1 1.0    1
15002701 0 0. 0. 0. 1
15002801 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* loop4  h & c collectors
15101000 22  5  2 1 0.425
15101100 0 1
15101101 4 0.545
15101201 2  4
15101301 0. 4
15101400 0
15101401 567. 5
15101501 510010000 00000        1 1 0.15   1
15101502 512010000 00000        1 1 0.31   2
15101503 514010000 2000000      1 1 0.29   7
15101504 524010000 10000        1 1 0.25   9
15101505 524030000 10000        1 1 0.65   11
15101506 560010000 0            1 1 0.15   12
15101507 562010000 00000        1 1 0.31   13
15101508 564010000 2000000      1 1 0.29
18
15101509 574040000 -10000       1 1 0.25   20
15101510 574020000 -10000       1 1 0.65   22
15101601 900010000 000000       1 1 0.15   1
15101602 920010000 0            1 1 0.31   2
15101603 920020000 10000        1 1 0.29   7
15101604 921010000 0            1 1 0.25   8
15101605 935010000 000000       1 1 0.25   9
15101606 940010000 0            1 1 0.65   10
15101607 945010000 00000        1 1 0.65   11
15101608 900010000 0            1 1 0.15   12
15101609 930010000 0            1 1 0.31   13
15101610 930020000 0            1 1 0.29   14
15101611 930030000 00000        1 1 0.29   15
15101612 930040000 00000        1 1 0.29   16
15101613 930050000 00000        1 1 0.29   17
15101614 930060000 00000        1 1 0.29   18
15101615 931010000 00000        1 1 0.25   19
15101616 935010000 00000        1 1 0.25   20
15101617 940010000 00000        1 1 0.65   21
15101618 945010000 00000        1 1 0.65   22
15101701 0 0. 0. 0. 22
15101801 0. 100. 100. 0. 0. 0. 0. 1. 22
15101901 0. 100. 100. 0. 0. 0. 0. 1. 22
*
* loop4  sg hor tubes hot package  (1/6 of
11000 = 1833.33 tubes)
15201000 72  5  2 1 0.0065
15201100 0 1
15201101 4 0.0080
15201201 2  4
15201301 0. 4
15201400 0
15201401 567. 5
15201501 513010000 2000000      1 1 366.6  6
15201502 513020000 2000000      1 1 549.9
12
15201503 513030000 2000000      1 1 549.9
18
15201504 513040000 2000000      1 1 733.2
24
15201505 513050000 2000000      1 1 733.2
30
15201506 513060000 2000000      1 1 733.2
36
15201507 513070000 2000000      1 1 916.5
42
15201508 513080000 2000000      1 1 916.5
48
15201509 513090000 2000000      1 1 916.5
54
15201510 513100000 2000000      1 1 1099.8
60
15201511 513110000 2000000      1 1 1283.1
66
15201512 513120000 2000000      1 1 1374.8
72
15201601 920010000 10000        1 1 366.6  6
15201602 920010000 10000        1 1 549.9  12
15201603 920010000 10000        1 1 549.9  18
15201604 920010000 10000        1 1 733.2  24
15201605 920010000 10000        1 1 733.2  30
15201606 920010000 10000        1 1 733.2  36
15201607 920010000 10000        1 1 916.5  42
15201608 920010000 10000        1 1 916.5  48
15201609 920010000 10000        1 1 916.5  54
15201610 920010000 10000        1 1 1099.8
60
```

```
15201611 920010000 10000       1 1 1283.1
66
15201612 920010000 10000       1 1 1374.8
72
15201701 0 0. 0. 0. 72
15201801 0. 100. 100. 0. 0. 0. 0. 1. 72
15201901 0. 100. 100. 0. 0. 0. 0. 1. 72
*
* loop4  sg hor tubes col package  (1/6 of
11000 = 1833.33 tubes)
15202000 36  5  2 1 0.0065
15202100 0 1
15202101 4 0.0080
15202201 2  4
15202301 0. 4
15202400 0
15202401 567. 5
15202501 513130000 2000000     1 1 1374.8
6
15202502 513140000 2000000     1 1 1466.4
12
15202503 513150000 2000000     1 1 1833.0
18
15202504 513160000 2000000     1 1 1833.0
24
15202505 513170000 2000000     1 1 1833.0
30
15202506 513180000 2000000     1 1 1833.0
36
15202601 930010000 10000       1 1 1374.8 6
15202602 930010000 10000       1 1 1466.4
12
15202603 930010000 10000       1 1 1833.  18
15202604 930010000 10000       1 1 1833.  24
15202605 930010000 10000       1 1 1833.  30
15202606 930010000 10000       1 1 1833.  36
15202701 0 0. 0. 0. 36
15202801 0. 100. 100. 0. 0. 0. 0. 1. 36
15202901 0. 100. 100. 0. 0. 0. 0. 1. 36
*
* loop4 sg ss walls
15301000 13 5 2 1 2.0000
15301100 0 1
15301101 4 2.148
15301201 2  4
15301301 0. 4
15301400 0
15301401 567. 5
15301501 901010000 0           1 1 1.18   1
15301502 900010000 00000       1 1 1.30   2
15301503 900010000 00000       1 1 1.30   3
15301504 911010000 00000       1 1 0.6    4
15301505 912010000 00000       1 1 0.6    5
15301506 940010000 00000       1 1 1.56   6
15301507 945010000 00000       1 1 3.67   7
15301508 910010000 10000       1 1 0.555
13
15301601 000000000 0           0 1 1.18   1
15301602 000000000 0           0 1 1.30   2
15301603 000000000 0           0 1 1.30   3
15301604 000000000 0           0 1 0.6    4
15301605 000000000 0           0 1 0.6    5
15301606 000000000 0           0 1 1.56   6
15301607 000000000 0           0 1 3.67   7
15301608 000000000 0           0 1 0.555  13
15301701 0 0. 0. 0. 13
15301801 0. 100. 100. 0. 0. 0. 0. 1. 13
*
* loop4 sg ss main steam line pipes
15401000 6  5 2 1 0.1095
15401100 0 1
15401101 4 0.126
15401201 2  4
15401301 0. 4
15401400 0
15401401 567. 5
15401501 950010000 10000       1 1 4.67   2
15401502 955010000 10000       1 1 4.67   4
15401503 960010000 10000       1 1 4.67   6
15401601 000000000 0           0 1 4.67   2
15401602 000000000 0           0 1 4.67   4
15401603 000000000 0           0 1 4.67   6
15401701 0 0. 0. 0. 6
15401801 0. 100. 100. 0. 0. 0. 0. 1. 6
*
* loop4 sg ss collectors
15501000 3  5 2 1 0.315
15501100 0 1
15501101 4 0.341
15501201 2  4
15501301 0. 4
15501400 0
15501401 567. 5
15501501 965010000 00000       1 1 3.72   1
15501502 970010000 00000       1 1 3.72   2
15501503 975010000 00000       1 1 3.72   3
15501601 000000000 0           0 1 3.72   1
15501602 000000000 0           0 1 3.72   2
15501603 000000000 0           0 1 3.72   3
15501701 0 0. 0. 0. 3
15501801 0. 100. 100. 0. 0. 0. 0. 1. 3
*
* SL part 1
15511000 84 5 2 1 0.300
15511100 0 1
15511101 4 0.315
15511201 2  4
15511301 0. 4
15511400 0
15511401 567. 5
15511501 680010000 10000       1 1 1.0  12
15511502 780010000 10000       1 1 1.0  24
15511503 880010000 10000       1 1 1.0  36
15511504 980010000 10000       1 1 1.0  48
15511505 682010000 2000000     1 1 2.0  51
15511506 782010000 2000000     1 1 2.0  54
15511507 882010000 2000000     1 1 2.0  57
15511508 982010000 2000000     1 1 2.0  60
15511509 688010000 10000       1 1 1.0  66
15511510 788010000 10000       1 1 1.0  72
15511511 888010000 10000       1 1 1.0  78
15511512 988010000 10000       1 1 1.0  84
15511601 000000000 0           0 1 1.0  12
15511602 000000000 0           0 1 1.0  24
15511603 000000000 0           0 1 1.0  36
15511604 000000000 0           0 1 1.0  48
15511605 000000000 0           0 1 2.0  51
15511606 000000000 0           0 1 2.0  54
15511607 000000000 0           0 1 2.0  57
15511608 000000000 0           0 1 2.0  60
15511609 000000000 0           0 1 1.0  66
15511610 000000000 0           0 1 1.0  72
15511611 000000000 0           0 1 1.0  78
15511612 000000000 0           0 1 1.0  84
15511701 0 0. 0. 0. 84
15511801 0. 100. 100. 0. 0. 0. 0. 1. 84
*
* SL part2
15512000 40 5 2 1 0.300
15512100 0 1
15512101 4 0.315
15512201 2  4
15512301 0. 4
15512400 0
15512401 567. 5
15512501 680130000 10000       1 1 1.0  10
15512502 780130000 10000       1 1 1.0  20
15512503 880130000 10000       1 1 1.0  30
15512504 980130000 10000       1 1 1.0  40
15512601 000000000 0           0 1 1.0  10
15512602 000000000 0           0 1 1.0  20
15512603 000000000 0           0 1 1.0  30
15512604 000000000 0           0 1 1.0  40
15512701 0 0. 0. 0. 40
15512801 0. 100. 100. 0. 0. 0. 0. 1. 40
*
* pipe to turbine
15513000 11 5 2 1 1.26
15513100 0 1
15513101 4 1.28
15513201 2  4
15513301 0. 4
15513400 0
15513401 567. 5
15513501 997010000 00000       1 1 0.56   1
15513502 995010000 10000       1 1 3.     11
15513601 000000000 0           0 1 0.56   1
15513602 000000000 0           0 1 3.     11
15513701 0 0. 0. 0. 11
15513801 0. 100. 100. 0. 0. 0. 0. 1. 11
*
*
* perforated plate
15601000 1 5  1 1 0.
15601100 0 1
15601101 4 0.12
15601201 1  4
15601301 0. 4
15601400 0
15601401 567. 5
15601501 935010000 0 1 1 44.    1
15601601 000000000 0 0 1 44.    1
15601701 0 0. 0. 0. 1
15601801 0. 100. 100. 0. 0. 0. 0. 1. 1
15601901 0. 100. 100. 0. 0. 0. 0. 1. 1
*
*-------------------------------------------------------
---------------*
* material tables
*
*-------------------------------------------------------
---------------*
*
20100100  tbl/fctn  1  1
20100200  tbl/fctn  1  1
20100300  tbl/fctn  1  1
20100400  tbl/fctn  1  1
20100500  tbl/fctn  1  1
20100600  tbl/fctn  1  1
*
* carbon steel conductivity (w/m/k)
20100101    3. 41.90
20100102  273. 51.90
20100103  373. 50.70
20100104  473. 48.20
20100105  573. 46.10
20100106  673. 42.30
20100107  773. 38.20
```

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20100108  873. 34.10
20100109  973. 29.90
20100110 1073. 25.20
20100111 1173. 24.80
20100112 1273. 26.40
20100113 1373. 27.90
20100114 1473. 29.40
20100115 3473. 29.40
*
*     "       heat capacity (j/m3/kg)
20100151    3. 2.82e6
20100152  348. 3.82e6
20100153  448. 4.07e6
20100154  498. 4.14e6
20100155  548. 4.30e6
20100156  598. 4.47e6
20100157  648. 4.60e6
20100158  748. 5.09e6
20100159  848. 5.55e6
20100160  948. 6.04e6
20100161  998. 12.4e6
20100162 1048. 4.90e6
20100163 3148. 4.30e6
*
* stainless steel conductivity (w/m/k)
20100201    3. 13.70
20100202  273. 14.70
20100203  300. 15.20
20100204  350. 16.20
20100205  400. 17.00
20100206  450. 17.70
20100207  500. 18.40
20100208  600. 19.80
20100209  700. 21.20
20100210  800. 22.50
20100211  900. 23.90
20100212 1000. 25.30
20100213 1100. 26.70
20100214 1200. 28.10
20100215 1300. 29.50
20100216 1400. 30.90
20100217 3400. 30.90
*
*     "       heat capacity (j/m3/kg)
20100251    3. 2.01e6
20100252  366. 3.01e6
20100253  422. 3.04e6
20100254  478. 3.04e6
20100255  533. 3.07e6
20100256  589. 3.10e6
20100257  644. 3.14e6
20100258  700. 3.18e6
20100259  755. 3.22e6
20100260  811. 3.27e6
20100261  866. 3.38e6
20100262  922. 3.47e6
20100263  978. 3.54e6
20100264 1033. 3.64e6
20100265 1089. 3.71e6
20100266 1144. 3.77e6
20100267 1200. 3.81e6
20100268 1255. 3.85e6
20100269 3311. 3.88e6
*
* inc 600 conductivity (w/m/k)
20100301   3.    12.
20100302 473.    15.5
20100303 573.    18.1
20100304 700.    20.4
20100305 922.    24.9
20100306 1033.   26.9
20100307 1144.   29.4
20100308 1477.   36.1
20100309 3477.   36.1
*
*       "        heat capacity (j/m3/kg)
20100351   3.   3.46e6
20100352 373.   3.67e6
20100353 473.   3.87e6
20100354 573.   4.05e6
20100355 673.   4.26e6
20100356 3073.  4.36e6
*
* uo2 conductivity (w/m/k)
20100401    3. 8.361
20100402  366. 7.27
20100403  373. 7.18
20100404  473. 6.10
20100405  533. 5.60
20100406  573. 5.31
20100407  623. 4.99
20100408  673. 4.70
20100409  723. 4.45
20100410  773. 4.22
20100411  823. 4.02
20100412  873. 3.84
20100413  923. 3.67
20100414  973. 3.52
20100415 1023. 3.38
20100416 1073. 3.26
20100417 1123. 3.14
20100418 1223. 2.94
20100419 1273. 2.85
20100420 1323. 2.76
20100421 1373. 2.69
20100422 1423. 2.62
20100423 1473. 2.55
20100424 1523. 2.50
20100425 1573. 2.44
20100426 1623. 2.39
20100427 1673. 2.35
20100428 1723. 2.31
20100429 1823. 2.25
20100430 1873. 2.22
20100431 1923. 2.20
20100432 1973. 2.22
20100433 2023. 2.25
20100434 2073. 2.29
20100435 2123. 2.33
20100436 2173. 2.37
20100437 2223. 2.42
20100438 2273. 2.47
20100439 2323. 2.52
20100440 2423. 2.65
20100441 2473. 2.73
20100442 2523. 2.81
20100443 2573. 2.90
20100444 2623. 2.99
20100445 2673. 3.10
20100446 2773. 3.35
20100447 2823. 3.49
20100448 2873. 3.65
20100449 4200. 5.29
*
*     "       heat capacity (j/m3/kg)
20100451    3. 2.31e6
20100452  323. 2.57e6
20100453  373. 2.75e6
20100454  473. 2.92e6
20100455  673. 3.13e6
20100456 1373. 3.44e6
20100457 4700. 6.80e6
*
* gap conductivity (w/m/k)
20100501   3.   0.56
20100502   5000. 0.56
*
*     "       heat capacity (j/m3/kg)
20100551   3.  5.40
20100552   5000. 5.40
*
* zr conductivity (w/m/k)
20100601     3.15   7.
20100602   473.15   1.200438e1
20100603   673.15   1.400510e1
20100604   873.15   1.700793e1
20100605  1073.15   1.900866e1
20100606  1273.15   2.000975e1
20100607  1473.15   2.501085e1
20100608  1673.15   3.001267e1
20100609  1873.15   3.601486e1
20100610  2073.15   4.401777e1
20100611  2273.15   5.502352e1
20100612  3473.15   6.802826e1
*
*     "       heat capacity (j/m3/kg)
20100651     5.3      1.904141e6
20100652  1077.594    2.312171e6
20100653  1185.928    5.712422e6
20100654  1248.428    2.311769e6
20100655  3199.817    2.312171e6
*
*-----------------------------------------------------------
--------------
*   general tables
*-----------------------------------------------------------
-------------
*
* scram table
20290000 reac-t 654
20290001  -1.       0.
20290002   0.       0.
20290003   1.      -5.
20290004   2.     -10.
20290005   3.     -20.
20290006  10.     -50.
20290007   1.e6   -50.
*
* prz heater power table high power
*20291000 power   612
*20291001  -1.      0.
*20291002   0.      0.
*20291003   1.     30.0e6
*20291004   1.e6   30.0e6
*
*
* prz heater power table low power off
*20291100 power   614
*20291101  -1.      0.
*20291102   0.      0.
*20291103   1.     2.52e6
*20291104   1.e6   2.52e6
*
*-----------------------------------------------------------
----------------
* control variables
*-----------------------------------------------------------
----------------
```

```
*
*  pressurizer level part 1
20500100    przlva      sum    1.    0.    1
20500101   0.      0.27    voidf   030010000
20500102           0.40    voidf   030020000
20500103           0.50    voidf   030030000
20500104           0.50    voidf   030040000
20500105           0.50    voidf   030050000
20500106           0.50    voidf   030060000
20500107           0.50    voidf   030070000
20500108           0.50    voidf   030080000
20500109           0.50    voidf   030090000
20500110           0.50    voidf   030100000
20500111           0.50    voidf   030110000
20500112           0.50    voidf   030120000
*
*  pressurizer level part 2
20500200    przlvb      sum    1.    0.    1
20500201   0.      0.50    voidf   030130000
20500202           0.50    voidf   030140000
20500203           0.50    voidf   030150000
20500204           0.50    voidf   030160000
20500205           0.50    voidf   030170000
20500206           0.50    voidf   030180000
20500207           0.50    voidf   030190000
20500208           0.50    voidf   030200000
20500209           0.50    voidf   030210000
20500210           0.50    voidf   030220000
20500211           0.50    voidf   030230000
*
*  pressurizer level
20500300    przlvl      sum    1.    0.    1
20500301   1.      1.    cntrlvar   001
20500302           1.    cntrlvar   002
*
*  pressurizer tempm
20500500    przt      sum    1.    0.    1
20500501   -273.15      0.0625    tempf
030010000
20500502              0.0625    tempf
030020000
20500503              0.0625    tempf
030030000
20500504              0.0625    tempf
030040000
20500505              0.0625    tempf
030050000
20500506              0.0625    tempf
030060000
20500507              0.0625    tempf
030070000
20500508              0.0625    tempf
030080000
20500509              0.0625    tempf
030090000
20500510              0.0625    tempf
030100000
20500511              0.0625    tempf
030110000
20500512              0.0625    tempf
030120000
20500513              0.0625    tempf
030130000
20500514              0.0625    tempf
030140000
20500515              0.0625    tempf
030150000
20500516              0.0625    tempf
030160000
*
20500400    przdp      sum    1.    0.    1
20500401    8.980e6      -1.0      p
030230000
*
20500700    przdp      sum    1.    0.    1
20500701    2.15e6      -1.0      p
030230000
*
20500800    przdp      sum    1.    0.    1
20500801    8.89e6      -1.0      p
030230000
*
*
*  core level
20500900    corelev      sum    1.    0.    1
20500901   0.      0.25    voidf   110010000
20500902           0.25    voidf   110020000
20500903           0.25    voidf   110030000
20500904           0.25    voidf   110040000
20500905           0.25    voidf   110050000
20500906           0.25    voidf   110060000
20500907           0.25    voidf   110070000
20500908           0.25    voidf   110080000
20500909           0.25    voidf   110090000
20500910           0.25    voidf   110100000
20500911           0.25    voidf   110110000
20500912           0.25    voidf   110120000
20500913           0.25    voidf   140010000
*
*  sg1 dc lvl
20501100    sgalvl      sum    1.    0.    1
20501101   0.      0.15    voidf   601010000
20501102           0.29    voidf   610010000
20501103           0.29    voidf   610020000
20501104           0.29    voidf   610030000
20501105           0.29    voidf   610040000
20501106           0.29    voidf   610050000
20501107           0.31    voidf   610060000
20501108           0.25    voidf   611010000
20501109           0.25    voidf   612010000
*
*  sg2 dc lvl
20501200    sgblvl      sum    1.    0.    1
20501201   0.      0.15    voidf   701010000
20501202           0.29    voidf   710010000
20501203           0.29    voidf   710020000
20501204           0.29    voidf   710030000
20501205           0.29    voidf   710040000
20501206           0.29    voidf   710050000
20501207           0.31    voidf   710060000
20501208           0.25    voidf   711010000
20501209           0.25    voidf   712010000
*
*  sg3 dc lvl
20501300    sgclvl      sum    1.    0.    1
20501301   0.      0.15    voidf   801010000
20501302           0.29    voidf   810010000
20501303           0.29    voidf   810020000
20501304           0.29    voidf   810030000
20501305           0.29    voidf   810040000
20501306           0.29    voidf   810050000
20501307           0.31    voidf   810060000
20501308           0.25    voidf   811010000
20501309           0.25    voidf   812010000
*
*  sg4 dc lvl
20501400    sgclvl      sum    1.    0.    1
20501401   0.      0.15    voidf   901010000
20501402           0.29    voidf   910010000
20501403           0.29    voidf   910020000
20501404           0.29    voidf   910030000
20501405           0.29    voidf   910040000
20501406           0.29    voidf   910050000
20501407           0.31    voidf   910060000
20501408           0.25    voidf   911010000
20501409           0.25    voidf   912010000
*
* mass integral acc1
20501700 sitaint   integral 1. 0. 0
20501701 mflowj    057000000
*
* mass integral acc2
20501800 sitbint   integral 1. 0. 0
20501801 mflowj    067000000
*
* mass integral acc3
20501900 sitcint   integral 1. 0. 0
20501901 mflowj    077000000
*
* mass integral acc4
20502000 sitdint   integral 1. 0. 0
20502001 mflowj    087000000
*
*
* sg1 thermal power
*
*  sg1 ht hot coll
20503100  sgahcq      sum    1.    0.    1
20503101   0.      1.    q      210010000
20503102           1.    q      212010000
20503103           1.    q      214010000
20503104           1.    q      216010000
20503105           1.    q      218010000
20503106           1.    q      220010000
20503107           1.    q      222010000
20503108           1.    q      224010000
20503109           1.    q      224020000
20503110           1.    q      224030000
20503111           1.    q      224040000
*
*  sg1 ht cold coll
20503200  sgaccq      sum    1.    0.    1
20503201   0.      1.    q      260010000
20503202           1.    q      262010000
20503203           1.    q      264010000
20503204           1.    q      266010000
20503205           1.    q      268010000
20503206           1.    q      270010000
20503207           1.    q      272010000
20503208           1.    q      274010000
20503209           1.    q      274020000
20503210           1.    q      274030000
20503211           1.    q      274040000
*
*  sg1 ht hor tubes line 1 of 6
20503300  sgalaq      sum    1.    0.    1
20503301   0.      1.    q      213010000
20503302           1.    q      213020000
20503303           1.    q      213030000
20503304           1.    q      213040000
20503305           1.    q      213050000
20503306           1.    q      213060000
20503307           1.    q      213070000
20503308           1.    q      213080000
20503309           1.    q      213090000
20503310           1.    q      213100000
20503311           1.    q      213110000
```

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20503312          1.      q       213120000
20503313          1.      q       213130000
20503314          1.      q       213140000
20503315          1.      q       213150000
20503316          1.      q       213160000
20503317          1.      q       213170000
20503318          1.      q       213180000
*
*  sg1 ht hor tubes line 2 of 6
20503400  sgalbq        sum     1.    0.    1
20503401  0.      1.      q       215010000
20503402          1.      q       215020000
20503403          1.      q       215030000
20503404          1.      q       215040000
20503405          1.      q       215050000
20503406          1.      q       215060000
20503407          1.      q       215070000
20503408          1.      q       215080000
20503409          1.      q       215090000
20503410          1.      q       215100000
20503411          1.      q       215110000
20503412          1.      q       215120000
20503413          1.      q       215130000
20503414          1.      q       215140000
20503415          1.      q       215150000
20503416          1.      q       215160000
20503417          1.      q       215170000
20503418          1.      q       215180000
*
*  sg1 ht hor tubes line 3 of 6
20503500  sgalcq        sum     1.    0.    1
20503501  0.      1.      q       217010000
20503502          1.      q       217020000
20503503          1.      q       217030000
20503504          1.      q       217040000
20503505          1.      q       217050000
20503506          1.      q       217060000
20503507          1.      q       217070000
20503508          1.      q       217080000
20503509          1.      q       217090000
20503510          1.      q       217100000
20503511          1.      q       217110000
20503512          1.      q       217120000
20503513          1.      q       217130000
20503514          1.      q       217140000
20503515          1.      q       217150000
20503516          1.      q       217160000
20503517          1.      q       217170000
20503518          1.      q       217180000
*
*  sg1 ht hor tubes line 4 of 6
20503600  sgaldq        sum     1.    0.    1
20503601  0.      1.      q       219010000
20503602          1.      q       219020000
20503603          1.      q       219030000
20503604          1.      q       219040000
20503605          1.      q       219050000
20503606          1.      q       219060000
20503607          1.      q       219070000
20503608          1.      q       219080000
20503609          1.      q       219090000
20503610          1.      q       219100000
20503611          1.      q       219110000
20503612          1.      q       219120000
20503613          1.      q       219130000
20503614          1.      q       219140000
20503615          1.      q       219150000
20503616          1.      q       219160000
20503617          1.      q       219170000
20503618          1.      q       219180000
*
*  sg1 ht hor tubes line 5 of 6
20503700  sgaleq        sum     1.    0.    1
20503701  0.      1.      q       221010000
20503702          1.      q       221020000
20503703          1.      q       221030000
20503704          1.      q       221040000
20503705          1.      q       221050000
20503706          1.      q       221060000
20503707          1.      q       221070000
20503708          1.      q       221080000
20503709          1.      q       221090000
20503710          1.      q       221100000
20503711          1.      q       221110000
20503712          1.      q       221120000
20503713          1.      q       221130000
20503714          1.      q       221140000
20503715          1.      q       221150000
20503716          1.      q       221160000
20503717          1.      q       221170000
20503718          1.      q       221180000
*
*  sg1 ht hor tubes line 6 of 6
20503800  sgalfq        sum     1.    0.    1
20503801  0.      1.      q       223010000
20503802          1.      q       223020000
20503803          1.      q       223030000
20503804          1.      q       223040000
20503805          1.      q       223050000
20503806          1.      q       223060000
20503807          1.      q       223070000
20503808          1.      q       223080000
20503809          1.      q       223090000
20503810          1.      q       223100000
20503811          1.      q       223110000
20503812          1.      q       223120000
20503813          1.      q       223130000
20503814          1.      q       223140000
20503815          1.      q       223150000
20503816          1.      q       223160000
20503817          1.      q       223170000
20503818          1.      q       223180000
*
*  sg1 ht total
20504000  sgahex        sum     1.    0.    1
20504001  0.      -1.     cntrlvar      031
20504002          -1.     cntrlvar      032
20504003          -1.     cntrlvar      033
20504004          -1.     cntrlvar      034
20504005          -1.     cntrlvar      035
20504006          -1.     cntrlvar      036
20504007          -1.     cntrlvar      037
20504008          -1.     cntrlvar      038
*
*
*  sg2 thermal power
*
*  sg2 ht hot coll
20507100  sgahcq2        sum     1.    0.    1
20507101  0.      1.      q       310010000
20507102          1.      q       312010000
20507103          1.      q       314010000
20507104          1.      q       316010000
20507105          1.      q       318010000
20507106          1.      q       320010000
20507107          1.      q       322010000
20507108          1.      q       324010000
20507109          1.      q       324020000
20507110          1.      q       324030000
20507111          1.      q       324040000
*
*  sg2 ht cold coll
20507200  sgaccq2        sum     1.    0.    1
20507201  0.      1.      q       360010000
20507202          1.      q       362010000
20507203          1.      q       364010000
20507204          1.      q       366010000
20507205          1.      q       368010000
20507206          1.      q       370010000
20507207          1.      q       372010000
20507208          1.      q       374010000
20507209          1.      q       374020000
20507210          1.      q       374030000
20507211          1.      q       374040000
*
*  sg2 ht hor tubes line 1 of 6
20507300  sgalaq2        sum     1.    0.    1
20507301  0.      1.      q       313010000
20507302          1.      q       313020000
20507303          1.      q       313030000
20507304          1.      q       313040000
20507305          1.      q       313050000
20507306          1.      q       313060000
20507307          1.      q       313070000
20507308          1.      q       313080000
20507309          1.      q       313090000
20507310          1.      q       313100000
20507311          1.      q       313110000
20507312          1.      q       313120000
20507313          1.      q       313130000
20507314          1.      q       313140000
20507315          1.      q       313150000
20507316          1.      q       313160000
20507317          1.      q       313170000
20507318          1.      q       313180000
*
*  sg2 ht hor tubes line 2 of 6
20507400  sgalbq2        sum     1.    0.    1
20507401  0.      1.      q       315010000
20507402          1.      q       315020000
20507403          1.      q       315070000
20507404          1.      q       315040000
20507405          1.      q       315050000
20507406          1.      q       315060000
20507407          1.      q       315070000
20507408          1.      q       315080000
20507409          1.      q       315090000
20507410          1.      q       315100000
20507411          1.      q       315110000
20507412          1.      q       315120000
20507413          1.      q       315130000
20507414          1.      q       315140000
20507415          1.      q       315150000
20507416          1.      q       315160000
20507417          1.      q       315170000
20507418          1.      q       315180000
*
*  sg2 ht hor tubes line 3 of 6
20507500  sgalcq2        sum     1.    0.    1
20507501  0.      1.      q       317010000
20507502          1.      q       317020000
20507503          1.      q       317030000
20507504          1.      q       317040000
20507505          1.      q       317050000
20507506          1.      q       317060000
20507507          1.      q       317070000
20507508          1.      q       317080000
20507509          1.      q       317090000
```

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20507510        1.      q       317100000
20507511        1.      q       317110000
20507512        1.      q       317120000
20507513        1.      q       317130000
20507514        1.      q       317140000
20507515        1.      q       317150000
20507516        1.      q       317160000
20507517        1.      q       317170000
20507518        1.      q       317180000
*
*  sg2 ht hor tubes line 4 of 6
20507600 sgaldq2        sum     1.      0.      1
20507601 0.     1.      q       319010000
20507602        1.      q       319020000
20507603        1.      q       319030000
20507604        1.      q       319040000
20507605        1.      q       319050000
20507606        1.      q       319060000
20507607        1.      q       319070000
20507608        1.      q       319080000
20507609        1.      q       319090000
20507610        1.      q       319100000
20507611        1.      q       319110000
20507612        1.      q       319120000
20507613        1.      q       319130000
20507614        1.      q       319140000
20507615        1.      q       319150000
20507616        1.      q       319160000
20507617        1.      q       319170000
20507618        1.      q       319180000
*
*  sg2 ht hor tubes line 5 of 6
20507700 sgaleq2        sum     1.      0.      1
20507701 0.     1.      q       321010000
20507702        1.      q       321020000
20507703        1.      q       321030000
20507704        1.      q       321040000
20507705        1.      q       321050000
20507706        1.      q       321060000
20507707        1.      q       321070000
20507708        1.      q       321080000
20507709        1.      q       321090000
20507710        1.      q       321100000
20507711        1.      q       321110000
20507712        1.      q       321120000
20507713        1.      q       321130000
20507714        1.      q       321140000
20507715        1.      q       321150000
20507716        1.      q       321160000
20507717        1.      q       321170000
20507718        1.      q       321180000
*
*  sg2 ht hor tubes line 6 of 6
20507800 sgalfq2        sum     1.      0.      1
20507801 0.     1.      q       323010000
20507802        1.      q       323020000
20507803        1.      q       323030000
20507804        1.      q       323040000
20507805        1.      q       323050000
20507806        1.      q       323060000
20507807        1.      q       323070000
20507808        1.      q       323080000
20507809        1.      q       323090000
20507810        1.      q       323100000
20507811        1.      q       323110000
20507812        1.      q       323120000
20507813        1.      q       323130000
20507814        1.      q       323140000
20507815        1.      q       323150000
20507816        1.      q       323160000
20507817        1.      q       323170000
20507818        1.      q       323180000
*
*  sg2 ht total
20508000 sgahex2        sum     1.      0.      1
20508001 0.     -1.     cntrlvar        071
20508002        -1.     cntrlvar        072
20508003        -1.     cntrlvar        073
20508004        -1.     cntrlvar        074
20508005        -1.     cntrlvar        075
20508006        -1.     cntrlvar        076
20508007        -1.     cntrlvar        077
20508008        -1.     cntrlvar        078
*
*
* sg3 thermal power
*
*  sg3 ht hot coll
20508100 sgahcq3        sum     1.      0.      1
20508101 0.     1.      q       410010000
20508102        1.      q       412010000
20508103        1.      q       414010000
20508104        1.      q       416010000
20508105        1.      q       418010000
20508106        1.      q       420010000
20508107        1.      q       422010000
20508108        1.      q       424010000
20508109        1.      q       424020000
20508110        1.      q       424030000
20508111        1.      q       424040000
*
*  sg1 ht cold coll
20508200 sgaccq3        sum     1.      0.      1
20508201 0.     1.      q       460010000
20508202        1.      q       462010000
20508203        1.      q       464010000
20508204        1.      q       466010000
20508205        1.      q       468010000
20508206        1.      q       470010000
20508207        1.      q       472010000
20508208        1.      q       474010000
20508209        1.      q       474020000
20508210        1.      q       474030000
20508211        1.      q       474040000
*
*  sg1 ht hor tubes line 1 of 6
20508300 sgalaq3        sum     1.      0.      1
20508301 0.     1.      q       413010000
20508302        1.      q       413020000
20508303        1.      q       413030000
20508304        1.      q       413040000
20508305        1.      q       413050000
20508306        1.      q       413060000
20508307        1.      q       413070000
20508308        1.      q       413080000
20508309        1.      q       413090000
20508310        1.      q       413100000
20508311        1.      q       413110000
20508312        1.      q       413120000
20508313        1.      q       413130000
20508314        1.      q       413140000
20508315        1.      q       413150000
20508316        1.      q       413160000
20508317        1.      q       413170000
20508318        1.      q       413180000
*
*  sg1 ht hor tubes line 2 of 6
20508400 sgalbq3        sum     1.      0.      1
20508401 0.     1.      q       415010000
20508402        1.      q       415020000
20508403        1.      q       415030000
20508404        1.      q       415040000
20508405        1.      q       415050000
20508406        1.      q       415060000
20508407        1.      q       415070000
20508408        1.      q       415080000
20508409        1.      q       415090000
20508410        1.      q       415100000
20508411        1.      q       415110000
20508412        1.      q       415120000
20508413        1.      q       415130000
20508414        1.      q       415140000
20508415        1.      q       415150000
20508416        1.      q       415160000
20508417        1.      q       415170000
20508418        1.      q       415180000
*
*  sg1 ht hor tubes line 3 of 6
20508500 sgalcq3        sum     1.      0.      1
20508501 0.     1.      q       417010000
20508502        1.      q       417020000
20508503        1.      q       417030000
20508504        1.      q       417040000
20508505        1.      q       417050000
20508506        1.      q       417060000
20508507        1.      q       417070000
20508508        1.      q       417080000
20508509        1.      q       417090000
20508510        1.      q       417100000
20508511        1.      q       417110000
20508512        1.      q       417120000
20508513        1.      q       417130000
20508514        1.      q       417140000
20508515        1.      q       417150000
20508516        1.      q       417160000
20508517        1.      q       417170000
20508518        1.      q       417180000
*
*  sg1 ht hor tubes line 4 of 6
20508600 sgaldq3        sum     1.      0.      1
20508601 0.     1.      q       419010000
20508602        1.      q       419020000
20508603        1.      q       419030000
20508604        1.      q       419040000
20508605        1.      q       419050000
20508606        1.      q       419060000
20508607        1.      q       419070000
20508608        1.      q       419080000
20508609        1.      q       419090000
20508610        1.      q       419100000
20508611        1.      q       419110000
20508612        1.      q       419120000
20508613        1.      q       419130000
20508614        1.      q       419140000
20508615        1.      q       419150000
20508616        1.      q       419160000
20508617        1.      q       419170000
20508618        1.      q       419180000
*
*  sg1 ht hor tubes line 5 of 6
20508700 sgaleq3        sum     1.      0.      1
20508701 0.     1.      q       421010000
20508702        1.      q       421020000
20508703        1.      q       421030000
20508704        1.      q       421040000
20508705        1.      q       421050000
20508706        1.      q       421060000
20508707        1.      q       421070000
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20508708        1.    q      421080000
20508709        1.    q      421090000
20508710        1.    q      421100000
20508711        1.    q      421110000
20508712        1.    q      421120000
20508713        1.    q      421130000
20508714        1.    q      421140000
20508715        1.    q      421150000
20508716        1.    q      421160000
20508717        1.    q      421170000
20508718        1.    q      421180000
*
*  sg1 ht hor tubes line 6 of 6
20508800 sgalfq3      sum    1.   0.    1
20508801  0.    1.    q      423010000
20508802        1.    q      423020000
20508803        1.    q      423030000
20508804        1.    q      423040000
20508805        1.    q      423050000
20508806        1.    q      423060000
20508807        1.    q      423070000
20508808        1.    q      423080000
20508809        1.    q      423090000
20508810        1.    q      423100000
20508811        1.    q      423110000
20508812        1.    q      423120000
20508813        1.    q      423130000
20508814        1.    q      423140000
20508815        1.    q      423150000
20508816        1.    q      423160000
20508817        1.    q      423170000
20508818        1.    q      423180000
*
*  sg1 ht total
20509000 sgahex3      sum    1.   0.    1
20509001  0.    -1.   cntrlvar    081
20509002        -1.   cntrlvar    082
20509003        -1.   cntrlvar    083
20509004        -1.   cntrlvar    084
20509005        -1.   cntrlvar    085
20509006        -1.   cntrlvar    086
20509007        -1.   cntrlvar    087
20509008        -1.   cntrlvar    088
*
*
* sg4 thermal power
*
*  sg4 ht hot coll
20509100 sgahcq4      sum    1.   0.    1
20509101  0.    1.    q      510010000
20509102        1.    q      512010000
20509103        1.    q      514010000
20509104        1.    q      516010000
20509105        1.    q      518010000
20509106        1.    q      520010000
20509107        1.    q      522010000
20509108        1.    q      524010000
20509109        1.    q      524020000
20509110        1.    q      524030000
20509111        1.    q      524040000
*
*  sg4 ht cold coll
20509200 sgaccq4      sum    1.   0.    1
20509201  0.    1.    q      560010000
20509202        1.    q      562010000
20509203        1.    q      564010000
20509204        1.    q      566010000
20509205        1.    q      568010000
20509206        1.    q      570010000
20509207        1.    q      572010000
20509208        1.    q      574010000
20509209        1.    q      574020000
20509210        1.    q      574030000
20509211        1.    q      574040000
*
*  sg4 ht hor tubes line 1 of 6
20509300 sgalaq4      sum    1.   0.    1
20509301  0.    1.    q      513010000
20509302        1.    q      513020000
20509303        1.    q      513030000
20509304        1.    q      513040000
20509305        1.    q      513050000
20509306        1.    q      513060000
20509307        1.    q      513070000
20509308        1.    q      513080000
20509309        1.    q      513090000
20509310        1.    q      513100000
20509311        1.    q      513110000
20509312        1.    q      513120000
20509313        1.    q      513130000
20509314        1.    q      513140000
20509315        1.    q      513150000
20509316        1.    q      513160000
20509317        1.    q      513170000
20509318        1.    q      513180000
*
*  sg4 ht hor tubes line 2 of 6
20509400 sgalbq4      sum    1.   0.    1
20509401  0.    1.    q      515010000
20509402        1.    q      515020000
20509403        1.    q      515030000
20509404        1.    q      515040000
20509405        1.    q      515050000
20509406        1.    q      515060000
20509407        1.    q      515070000
20509408        1.    q      515080000
20509409        1.    q      515090000
20509410        1.    q      515100000
20509411        1.    q      515110000
20509412        1.    q      515120000
20509413        1.    q      515130000
20509414        1.    q      515140000
20509415        1.    q      515150000
20509416        1.    q      515160000
20509417        1.    q      515170000
20509418        1.    q      515180000
*
*  sg4 ht hor tubes line 3 of 6
20509500 sgalcq4      sum    1.   0.    1
20509501  0.    1.    q      517010000
20509502        1.    q      517020000
20509503        1.    q      517030000
20509504        1.    q      517040000
20509505        1.    q      517050000
20509506        1.    q      517060000
20509507        1.    q      517070000
20509508        1.    q      517080000
20509509        1.    q      517090000
20509510        1.    q      517100000
20509511        1.    q      517110000
20509512        1.    q      517120000
20509513        1.    q      517130000
20509514        1.    q      517140000
20509515        1.    q      517150000
20509516        1.    q      517160000
20509517        1.    q      517170000
20509518        1.    q      517180000
*
*  sg4 ht hor tubes line 4 of 6
20509600 sgaldq4      sum    1.   0.    1
20509601  0.    1.    q      519010000
20509602        1.    q      519020000
20509603        1.    q      519030000
20509604        1.    q      519040000
20509605        1.    q      519050000
20509606        1.    q      519060000
20509607        1.    q      519070000
20509608        1.    q      519080000
20509609        1.    q      519090000
20509610        1.    q      519100000
20509611        1.    q      519110000
20509612        1.    q      519120000
20509613        1.    q      519130000
20509614        1.    q      519140000
20509615        1.    q      519150000
20509616        1.    q      519160000
20509617        1.    q      519170000
20509618        1.    q      519180000
*
*  sg4 ht hor tubes line 5 of 6
20509700 sgaleq4      sum    1.   0.    1
20509701  0.    1.    q      521010000
20509702        1.    q      521020000
20509703        1.    q      521030000
20509704        1.    q      521040000
20509705        1.    q      521050000
20509706        1.    q      521060000
20509707        1.    q      521070000
20509708        1.    q      521080000
20509709        1.    q      521090000
20509710        1.    q      521100000
20509711        1.    q      521110000
20509712        1.    q      521120000
20509713        1.    q      521130000
20509714        1.    q      521140000
20509715        1.    q      521150000
20509716        1.    q      521160000
20509717        1.    q      521170000
20509718        1.    q      521180000
*
*  sg4 ht hor tubes line 6 of 6
20509800 sgalfq4      sum    1.   0.    1
20509801  0.    1.    q      523010000
20509802        1.    q      523020000
20509803        1.    q      523030000
20509804        1.    q      523040000
20509805        1.    q      523050000
20509806        1.    q      523060000
20509807        1.    q      523070000
20509808        1.    q      523080000
20509809        1.    q      523090000
20509810        1.    q      523100000
20509811        1.    q      523110000
20509812        1.    q      523120000
20509813        1.    q      523130000
20509814        1.    q      523140000
20509815        1.    q      523150000
20509816        1.    q      523160000
20509817        1.    q      523170000
20509818        1.    q      523180000
*
*  sg4 ht total
20505000 sgahex4      sum    1.   0.    1
20505001  0.    -1.   cntrlvar    091
20505002        -1.   cntrlvar    092
20505003        -1.   cntrlvar    093
20505004        -1.   cntrlvar    094
20505005        -1.   cntrlvar    095
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20505006        -1.  cntrlvar   096
20505007        -1.  cntrlvar   097
20505008        -1.  cntrlvar   098
*
*-----------------------------------------------
* massa del secondario
*-----------------------------------------------
*  sg1 dc mass
20505400   sgdcmas      sum    1.   0.    1
20505401  0.      0.450    rho   601010000
20505402          2.320    rho   610010000
20505403          2.320    rho   610020000
20505404          2.047    rho   610030000
20505405          2.047    rho   610040000
20505406          1.087    rho   610050000
20505407          1.162    rho   610060000
20505408          1.690    rho   611010000
20505409          2.030    rho   612010000
*
*  sg1 hotp mass
20505100   sghpmas       sum    1.   0.    1
20505101  0.      1.0876   rho   600010000
20505102          3.1      rho   620010000
20505103          2.9      rho   620020000
20505104          2.9      rho   620030000
20505105          2.9      rho   620040000
20505106          3.48     rho   620050000
20505107          3.48     rho   620060000
20505108          3.75     rho   621010000
*
*  sg1 coldp mass
20505200   sgcpmas       sum    1.   0.    1
20505201  0.      1.0876   rho   600010000
20505202          3.1      rho   630010000
20505203          2.9      rho   630020000
20505204          2.9      rho   630030000
20505205          2.9      rho   630040000
20505206          3.48     rho   630050000
20505207          3.48     rho   630060000
20505208          3.75     rho   631010000
*
*  sg1 onlyvap mass
20505300   sgovmas       sum    1.   0.    1
20505301  0.      9.5      rho   635010000
20505302         26.9010     rho   640010000
20505303         28.2338     rho   645010000
*
*  massa secondario
20505500   secmass       sum    1.   0.    1
20505501  0.      1.    cntrlvar   054
20505502          1.    cntrlvar   051
20505503          1.    cntrlvar   052
20505504          1.    cntrlvar   053
*
*-----------------------------------------------
* massa del secondario2
*-----------------------------------------------
*  sg2 dc mass
20505600   sgdcmas2      sum    1.   0.    1
20505601  0.      0.450    rho   701010000
20505602          2.320    rho   710010000
20505603          2.320    rho   710020000
20505604          2.047    rho   710030000
20505605          2.047    rho   710040000
20505606          1.087    rho   710050000
20505607          1.162    rho   710060000
20505608          1.690    rho   711010000
20505609          2.030    rho   712010000
*
*  sg2 hotp mass
20505700   sghpmas2      sum    1.   0.    1
20505701  0.      1.0876   rho   700010000
20505702          3.1      rho   720010000
20505703          2.9      rho   720020000
20505704          2.9      rho   720030000
20505705          2.9      rho   720040000
20505706          3.48     rho   720050000
20505707          3.48     rho   720060000
20505708          3.75     rho   721010000
*
*  sg2 coldp mass
20505800   sgcpmas2      sum    1.   0.    1
20505801  0.      1.0876   rho   700010000
20505802          3.1      rho   730010000
20505803          2.9      rho   730020000
20505804          2.9      rho   730030000
20505805          2.9      rho   730040000
20505806          3.48     rho   730050000
20505807          3.48     rho   730060000
20505808          3.75     rho   731010000
*
*  sg2 onlyvap mass
20505900   sgovmas2      sum    1.   0.    1
20505901  0.      9.5      rho   735010000
20505902         26.9010     rho   740010000
20505903         28.2338     rho   745010000
*
*  massa secondario
20506000   secmass       sum    1.   0.    1
20506001  0.      1.    cntrlvar   056
20506002          1.    cntrlvar   057
20506003          1.    cntrlvar   058
20506004          1.    cntrlvar   059
*
*
*-----------------------------------------------
* massa del secondario3
*-----------------------------------------------
*  sg3 dc mass
20506100   sgdcmas3      sum    1.   0.    1
20506101  0.      0.450    rho   801010000
20506102          2.320    rho   810010000
20506103          2.320    rho   810020000
20506104          2.047    rho   810030000
20506105          2.047    rho   810040000
20506106          1.087    rho   810050000
20506107          1.162    rho   810060000
20506108          1.690    rho   811010000
20506109          2.030    rho   812010000
*
*  sg3 hotp mass
20506200   sghpmas3      sum    1.   0.    1
20506201  0.      1.0876   rho   800010000
20506202          3.1      rho   820010000
20506203          2.9      rho   820020000
20506204          2.9      rho   820030000
20506205          2.9      rho   820040000
20506206          3.48     rho   820050000
20506207          3.48     rho   820060000
20506208          3.75     rho   821010000
*
*  sg3 coldp mass
20506300   sgcpmas3      sum    1.   0.    1
20506301  0.      1.0876   rho   800010000
20506302          3.1      rho   830010000
20506303          2.9      rho   830020000
20506304          2.9      rho   830030000
20506305          2.9      rho   830040000
20506306          3.48     rho   830050000
20506307          3.48     rho   830060000
20506308          3.75     rho   831010000
*
*  sg3 onlyvap mass
20506400   sgovmas3      sum    1.   0.    1
20506401  0.      9.5      rho   835010000
20506402         26.9010     rho   840010000
20506403         28.2338     rho   845010000
*
*  massa secondario
20506500   secmass3      sum    1.   0.    1
20506501  0.      1.    cntrlvar   061
20506502          1.    cntrlvar   062
20506503          1.    cntrlvar   063
20506504          1.    cntrlvar   064
*
*-----------------------------------------------
* massa del secondario4
*-----------------------------------------------
*  sg4 dc mass
20506600   sgdcmas4      sum    1.   0.    1
20506601  0.      0.450    rho   901010000
20506602          2.320    rho   910010000
20506603          2.320    rho   910020000
20506604          2.047    rho   910030000
20506605          2.047    rho   910040000
20506606          1.087    rho   910050000
20506607          1.162    rho   910060000
20506608          1.690    rho   911010000
20506609          2.030    rho   912010000
*
*  sg4 hotp mass
20506700   sghpmas4      sum    1.   0.    1
20506701  0.      1.0876   rho   900010000
20506702          3.1      rho   920010000
20506703          2.9      rho   920020000
20506704          2.9      rho   920030000
20506705          2.9      rho   920040000
20506706          3.48     rho   920050000
20506707          3.48     rho   920060000
20506708          3.75     rho   921010000
*
*  sg4 coldp mass
20506800   sgcpmas4      sum    1.   0.    1
20506801  0.      1.0876   rho   900010000
20506802          3.1      rho   930010000
20506803          2.9      rho   930020000
20506804          2.9      rho   930030000
20506805          2.9      rho   930040000
20506806          3.48     rho   930050000
20506807          3.48     rho   930060000
20506808          3.75     rho   931010000
*
*  sg4 onlyvap mass
20506900   sgovmas4      sum    1.   0.    1
20506901  0.      9.5      rho   935010000
20506902         26.9010     rho   940010000
20506903         28.2338     rho   945010000
*
*  sg ss mass
20507000   secmass4      sum    1.   0.    1
20507001  0.      1.    cntrlvar   066
20507002          1.    cntrlvar   067
20507003          1.    cntrlvar   068
20507004          1.    cntrlvar   069
*
* 179  core power (hot rod)
20517900    hotro.pw       sum    1.  0.   1
```

```
20517901   0.  0.007147    htrnr
190400101
20517902       0.007147    htrnr
190400201
20517903       0.007147    htrnr
190400301
20517904       0.007147    htrnr
190400401
20517905       0.007147    htrnr
190400501
20517906       0.007147    htrnr
190400601
20517907       0.007147    htrnr
190400701
20517908       0.007147    htrnr
190400801
20517909       0.007147    htrnr
190400901
20517910       0.007147    htrnr
190401001
20517911       0.007147    htrnr
190401101
20517912       0.007147    htrnr
190401201
20517913       0.007147    htrnr
190401301
20517914       0.008005    htrnr
190401401
*
* 180  core power (central channel)
20518000     cecha.pw        sum    1.  0.   1
20518001   0.  121.1508    htrnr
190100101
20518002       121.1508    htrnr
190100201
20518003       121.1508    htrnr
190100301
20518004       121.1508    htrnr
190100401
20518005       121.1508    htrnr
190100501
20518006       121.1508    htrnr
190100601
20518007       121.1508    htrnr
190100701
20518008       121.1508    htrnr
190100801
20518009       121.1508    htrnr
190100901
20518010       121.1508    htrnr
190101001
20518011       121.1508    htrnr
190101101
20518012       121.1508    htrnr
190101201
20518013       121.1508    htrnr
190101301
20518014       135.6889    htrnr
190101401
*
* 181  core power (middle channel)
20518100     micha.pw        sum    1.  0.   1
20518101   0.  121.1580    htrnr
190200101
20518102       121.1580    htrnr
190200201
20518103       121.1580    htrnr
190200301
20518104       121.1580    htrnr
190200401
20518105       121.1580    htrnr
190200501
20518106       121.1580    htrnr
190200601
20518107       121.1580    htrnr
190200701
20518108       121.1580    htrnr
190200801
20518109       121.1580    htrnr
190200901
20518110       121.1580    htrnr
190201001
20518111       121.1580    htrnr
190201101
20518112       121.1580    htrnr
190201201
20518113       121.1580    htrnr
190201301
20518114       135.6970    htrnr
190201401
*
* 182  core power (peripheral channel)
20518200     pecha.pw        sum    1.  0.   1
20518201   0.  121.1580    htrnr
190300101
20518202       121.1580    htrnr
190300201
20518203       121.1580    htrnr
190300301
20518204       121.1580    htrnr
190300401
20518205       121.1580    htrnr
190300501
20518206       121.1580    htrnr
190300601
20518207       121.1580    htrnr
190300701
20518208       121.1580    htrnr
190300801
20518209       121.1580    htrnr
190300901
20518210       121.1580    htrnr
190301001
20518211       121.1580    htrnr
190301101
20518212       121.1580    htrnr
190301201
20518213       121.1580    htrnr
190301301
20518214       135.6970    htrnr
190301401
*
* 183 core power to fluid
20518300  coretot             sum    1.  0.  1
20518301  0.  1.e-6    cntrlvar     179
20518302      1.e-6    cntrlvar     180
20518303      1.e-6    cntrlvar     181
20518304      1.e-6    cntrlvar     182
*
* 197 core zone temp                tempf
20519700     coret       sum   1.  0.   1
20519701   0.  1.          tempf
110010000
20519702        1.          tempf       110020000
20519703        1.          tempf       110030000
20519704        1.          tempf       110040000
20519705        1.          tempf       110050000
20519706        1.          tempf       110060000
20519707        1.          tempf       110070000
20519708        1.          tempf       110080000
20519709        1.          tempf       110090000
20519710        1.          tempf       110100000
20519711        1.          tempf       110110000
20519712        1.          tempf       110120000
20519713        1.          tempf       110130000
20519714        1.          tempf       140010000
*
*  198 core coolant medium temp (øC)
20519800     ccmt          sum      1.     0.   1
20519801  -273.  0.0714      cntrlvar  197
*
*
*  199 core coolant medium temp (øF)
20519900     ccmt          sum      1.     0.   1
20519901  32.  1.8       cntrlvar  198
*
*
* 200 core fuel temperature (peripheral
channel)
20520000     pecha.t       sum      1.  0.   1
20520001   0.  1.            httemp
190300101
20520002       1.            httemp
190300201
20520003       1.            httemp
190300301
20520004       1.            httemp
190300401
20520005       1.            httemp
190300501
20520006       1.            httemp
190300601
20520007       1.            httemp
190300701
20520008       1.            httemp
190300801
20520009       1.            httemp
190300901
20520010       1.            httemp
190301001
20520011       1.            httemp
190301101
20520012       1.            httemp
190301201
20520013       1.            httemp
190301301
20520014       1.            httemp
190301401
*
* 201 fuel medium temperature  (øC)
20520100  fuelmt              sum     1.  0.  1
20520101  -273.   0.0714    cntrlvar       200
*
*  202 core fuel    medium temp (øF)
20520200     cfmt          sum      1.     0.   1
20520201  32.  1.8       cntrlvar  201
*
* 203 core delta temp between coolant and fuel
20520300  coret             sum     1.  0.  1
20520301  0.   1.        cntrlvar      202
20520302     -1.        cntrlvar      199
*
* 204 core nominal mass flow W  (lbm/s)
20520400  comfl              sum     1.  0.  1
20520401  0.  2.2046     mflowj      106020000
*
* 205 C0 value1
```

```
20520500 c0val1          mult    1.  0.  1
20520501          cntrlvar       203
20520502          cntrlvar       204
*
* 206 C0 value  (Qnominal=100)
20520600 c0val           sum     1.  0.  1
20520601 0. 0.01        cntrlvar       205
*
* 207 C0 constant value (0-100s)
20520700  C0cst     tripunit     1.  1.  0
20520701  720
*
* 208 c0   value product
20520800  c0pro           mult    1.  0.  1
20520801       cntrlvar       207
20520802       cntrlvar       206
*
* 209 C0 constant
20520900  C0  constant 249350.0     0.  1
*
* 210 C0 constant value trip (>100s)
20521000  C0cst     tripunit     1.  0.  1
20521001  721
*
* 211 c0  constant value (100 s)
20521100  c0100           sum     1.  0.  1
20521101  0. 249350.0      cntrlvar       210
*
* 212 c0 function
20521200  c0  stdfnctn    1.  0.   1
20521201  max    cntrlvar   208
20521202         cntrlvar   211
*
* 213 c0 inverse
20521300  c0inv           div     1.  0.  1
20521301     cntrlvar       212
*
*  214 Q*
20521400     qtot         mult     1.      0.   1
20521401      cntrlvar  213
20521402      cntrlvar  205
*
* 215 Q*^2 value
20521500  q2val         mult    1.  0.  1
20521501  cntrlvar 214
20521502  cntrlvar 214
*
* 216 core coolant density    (g/cm^3)
20521600      coden       sum    1.  0.   1
20521601    0.   1.e-3        rho          110010000
20521602         1.e-3        rho          110020000
20521603         1.e-3        rho          110030000
20521604         1.e-3        rho          110040000
20521605         1.e-3        rho          110050000
20521606         1.e-3        rho          110060000
20521607         1.e-3        rho          110070000
20521608         1.e-3        rho          110080000
20521609         1.e-3        rho          110090000
20521610         1.e-3        rho          110100000
20521611         1.e-3        rho          110110000
20521612         1.e-3        rho          110120000
20521613         1.e-3        rho          110130000
20521614         1.e-3        rho          140010000
*
* 217 Core medium coolant density
20521700  comed             sum     1.  0.  1
20521701  0. 0.0714      cntrlvar       216
*
* 218 W*^2 value
20521800  w2val          mult    1.  0.  1
20521801  cntrlvar 204
20521802  cntrlvar 204
*
* 219 rho*^2 value
20521900  rho2            mult    1.  0.  1
20521901  cntrlvar 217
20521902  cntrlvar 217
*
* 220 rktpower (Qnominal value)  (MW)
20522000   power constant 3000.  0.  1
*
* 221 Qnom normalized value
20522100  qnominv          div     1.  0.  1
20522101  cntrlvar 220
*
*  222 Q  effective
20522200     qeff         mult     1.      0.   1
20522201      cntrlvar  183
20522202      cntrlvar  221
*
* 223 Q%
20522300  qperc              sum     1.  0.  1
20522301  0.  100.       cntrlvar 222
*
* 224 W^-2 value
20522400  w2inv         div     1.  0.  1
20522401  cntrlvar 218
*
* 225 Q^2% value
20522500  q2perc         mult    1.  0.  1
20522501  cntrlvar 223
20522502  cntrlvar 223
*
*  226 (Q/W)^2
20522600     qrap         mult     1.      0.   1
20522601      cntrlvar  224
20522602      cntrlvar  225
*
* 227 boron        density    (g/cm^3)
20522700     boden       sum    1.  0.   1
20522701    0.   1.e-3        boron
110010000
20522702         1.e-3        boron
110020000
20522703         1.e-3        boron
110030000
20522704         1.e-3        boron
110040000
20522705         1.e-3        boron
110050000
20522706         1.e-3        boron
110060000
20522707         1.e-3        boron
110070000
20522708         1.e-3        boron
110080000
20522709         1.e-3        boron
110090000
20522710         1.e-3        boron
110100000
20522711         1.e-3        boron
110110000
20522712         1.e-3        boron
110120000
20522713         1.e-3        boron
110130000
20522714         1.e-3        boron
140010000
*
* 228 boron medium density
20522800  bomed              sum     1.  0.  1
20522801  0. 0.0714      cntrlvar       227
*
* 229 cb    coefficient    10*(-6.5) [pcm]
20522900  cbcoef   constant  -65.          0.  1
*
* 230 coolant reference density for Cb
normalization
20523000  cooden        div         1.   0.  1
20523001     cntrlvar  217
*
* 231 cbron  coefficient product
20523100  cbprod             mult    1.  0.  1
20523101       cntrlvar       228
20523102       cntrlvar       229
20523103       cntrlvar       230
*
* 232 table react-t
20523200  scram  function    1.  0.   1
20523201  rkreac    20290000   900
*
* 233 first product value
20523300  fpval             sum     1.  0.  1
20523301  0. 0.9866       cntrlvar       217
*
* 234 second product value
20523400  spval             sum     1.  0.  1
20523401  0. -0.6133       cntrlvar       219
*
* 235 third  product value
20523500  tpval             sum     1.  0.  1
20523501  0. -0.1425e-3  cntrlvar       214
*
* 236 fourth product value
20523600  fpval             sum     1.  0.  1
20523601  0. 0.7400e-6  cntrlvar       215
*
* 237 fifth product value
20523700  fipval            sum     1.  0.  1
20523701  0. -197.8      cntrlvar       226
*
* 238 sixth product value
20523800  sipval            sum     1.  0.  1
20523801  0. -0.1398e-4  cntrlvar       199
*
*  239 Keff polinomial form
20523900     keff          sum    167.701   0.   1
20523901   0.     1.              cntrlvar          231
20523902         0.005963          cntrlvar
232
20523903         1.              cntrlvar          233
20523904         1.              cntrlvar          234
20523905         1.              cntrlvar          235
20523906         1.              cntrlvar          236
20523907         1.              cntrlvar          237
20523908         1.              cntrlvar          238
*
* 240 keff value (100 s)
20524000   k100s      tripunit     1.  1.  0
20524001  720
*
* 241 keff value product
20524100  kefpro             mult    1.  0.  1
20524101       cntrlvar       239
20524102       cntrlvar       240
*
* 242 keff constant value (>100s)
20524200   kcst     tripunit     1.  0.  1
```

```
20524201  721
*
* 243 keff constant
20524300 keff  constant 32.2873    0.  1
*
* 244 keff constant value (100 s)
20524400  ke100              sum     1.  0.  1
20524401 0.  32.2873      cntrlvar       242
*
* 245 keff difference between calc. and
extimate
20524500  kediff             sum     1.  0.  1
20524501  0.   1.        cntrlvar       239
20524502      -1.        cntrlvar       243
*
*
* 246 keff  function
20524600  keff   stdfnctn    1.  0.   1
20524601  max    cntrlvar   241
20524602         cntrlvar   244
*
* 247 r= -keff(0-100) + keff
20524700  r                sum     1.  0.  1
20524701  0.   1.        cntrlvar       239
20524702      -1.        cntrlvar       246
*
* 248 c0 difference between calc. and extimate
20524800  c0diff             sum     1.  0.  1
20524801  0.   1.        cntrlvar       206
20524802      -1.        cntrlvar       209
*
* Liquid Mass MCP loop1
*
*
* Mass loop1
*
20530000     mpompa      sum     1.   0.     1
20530001   0.         2.0100 rho 239010000
20530002              0.5103 rho 241010000
20530003              0.5670 rho 243010000
20530004              0.5670 rho 243020000
20530005              0.5670 rho 243030000
20530006              0.5670 rho 243040000
20530007              0.5670 rho 243050000
20530008              0.5670 rho 245010000
20530009              0.5670 rho 247010000
20530010              0.5670 rho 247020000
20530011              0.3402 rho 247030000
20530012              0.2268 rho 250010000
20530013              0.2268 rho 250010000
20530014              0.2268 rho 200010000
*
*
*
20530100   m201205           sum     1.   0.     1
20530101   0.         0.4252 rho 201010000
20530102              0.4252 rho 201020000
20530103              0.4252 rho 201030000
20530104              0.4252 rho 201040000
20530105              0.2268 rho 203010000
20530106              0.4252 rho 205010000
20530107              0.4252 rho 205020000
20530108              0.4082 rho 205030000
20530109              0.3402 rho 205040000
20530110              0.3402 rho 205050000
20530111              0.3402 rho 205060000
20530112              0.1928 rho 205070000
*
*
20530200   m209213       sum     1.   0.     1
20530201   0.         0.2835 rho 209010000
20530202              8.805e-02 rho 210010000
20530203              0.1820 rho 212010000
20530204              4.86e-02 rho 213010000
20530205              7.29e-02 rho 213020000
20530206              7.29e-02 rho 213030000
20530207              9.29e-02 rho 213040000
20530208              9.29e-02 rho 213050000
20530209              9.29e-02 rho 213060000
20530210              0.1215 rho 213070000
20530211              0.1215 rho 213080000
20530212              0.1215 rho 213090000
20530213              0.1458 rho 213100000
20530214              0.1701 rho 213110000
20530215              0.1822 rho 213120000
*
*
20530300   m213215       sum     1.   0.     1
20530301   0.         0.1822 rho 213130000
20530302              0.1944 rho 213140000
20530303              0.2430 rho 213150000
20530304              0.2430 rho 213160000
20530305              0.2430 rho 213170000
20530306              0.2430 rho 213180000
20530307              0.1702 rho 214010000
20530308              4.86e-02 rho 215010000
20530309              7.29e-02 rho 215020000
20530310              7.29e-02 rho 215030000
20530311              9.29e-02 rho 215040000
20530312              9.29e-02 rho 215050000
20530313              9.29e-02 rho 215060000
20530314              0.1215 rho 215070000
20530315              0.1215 rho 215080000
*
*
*
20530400   m215217       sum     1.   0.     1
20530401   0.         0.1215 rho 215090000
20530402              0.1458 rho 215100000
20530403              0.1701 rho 215110000
20530404              0.1822 rho 215120000
20530405              0.1822 rho 215130000
20530406              0.1944 rho 215140000
20530407              0.2430 rho 215150000
20530408              0.2430 rho 215160000
20530409              0.2430 rho 215170000
20530410              0.2430 rho 215180000
20530411              0.1702 rho 216010000
20530412              4.86e-02 rho 217010000
20530413              7.29e-02 rho 217020000
20530414              7.29e-02 rho 217030000
20530415              9.29e-02 rho 217040000
*
*
20530500   m215217       sum     1.   0.     1
20530501   0.         9.29e-02 rho 217050000
20530502              9.29e-02 rho 217060000
20530503              0.1215 rho 217070000
20530504              0.1215 rho 217080000
20530505              0.1215 rho 217090000
20530506              0.1458 rho 217100000
20530507              0.1701 rho 217110000
20530508              0.1822 rho 217120000
20530509              0.1822 rho 217130000
20530510              0.1944 rho 217140000
20530511              0.2430 rho 217150000
20530512              0.2430 rho 217160000
20530513              0.2430 rho 217170000
20530514              0.2430 rho 217180000
20530515              0.1702 rho 218010000
*
*
20530600   m219          sum     1.   0.     1
20530601   0.         4.86e-02 rho 219010000
20530602              7.29e-02 rho 219020000
20530603              7.29e-02 rho 219030000
20530604              9.29e-02 rho 219040000
20530605              9.29e-02 rho 219050000
20530606              9.29e-02 rho 219060000
20530607              0.1215 rho 219070000
20530608              0.1215 rho 219080000
20530609              0.1215 rho 219090000
20530610              0.1458 rho 219100000
20530611              0.1701 rho 219110000
20530612              0.1822 rho 219120000
20530613              0.1822 rho 219130000
20530614              0.1944 rho 219140000
20530615              0.2430 rho 219150000
*
*
20530700   m219221       sum     1.   0.     1
20530701   0.         0.2430 rho 219160000
20530702              0.2430 rho 219170000
20530703              0.2430 rho 219180000
20530704              0.1702 rho 220010000
20530705              4.86e-02 rho 221010000
20530706              7.29e-02 rho 221020000
20530707              7.29e-02 rho 221030000
20530708              9.29e-02 rho 221040000
20530709              9.29e-02 rho 221050000
20530710              9.29e-02 rho 221060000
20530711              0.1215 rho 221070000
20530712              0.1215 rho 221080000
20530713              0.1215 rho 221090000
20530714              0.1458 rho 221100000
20530715              0.1701 rho 221110000
*
*
20530800   m221223       sum     1.   0.     1
20530801   0.         0.1822 rho 221120000
20530802              0.1822 rho 221130000
20530803              0.1944 rho 221140000
20530804              0.2430 rho 221150000
20530805              0.2430 rho 221160000
20530806              0.2430 rho 221170000
20530807              0.2430 rho 221180000
20530808              0.1702 rho 222010000
20530809              4.86e-02 rho 223010000
20530810              7.29e-02 rho 223020000
20530811              7.29e-02 rho 223030000
20530812              9.29e-02 rho 223040000
20530813              9.29e-02 rho 223050000
20530814              9.29e-02 rho 223060000
20530815              0.1215 rho 223070000
*
*
20530900   m223          sum     1.   0.     1
20530901   0.         0.1215 rho 223080000
20530902              0.1215 rho 223090000
20530903              0.1458 rho 223100000
20530904              0.1701 rho 223110000
20530905              0.1822 rho 223120000
20530906              0.1822 rho 223130000
20530907              0.1944 rho 223140000
20530908              0.2430 rho 223150000
20530909              0.2430 rho 223160000
20530910              0.2430 rho 223170000
20530911              0.2430 rho 223180000
20530912              0.1467 rho 224010000
```

```
20530913          0.1467 rho 224020000
20530914          0.3581 rho 224030000
20530915          0.4109 rho 224040000
*
*
*
20531000  m274          sum    1.   0.    1
20531001  0.       0.1467 rho 274010000
20531002          0.1467 rho 274020000
20531003          0.3581 rho 274030000
20531004          0.4109 rho 274040000
20531005          0.1702 rho 272010000
20531006          0.1702 rho 270010000
20531007          0.1702 rho 268010000
20531008          0.1702 rho 266010000
20531009          0.1702 rho 264010000
20531010          0.1820 rho 262010000
20531011          8.8050e-02 rho 260010000
20531012          0.2835 rho 231010000
20531013          0.3402 rho 233010000
20531014          0.3402 rho 233020000
20531015          0.5670 rho 233030000
*
*
*
20531100  m233       sum    1.   0.    1
20531101  0.       0.5670 rho 233040000
20531102          0.5670 rho 233050000
20531103          0.5670 rho 233060000
20531104          0.5670 rho 233070000
20531105          0.5670 rho 233080000
20531106          0.4479 rho 233090000
20531107          0.4479 rho 233100000
20531108          0.4479 rho 233110000
20531109          0.4479 rho 233120000
20531110          0.4479 rho 233130000
20531111          0.4479 rho 233140000
20531112          0.5670 rho 233150000
20531113          0.5670 rho 233160000
20531114          0.4309 rho 233170000
*
20531200  l1tot       sum    1.   0.    1
20531201  0.   1.  cntrlvar 300
20531202     1.  cntrlvar 301
20531203     1.  cntrlvar 302
20531204     1.  cntrlvar 303
20531205     1.  cntrlvar 304
20531206     1.  cntrlvar 305
20531207     1.  cntrlvar 306
20531208     1.  cntrlvar 307
20531209     1.  cntrlvar 308
20531210     1.  cntrlvar 309
20531211     1.  cntrlvar 310
20531212     1.  cntrlvar 311
*
*
*    fine loop1
*
*
*    inizio loop2
*
*
20540000  mpompa       sum    1.   0.    1
20540001  0.       2.0100 rho 339010000
20540002          0.5103 rho 341010000
20540003          0.5670 rho 343010000
20540004          0.5670 rho 343020000
20540005          0.5670 rho 343030000
20540006          0.5670 rho 343040000
20540007          0.5670 rho 343050000
20540008          0.5670 rho 345010000
20540009          0.5670 rho 347010000
20540010          0.5670 rho 347020000
20540011          0.3402 rho 347030000
20540012          0.2268 rho 350010000
20540013          0.2268 rho 350010000
20540014          0.2268 rho 300010000
*
*
*
20540100  m201205          sum    1.   0.    1
20540101  0.       0.4252 rho 301010000
20540102          0.4252 rho 301020000
20540103          0.4252 rho 301030000
20540104          0.4252 rho 301040000
20540105          0.2268 rho 303010000
20540106          0.4252 rho 305010000
20540107          0.4252 rho 305020000
20540108          0.4082 rho 305030000
20540109          0.3402 rho 305040000
20540110          0.3402 rho 305050000
20540111          0.3402 rho 305060000
20540112          0.1928 rho 305070000
*
*
20540200  m209213       sum    1.   0.    1
20540201  0.       0.2835 rho 309010000
20540202          8.805e-02 rho 310010000
20540203          0.1820 rho 312010000
20540204          4.86e-02 rho 313010000
20540205          7.29e-02 rho 313020000
20540206          7.29e-02 rho 313030000
20540207          9.29e-02 rho 313040000
20540208          9.29e-02 rho 313050000
20540209          9.29e-02 rho 313060000
20540210          0.1215 rho 313070000
20540211          0.1215 rho 313080000
20540212          0.1215 rho 313090000
20540213          0.1458 rho 313100000
20540214          0.1701 rho 313110000
20540215          0.1822 rho 313120000
*
*
20540300  m213215       sum    1.   0.    1
20540301  0.       0.1822 rho 313130000
20540302          0.1944 rho 313140000
20540303          0.2430 rho 313150000
20540304          0.2430 rho 313160000
20540305          0.2430 rho 313170000
20540306          0.2430 rho 313180000
20540307          0.1702 rho 314010000
20540308          4.86e-02 rho 315010000
20540309          7.29e-02 rho 315020000
20540310          7.29e-02 rho 315030000
20540311          9.29e-02 rho 315040000
20540312          9.29e-02 rho 315050000
20540313          9.29e-02 rho 315060000
20540314          0.1215 rho 315070000
20540315          0.1215 rho 315080000
*
*
20540400  m215217       sum    1.   0.    1
20540401  0.       0.1215 rho 315090000
20540402          0.1458 rho 315100000
20540403          0.1701 rho 315110000
20540404          0.1822 rho 315120000
20540405          0.1822 rho 315130000
20540406          0.1944 rho 315140000
20540407          0.2430 rho 315150000
20540408          0.2430 rho 315160000
20540409          0.2430 rho 315170000
20540410          0.2430 rho 315180000
20540411          0.1702 rho 316010000
20540412          4.86e-02 rho 317010000
20540413          7.29e-02 rho 317020000
20540414          7.29e-02 rho 317030000
20540415          9.29e-02 rho 317040000
*
*
20540500  m215217       sum    1.   0.    1
20540501  0.       9.29e-02 rho 317050000
20540502          9.29e-02 rho 317060000
20540503          0.1215 rho 317070000
20540504          0.1215 rho 317080000
20540505          0.1215 rho 317090000
20540506          0.1458 rho 317100000
20540507          0.1701 rho 317110000
20540508          0.1822 rho 317120000
20540509          0.1822 rho 317130000
20540510          0.1944 rho 317140000
20540511          0.2430 rho 317150000
20540512          0.2430 rho 317160000
20540513          0.2430 rho 317170000
20540514          0.2430 rho 317180000
20540515          0.1702 rho 318010000
*
*
20540600  m219          sum    1.   0.    1
20540601  0.       4.86e-02 rho 319010000
20540602          7.29e-02 rho 319020000
20540603          7.29e-02 rho 319030000
20540604          9.29e-02 rho 319040000
20540605          9.29e-02 rho 319050000
20540606          9.29e-02 rho 319060000
20540607          0.1215 rho 319070000
20540608          0.1215 rho 319080000
20540609          0.1215 rho 319090000
20540610          0.1458 rho 319100000
20540611          0.1701 rho 319110000
20540612          0.1822 rho 319120000
20540613          0.1822 rho 319130000
20540614          0.1944 rho 319140000
20540615          0.2430 rho 319150000
*
*
20540700  m219221       sum    1.   0.    1
20540701  0.       0.2430 rho 319160000
20540702          0.2430 rho 319170000
20540703          0.2430 rho 319180000
20540704          0.1702 rho 320010000
20540705          4.86e-02 rho 321010000
20540706          7.29e-02 rho 321020000
20540707          7.29e-02 rho 321030000
20540708          9.29e-02 rho 321040000
20540709          9.29e-02 rho 321050000
20540710          9.29e-02 rho 321060000
20540711          0.1215 rho 321070000
20540712          0.1215 rho 321080000
20540713          0.1215 rho 321090000
20540714          0.1458 rho 321100000
20540715          0.1701 rho 321110000
*
*
20540800  m221223       sum    1.   0.    1
20540801  0.       0.1822 rho 321120000
20540802          0.1822 rho 321130000
20540803          0.1944 rho 321140000
20540804          0.2430 rho 321150000
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20540805          0.2430 rho 321160000
20540806          0.2430 rho 321170000
20540807          0.2430 rho 321180000
20540808          0.1702 rho 322010000
20540809          4.86e-02 rho 323010000
20540810          7.29e-02 rho 323020000
20540811          7.29e-02 rho 323030000
20540812          9.29e-02 rho 323040000
20540813          9.29e-02 rho 323050000
20540814          9.29e-02 rho 323060000
20540815          0.1215 rho 323070000
*
*
20540900  m223        sum    1.   0.    1
20540901  0.       0.1215 rho 323080000
20540902          0.1215 rho 323090000
20540903          0.1458 rho 323100000
20540904          0.1701 rho 323110000
20540905          0.1822 rho 323120000
20540906          0.1822 rho 323130000
20540907          0.1944 rho 323140000
20540908          0.2430 rho 323150000
20540909          0.2430 rho 323160000
20540910          0.2430 rho 323170000
20540911          0.2430 rho 323180000
20540912          0.1467 rho 324010000
20540913          0.1467 rho 324020000
20540914          0.3581 rho 324030000
20540915          0.4109 rho 324040000
*
*
*
20541000  m274        sum    1.   0.    1
20541001  0.       0.1467 rho 374010000
20541002          0.1467 rho 374020000
20541003          0.3581 rho 374030000
20541004          0.4109 rho 374040000
20541005          0.1702 rho 372010000
20541006          0.1702 rho 370010000
20541007          0.1702 rho 368010000
20541008          0.1702 rho 366010000
20541009          0.1702 rho 364010000
20541010          0.1820 rho 362010000
20541011          8.8050e-02 rho 360010000
20541012          0.2835 rho 331010000
20541013          0.3402 rho 333010000
20541014          0.3402 rho 333020000
20541015          0.5670 rho 333030000
*
*
*
20541100  m233       sum    1.   0.    1
20541101  0.       0.5670 rho 333040000
20541102          0.5670 rho 333050000
20541103          0.5670 rho 333060000
20541104          0.5670 rho 333070000
20541105          0.5670 rho 333080000
20541106          0.4479 rho 333090000
20541107          0.4479 rho 333100000
20541108          0.4479 rho 333110000
20541109          0.4479 rho 333120000
20541110          0.4479 rho 333130000
20541111          0.4479 rho 333140000
20541112          0.5670 rho 333150000
20541113          0.5670 rho 333160000
20541114          0.4309 rho 333170000
*
20541200  l1tot       sum    1.   0.    1
20541201 0.   1.  cntrlvar 400
20541202      1.  cntrlvar 401
20541203      1.  cntrlvar 402
20541204      1.  cntrlvar 403
20541205      1.  cntrlvar 404
20541206      1.  cntrlvar 405
20541207      1.  cntrlvar 406
20541208      1.  cntrlvar 407
20541209      1.  cntrlvar 408
20541210      1.  cntrlvar 409
20541211      1.  cntrlvar 410
20541212      1.  cntrlvar 411
*
*
*    fine loop2
*
*
*    inizio loop3
*
*
*
20550000    mpompa     sum    1.   0.    1
20550001  0.       2.0100 rho 439010000
20550002          0.5103 rho 441010000
20550003          0.5670 rho 443010000
20550004          0.5670 rho 443020000
20550005          0.5670 rho 443030000
20550006          0.5670 rho 443040000
20550007          0.5670 rho 443050000
20550008          0.5670 rho 445010000
20550009          0.5670 rho 447010000
20550010          0.5670 rho 447020000
20550011          0.3402 rho 447030000
20550012          0.2268 rho 450010000
20550013          0.2268 rho 450010000
20550014          0.2268 rho 400010000
*
*
*
20550100  m201205       sum    1.   0.    1
20550101  0.       0.4252 rho 401010000
20550102          0.4252 rho 401020000
20550103          0.4252 rho 401030000
20550104          0.4252 rho 401040000
20550105          0.2268 rho 403010000
20550106          0.4252 rho 405010000
20550107          0.4252 rho 405020000
20550108          0.4082 rho 405030000
20550109          0.3402 rho 405040000
20550110          0.3402 rho 405050000
20550111          0.3402 rho 405060000
20550112          0.1928 rho 405070000
*
*
20550200  m209213       sum    1.   0.    1
20550201  0.       0.2835 rho 409010000
20550202          8.805e-02 rho 410010000
20550203          0.1820 rho 412010000
20550204          4.86e-02 rho 413010000
20550205          7.29e-02 rho 413020000
20550206          7.29e-02 rho 413030000
20550207          9.29e-02 rho 413040000
20550208          9.29e-02 rho 413050000
20550209          9.29e-02 rho 413060000
20550210          0.1215 rho 413070000
20550211          0.1215 rho 413080000
20550212          0.1215 rho 413090000
20550213          0.1458 rho 413100000
20550214          0.1701 rho 413110000
20550215          0.1822 rho 413120000
*
*
20550300  m213215       sum    1.   0.    1
20550301  0.       0.1822 rho 413130000
20550302          0.1944 rho 413140000
20550303          0.2430 rho 413150000
20550304          0.2430 rho 413160000
20550305          0.2430 rho 413170000
20550306          0.2430 rho 413180000
20550307          0.1702 rho 414010000
20550308          4.86e-02 rho 415010000
20550309          7.29e-02 rho 415020000
20550310          7.29e-02 rho 415030000
20550311          9.29e-02 rho 415040000
20550312          9.29e-02 rho 415050000
20550313          9.29e-02 rho 415060000
20550314          0.1215 rho 415070000
20550315          0.1215 rho 415080000
*
*
20550400  m215217       sum    1.   0.    1
20550401  0.       0.1215 rho 415090000
20550402          0.1458 rho 415100000
20550403          0.1701 rho 415110000
20550404          0.1822 rho 415120000
20550405          0.1822 rho 415130000
20550406          0.1944 rho 415140000
20550407          0.2430 rho 415150000
20550408          0.2430 rho 415160000
20550409          0.2430 rho 415170000
20550410          0.2430 rho 415180000
20550411          0.1702 rho 416010000
20550412          4.86e-02 rho 417010000
20550413          7.29e-02 rho 417020000
20550414          7.29e-02 rho 417030000
20550415          9.29e-02 rho 417040000
*
*
20550500  m215217       sum    1.   0.    1
20550501  0.       9.29e-02 rho 417050000
20550502          9.29e-02 rho 417060000
20550503          0.1215 rho 417070000
20550504          0.1215 rho 417080000
20550505          0.1215 rho 417090000
20550506          0.1458 rho 417100000
20550507          0.1701 rho 417110000
20550508          0.1822 rho 417120000
20550509          0.1822 rho 417130000
20550510          0.1944 rho 417140000
20550511          0.2430 rho 417150000
20550512          0.2430 rho 417160000
20550513          0.2430 rho 417170000
20550514          0.2430 rho 417180000
20550515          0.1702 rho 418010000
*
*
20550600  m219        sum    1.   0.    1
20550601  0.       4.86e-02 rho 419010000
20550602          7.29e-02 rho 419020000
20550603          7.29e-02 rho 419030000
20550604          9.29e-02 rho 419040000
20550605          9.29e-02 rho 419050000
20550606          9.29e-02 rho 419060000
20550607          0.1215 rho 419070000
20550608          0.1215 rho 419080000
20550609          0.1215 rho 419090000
20550610          0.1458 rho 419100000
20550611          0.1701 rho 419110000
20550612          0.1822 rho 419120000
20550613          0.1822 rho 419130000
```

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20550614          0.1944 rho 419140000
20550615          0.2430 rho 419150000
*
*
20550700  m219221       sum    1.   0.    1
20550701  0.        0.2430 rho 419160000
20550702          0.2430 rho 419170000
20550703          0.2430 rho 419180000
20550704          0.1702 rho 420010000
20550705          4.86e-02 rho 421010000
20550706          7.29e-02 rho 421020000
20550707          7.29e-02 rho 421030000
20550708          9.29e-02 rho 421040000
20550709          9.29e-02 rho 421050000
20550710          9.29e-02 rho 421060000
20550711          0.1215 rho 421070000
20550712          0.1215 rho 421080000
20550713          0.1215 rho 421090000
20550714          0.1458 rho 421100000
20550715          0.1701 rho 421110000
*
*
20550800  m221223       sum    1.   0.    1
20550801  0.        0.1822 rho 421120000
20550802          0.1822 rho 421130000
20550803          0.1944 rho 421140000
20550804          0.2430 rho 421150000
20550805          0.2430 rho 421160000
20550806          0.2430 rho 421170000
20550807          0.2430 rho 421180000
20550808          0.1702 rho 422010000
20550809          4.86e-02 rho 423010000
20550810          7.29e-02 rho 423020000
20550811          7.29e-02 rho 423030000
20550812          9.29e-02 rho 423040000
20550813          9.29e-02 rho 423050000
20550814          9.29e-02 rho 423060000
20550815          0.1215 rho 423070000
*
*
20550900  m223         sum    1.   0.    1
20550901  0.        0.1215 rho 423080000
20550902          0.1215 rho 423090000
20550903          0.1458 rho 423100000
20550904          0.1701 rho 423110000
20550905          0.1822 rho 423120000
20550906          0.1822 rho 423130000
20550907          0.1944 rho 423140000
20550908          0.2430 rho 423150000
20550909          0.2430 rho 423160000
20550910          0.2430 rho 423170000
20550911          0.2430 rho 423180000
20550912          0.1467 rho 424010000
20550913          0.1467 rho 424020000
20550914          0.3581 rho 424030000
20550915          0.4109 rho 424040000
*
*
*
20551000  m274         sum    1.   0.    1
20551001  0.        0.1467 rho 474010000
20551002          0.1467 rho 474020000
20551003          0.3581 rho 474030000
20551004          0.4109 rho 474040000
20551005          0.1702 rho 472010000
20551006          0.1702 rho 470010000
20551007          0.1702 rho 468010000
20551008          0.1702 rho 466010000
20551009          0.1702 rho 464010000
20551010          0.1820 rho 462010000
20551011          8.8050e-02 rho 460010000
20551012          0.2835 rho 431010000
20551013          0.3402 rho 433010000
20551014          0.3402 rho 433020000
20551015          0.5670 rho 433030000
*
*
*
20551100  m233         sum    1.   0.    1
20551101  0.        0.5670 rho 433040000
20551102          0.5670 rho 433050000
20551103          0.5670 rho 433060000
20551104          0.5670 rho 433070000
20551105          0.5670 rho 433080000
20551106          0.4479 rho 433090000
20551107          0.4479 rho 433100000
20551108          0.4479 rho 433110000
20551109          0.4479 rho 433120000
20551110          0.4479 rho 433130000
20551111          0.4479 rho 433140000
20551112          0.5670 rho 433150000
20551113          0.5670 rho 433160000
20551114          0.4309 rho 433170000
*
20551200  l1tot        sum    1.   0.    1
20551201  0.   1.  cntrlvar 500
20551202       1.  cntrlvar 501
20551203       1.  cntrlvar 502
20551204       1.  cntrlvar 503
20551205       1.  cntrlvar 504
20551206       1.  cntrlvar 505
20551207       1.  cntrlvar 506
20551208       1.  cntrlvar 507
20551209       1.  cntrlvar 508
20551210       1.  cntrlvar 509
20551211       1.  cntrlvar 510
20551212       1.  cntrlvar 511
*
*
*     fine loop3
*
*
*     inizio loop4
*
*
*
20560000  mpompa       sum    1.   0.    1
20560001  0.        2.0100 rho 539010000
20560002          0.5103 rho 541010000
20560003          0.5670 rho 543010000
20560004          0.5670 rho 543020000
20560005          0.5670 rho 543030000
20560006          0.5670 rho 543040000
20560007          0.5670 rho 543050000
20560008          0.5670 rho 545010000
20560009          0.5670 rho 547010000
20560010          0.5670 rho 547020000
20560011          0.3402 rho 547030000
20560012          0.2268 rho 550010000
20560013          0.2268 rho 550010000
20560014          0.2268 rho 500010000
*
*
*
20560100  m201205       sum    1.   0.    1
20560101  0.        0.4252 rho 501010000
20560102          0.4252 rho 501020000
20560103          0.4252 rho 501030000
20560104          0.4252 rho 501040000
20560105          0.2268 rho 503010000
20560106          0.4252 rho 505010000
20560107          0.4252 rho 505020000
20560108          0.4082 rho 505030000
20560109          0.3402 rho 505040000
20560110          0.3402 rho 505050000
20560111          0.3402 rho 505060000
20560112          0.1928 rho 505070000
*
*
20560200  m209213       sum    1.   0.    1
20560201  0.        0.2835 rho 509010000
20560202          8.805e-02 rho 510010000
20560203          0.1820 rho 512010000
20560204          4.86e-02 rho 513010000
20560205          7.29e-02 rho 513020000
20560206          7.29e-02 rho 513030000
20560207          9.29e-02 rho 513040000
20560208          9.29e-02 rho 513050000
20560209          9.29e-02 rho 513060000
20560210          0.1215 rho 513070000
20560211          0.1215 rho 513080000
20560212          0.1215 rho 513090000
20560213          0.1458 rho 513100000
20560214          0.1701 rho 513110000
20560215          0.1822 rho 513120000
*
*
20560300  m213215       sum    1.   0.    1
20560301  0.        0.1822 rho 513130000
20560302          0.1944 rho 513140000
20560303          0.2430 rho 513150000
20560304          0.2430 rho 513160000
20560305          0.2430 rho 513170000
20560306          0.2430 rho 513180000
20560307          0.1702 rho 514010000
20560308          4.86e-02 rho 515010000
20560309          7.29e-02 rho 515020000
20560310          7.29e-02 rho 515030000
20560311          9.29e-02 rho 515040000
20560312          9.29e-02 rho 515050000
20560313          9.29e-02 rho 515060000
20560314          0.1215 rho 515070000
20560315          0.1215 rho 515080000
*
*
20560400  m215217       sum    1.   0.    1
20560401  0.        0.1215 rho 515090000
20560402          0.1458 rho 515100000
20560403          0.1701 rho 515110000
20560404          0.1822 rho 515120000
20560405          0.1822 rho 515130000
20560406          0.1944 rho 515140000
20560407          0.2430 rho 515150000
20560408          0.2430 rho 515160000
20560409          0.2430 rho 515170000
20560410          0.2430 rho 515180000
20560411          0.1702 rho 516010000
20560412          4.86e-02 rho 517010000
20560413          7.29e-02 rho 517020000
20560414          7.29e-02 rho 517030000
20560415          9.29e-02 rho 517040000
*
*
20560500  m215217       sum    1.   0.    1
20560501  0.        9.29e-02 rho 517050000
20560502          9.29e-02 rho 517060000
20560503          0.1215 rho 517070000
20560504          0.1215 rho 517080000
```

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20560505          0.1215 rho 517090000
20560506          0.1458 rho 517100000
20560507          0.1701 rho 517110000
20560508          0.1822 rho 517120000
20560509          0.1822 rho 517130000
20560510          0.1944 rho 517140000
20560511          0.2430 rho 517150000
20560512          0.2430 rho 517160000
20560513          0.2430 rho 517170000
20560514          0.2430 rho 517180000
20560515          0.1702 rho 518010000
*
*
20560600  m219          sum    1.   0.    1
20560601  0.       4.86e-02 rho 519010000
20560602          7.29e-02 rho 519020000
20560603          7.29e-02 rho 519030000
20560604          9.29e-02 rho 519040000
20560605          9.29e-02 rho 519050000
20560606          9.29e-02 rho 519060000
20560607          0.1215 rho 519070000
20560608          0.1215 rho 519080000
20560609          0.1215 rho 519090000
20560610          0.1458 rho 519100000
20560611          0.1701 rho 519110000
20560612          0.1822 rho 519120000
20560613          0.1822 rho 519130000
20560614          0.1944 rho 519140000
20560615          0.2430 rho 519150000
*
*
20560700  m219221        sum    1.   0.    1
20560701  0.       0.2430 rho 519160000
20560702          0.2430 rho 519170000
20560703          0.2430 rho 519180000
20560704          0.1702 rho 520010000
20560705          4.86e-02 rho 521010000
20560706          7.29e-02 rho 521020000
20560707          7.29e-02 rho 521030000
20560708          9.29e-02 rho 521040000
20560709          9.29e-02 rho 521050000
20560710          9.29e-02 rho 521060000
20560711          0.1215 rho 521070000
20560712          0.1215 rho 521080000
20560713          0.1215 rho 521090000
20560714          0.1458 rho 521100000
20560715          0.1701 rho 521110000
*
*
20560800  m221223        sum    1.   0.    1
20560801  0.       0.1822 rho 521120000
20560802          0.1822 rho 521130000
20560803          0.1944 rho 521140000
20560804          0.2430 rho 521150000
20560805          0.2430 rho 521160000
20560806          0.2430 rho 521170000
20560807          0.2430 rho 521180000
20560808          0.1702 rho 522010000
20560809          4.86e-02 rho 523010000
20560810          7.29e-02 rho 523020000
20560811          7.29e-02 rho 523030000
20560812          9.29e-02 rho 523040000
20560813          9.29e-02 rho 523050000
20560814          9.29e-02 rho 523060000
20560815          0.1215 rho 523070000
*
*
20560900  m223          sum    1.   0.    1
20560901  0.       0.1215 rho 523080000
20560902          0.1215 rho 523090000
20560903          0.1458 rho 523100000
20560904          0.1701 rho 523110000
20560905          0.1822 rho 523120000
20560906          0.1822 rho 523130000
20560907          0.1944 rho 523140000
20560908          0.2430 rho 523150000
20560909          0.2430 rho 523160000
20560910          0.2430 rho 523170000
20560911          0.2430 rho 523180000
20560912          0.1467 rho 524010000
20560913          0.1467 rho 524020000
20560914          0.3581 rho 524030000
20560915          0.4109 rho 524040000
*
*
*
20561000  m274          sum    1.   0.    1
20561001  0.       0.1467 rho 574010000
20561002          0.1467 rho 574020000
20561003          0.3581 rho 574030000
20561004          0.4109 rho 574040000
20561005          0.1702 rho 572010000
20561006          0.1702 rho 570010000
20561007          0.1702 rho 568010000
20561008          0.1702 rho 566010000
20561009          0.1702 rho 564010000
20561010          0.1820 rho 562010000
20561011          8.8050e-02 rho 560010000
20561012          0.2835 rho 531010000
20561013          0.3402 rho 533010000
20561014          0.3402 rho 533020000
20561015          0.5670 rho 533030000
*
*
*
20561100  m233          sum    1.   0.    1
20561101  0.       0.5670 rho 533040000
20561102          0.5670 rho 533050000
20561103          0.5670 rho 533060000
20561104          0.5670 rho 533070000
20561105          0.5670 rho 533080000
20561106          0.4479 rho 533090000
20561107          0.4479 rho 533100000
20561108          0.4479 rho 533110000
20561109          0.4479 rho 533120000
20561110          0.4479 rho 533130000
20561111          0.4479 rho 533140000
20561112          0.5670 rho 533150000
20561113          0.5670 rho 533160000
20561114          0.4309 rho 533170000
*
20561200  l1tot         sum    1.   0.    1
20561201 0.   1.  cntrlvar 600
20561202      1.  cntrlvar 601
20561203      1.  cntrlvar 602
20561204      1.  cntrlvar 603
20561205      1.  cntrlvar 604
20561206      1.  cntrlvar 605
20561207      1.  cntrlvar 606
20561208      1.  cntrlvar 607
20561209      1.  cntrlvar 608
20561210      1.  cntrlvar 609
20561211      1.  cntrlvar 610
20561212      1.  cntrlvar 611
*
*
*
*   fine loop4
*
*
*
*  Vessel
*
20561300  mvess          sum    1.   0.    1
20561301  0.       1.335 rho 100010000
20561302          1.920 rho 105010000
20561303          1.920 rho 105020000
20561304          1.920 rho 105030000
20561305          1.536 rho 106010000
20561306          1.043 rho 110010000
20561307          1.043 rho 110020000
20561308          1.043 rho 110030000
20561309          1.043 rho 110040000
20561310          1.043 rho 110050000
20561311          1.043 rho 110060000
20561312          1.043 rho 110070000
20561313          1.043 rho 110080000
20561314          1.043 rho 110090000
20561315          1.043 rho 110100000
*
*
*
20561400  mvess          sum    1.   0.    1
20561401  0.       1.043 rho 110110000
20561402          1.043 rho 110120000
20561403          1.043 rho 110130000
20561404          5.2150e-02 rho 120010000
20561405          5.2150e-02 rho 120020000
20561406          5.2150e-02 rho 120030000
20561407          5.2150e-02 rho 120040000
20561408          5.2150e-02 rho 120050000
20561419          5.2150e-02 rho 120060000
20561410          5.2150e-02 rho 120070000
20561411          5.2150e-02 rho 120080000
20561412          5.2150e-02 rho 120090000
20561413          5.2150e-02 rho 120100000
20561414          5.2150e-02 rho 120110000
20561415          5.2150e-02 rho 120120000
*
*
20561500  mvess          sum    1.   0.    1
20561501  0.       5.8408e-02 rho 121010000
20561502          1.0060 rho 130010000
20561503          0.2200 rho 130020000
20561504          0.7857 rho 130030000
20561505          0.7857 rho 130040000
20561506          0.7857 rho 130050000
20561507          0.7857 rho 130060000
20561508          0.7857 rho 130070000
20561509          0.7857 rho 130080000
20561510          0.7857 rho 130090000
20561511          0.7857 rho 130100000
20561512          0.7857 rho 130110000
20561513          0.7857 rho 130120000
20561514          0.7857 rho 130130000
20561515          0.7857 rho 130140000
*
*
*
20561600  mvess          sum    1.   0.    1
20561601  0.       0.7857 rho 130150000
20561602          1.006  rho 130160000
20561603          1.257  rho 130170000
20561604          1.257  rho 130180000
20561605          1.257  rho 130190000
20561606          0.9429 rho 139010000
20561607          0.1200 rho 133010000
20561608          0.1200 rho 133020000
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20561609          0.1200 rho 133030000
20561610          0.1200 rho 133040000
20561611          3.2740e-02 rho 134010000
20561612          3.2740e-02 rho 134020000
20561613          3.2740e-02 rho 134030000
20561614          3.2740e-02 rho 134040000
20561615          5.2150e-02 rho 120130000
*
*
20561700  mvess        sum    1.    0.    1
20561701 0.         0.1200 rho 135010000
20561702          0.1200 rho 135020000
20561703          0.1200 rho 135030000
20561704          0.1200 rho 135040000
20561705          0.1200 rho 136010000
20561706          0.1200 rho 136020000
20561707          0.1200 rho 136030000
20561708          0.1200 rho 136040000
20561709          3.2740e-02 rho 137010000
20561710          3.2740e-02 rho 137020000
20561711          3.2740e-02 rho 137030000
20561712          3.2740e-02 rho 137040000
*
*
*
20561800  mvess        sum    1.    0.    1
20561801 0.         0.1200 rho 138010000
20561802          0.1200 rho 138020000
20561803          0.1200 rho 138030000
20561804          0.1200 rho 138040000
20561805          0.1200 rho 176010000
20561806          0.1200 rho 176020000
20561807          0.1200 rho 176030000
20561808          0.1200 rho 176040000
20561809          0.1200 rho 177010000
20561810          0.1200 rho 177020000
20561811          0.1200 rho 177030000
20561812          0.1200 rho 177040000
20561813          1.3200 rho 131010000
20561814          0.9429 rho 132010000
20561815          1.0370 rho 132020000
*
*
*
*
20561900  mvess        sum    1.    0.    1
20561901 0.         1.1680 rho 140010000
20561902          2.3260 rho 141010000
20561903          2.1810 rho 142010000
20561904          1.8170 rho 143010000
20561905          1.8170 rho 143020000
20561906          1.8170 rho 143030000
20561907          1.8170 rho 143040000
20561908          3.0530 rho 144010000
20561909          2.1810 rho 145010000
20561910          2.3990 rho 146010000
20561911          3.0530 rho 147010000
20561912          2.3990 rho 148010000
*
*
20562000  mvess        sum    1.    0.    1
20562001 0.         2.3630 rho 150010000
20562002          2.3630 rho 150020000
20562003          2.3630 rho 150030000
20562004          2.3630 rho 150040000
20562005          2.3630 rho 150050000
20562006          2.3630 rho 150060000
20562007          2.3630 rho 150070000
20562008          2.3630 rho 150080000
20562009          2.1260 rho 155010000
20562010          0.2372 rho 156010000
20562011          2.1260 rho 160010000
20562012          2.1260 rho 160020000
20562013          2.0825e-02 rho 113010000
20562014          2.0825e-02 rho 113020000
20562015          2.0825e-02 rho 113030000
*
*
*
*
20562100  mvess        sum    1.    0.    1
20562101 0.         2.0825e-02 rho 113040000
20562102          2.0825e-02 rho 113050000
20562103          2.0825e-02 rho 113060000
20562104          2.0825e-02 rho 113070000
20562105          2.0825e-02 rho 113080000
20562106          2.0825e-02 rho 113090000
20562107          2.0825e-02 rho 113100000
20562108          2.0825e-02 rho 113110000
20562109          2.0825e-02 rho 113120000
20562110          2.0825e-02 rho 113130000
20562111          2.3324e-02 rho 113140000
20562112          2.6656e-02 rho 113150000
20562113          2.4990e-02 rho 113160000
20562114          2.0825e-02 rho 113170000
20562115          2.0825e-02 rho 113180000
*
*
*
*
20562200  mvess        sum    1.    0.    1
20562201 0.         2.0825e-02 rho 113190000
20562202          2.0825e-02 rho 113200000
20562203          3.4986e-02 rho 113210000
20562204          2.4990e-02 rho 113220000
20562205          2.7489e-02 rho 113230000
20562206          3.4986e-02 rho 113240000
20562207          2.7489e-02 rho 113250000
20562208          2.7073e-02 rho 113260000
20562209          2.7073e-02 rho 113270000
20562210          2.7073e-02 rho 113280000
20562211          2.7073e-02 rho 113290000
20562212          2.7073e-02 rho 113300000
20562213          2.7073e-02 rho 113310000
20562214          2.7073e-02 rho 113320000
20562215          2.7073e-02 rho 113330000
*
*
*
20562300  mvess        sum    1.    0.    1
20562301 0.         0.2372 rho 161010000
20562302          0.2372 rho 161020000
20562303          2.3630 rho 162010000
20562304          0.8125 rho 170010000
20562305          0.8125 rho 170020000
20562306          0.8125 rho 170030000
20562307          0.8125 rho 170040000
20562308          0.8125 rho 170050000
20562309          0.8125 rho 170060000
20562310          0.1625 rho 170070000
20562311          0.1625 rho 170080000
20562312          0.6510 rho 185010000
20562313          0.3875 rho 190010000
20562314          0.3875 rho 190020000
20562315          0.3875 rho 190030000
*
*
*
20562400  mvess        sum    1.    0.    1
20562401 0.         0.3875 rho 190040000
20562402          0.4650 rho 190050000
20562403          0.2372 rho 180010000
20562404          0.2372 rho 180020000
20562405          2.3630 rho 180030000
20562406          0.8125 rho 180040000
20562407          0.8125 rho 180050000
20562408          0.8125 rho 180060000
20562409          0.8125 rho 180070000
20562410          0.8125 rho 180080000
20562411          0.8125 rho 180090000
20562412          0.1625 rho 180100000
20562413          0.1625 rho 180110000
20562414          0.1625 rho 180120000
*
*
20570000 msom        sum    1.    0.    1
20570001 0.   1.  cntrlvar 613
20570002      1.  cntrlvar 614
20570003      1.  cntrlvar 615
20570004      1.  cntrlvar 616
20570005      1.  cntrlvar 617
20570006      1.  cntrlvar 618
20570007      1.  cntrlvar 619
20570008      1.  cntrlvar 620
20570009      1.  cntrlvar 621
20570010      1.  cntrlvar 622
20570011      1.  cntrlvar 623
20570012      1.  cntrlvar 624
*
* Pressurizzatore
*
*
20562500  mpres1       sum    1.    0.    1
20562501 0.         1.9090 rho 030010000
20562502          2.8280 rho 030020000
20562503          3.5350 rho 030030000
20562504          3.5350 rho 030040000
20562505          3.5350 rho 030050000
20562506          3.5350 rho 030060000
20562507          3.5350 rho 030070000
20562508          3.5350 rho 030080000
20562509          3.5350 rho 030090000
20562510          3.5350 rho 030100000
20562511          3.5350 rho 030110000
20562512          3.5350 rho 030120000
20562513          3.5350 rho 030130000
20562514          3.5350 rho 030140000
20562515          3.5350 rho 030150000
*
*
*
20562600  mpres2       sum    1.    0.    1
20562601 0.         3.5350 rho 030160000
20562602          3.5350 rho 030170000
20562603          3.5350 rho 030180000
20562604          3.5350 rho 030190000
20562605          3.5350 rho 030200000
20562606          2.4500 rho 030210000
20562607          1.5700 rho 030220000
20562608          0.3900 rho 030230000
*
* fine pressurizzatore
*
20570100 mpresom        sum    1.    0.    1
20570101 0.   1.  cntrlvar 625
20570102      1.  cntrlvar 626
*
```

```
*
*
*
20562700  m32          sum    1.   0.    1
20562701  0.       3.76e-02 rho 032010000
20562702           1.285e-02 rho 026010000
20562703           5.264e-02 rho 036010000
20562704           9.4e-02 rho 036020000
20562705           9.4e-02 rho 036030000
20562706           9.4e-02 rho 036040000
20562707           9.4e-02 rho 036050000
20562708           9.4e-02 rho 036060000
20562709           8.742e-02 rho 036070000
20562710           9.4e-02 rho 036080000
20562711           9.4e-02 rho 036090000
20562712           9.4e-02 rho 036100000
20562713           9.4e-02 rho 036110000
20562714           9.4e-02 rho 036120000
20562715           9.4e-02 rho 036130000
*
*
*
*
20562800  m36          sum    1.   0.    1
20562801  0.       9.4e-02 rho 036140000
20562802           9.4e-02 rho 036150000
20562803           9.4e-02 rho 036160000
20562804           7.614e-02 rho 036170000
20562805           5.64e-02 rho 036180000
20562806           2.57e-02 rho 022010000
20562807           5.14e-02 rho 022020000
20562808           5.14e-02 rho 022030000
20562809           5.14e-02 rho 022040000
20562810           5.14e-02 rho 022050000
20562811           4.5746e-02 rho 022060000
20562812           5.140e-02 rho 022070000
20562813           5.140e-02 rho 022080000
20562814           5.140e-02 rho 022090000
20562815           5.140e-02 rho 022100000
*
*
*
20562900  m22          sum    1.   0.    1
20562901  0.       5.140e-02 rho 022110000
20562902           5.140e-02 rho 022120000
20562903           5.140e-02 rho 022130000
20562904           5.140e-02 rho 022140000
20562905           5.140e-02 rho 022150000
20562906           5.140e-02 rho 022160000
20562907           5.140e-02 rho 022140000
20562908           5.140e-02 rho 022150000
20562909           5.140e-02 rho 022160000
*
*
*
20571000  mpresom       sum    1.   0.    1
20571001  0.   1.  cntrlvar 627
20571002       1.  cntrlvar 628
20571003       1.  cntrlvar 629
*
*
* Sommo tutto
*
*
20572000  mpresom       sum    1.   0.    1
20572001  0.   1.  cntrlvar 312
20572002       1.  cntrlvar 412
20572003       1.  cntrlvar 512
20572004       1.  cntrlvar 612
20572005       1.  cntrlvar 700
20572006       1.  cntrlvar 701
20572007       1.  cntrlvar 710
*
20580100  dpcore       sum    1.   0.    1
20580101  0.   1.  p 106010000
20580102     -1.  p 141010000
*
20580200  dprpv1       sum    1.   0.    1
20580201  0.   1.  p 250010000
20580202     -1.  p 200010000
*
20580300  dprpv2       sum    1.   0.    1
20580301  0.   1.  p 350010000
20580302     -1.  p 300010000
*
20580400  dprpv3       sum    1.   0.    1
20580401  0.   1.  p 450010000
20580402     -1.  p 400010000
*
20580500  dprpv4       sum    1.   0.    1
20580501  0.   1.  p 550010000
20580502     -1.  p 500010000
*
20580600  dpsg1        sum    1.   0.    1
20580601  0.   1.  p 209010000
20580602     -1.  p 231010000
*
20580700  dpsg2        sum    1.   0.    1
20580701  0.   1.  p 309010000
20580702     -1.  p 331010000
*
20580800  dpsg3        sum    1.   0.    1
20580801  0.   1.  p 409010000
20580802     -1.  p 431010000
*
20580900  dpsg4        sum    1.   0.    1
20580901  0.   1.  p 509010000
20580902     -1.  p 531010000
*
*-----------------------------------------------
* neutron kinetics data
*-----------------------------------------------
*
* point kinetics data
30000000 point separabl
30000001 gamma-ac 3000.0e6 0. 148.4 1.2 1.
30000002 ans79-1
30000101 0.032     1.28e-2
30000102 0.205     3.15e-2
30000103 0.185     12.11e-2
30000104 0.396     32.25e-2
30000105 0.146     1.404
30000106 0.036     3.8661
30000011 10886
30000012 900
*
* moderator density coefficient
*       kg/m3         $
30000501  50.        0.
30000502  512.       0.
30000503  614.       0.
30000504  655.       1.91
30000505  843.       14.0
30000506  944.       26.
30000507  1000.      38.
*
*
* doppler coefficient
*       k           $
30000601  274.       3.
30000602  974.       0.
30000603  1274.      0.
30000604  1474.     -3.
*
* volumes weighting factors
30000701  110010000  0     0.0286    0.
30000702  110020000  0     0.0607    0.
30000703  110030000  0     0.0643    0.
30000704  110040000  0     0.0714    0.
30000705  110050000  0     0.0821    0.
30000706  110060000  0     0.0929    0.
30000707  110070000  0     0.1       0.
30000708  110080000  0     0.1       0.
30000709  110090000  0     0.0929    0.
30000710  110100000  0     0.0821    0.
30000711  110110000  0     0.0714    0.
30000712  110120000  0     0.0643    0.
30000713  110130000  0     0.0607    0.
30000714  140010000  0     0.0286    0.
*
* structures weighting factors
30000801  1901001    0     0.0286    0.
30000802  1901002    0     0.0607    0.
30000803  1901003    0     0.0643    0.
30000804  1901004    0     0.0714    0.
30000805  1901005    0     0.0821    0.
30000806  1901006    0     0.0929    0.
30000807  1901007    0     0.1       0.
30000808  1901008    0     0.1       0.
30000809  1901009    0     0.0929    0.
30000810  1901010    0     0.0821    0.
30000811  1901011    0     0.0714    0.
30000812  1901012    0     0.0643    0.
30000813  1901013    0     0.0607    0.
30000814  1901014    0     0.0286    0.
*
* nue kin control ss 50*(time - 100.0)
20588000  expon    sum      50.  -50.  1   3  -
50.  50.
20588001  -100.0   1.         time      0
*
* exp(expon)
20588100  eldt         stdfnctn     1.    0.   1
20588101  exp          cntrlvar     880
*
* 1 + exp(expon)
20588200  den          sum       1.    0.   1
20588201  1.     1.    cntrlvar     881
*
* 1 / ( 1 + exp(expon) )
20588300  fact         div       1.    0.   1
20588301  cntrlvar     882
*
* p0 - p
20588400  deltp         sum       1.    0.   1
20588401  3.000e9   -1.   rktpow    0
*
* (p0 - p) * fact
20588500  ainteg        mult      1.    0.   1
20588501  cntrlvar  883
20588502  cntrlvar  884
*
* external reactivity for test initial conditions
20588600  extrea      integral     1.0e-08    0.   1
20588601  cntrlvar  885
.
```

APPENDICE F

ESTRATTO DEL FILE DI INPUT PER ILCODICE RELAP 5/MOD 3.3
STRUTTURE TERMICHE DEL VESSEL CON CLADDING
MODELLO RAFFINATO

```
*---------------------------------------------------------------------*
*                                                                     *
*       heat structures                                               *
*                                                                     *
*---------------------------------------------------------------------*
*    1. pressure vessel                                               *
*---------------------------------------------------------------------*
*
* surge line
11001000 19 5 2 1 0.173
11001100 0 1
11001101 4 0.213
11001201 1  4
11001301 0. 4
11001400 0
11001401 567. 5
11001501 036010000 0            1 1 0.56   1
11001502 036020000 10000          1 1 0.95   18
11001503 032010000 0            1 1 0.4    19
11001601 000000000 0            0 1 0.56   1
11001602 000000000 0            0 1 0.95   18
11001603 000000000 0            0 1 0.4    19
11001701 0 0. 0. 0. 19
11001801 0. 100. 100. 0. 0. 0. 0. 1. 19
*
* spray line
11002000 21 5 2 1 0.0905
11002100 0 1
11002101 4 0.1095
11002201 1  4
11002301 0. 4
11002400 0
11002401 567. 5
11002501 020010000 0            1 1 0.72   1
11002502 022010000 0            1 1 1.0    2
11002503 022020000 10000          1 1 1.95   20
11002504 026010000 00000          1 1 0.5    21
11002601 000000000 0            0 1 0.72   1
11002602 000000000 0            0 1 1.0    2
11002603 000000000 0            0 1 1.95   20
11002604 000000000 0            0 1 0.5    21
11002701 0 0. 0. 0. 21
11002801 0. 100. 100. 0. 0. 0. 0. 1. 21
*
* prz walls
11012000 23 5 2 1 1.5000
11012100 0 1
11012101 4 1.65
11012201 1  4
11012301 0. 4
11012400 0
11012401 567. 5
11012501 030010000 0            1 1 0.17   1
11012502 030020000 10000          1 1 0.5    23
11012601 000000000 0            0 1 0.17   1
11012602 000000000 0            0 1 0.5    23
11012701 0 0. 0. 0. 23
11012801 0. 100. 100. 0. 0. 0. 0. 1. 23
*
* prz bot & top plates
11013000 2 5  1 1 0.
11013100 0 1
11013101 4 0.15
11013201 1  4
11013301 0. 4
11013400 0
11013401 567. 5
11013501 030010000 0 1 1 9.0    1
11013502 030230000 0 1 1 9.0    2
11013601 000000000 0 0 1 9.0    2
11013701 0 0. 0. 0. 2
11013801 0. 100. 100. 0. 0. 0. 0. 1. 2
*
* prz internal heaters high power off
*11014000  4    5   2  1  0.
*11014100  0    1
*11014104  4    0.0115
*11014201  3    4
*11014301  1.   4
*11014401  561.0   5
*11014501  000000000  0      0        1      6000.00   4
*11014601  030010000  10000  1        1      6000.00   4
*11014701  910        0.25      0.0       0.0    4
*11014901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* prz internal heaters low power off
*11015000  4    5   2  1  0.
*11015100  0    1
*11015104  4    0.0115
*11015201  3    4
*11015301  1.   4
*11015401  561.0   5
*11015501  000000000  0      0        1      6000.00   4
*11015601  030010000  10000  1        1      6000.00   4
*11015701  911        0.25      0.0       0.0    4
*11015901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* vessel parte1
11091000  3    50  2  1  2.068
11091100  0    1
11091101  1    2.07298
11091102  48   2.312
11091201  2    1
11091202  1    49
11091301  0.   49
11091400  0
```

```
11091401  567.   50
11091501  100010000  0      1        1      0.3   1
11091502  130190000  0      1        1      0.4   2
11091503  130180000  0      1        1      0.267 3
11091601  000000000  0      0        1      0.3   1
11091602  000000000  0      0        1      0.4   2
11091603  000000000  0      0        1      0.267 3
11091701  0        0.     0.       0.    3
11091801  0. 100. 100. 0. 0. 0. 0. 1.    3
*
* vessel parte2
11092000  16   50  2  1  2.068
11092100  0    1
11092101  2    2.07614
11092102  47   2.2675
11092201  2    2
11092202  1    49
11092301  0.   49
11092400  0
11092401  567.   50
11092501  130180000  0      1        1      0.033 1
11092502  130170000  -10000  1        1      0.32  3
11092503  130150000  0      1        1      0.25  4
11092504  130140000  -10000  1        1      0.28  15
11092505  130030000  0      1        1      0.192 16
11092601  000000000  0      0        1      0.033 1
11092602  000000000  0      0        1      0.32  3
11092603  000000000  0      0        1      0.25  4
11092604  000000000  0      0        1      0.28  15
11092605  000000000  0      0        1      0.192 16
11092701  0        0.     0.       0.    16
11092801 0. 100. 100. 0. 0. 0. 0. 1. 16
*
* vessel parte3
11093000  13   50  2  1  1.993
11093100  0    1
11093101  1    1.99896
11093102  48   2.285
11093201  2    1
11093202  1    49
11093301  0.   49
11093400  0
11093401  567.   50
11093501  130030000  0      1        1      0.192 1
11093502  130020000  0      1        1      0.28  2
11093503  130010000  0      1        1      0.32  3
11093504  139010000  0      1        1      0.3   4
11093505  131010000  0      1        1      0.42  5
11093506  132010000  0      1        1      0.3   6
11093507  132020000  0      1        1      0.33  7
11093508  170010000  10000   1        1      0.325 12
11093509  170060000  0      1        1      0.312 13
11093601  000000000  0      0        1      0.192 1
11093602  000000000  0      0        1      0.28  2
11093603  000000000  0      0        1      0.32  3
11093604  000000000  0      0        1      0.3   4
11093605  000000000  0      0        1      0.42  5
11093606  000000000  0      0        1      0.3   6
11093607  000000000  0      0        1      0.33  7
11093608  000000000  0      0        1      0.325 12
11093609  000000000  0      0        1      0.312 13
11093701  0        0.     0.       0.    13
11093801 0. 100. 100. 0. 0. 0. 0. 1. 13
*
* vessel parte4
11094000  3   50  2  1  1.820
11094100  0    1
11094101  1    1.82949
11094102  48   2.285
11094201  2    1
11094202  1    49
11094301  0.   49
11094400  0
11094401  567.   50
11094501  170060000  0      1        1      0.013 1
11094502  170070000  0      1        1      0.325 2
11094503  170080000  0      1        1      0.158 3
11094601  000000000  0      0        1      0.013 1
11094602  000000000  0      0        1      0.325 2
11094603  000000000  0      0        1      0.158 3
11094701  0        0.     0.       0.    3
11094801 0. 100. 100. 0. 0. 0. 0. 1. 3
*
* vessel parte5
11095000  5   50  2  1  1.698
11095100  0    1
11095101  1    1.70998
11095102  48   2.285
11095201  2    1
11095202  1    49
11095301  0.   49
11095400  0
11095401  567.   50
11095501  170080000  0      1        1      0.167 1
11095502  155010000  0      1        1      0.325 2
11095503  160010000  0      1        1      0.325 3
11095504  160020000  0      1        1      0.325 4
11095505  162010000  0      1        1      0.325 5
11095601  000000000  0      0        1      0.167 1
11095602  000000000  0      0        1      0.325 2
11095603  000000000  0      0        1      0.325 3
11095604  000000000  0      0        1      0.325 4
11095605  000000000  0      0        1      0.325 5
11095701  0        0.     0.       0.    5
11095801  0. 100. 100. 0. 0. 0. 0. 1. 5
*
*
*
```

```
*
*  VECCHIO VESSEL
*rpv walls
*11101000 36 10 2 1 2.068
*11101100 0 1
*11101101 9 2.267
*11101201 1  9
*11101301 0. 9
*11101400 0
*11101401 567. 10
*11101501 100010000 0            1 1 0.3    1
*11101502 130190000 -10000       1 1 0.4    4
*11101503 130160000 0            1 1 0.32   5
*11101504 130150000 -10000       1 1 0.25   18
*11101505 130020000  0           1 1 0.28   19
*11101506 130010000  0           1 1 0.32   20
*11101507 139010000  00000       1 1 0.30   21
*11101508 131010000  00000       1 1 0.42   22
*11101509 132010000  10000       1 1 0.31   24
*11101510 170010000  10000       1 1 0.325  32
*11101511 155010000  00000       1 1 0.325  33
*11101512 160020000 -10000       1 1 0.325  35
*11101513 162010000  00000       1 1 0.325  36
*11101601 000000000 0            0 1 0.3    1
*11101602 000000000 0            0 1 0.4    4
*11101603 000000000 0            0 1 0.32   5
*11101604 000000000 0            0 1 0.25   18
*11101605 000000000 0            0 1 0.28   19
*11101606 000000000 0            0 1 0.32   20
*11101607 000000000 0            0 1 0.30   21
*11101608 000000000 0            0 1 0.42   22
*11101609 000000000 0            0 1 0.31   24
*11101610 000000000 0            0 1 0.325  32
*11101611 000000000 0            0 1 0.325  33
*11101612 000000000 0            0 1 0.325  35
*11101613 000000000 0            0 1 0.325  36
*11101701 0 0. 0. 0. 36
*11101801 0. 100. 100. 0. 0. 0. 0. 1. 36
*
* rpv part - 1 for pts cl 1
*11102000 4 30 2 1 2.068
*11102100 0 1
*11102101 29 2.267
*11102201 1  29
*11102301 0. 29
*11102400 0
*11102401 567. 30
*11102501 133010000 10000        1 1 0.016  4
*11102601 000000000 0            0 1 0.016  4
*11102701 0 0. 0. 0. 4
*11102801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 1 for pts cl 1
11102000 4 90 1 1 1.993
11102100 0 1
11102101  1    1.995102
11102102  1    1.996773
11102103  1    1.998102
11102104  1    1.999159
11102105  1    2.0
11102106  1    2.000865
11102107  1    2.001943
11102108  1    2.003288
11102109  1    2.004964
11102110  1    2.007054
11102111  1    2.009659
11102112  1    2.012907
11102113  1    2.016957
11102114  1    2.022005
11102115  1    2.028299
11102116  74   2.285
11102201  2    5
11102202  1    89
11102301 0. 89
11102400 0
11102401 567. 90
11102501 133010000 10000         1 1 0.4963  4
11102601 000000000 0             0 1 0.4963  4
11102701 0 0. 0. 0. 4
11102801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 2 for pts transition zone
*11103000 4 30 2 1 2.068
*11103100 0 1
*11103101 29 2.267
*11103201 1  29
*11103301 0. 29
*11103400 0
*11103401 567. 30
*11103501 176010000 10000         1 1 0.016  4
*11103601 000000000 0             0 1 0.016  4
*11103701 0 0. 0. 0. 4
*11103801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 2 for pts transition zone
11103000 4 90 1 1 1.993
11103100 0 1
11103101  1    1.995102
11103102  1    1.996773
11103103  1    1.998102
11103104  1    1.999159
11103105  1    2.0
11103106  1    2.000865
11103107  1    2.001943
11103108  1    2.003288
11103109  1    2.004964
11103110  1    2.007054
11103111  1    2.009659
```

```
11103112  1    2.012907
11103113  1    2.016957
11103114  1    2.022005
11103115  1    2.028299
11103116  74   2.285
11103201  2    5
11103202  1    89
11103301 0. 89
11103400 0
11103401 567. 90
11103501 176010000 10000          1 1 0.4963  4
11103601 000000000 0              0 1 0.4963  4
11103701 0 0. 0. 0. 4
11103801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 3 for pts sit 3
*11104000 4 30 2 1 2.068
*11104100 0 1
*11104101 29 2.267
*11104201 1  29
*11104301 0. 29
*11104400 0
*11104401 567. 30
*11104501 134010000 10000         1 1 0.016  4
*11104601 000000000 0             0 1 0.016  4
*11104701 0 0. 0. 0. 4
*11104801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 3 for pts sit 3
11104000 4 90 1 1 1.993
11104100 0 1
11104101  1    1.995102
11104102  1    1.996773
11104103  1    1.998102
11104104  1    1.999159
11104105  1    2.0
11104106  1    2.000865
11104107  1    2.001943
11104108  1    2.003288
11104109  1    2.004964
11104110  1    2.007054
11104111  1    2.009659
11104112  1    2.012907
11104113  1    2.016957
11104114  1    2.022005
11104115  1    2.028299
11104116  74   2.285
11104201  2    5
11104202  1    89
11104301 0. 89
11104400 0
11104401 567. 90
11104501 134010000 10000          1 1 0.1353  4
11104601 000000000 0              0 1 0.1353  4
11104701 0 0. 0. 0. 4
11104801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 4 for pts cl 2
*11105000 4 30 2 1 2.068
*11105100 0 1
*11105101 29 2.267
*11105201 1  29
*11105301 0. 29
*11105400 0
*11105401 567. 30
*11105501 135010000 10000         1 1 0.016  4
*11105601 000000000 0             0 1 0.016  4
*11105701 0 0. 0. 0. 4
*11105801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 4 for pts cl 2
11105000 4 90 2 1 1.993
11105100 0 1
11105101  1    1.995102
11105102  1    1.996773
11105103  1    1.998102
11105104  1    1.999159
11105105  1    2.0
11105106  1    2.000865
11105107  1    2.001943
11105108  1    2.003288
11105109  1    2.004964
11105110  1    2.007054
11105111  1    2.009659
11105112  1    2.012907
11105113  1    2.016957
11105114  1    2.022005
11105115  1    2.028299
11105116  74   2.285
11105201  2    5
11105202  1    89
11105301 0. 89
11105400 0
11105401 567. 90
11105501 135010000 10000          1 1 0.4963  4
11105601 000000000 0              0 1 0.4963  4
11105701 0 0. 0. 0. 4
11105801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 5 for pts cl 3
*11106000 4 30 2 1 2.068
*11106100 0 1
*11106101 29 2.267
*11106201 1  29
*11106301 0. 29
```

```
*11106400 0
*11106401 567. 30
*11106501 136010000 10000          1 1 0.016  4
*11106601 000000000 0              0 1 0.016  4
*11106701 0 0. 0. 0. 4
*11106801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 5 for pts cl 3
11106000 4 90 1 1 1.993
11106100 0 1
11106101  1    1.995102
11106102  1    1.996773
11106103  1    1.998102
11106104  1    1.999159
11106105  1    2.0
11106106  1    2.000865
11106107  1    2.001943
11106108  1    2.003288
11106109  1    2.004964
11106110  1    2.007054
11106111  1    2.009659
11106112  1    2.012907
11106113  1    2.016957
11106114  1    2.022005
11106115  1    2.028299
11106116  74   2.285
11106201  2    5
11106202  1    89
11106301 0. 89
11106400 0
11106401 567. 90
11106501 136010000 10000          1 1 0.4963  4
11106601 000000000 0              0 1 0.4963  4
11106701 0 0. 0. 0. 4
11106801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 6 for pts transition zone
*11107000 4 30 2 1 2.068
*11107100 0 1
*11107101 29 2.267
*11107201 1  29
*11107301 0. 29
*11107400 0
*11107401 567. 30
*11107501 177010000 10000          1 1 0.016  4
*11107601 000000000 0              0 1 0.016  4
*11107701 0 0. 0. 0. 4
*11107801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 6 for pts transition zone
11107000 4 90 1 1 1.993
11107100 0 1
11107101  1    1.995102
11107102  1    1.996773
11107103  1    1.998102
11107104  1    1.999159
11107105  1    2.0
11107106  1    2.000865
11107107  1    2.001943
11107108  1    2.003288
11107109  1    2.004964
11107110  1    2.007054
11107111  1    2.009659
11107112  1    2.012907
11107113  1    2.016957
11107114  1    2.022005
11107115  1    2.028299
11107116  74   2.285
11107201  2    5
11107202  1    89
11107301 0. 89
11107400 0
11107401 567. 90
11107501 177010000 10000          1 1 0.4963  4
11107601 000000000 0              0 1 0.4963  4
11107701 0 0. 0. 0. 4
11107801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 7 for pts sit 4
*11108000 4 30 2 1 2.068
*11108100 0 1
*11108101 29 2.267
*11108201 1  29
*11108301 0. 29
*11108400 0
*11108401 567. 30
*11108501 137010000 10000          1 1 0.016  4
*11108601 000000000 0              0 1 0.016  4
*11108701 0 0. 0. 0. 4
*11108801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 7 for pts sit 4
11108000 4 90 1 1 1.993
11108100 0 1
11108101  1    1.995102
11108102  1    1.996773
11108103  1    1.998102
11108104  1    1.999159
11108105  1    2.0
11108106  1    2.000865
11108107  1    2.001943
11108108  1    2.003288
11108109  1    2.004964
11108110  1    2.007054
11108111  1    2.009659
11108112  1    2.012907
```

```
11108113  1    2.016957
11108114  1    2.022005
11108115  1    2.028299
11108116  74   2.285
11108201  2    5
11108202  1    89
11108301 0. 89
11108400 0
11108401 567. 90
11108501 137010000 10000          1 1 0.1353  4
11108601 000000000 0              0 1 0.1353  4
11108701 0 0. 0. 0. 4
11108801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* rpv part - 8 for pts cl 4
*11109000 4 30 2 1 2.068
*11109100 0 1
*11109101 29 2.267
*11109201 1  29
*11109301 0. 29
*11109400 0
*11109401 567. 30
*11109501 138010000 10000          1 1 0.016  4
*11109601 000000000 0              0 1 0.016  4
*11109701 0 0. 0. 0. 4
*11109801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* rpv part - 8 for pts cl 4
11109000 4 90 1 1 1.993
11109100 0 1
11109101  1    1.995102
11109102  1    1.996773
11109103  1    1.998102
11109104  1    1.999159
11109105  1    2.0
11109106  1    2.000865
11109107  1    2.001943
11109108  1    2.003288
11109109  1    2.004964
11109110  1    2.007054
11109111  1    2.009659
11109112  1    2.012907
11109113  1    2.016957
11109114  1    2.022005
11109115  1    2.028299
11109116  74   2.285
11109201  2    5
11109202  1    89
11109301 0. 89
11109400 0
11109401 567. 90
11109501 138010000 10000          1 1 0.4963  4
11109601 000000000 0              0 1 0.4963  4
11109701 0 0. 0. 0. 4
11109801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
*
* rpv bot & top plates
*11113000 2 5  1 1 0.
*11113100 0 1
*11113101 4 0.24
*11113201 1  4
*11113301 0. 4
*11113400 0
*11113401 567. 5
*11113501 100010000 0 1 1 15.    1
*11113502 162010000 0 1 1 15.    2
*11113601 000000000 0 0 1 15.    2
*11113701 0 0. 0. 0. 2
*11113801 0. 100. 100. 0. 0. 0. 0. 1. 2
*
*
* rpv bot plate
11111000 1 50 1 1 0.
11111100 0 1
11111101 1 0.004979
11111102 48 0.244
11111201 2  1
11111202 1  49
11111301 0. 49
11111400 0
11111401 567. 50
11111501 100010000 0 1 1 15.    1
11111601 000000000 0 0 1 15.    1
11111701 0 0. 0. 0. 1
11111801 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* rpv top plate
11112000 1 50 1 1 0.
11112100 0 1
11112101 1 0.005959
11112102 48 0.292
11112201 2  1
11112202 1  49
11112301 0. 49
11112400 0
11112401 567. 50
11112501 162010000 0 1 1 15.    1
11112601 000000000 0 0 1 15.    1
11112701 0 0. 0. 0. 1
11112801 0. 100. 100. 0. 0. 0. 0. 1. 1
*
*
* core barrel shell
11202000 31  5  2 1 1.75
11202100 0 1
```

```
11202101 4 1.81
11202201 1  4
11202301 0. 4
11202400 0
11202401 567. 5
11202501 105010000 10000       1 1 0.4    3
11202502 106010000 0           1 1 0.32   4
11202503 120010000 10000       1 1 0.25   17
11202504 121010000 0           1 1 0.28   18
11202505 141010000 0           1 1 0.32   19
11202506 142010000 0           1 1 0.30   20
11202507 144010000 0           1 1 0.42   21
11202508 145010000 0           1 1 0.3    22
11202509 146010000 0           1 1 0.33   23
11202510 150080000 -10000      1 1 0.325  31
11202601 130190000 -10000      1 1 0.4    3
11202602 130160000 0           1 1 0.32   4
11202603 130150000 -10000      1 1 0.25   17
11202604 130020000 0           1 1 0.28   18
11202605 130010000 00000       1 1 0.32   19
11202606 139010000 0           1 1 0.30   20
11202607 131010000 0           1 1 0.42   21
11202608 132010000 0           1 1 0.3    22
11202609 132020000 00000       1 1 0.33   23
11202610 170010000 10000       1 1 0.325  31
11202701 0 0. 0. 0. 31
11202801 0. 100. 100. 0. 0. 0. 0. 1. 31
11202901 0. 100. 100. 0. 0. 0. 0. 1. 31
*
* up barrel
11203000 19  5  2 1 1.6
11203100 0 1
11203101 4 1.65
11203201 1  4
11203301 0. 4
11203400 0
11203401 567. 5
11203501 141010000 0           1 1 0.32   1
11203502 142010000 0           1 1 0.30   2
11203503 143010000 10000       1 1 0.25   6
11203504 144010000 0           1 1 0.42   7
11203505 145010000 0           1 1 0.3    8
11203506 146010000 0           1 1 0.33   9
11203507 147010000 0           1 1 0.42   10
11203508 148010000 0           1 1 0.33   11
11203509 150010000 10000       1 1 0.325  19
11203601 000000000 0           0 1 0.32   1
11203602 000000000 0           0 1 0.30   2
11203603 000000000 0           0 1 0.25   6
11203604 000000000 0           0 1 0.42   7
11203605 000000000 0           0 1 0.3    8
11203606 000000000 0           0 1 0.33   9
11203607 000000000 0           0 1 0.42   10
11203608 000000000 0           0 1 0.33   11
11203609 000000000 0           0 1 0.325  19
11203701 0 0. 0. 0. 19
11203801 0. 100. 100. 0. 0. 0. 0. 1. 19
*
* core barrel part - 1 (pts cl 1)
11192000 4  10  1 1 1.75
11192100 0 1
11192101 9 1.81
11192201 1  9
11192301 0. 9
11192400 0
11192401 567. 10
11192501 143010000  10000       1 1 0.4272  4
11192601 133040000 -10000       1 1 0.4272  4
11192701 0 0. 0. 0. 4
11192801 0. 100. 100. 0. 0. 0. 0. 1. 4
11192901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 2 (pts transition zone)
11193000 4  10  1 1 1.75
11193100 0 1
11193101 9 1.81
11193201 1  9
11193301 0. 9
11193400 0
11193401 567. 10
11193501 143010000  10000       1 1 0.4272  4
11193601 176040000 -10000       1 1 0.4272  4
11193701 0 0. 0. 0. 4
11193801 0. 100. 100. 0. 0. 0. 0. 1. 4
11193901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 3 (pts sit 3)
11194000 4  10  1 1 1.75
11194100 0 1
11194101 9 1.81
11194201 1  9
11194301 0. 9
11194400 0
11194401 567. 10
11194501 143010000  10000       1 1 0.0777  4
11194601 134040000 -10000       1 1 0.0777  4
11194701 0 0. 0. 0. 4
11194801 0. 100. 100. 0. 0. 0. 0. 1. 4
11194901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 4 (pts cl2)
11195000 4  10  1 1 1.75
11195100 0 1
11195101 9 1.81
11195201 1  9
11195301 0. 9
11195400 0
11195401 567. 10
```

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11195501 143010000  10000       1 1 0.4272  4
11195601 135040000 -10000       1 1 0.4272  4
11195701 0 0. 0. 0. 4
11195801 0. 100. 100. 0. 0. 0. 0. 1. 4
11195901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 5 (pts cl3)
11196000 4  10  1 1 1.75
11196100 0 1
11196101 9 1.81
11196201 1  9
11196301 0. 9
11196400 0
11196401 567. 10
11196501 143010000  10000       1 1 0.4272  4
11196601 136040000 -10000       1 1 0.4272  4
11196701 0 0. 0. 0. 4
11196801 0. 100. 100. 0. 0. 0. 0. 1. 4
11196901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 6 (pts transition zone)
11197000 4  10  1 1 1.75
11197100 0 1
11197101 9 1.81
11197201 1  9
11197301 0. 9
11197400 0
11197401 567. 10
11197501 143010000  10000       1 1 0.4272  4
11197601 177040000 -10000       1 1 0.4272  4
11197701 0 0. 0. 0. 4
11197801 0. 100. 100. 0. 0. 0. 0. 1. 4
11197901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 7 (pts sit 4)
11198000 4  10  1 1 1.75
11198100 0 1
11198101 9 1.81
11198201 1  9
11198301 0. 9
11198400 0
11198401 567. 10
11198501 143010000  10000       1 1 0.0777  4
11198601 137040000 -10000       1 1 0.0777  4
11198701 0 0. 0. 0. 4
11198801 0. 100. 100. 0. 0. 0. 0. 1. 4
11198901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 8 (pts cl4)
11199000 4  10  1 1 1.75
11199100 0 1
11199101 9 1.81
11199201 1  9
11199301 0. 9
11199400 0
11199401 567. 10
11199501 143010000  10000       1 1 0.4272  4
11199601 138040000 -10000       1 1 0.4272  4
11199701 0 0. 0. 0. 4
11199801 0. 100. 100. 0. 0. 0. 0. 1. 4
11199901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 1 (pts cl 1)
*11192000 4  10  2 1 1.75
*11192100 0 1
*11192101 9 1.81
*11192201 1  9
*11192301 0. 9
*11192400 0
*11192401 567. 10
*11192501 143010000  10000       1 1 0.046  4
*11192601 133040000 -10000       1 1 0.046  4
*11192701 0 0. 0. 0. 4
*11192801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11192901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 2 (pts transition zone)
*11193000 4  10  2 1 1.75
*11193100 0 1
*11193101 9 1.81
*11193201 1  9
*11193301 0. 9
*11193400 0
*11193401 567. 10
*11193501 143010000  10000       1 1 0.046  4
*11193601 176040000 -10000       1 1 0.046  4
*11193701 0 0. 0. 0. 4
*11193801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11193901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 3 (pts sit 3)
*11194000 4  10  2 1 1.75
*11194100 0 1
*11194101 9 1.81
*11194201 1  9
*11194301 0. 9
*11194400 0
*11194401 567. 10
*11194501 143010000  10000       1 1 0.046  4
*11194601 134040000 -10000       1 1 0.046  4
*11194701 0 0. 0. 0. 4
*11194801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11194901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 4 (pts cl2)
*11195000 4  10  2 1 1.75
*11195100 0 1
*11195101 9 1.81
```

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*11195201 1  9
*11195301 0. 9
*11195400 0
*11195401 567. 10
*11195501 143010000  10000        1 1 0.046  4
*11195601 135040000 -10000        1 1 0.046  4
*11195701 0 0. 0. 0. 4
*11195801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11195901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 5 (pts cl3)
*11196000 4  10  2 1 1.75
*11196100 0 1
*11196101 9 1.81
*11196201 1  9
*11196301 0. 9
*11196400 0
*11196401 567. 10
*11196501 143010000  10000        1 1 0.046  4
*11196601 136040000 -10000        1 1 0.046  4
*11196701 0 0. 0. 0. 4
*11196801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11196901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 6 (pts transition zone)
*11197000 4  10  2 1 1.75
*11197100 0 1
*11197101 9 1.81
*11197201 1  9
*11197301 0. 9
*11197400 0
*11197401 567. 10
*11197501 143010000  10000        1 1 0.046  4
*11197601 177040000 -10000        1 1 0.046  4
*11197701 0 0. 0. 0. 4
*11197801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11197901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 7 (pts sit 4)
*11198000 4  10  2 1 1.75
*11198100 0 1
*11198101 9 1.81
*11198201 1  9
*11198301 0. 9
*11198400 0
*11198401 567. 10
*11198501 143010000  10000        1 1 0.046  4
*11198601 137040000 -10000        1 1 0.046  4
*11198701 0 0. 0. 0. 4
*11198801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11198901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* core barrel part - 8 (pts cl4)
*11199000 4  10  2 1 1.75
*11199100 0 1
*11199101 9 1.81
*11199201 1  9
*11199301 0. 9
*11199400 0
*11199401 567. 10
*11199501 143010000  10000        1 1 0.046  4
*11199601 138040000 -10000        1 1 0.046  4
*11199701 0 0. 0. 0. 4
*11199801 0. 100. 100. 0. 0. 0. 0. 1. 4
*11199901 0. 100. 100. 0. 0. 0. 0. 1. 4
*
*
* up barrel top plates
11211000 2 5  1 1 0.
11211100 0 1
11211101 4 0.12
11211201 1  4
11211301 0. 4
11211400 0
11211401 567. 5
11211501 150010000 0 1 1 4.7    1
11211502 148010000 0 1 1 4.7    2
11211601 155010000 0 1 1 4.7    1
11211602 150080000 0 1 1 4.7    2
11211701 0 0. 0. 0. 2
11211801 0. 100. 100. 0. 0. 0. 0. 1. 2
11211901 0. 100. 100. 0. 0. 0. 0. 1. 2
*
* core bottom support plate
11212000 1 5  1 1 0.
11212100 0 1
11212101 4 0.10
11212201 1  4
11212301 0. 4
11212400 0
11212401 567. 5
11212501 106010000 0 1 1 4.5    1
11212601 110010000 0 1 1 4.5    1
11212701 0 0. 0. 0. 1
11212801 0. 100. 100. 0. 0. 0. 0. 1. 1
11212901 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* core top plate
11213000 1 5  1 1 0.
11213100 0 1
11213101 4 0.10
11213201 1  4
11213301 0. 4
11213400 0
11213401 567. 5
11213501 141010000 0 1 1 4.5    1
11213601 142010000 0 1 1 4.5    1
11213701 0 0. 0. 0. 1
```

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11213801 0. 100. 100. 0. 0. 0. 0. 1. 1
11213901 0. 100. 100. 0. 0. 0. 0. 1. 1
*
* guide tube walls
11251000 18  5  2 1 0.09
11251100 0 1
11251101 4 0.097
11251201 1  4
11251301 0. 4
11251400 0
11251401 567. 5
11251501 180010000 10000       1 1 19.8   8
11251502 180090000 0           1 1 20.1   9
11251503 180100000 0           1 1 25.6   10
11251504 180110000 10000       1 1 18.3   12
11251505 185010000 0           1 1 25.6   13
11251506 190010000 10000       1 1 20.1   18
11251601 150010000 10000       1 1 19.8   8
11251602 148010000 0           1 1 20.1   9
11251603 147010000 0           1 1 25.6   10
11251604 146010000 0           1 1 18.3   11
11251605 145010000 0           1 1 18.3   12
11251606 144010000 0           1 1 25.6   13
11251607 143040000 -10000      1 1 20.1   17
11251608 142010000 0           1 1 20.1   18
11251701 0 0. 0. 0. 18
11251801 0. 100. 100. 0. 0. 0. 0. 1. 18
11251901 0. 100. 100. 0. 0. 0. 0. 1. 18
*
* guide tube bot
11303000 4   5  2 1 0.10
11303100 0 1
11303101 4 0.112
11303201 1  4
11303301 0. 4
11303400 0
11303401 567. 5
11303501 105010000 10000       1 1 128.   3
11303502 106010000 0           1 1 128.   4
11303601 000000000 0           0 1 128.   4
11303701 0 0. 0. 0. 4
11303801 0. 100. 100. 0. 0. 0. 0. 1. 4
*
* fuel bundle central - active zone   1/3  of 2
11901000 14 12 2 1 0.0  *  744 1 32
11901100 0 2
11901101 0.00035 2 6.1300e-4 7 6.75e-5 9  3.2500e-4 11
11901201 5   2
11901202 4   7
11901203 5   9
11901204 6   11
11901301 0.  2
11901302 1.  7
11901303 0.  11
11901400 0
11901401 600. 12
11901501 0             0      0  1 4237.75     13
11901502 0             0      0  1 4746.28     14
11901601 110010000  10000       1  1 4237.75     13
11901602 140010000      0      1  1 4746.28     14
11901701 1000  1.1398655e-2       0. 0.  1
11901702 1000  2.4297133e-2       0. 0.  2
11901703 1000  2.5696968e-2       0. 0.  3
11901704 1000  2.8596626e-2       0. 0.  4
11901705 1000  3.2896118e-2       0. 0.  5
11901706 1000  3.7095623e-2       0. 0.  6
11901707 1000  3.9995281e-2       0. 0.  7
11901708 1000  3.9995281e-2       0. 0.  8
11901709 1000  3.7095623e-2       0. 0.  9
11901710 1000  3.2896118e-2       0. 0.  10
11901711 1000  2.8596626e-2       0. 0.  11
11901712 1000  2.5696968e-2       0. 0.  12
11901713 1000  2.4297133e-2       0. 0.  13
11901714 1000  1.1398655e-2       0. 0.  14
11901901 0. 100. 100. 0. 0. 0.1   0.1  1. 14
*
* fuel bundle middle  - active zone  1/3 of core (+ hot rod power)
11902000 14 12 2 1 0.0  *  744 1 32
11902100 0 2
11902101 0.00035 2 6.1300e-4 7 6.75e-5 9  3.2500e-4 11
11902201 5   2
11902202 4   7
11902203 5   9
11902204 6   11
11902301 0.  2
11902302 1.  7
11902303 0.  11
11902400 0
11902401 600. 12
11902501 0             0      0  1 4238.0     13
11902502 0             0      0  1 4746.56    14
11902601 110010000  10000       1  1 4238.0     13
11902602 140010000      0      1  1 4746.56    14
11902701 1000  0.008401      0. 0.  1
11902702 1000  0.020001      0. 0.  2
11902703 1000  0.021401      0. 0.  3
11902704 1000  0.023601      0. 0.  4
11902705 1000  0.027101      0. 0.  5
11902706 1000  0.030701      0. 0.  6
11902707 1000  0.032901      0. 0.  7
11902708 1000  0.032901      0. 0.  8
11902709 1000  0.030701      0. 0.  9
11902710 1000  0.027101      0. 0.  10
11902711 1000  0.023601      0. 0.  11
11902712 1000  0.021401      0. 0.  12
11902713 1000  0.020001      0. 0.  13
11902714 1000  0.008401      0. 0.  14
11902901 0. 100. 100. 0. 0. 0.05  0.05 1. 14
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*
* fuel bundle periph. - active zone  1/3 of core
11903000 14 12 2 1 0.0  *   744 1 32
11903100 0 2
11903101 0.00035 2 6.1300e-4 7 6.75e-5 9  3.2500e-4 11
11903201 5   2
11903202 4   7
11903203 5   9
11903204 6   11
11903301 0.  2
11903302 1.  7
11903303 0.  11
11903400 0
11903401 600. 12
11903501 0              0       0  1 4238.0     13
11903502 0              0       0  1 4746.56    14
11903601 110010000  10000        1  1 4238.0     13
11903602 140010000       0       1  1 4746.56    14
11903701 1000  0.0079        0. 0.  1
11903702 1000  0.0164        0. 0.  2
11903703 1000  0.0172        0. 0.  3
11903704 1000  0.0193        0. 0.  4
11903705 1000  0.0221        0. 0.  5
11903706 1000  0.0250        0. 0.  6
11903707 1000  0.0271        0. 0.  7
11903708 1000  0.0271        0. 0.  8
11903709 1000  0.0250        0. 0.  9
11903710 1000  0.0221        0. 0.  10
11903711 1000  0.0193        0. 0.  11
11903712 1000  0.0172        0. 0.  12
11903713 1000  0.0164        0. 0.  13
11903714 1000  0.0079        0. 0.  14
11903901 0. 100. 100. 0. 0. 0.05  0.05 1. 14
*
* hot rod (attention hot rod power fraction -1.e-6)
11904000 14 12 2 1 0.0  *  744 1 32
11904100 0 2
11904101 0.00035 2 6.1300e-4 7 6.75e-5 9  3.2500e-4 11
11904201 5   2
11904202 4   7
11904203 5   9
11904204 6   11
11904301 0.  2
11904302 1.  7
11904303 0.  11
11904400 0
11904401 600. 12
11904501 0              0       0  1 0.25       13
11904502 0              0       0  1 0.28       14
11904601 110010000  10000        1  1 0.25       13
11904602 140010000       0       1  1 0.28       14
11904701 1000  0.345e-6        0. 0.  1
11904702 1000  1.867e-6        0. 0.  2
11904703 1000  2.032e-6        0. 0.  3
11904704 1000  2.374e-6        0. 0.  4
11904705 1000  2.882e-6        0. 0.  5
11904706 1000  3.377e-6        0. 0.  6
11904707 1000  3.719e-6        0. 0.  7
11904708 1000  3.719e-6        0. 0.  8
11904709 1000  3.377e-6        0. 0.  9
11904710 1000  2.882e-6        0. 0.  10
11904711 1000  2.374e-6        0. 0.  11
11904712 1000  2.032e-6        0. 0.  12
11904713 1000  1.867e-6        0. 0.  13
11904714 1000  0.345e-6        0. 0.  14
11904901 0. 100. 100. 0. 0. 0.1   0.1  1. 14
*
* new bypass heat structure
11131000 33  5  2 1 0.0038
11131100 0 1
11131101 4 0.0041
11131201 1  4
11131301 0. 4
11131400 0                                  *qui
11131401 567.  5
11131501 113010000 10000        1 1 459.00   13
11131502 113140000 0            1 1 514.08   14
11131503 113150000 10000        1 1 587.52   16
11131504 113170000 0            1 1 449.82   17
11131505 113180000 0            1 1 449.82   18
11131506 113190000 0            1 1 449.82   19
11131507 113200000 0            1 1 449.82   20
11131508 113210000 0            1 1 771.12   21
11131509 113220000 0            1 1 550.80   22
11131510 113230000 0            1 1 605.88   23
11131511 113240000 0            1 1 771.12   24
11131512 113250000 0            1 1 605.88   25
11131513 113260000 10000        1 1 596.70   33
11131601 110010000 10000        1 1 459.00   13
11131602 140010000 0            1 1 514.08   14
11131603 141010000 0            1 1 587.52   15
11131604 142010000 0            1 1 587.52   16
11131605 143010000 0            1 1 449.82   17
11131606 143020000 0            1 1 449.82   18
11131607 143030000 0            1 1 449.82   19
11131608 143040000 0            1 1 449.82   20
11131609 144010000 0            1 1 771.12   21
11131610 145010000 0            1 1 550.80   22
11131611 146010000 0            1 1 605.88   23
11131612 147010000 0            1 1 771.12   24
11131613 148010000 0            1 1 605.88   25
11131614 150080000 -10000       1 1 596.70   33
11131701 0  0. 0. 0. 33
11131801 0. 100. 100. 0. 0. 0. 0. 1. 33
11131901 0. 100. 100. 0. 0. 0. 0. 1. 33
*
```

APPENDICE G

ESTRATTO DEL FILE DI INPUT PER
IL CODICE TRIO_U - VESSEL SENZA BARREL

```
# Thermohydraulique 3D couplee a conduction 3D #
dimension 3
Schema_Euler_explicite sch
Lire sch
{
        tinit 0.
        tmax 0.5
        dt_min 0.0000001
        dt_max 1.
        dt_impr .005
        dt_sauv 10.
        seuil_statio 1.e-6
}

Pb_Thermohydraulique_Turbulent pb1

export domaine dom_pb1

# DEBUT MAILLAGE #
lire_fichier dom_pb1 dc_1_Pb1.geom
# FIN MAILLAGE #

# DEBUT DECOUPAGE
Decouper dom_pb1
{
    PMetis
    Nb_parts 2
    Larg_joint 2
    Nom_Zones DOMdc2
}

Fin
FIN DECOUPAGE #

# DEBUT LECTURE
Scatter DOMdc2.Zones dom_pb1
 FIN LECTURE #



VDF dis

Fluide_Incompressible fluide
Lire fluide
{
        mu Champ_Fonc_Tabule 1 temperature
        { 7 453.15 473.15 493.15 513.15 533.15 553.15 573.15 1.52e-4 1.37e-4 1.25e-4 1.15e-4 1.06e-4 9.8e-5 9.1e-5
}
        rho Champ_Uniforme 1 886.2
        lambda Champ_Fonc_Tabule 1 temperature
        { 7 453.15 473.15 493.15 513.15 533.15 553.15 573.15 0.568 0.552 0.534 0.515 0.497 0.481 0.467 }
        Cp Champ_Uniforme 1 4808.4
        beta_th Champ_Uniforme 1 0.001564
}

Solide sol
Lire sol
{
        rho Champ_Uniforme 1 7860.
        lambda  Champ_Fonc_Tabule 1 temperature { 3 373.15 473.15 573.15 50.7 48.2 46.1 }
        Cp Champ_Uniforme 1 537.
}
```

```
Champ_Uniforme gravite
Lire gravite 3 0. 0. -9.81
Associer fluide gravite

Associer pb1 dom_pb1
Associer pb1 fluide
Associer pb1 sch
Discretiser pb1 dis

Lire pb1
{
        Navier_Stokes_turbulent
        {
                solveur_pression GCP {
                      precond ssor { omega 1.500000 }
                          seuil 1.0e-14
                            }
                convection { quick }
                diffusion { }
                sources { boussinesq_temperature { T0 463.67 } }
                conditions_initiales { vitesse Champ_Uniforme 3 0. 0. 0. }
                conditions_limites {
                        ingresso1 frontiere_ouverte_vitesse_imposee Champ_front_tabule 3
                        { 178
                        0.0
                        0.4
                        0.5
                        6.0
                        6.1
                        10.3
                        10.4
                        10.6
                        10.7
                        10.8
                        10.9
                        11.0
                        11.1
                        11.2
                        11.3
                        11.4
                        11.5
                        11.6
                        11.7
                        11.8
                        11.9
                        12.0
                        ........
                        ........
                        ........
                        -6.2    8.8     0
                        -6.2    8.8     0
                        -6.2    8.8     0
                        -6.2    8.8     0
                        -6.2    8.8     0
                        -6.2    8.8     0
                        -6.2    8.8     0
                        -6.1    8.8     0
                        -6.1    8.7     0
                        -6      8.6     0
                        -6      8.5     0
                        -5.9    8.4     0
```

-5.9 8.4 0
-5.8 8.3 0
-5.8 8.2 0
-5.7 8.2 0
-5.7 8.1 0
-5.6 8.1 0
-5.6 8 0
-5.6 8 0
-5.5 7.9 0
-5.5 7.9 0
.....
.....
}
ingresso2 frontiere_ouverte_vitesse_imposee Champ_front_tabule 3
{ 115
0.0
12.2
12.3
14.7
14.8
18.5
18.6
24.0
25.0
26.0
27.0
28.0
29.0
30.0
31.0
32.0
33.0
34.0
35.0
.....
.....
.....
0.0 -10.8 0.0
0.0 -10.8 0.0
0.0 -10.9 0.0
0.0 -10.9 0.0
0.0 -11.0 0.0
0.0 -11.0 0.0
0.0 -11.1 0.0
0.0 -11.1 0.0
0.0 -11.2 0.0
0.0 -11.1 0.0
0.0 -10.4 0.0
0.0 -9.9 0.0
0.0 -9.5 0.0
0.0 -9.0 0.0
0.0 -8.7 0.0
0.0 -8.3 0.0
0.0 -7.9 0.0
0.0 -7.6 0.0
0.0 -7.3 0.0
.....
.....
}
ingresso3 frontiere_ouverte_vitesse_imposee Champ_front_tabule 3
{ 114
0.0

11.2
13.4
13.5
16.3
16.4
21.0
26.0
27.0
28.0
29.0
30.0
31.0
32.0
33.0
.....
.....
8.8 -6.2 0.0
8.8 -6.2 0.0
8.9 -6.3 0.0
8.9 -6.3 0.0
9.0 -6.3 0.0
9.0 -6.3 0.0
9.1 -6.4 0.0
9.1 -6.4 0.0
8.5 -6.0 0.0
8.1 -5.7 0.0
7.8 -5.4 0.0
7.4 -5.2 0.0
7.1 -5.0 0.0
6.8 -4.8 0.0
6.5 -4.6 0.0
6.3 -4.4 0.0
.....
.....
}
ingresso4 frontiere_ouverte_vitesse_imposee Champ_front_tabule 3
{ 114
0.0
6.7
6.8
11.0
11.1
15.3
15.4
21.0
22.0
25.0
26.0
27.0
28.0
29.0
30.0
31.0
.....
.....
0.0 10.8 0.0
0.0 10.8 0.0
0.0 10.9 0.0
0.0 10.9 0.0
0.0 11.0 0.0
0.0 11.0 0.0
0.0 11.1 0.0

```
                0.0     11.1    0.0
                0.0     11.2    0.0
                0.0     11.2    0.0
                0.0     10.9    0.0
                0.0     10.2    0.0
                0.0     9.7     0.0
                .............
                .............
                }
        uscita frontiere_ouverte_pression_imposee Champ_front_Uniforme 1 0.
                vide paroi_fixe
                r_1000_2000 paroi_fixe

        }
        modele_turbulence K_Epsilon {
                Transport_K_Epsilon
                {
                        convection { quick }
                        diffusion { }
                        conditions_limites {
                                r_1000_2000 paroi
                                vide paroi
                                ingresso1 Frontiere_ouverte_K_Eps_impose Champ_front_Uniforme 2
1.e-3 1.e-4
                                ingresso2 Frontiere_ouverte_K_Eps_impose Champ_front_Uniforme 2
1.e-3 1.e-4
                                ingresso3 Frontiere_ouverte_K_Eps_impose Champ_front_Uniforme 2
1.e-3 1.e-4
                                ingresso4 Frontiere_ouverte_K_Eps_impose Champ_front_Uniforme 2
1.e-3 1.e-4
                                uscita Frontiere_ouverte K_Eps_ext Champ_front_Uniforme 2 0. 0.

                                                }
                        conditions_initiales { k_eps Champ_Uniforme 2 0. 0. }
                }
        Turbulence_paroi Loi_standard_hydr dt_impr_ustar 0.1
        }
}
Convection_Diffusion_Temperature_Turbulent
{
        diffusion { }
        convection { quick }
        conditions_limites
        {
                ingresso1 frontiere_ouverte_temperature_imposee
                        Champ_front_tabule 1
                { 756
                0.0
                2.3
                2.4
                2.7
                2.8
                2.9
                3.0
                3.1
                3.2
                3.3
                3.4
                3.5
                3.6
                3.7
                3.8
```

3.9
4.0
4.1
4.2
4.3
4.4
4.5
4.6
4.7
4.8
4.9
5.0
.....
.....
.....
562.4
562.4
562.3
562.3
562.2
562.1
562.1
562.0
561.8
561.7
561.5
561.4
561.2
560.9
560.7
560.5
560.2
559.9
559.6
559.3
558.9
558.6
558.3
557.9
.....
.....
.....
}
ingresso2 frontiere_ouverte_temperature_imposee
Champ_front_tabule 1
{ 532
0.0
1.6
1.7
3.4
3.5
5.3
5.4
5.7
5.8
6.4
6.5
7.8
7.9
8.7
8.8
……

……..
562.3
562.3
562.2
562.2
562.1
562.1
562.0
562.0
562.1
562.1
562.0
562.0
561.9
561.9
561.8
561.8
561.7
561.7
561.6
……..
……..
}
ingresso3 frontiere_ouverte_temperature_imposee
Champ_front_tabule 1
{ 535
0.0
1.6
1.7
3.4
3.5
5.3
5.4
5.7
5.8
6.4
6.5
7.8
7.9
8.7
8.8
……
……
……
562.3
562.3
562.2
562.2
562.1
562.1
562.0
562.0
562.1
562.1
562.0
562.0
561.9
561.9
561.8
561.8
561.7
561.7

561.6
561.6
561.5
561.4
…….
…….
…….
}
ingresso4 frontiere_ouverte_temperature_imposee
Champ_front_tabule 1
{ 533
0.0
1.6
1.7
3.4
3.5
7.7
7.8
10.6
10.7
11.2
11.3
11.7
11.8
12.1
12.2
12.5
12.6
13.0
…….
…….
…….
562.3
562.3
562.2
562.2
562.1
562.1
562.0
562.0
562.1
562.1
562.2
562.2
562.3
562.3
562.4
562.4
562.5
562.5
562.6
562.6
562.5
562.5
562.4
562.4
562.3
562.3
562.2
562.1
562.1
562.0

```
                        562.0
                        561.9
                        561.8
                        ……
                        ……
                        ……
                        }
                        uscita frontiere_ouverte T_ext Champ_front_Uniforme 1 500.15
                        r_1000_2000 paroi_adiabatique
                        vide paroi_adiabatique
                }
                conditions_initiales { Temperature Champ_Uniforme 1 563.67 }
        Modele_Turbulence Prandtl {
                                        Turbulence_paroi Loi_standard_hydr_scalaire
                                        }
        }
        Postraitement
        {
                Sondes
                {
                        sonde_tflu temperature periode 0.1 points 1 5. 2.9 2.
                        sonde_pflu pression periode 0.1 points 1 5. 2.9  2.
                }

                format meshtv
                Champs dt_post 0.005
                {
                        vitesse som
                        temperature som
              temperature elem
                }

        }
        sauvegarde formatte fluide.rep


}
Resoudre pb1
Fin
Fin
```

APPENDICE H

FILE X-PREPRO PER LA COSTRUZIONE DELLA
MESH DI TRIO_U (DOWNCOMER CON E SENZA BARREL)

FILE X-PREPRO – DOWNCOMER SENZA BARREL

```
TAILLES 3 93 93 61
RIEN 0 maillage
MAIL_X_REG 4 xomin xomax nx-2 2 dx
MAIL_Y_REG 4 yomin yomax ny-2 2 dy
MAIL_Z_REG 4 zomin 0.5 ncz0+1 2 dz
MAIL_Z_REG 4 0.5 h1 ncz1+1 2+ncz0 dz0
MAIL_Z_REG 4 h1 h2 ncz2+1 2+ncz1+ncz0 dz1
MAIL_Z_REG 4 5 zomax nz-2-(ncz1+ncz2+ncz0) 2+ncz1+ncz2+ncz0 dz2
PARALAX 7 xomin-eps xomax+eps yomin-eps yomax+eps zomin-eps zomax+eps -1000 vide
RIEN 0 sfere fondo ellittico
REVOLAX 14 5. 5. 0. 3.204 3.204 0 0 -PI/2 3*PI/2 2. 20. 2. 3 2000
REVOLAX 14 5. 5. 0. 2.867 2.867 0. 0. -PI/2 3*PI/2 1.9 20. 1.9 3 1000
TUBE 10 5 -1.5 3 0. 0. 5. 5. 0. -1000 2.2675
RIEN 0 belt line
TUBE 10 2.2675 0. h1 0. 0. 5. 5. 0. 2000 2.068 Solido
TUBE 10 2.068 0. h1 0. 0. 5. 5. 0. 1000 1.810 belt line
RIEN 0 variazione di spessore
FORT 0 do i1=1,ncz2
FORT 0 altmin=h1+deltaz*(i1-1)
FORT 0 altmax=h1+deltaz*i1
FORT 0 if (altmin.lt.4.111) then
FORT 0 raggioe=2.068
FORT 0 raggiose=2.2675
FORT 0 i1min = i1min+1
FORT 0 endif
FORT 0 if (altmin.gt.4.686) then
FORT 0 raggioe=1.993
FORT 0 raggiose=2.285
FORT 0 endif
FORT 0 if ((altmin.le.4.686).and.(altmin.ge.4.111)) then
FORT 0 raggioe=2.068-((2.068-1.993)/(4.686-4.111)*(altmax-4.111))
FORT 0 raggiose=2.2675+((2.285-2.2675)/(4.686-4.111)*(altmax-4.111))
FORT 0 endif
FORT 0 if (raggioe.lt.1.993) then
FORT 0 raggioe=1.993
FORT 0 endif
FORT 0 raggiosi=raggioe
TUBE 10 raggiose altmin altmax 0. 0. 5. 5. 0. 2000 raggiosi raccordos
TUBE 10 raggioe altmin altmax 0. 0. 5. 5. 0. 1000 1.810 raccordo
FORT 0 enddo
RIEN 0 upper downcomer
TUBE 10 2.285 h2 6.5 0. 0. 5. 5. 0. 2000 1.993 Solido up
TUBE 10 1.993 h2 6.5 0. 0. 5. 5. 0. 1000 1.810 upper dc
TUBE 10 1.810 0. 6.936 0. 0. 5. 5. 0. -1000 1.75
RIEN 0 cold legs
TUBE 10 0.51 1.993 3.2 PI/2 PI/2*3 5 5 5.976 2000 0.428
TUBE 10 0.545 1.993 3.2 PI/2 PI/36*29 5 5 5.976 2000 0.458
TUBE 10 0.51 1.993 3.2 PI/2 PI/2 5. 5. 5.976 2000 0.428
TUBE 10 0.535 1.993 3.2 PI/2 PI/36*65 5 5 5.976 2000 0.448
TUBE 10 0.428 1.810 3. PI/2 PI/2 5 5 5.976 1000 0. CL4
TUBE 10 0.458 1.810 3. PI/2 PI/36*29 5 5 5.976 1000 0. CL1
TUBE 10 0.428 1.810 3. PI/2 PI/2*3 5 5 5.976 1000 0. CL2
TUBE 10 0.448 1.810 3. PI/2 PI/36*65 5 5 5.976 1000 0. CL3
TUBE 10 0.428 3. 3.5 PI/2 PI/2 5 5 5.976 -5000 0. ingresso4
TUBE 10 0.458 3 3.5 PI/2 PI/36*29 5 5 5.976 -4000 0. ingresso1
TUBE 10 0.428 3 3.5 PI/2 PI/2*3 5 5 5.976 -2000 0. ingresso2
TUBE 10 0.448 3 3.5 PI/2 PI/36*65 5 5 5.976 -3000 0. ingresso3
CYLAX 7 5. 5. 1.75 0. 0.5 3 -6000 uscita
RIEN 0 barrel
CYLAX 7 5. 5. 1.75 0.5 6.5 3 -1000
```

```
file maillage
      real xomin,xomax,yomin,yomax,zomin,zomax,eps
      real altmin,altmax,raggioe,deltaz,raggiose,raggiosi
      real h1,h2

      integer i1max,ncz,i1,i1min,ncz1,ncz2,ncz0

      xomin=1.5
      xomax=8.5
      yomin=1.
      yomax=9.
      zomin=-1.5
      zomax=7.
      eps=0.1

      XM(1)=xomin-eps
      XM(nx)=xomax+eps
      YM(1)=yomin-eps
      YM(ny)=yomax+eps
      ZM(1)=zomin-eps
      ZM(nz)=zomax+eps

      ncz0 = 8
      ncz1 = 10
      ncz2 = 10

      h1 = 3.9
      h2 = 5.
      deltaz = (h2-h1)/ncz2
```

FILE X-PREPRO – DOWNCOMER CON BARREL

```
TAILLES 3 110 110 61
RIEN 0 maillage
MAIL_X_REG 4 xomin xomax nx-2 2 dx
MAIL_Y_REG 4 yomin yomax ny-2 2 dy
MAIL_Z_IRREG 5 zomin 0. 0.85 ncz+1 2 dz
MAIL_Z_REG 4 0. hpiastra ncz0+1 ncz+2 dz piastra
MAIL_Z_IRREG 5 hpiastra h1 1.25 ncz1+1 2+ncz+ncz0 dz0
MAIL_Z_REG 4 h1 h2 ncz2+1 2+ncz1+ncz0+ncz dz1
MAIL_Z_REG 4 h2 zomax nz-2-(ncz1+ncz2+ncz0+ncz) 2+ncz1+ncz2+ncz0+ncz dz2
PARALAX 7 xomin-eps xomax+eps yomin-eps yomax+eps zomin-eps zomax+eps -1000 vide
RIEN 0 sfere fondo ellittico
REVOLAX 14 5. 5. 0. 3.204 3.204 0 0 -PI/2 3*PI/2 2. 20. 2. 3 2000
REVOLAX 14 5. 5. 0. 2.867 2.867 0. 0. -PI/2 3*PI/2 1.9 20. 1.9 3 1000
TUBE 10 5 -1.5 3 0. 0. 5. 5. 0. -1000 2.2675
RIEN 0 belt line
TUBE 10 2.2675 0. h1 0. 0. 5. 5. 0. 2000 2.068 Solido
TUBE 10 2.068 0. h1 0. 0. 5. 5. 0. 1000 1.810 belt line
RIEN 0 variazione di spessore
FORT 0 do i1=1,ncz2
FORT 0 altmin=h1+deltaz*(i1-1)
FORT 0 altmax=h1+deltaz*i1
FORT 0 if (altmin.lt.4.111) then
FORT 0 raggioe=2.068
FORT 0 raggiose=2.2675
FORT 0 i1min = i1min+1
FORT 0 endif
FORT 0 if (altmin.gt.4.686) then
```

```
FORT 0 raggioe=1.993
FORT 0 raggiose=2.285
FORT 0 endif
FORT 0 if ((altmin.le.4.686).and.(altmin.ge.4.111)) then
FORT 0 raggioe=2.068-((2.068-1.993)/(4.686-4.111)*(altmax-4.111))
FORT 0 raggiose=2.2675+((2.285-2.2675)/(4.686-4.111)*(altmax-4.111))
FORT 0 endif
FORT 0 if (raggioe.lt.1.993) then
FORT 0 raggioe=1.993
FORT 0 endif
FORT 0 raggiosi=raggioe
TUBE 10 raggiose altmin altmax 0. 0. 5. 5. 0. 2000 raggiosi raccordos
TUBE 10 raggioe altmin altmax 0. 0. 5. 5. 0. 1000 1.810 raccordo
FORT 0 enddo
RIEN 0 upper downcomer
TUBE 10 2.285 h2 6.5 0. 0. 5. 5. 0. 2000 1.993 Solido up
TUBE 10 1.993 h2 6.5 0. 0. 5. 5. 0. 1000 1.810 upper dc
TUBE 10 1.810 0. 6.936 0. 0. 5. 5. 0. -1000 1.75
RIEN 0 cold legs
TUBE 10 0.51 1.993 3.2 PI/2 PI/2*3 5 5 5.976 2000 0.424
TUBE 10 0.545 1.993 3.2 PI/2 PI/36*29 5 5 5.976 2000 0.455
TUBE 10 0.51 1.993 3.2 PI/2 PI/2 5. 5. 5.976 2000 0.424
TUBE 10 0.535 1.993 3.2 PI/2 PI/36*65 5 5 5.976 2000 0.442
TUBE 10 0.424 1.810 3. PI/2 PI/2 5 5 5.976 1000 0. CL4
TUBE 10 0.455 1.810 3. PI/2 PI/36*29 5 5 5.976 1000 0. CL1
TUBE 10 0.424 1.810 3. PI/2 PI/2*3 5 5 5.976 1000 0. CL2
TUBE 10 0.442 1.810 3. PI/2 PI/36*65 5 5 5.976 1000 0. CL3
TUBE 10 0.424 3. 3.5 PI/2 PI/2 5 5 5.976 -5000 0. ingresso4
TUBE 10 0.455 3 3.5 PI/2 PI/36*29 5 5 5.976 -4000 0. ingresso1
TUBE 10 0.424 3 3.5 PI/2 PI/2*3 5 5 5.976 -2000 0. ingresso2
TUBE 10 0.442 3 3.5 PI/2 PI/36*65 5 5 5.976 -3000 0. ingresso3
CYLAX 7 5. 5. 1.75 0.8 1.3 3 -6000 uscita
RIEN 0 barrel
CYLAX 7 5. 5. 1.75 1.3 6.5 3 -1000
CYLAX 7 5 5 1.75 0 0.20 3 -1000 piastra forata
CYLAX 7 5 5 1.75 0.20 0.8 3 1000 plenum inferiore nocciolo
CYLAX 7 5.3 5.3 0.12 0 0.2 3 1000 foro
CYLAX 7 4.7 5.3 0.12 0 0.2 3 1000 foro
CYLAX 7 4.7 4.7 0.12 0 0.2 3 1000 foro
CYLAX 7 5.3 4.7 0.12 0 0.2 3 1000 foro
CYLAX 7 5.76 5.44 0.12 0 0.2 3 1000 foro
CYLAX 7 5.76 4.56 0.12 0 0.2 3 1000 foro
CYLAX 7 4.24 4.56 0.12 0 0.2 3 1000 foro
CYLAX 7 4.24 5.44 0.12 0 0.2 3 1000 foro
CYLAX 7 5.44 5.76 0.12 0 0.2 3 1000 foro
CYLAX 7 5.44 4.24 0.12 0 0.2 3 1000 foro
CYLAX 7 4.56 4.24 0.12 0 0.2 3 1000 foro
CYLAX 7 4.56 5.76 0.12 0 0.2 3 1000 foro
CYLAX 7 5 5 0.12 0 0.2 3 1000 foro
CYLAX 7 5.44 5 0.12 0 0.2 3 1000 foro
CYLAX 7 5.88 5 0.12 0 0.2 3 1000 foro
CYLAX 7 5 5.44 0.12 0 0.2 3 1000 foro
CYLAX 7 5 5.88 0.12 0 0.2 3 1000 foro
CYLAX 7 4.56 5 0.12 0 0.2 3 1000 foro
CYLAX 7 4.12 5 0.12 0 0.2 3 1000 foro
CYLAX 7 5 4.56 0.12 0 0.2 3 1000 foro
CYLAX 7 5 4.12 0.12 0 0.2 3 1000 foro
CYLAX 7 6.22 5.5 0.12 0 0.2 3 1000 foro
CYLAX 7 6.22 4.5 0.12 0 0.2 3 1000 foro
CYLAX 7 3.8 4.5 0.12 0 0.2 3 1000 foro
CYLAX 7 3.8 5.5 0.12 0 0.2 3 1000 foro
CYLAX 7 5.93 5.93 0.12 0 0.2 3 1000 foro
```

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CYLAX 7 5.93 4.07 0.12 0 0.2 3 1000 foro
CYLAX 7 4.07 4.07 0.12 0 0.2 3 1000 foro
CYLAX 7 4.07 5.93 0.12 0 0.2 3 1000 foro
CYLAX 7 5.5 6.21 0.12 0 0.2 3 1000 foro
CYLAX 7 5.5 3.79 0.12 0 0.2 3 1000 foro
CYLAX 7 4.5 3.79 0.12 0 0.2 3 1000 foro
CYLAX 7 4.5 6.21 0.12 0 0.2 3 1000 foro
CYLAX 7 6.32 5 0.12 0 0.2 3 1000 foro
CYLAX 7 5 6.32 0.12 0 0.2 3 1000 foro
CYLAX 7 3.68 5 0.12 0 0.2 3 1000 foro
CYLAX 7 5 3.68 0.12 0 0.2 3 1000 foro
file maillage
      real xomin,xomax,yomin,yomax,zomin,zomax,eps
      real altmin,altmax,raggioe,deltaz,raggiose,raggiosi
      real h1,h2,hpiastra

      integer i1max,i1,i1min,ncz1,ncz2,ncz0
          integer ncz

      xomin=1.5
      xomax=8.5
      yomin=1.
      yomax=9.
      zomin=-1.5
      zomax=7.
      eps=0.1

      XM(1)=xomin-eps
      XM(nx)=xomax+eps
      YM(1)=yomin-eps
      YM(ny)=yomax+eps
      ZM(1)=zomin-eps
      ZM(nz)=zomax+eps

      ncz = 8
          ncz0 = 2
      ncz1 = 10
      ncz2 = 10

      h1 = 3.9
      h2 = 5.
      deltaz = (h2-h1)/ncz2
          hpiastra = 0.2
```