

MITNE-217

SPATIALLY DEPENDENT VELOCITIES
FOR THE GAKIN II REACTOR
KINETICS CODE

by

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June, 1978

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1. Introduction

GAKIN II is a one-dimensional multigroup diffusion theory reactor kinetics code. The code is capable of solving the time dependent multigroup diffusion equations in slab, cylindrical, or spherical geometry. At the user's option, the effects of time dependent cross sections, external sources, and xenon poisoning may be included. A complete description of the code, as well as detailed input specifications, is given in reference 1. GAKIN II has been modified to include a temperature feedback model and a steady state xenon calculation (2).

GAKIN II has recently been modified to accept composition dependent velocities; the theoretical motivation for such a modification is presented in reference 3. What follows is a brief description of the input format for composition dependent velocities, a listing of the changed subroutines, and a sample problem. There is also a brief description of the shortcomings of the code. In the following discussion it is assumed that the reader is familiar with the code.

2. Modifications to Input Data

All existing options available in GAKIN II remain unchanged. The only input change is that CARD 11 should be repeated for each composition.

CARD 11 - NEUTRON SPEED ($v(G)$ | $G=1, \dots, GRP$)

$v(G)$: Average neutron speed for group G (cm/sec).

Start a new card for each composition, in order

of increasing composition number.

3. Comments concerning the use of GAKIN II

The user of GAKIN II should be aware of three programming errors which can significantly affect calculations. The first of these is that values for the number of neutrons per fission, ν_g , are not retained for each composition as claimed in reference 1. In fact the code retains only the values input for the last composition and uses these values for all compositions.

Second, the code does not initiate a given transient until the beginning of the second time step. This means that the calculation is one time step behind the number of time steps printed at the top of each transient calculation edit. As a result, the calculation terminates one time step before it should and time dependent cross sections are not correctly handled. For example, if one desires to linearly reduce the capture cross section by a factor of 0.1 in the first ten time steps (let each time step be of equal size), the code actually reduces the capture cross section by a factor of 0.09 ($0.1 \times 9/10$) since it does nothing in the first time step.

Finally, one must be careful when preparing the input parameters for CARD 3 (2). Specifically, the parameter NTYPE, which determines whether the problem is a spherical, a radial, or an axial type problem, must be carefully chosen even if the thermal-hydraulic feedback option is not selected (THFEDB=0).

If one is solving a problem in cylindrical geometry (GEOM=1) with no thermal-hydraulic feedback (THFEDB=0) the parameter NTYPE, which should have no effect on the calculations since it is a parameter associated with temperature feedback, can significantly alter the geometry of the problem being solved. If one allows the value of NTYPE to be three (axial type problem), naturally assuming that this will not affect the calculation, the code changes the problem from cylindrical geometry to slab geometry. Further, there is no print out to inform the user that this switch has been made; the code simply solves the diffusion equations for a slab geometry and prints out the solution under a heading which says that the geometry is cylindrical. Thus, what one thinks is the solution for a cylindrical core is actually the solution for an equivalent slab core. This problem only occurs for cylindrical cores (GEOM=1) and can be avoided by selecting NTYPE=2 (radial type problem), if one is not using the thermal-hydraulic feedback option.

REFERENCES

1. Mason, J.H., and Hansen, K.F. GAKIN II: A One-Dimensional Multigroup Diffusion Theory Reactor Kinetics Code. MITNE-151, MIT, Cambridge, Ma. (1973).
2. Grill, S.F. Temperature Feedback and Steady State Xenon Calculation for the GAKIN II Reactor Kinetics Code. MIT Course 22.90, MIT, Cambridge, Ma. (1975).
3. Strohmayer, W.H. Approximate Representation of Thermal Neutron Spectra in Reactor Transients. S.M. Thesis, Department of Nuclear Engineering, MIT, Cambridge, Ma. (1978)

Appendix A Code Listing

The following subroutines have been modified to incorporate composition dependent velocities:

MAIN	RHS
DIRECT	LHS
SETUP	INPTA2
UPDAT	INEDA
CALC	

Note that subroutine UPDAT does not require modification. However, the inverse velocity has been included in the parameter list (with the attendant changes in all CALL UPDAT statements in all calling subroutines) so that one may easily incorporate feedback effects by simply recompiling this subroutine.

```

C      MAIN PROGRAM                                00000010
C001  IMPLICIT REAL*8 (A-F,C-Z)                   00000020
C002  INTEGER RTAG                                 00000030
C003  INTEGER BCL,BCR,CHANGE,DEL,DNSCAT,TAGX,TESTS,THG,XEN, 00000040
      1  UPSCAT,WPT, FUEL,G,GECM,GP,GPL,GPR,GD,GL,GU,GRP,GPU,CUT,00000050
      2  P,PL,PR,PE, PRBND , PT , PUNBAL , PUNFRS , R,REG,SGR, 00000060
      3  SCRC , SCRG , SOZ , STEADY , STEP , TAGC , TAGF , TAGT 00000070
C004  INTEGER THFEDB,GEOM1
C005  REAL*8 IODINE                                00000080
C006  REAL*8 LR,NU,NUSIGF,NX                       00000090
C007  COMMON /A1/GRP,REG,PT,GL,GU,DEL,TAG,IDEI     00000100
C008  COMMON /A2/NUM,NCCMP,BCL,BCR,MTZ,NTZ,XEN,STEADY 00000110
C009  COMMON /A3/PUNBAL,SCRC,GECM,NTAG,NUM2,PUNFRS 00000120
C010  COMMON /A4/TIGHT1,TIGHT2,TIGHT3             00000130
C011  COMMON/A5/IN,CUT,NERR                        00000140
C012  COMMON/C1/M1,M2,M4,M5,M7                    00000150
C013  COMMON /TH1/ THFEDB,NPASS,GEOM1,INDXTH,NTYPE
C014  COMMON /TH2/TCOOLC,WFLCNO,POWER0,THDIM1,THDIM2,CCRVOL,WFLCW,PCWFAC
C FOR CONSERVATION OF CORE RECCMPLE MAIN WITH THE FOLLOWING DIMENSIONS 00000160
C ALTERED TO ACCOMMODATE THE MAXIMUM EXPECTED PROBLEM SIZE. THE VARIABLE 00000170
C IN ( ) INDICATE THE DIMENSION INFORMATION TO BE PUNCHED ON SUBSEQUENT 00000180
C CARDS, WHERE,
C      GRP IS THE # OF NEUTRON GROUPS              00000190
C      REG IS THE # OF REGIONS                     00000200
C      DEL IS THE # OF DELAYED GROUP              00000210
C      PT IS THE # OF SPACE POINTS                 00000220
C      NUM IS THE # OF TEST POINTS                 00000230
C      (PT,GRP+DEL)                                00000240
C015  DIMENSION PSI(100,16)                        00000250
C      (GRP,DEL) ***** IF DEL EQUALS 0: (GRP,1) ***** 00000260
C016  DIMENSION SC(10,6),SCIN(10,6)                00000270
C      (GRP)                                        00000280
C017  DIMENSION CHI(10),NL(10),NX(10),TC(10),V(10,10),VINV(10,10) 00000290
C      VI(NCCMP,GRP)
C018  DIMENSION VI(10,10)
C019  DIMENSION SIGCIN(10),SIGFIN(10),SIGTIN(10)    00000310
C020  DIMENSION DFFIN(10),DFCIN(10),DFTIN(10),DCFIN(10),CCCIN(10),DCTIN(
110)
C      (GRP+1,GRP)                                00000320
C021  DIMENSION SIGXIN(11,10)                       00000330
C022  DIMENSION DFXIN(11,10),DCXIN(11,10)
C      (REG)                                       00000340
C023  DIMENSION PCWREG(10),PCWORG(10),REGFR(10),WCOEFL(10),WCOEFR(10) 00000350
C024  DIMENSION NCMF(10),FUEL(10),CHANGE(10),SOR(10),CXL(10),CXQ(10),
1DR(10),LR(10),PB(10),IPL(10),IPR(10),XL(10),XR(10),RTAG(10), 00000360
2TAGC(10),TAGF(10),TAGT(10),TAGX(10),TII(10),IODINE(10),XENCN(10) 00000370
C025  DIMENSION ASUBH(10),CLADK(10),HTCOEF(10),RFACT1(10),SPHTC(10),
1CFRAC(10),HCAPC(10),HCAPF(10),TEMPC(10),TEMPI(10),REGVOL(10),TEMPC
2I(10),TEMPI1(10),GAMA1(10),GAMA2(10),GAMA3(10),GAMA4(10),GAMA5(10)
C      (REG,GRP)                                00000390
C026  DIMENSION CCL(10,10),CCQ(10,10),CFL(10,10),CFQ(10,10),CTRL(10,10),00000400
1CTRQ(10,10),SIGC(10,10),SIGF(10,10),SIGT(10,10),NLSIGF(10,10), 00000410
2DNSCAT(10,10),UPSCAT(10,10),SORG(10,10),D(10,10),XABS(10,10), 00000420

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0027      3PSIBAR(10,10),PSITOT(10,10),PSIB1(10,10),POWER(10,10)      00000430
          DIMENSION TSIGFF(10,10),TSIGCF(10,10),TSIGFC(10,10),TSIGCC(10,10)
          1,TSIGTC(10,10),TSIGTF(10,10),ZEN(10,10)
          C      (REG,GRP,GRP)      00000440
0028      DIMENSION SIGX(10,10,10)      00000450
0029      DIMENSION TSIGXF(10,10,10),TSIGXC(10,10,10)
          C      (PT)      00000460
0030      DIMENSION WHZ(100),WZ(100),FF1(100),FF2(100),WCOEF(100)      00000470
0031      DIMENSION CPSI(100),CC(100),CL(100),DU(100),WA(100),GA(100)      00000480
          C      (PT,GRP)      00000490
0032      DIMENSION SRCEO(100,10),SRCE1(100,10),CM(100,10),CP(100,10)      00000500
          C      (NUM)      00000510
0033      DIMENSION WPT(50),PSISTC(50)      00000520
          C      (NUM2)      00000530
0034      DIMENSION STPRN(50)      00000540
          C      MAXIMLM # CF PRINT TIMES (NUM2) IS FIXED AT 50      00000550
          C      M1= MAX # CF REGICNS      00000560
0035      M1=10      00000570
          C      M2= MAX # OF NEUTRON GROUPS      00000580
0036      M2=10      00000590
          C      M4= MAX # CF DELAYED GROUPS      00000600
0037      M4=6      00000610
          C      M5= MAX # CF SPACE POINTS      00000620
0038      M5=100      00000630
          C      M7= MAX # CF TEST POINTS (NUM)      00000640
0039      M7=50      00000650
0040      IN=5      00000660
0041      OUT=6      00000670
0042      100 NERR=0      00000680
0043      CALL INPTA1      00000690
0044      CALL      DIRECT(PSI,SIGC,SIGF,SIGT,SIGX,NU,SD,SDIN,CHI,NCMP,
          1FUEL,XABS,XENCN,IODINE,LR,IPL,IPR,PB,XL,XR,DR,WHZ,WZ,WPT,NX,
          2NUSIGF,DNSCAT,UPSCAT,REGFR,WCOEF,WCOEFL,WCOEFR,D,CHANGE,CM,CP,
          3SOR,SGRG,SRCEC,SRCE1,STPRN,RTAG,TAGC,TAGF,TAGT,TAGX,CCL,CCQ,CFL,
          4CFC,CTRL,CTRC,CXL,CXQ,V,VINV,PSITCT,PCWREG,POWORG,POWER,PSISTC,
          5DD,DL,DU,FF1,FF2,TI1,SIGCIN,SIGFIN,SIGTIN,SIGXIN,PSIB1,TD,
          6WA,GA,DPSI,PSIBAR,DFFIN,DFTIN,DCFIN,DCCIN,DCTIN,DFXIN,DCXIN,ASUBH,
          7CLADK,HTCOEF,RFACT1,SPHTC,CFRAC,HCAPC,HCAFP,TEMPC,TEMPF,REGVOL,TSI
          8GFF,TSIGCF,TSIGFC,TSIGCC,TSIGTC,TSIGTF,TSIGXF,TSIGXC,CFCIN,TEMPF1,
          9TEMPC1,GAMA1,GAMA2,GAMA3,GAMA4,GAMA5,ZEN,VI)
          C      CALL TITLE(4)      00000770
0045      GO TO 100      00000780
0046      END      00000790
0047

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CCCC1 SUPROCLTINE DIRECT(PSI,SIGC,SIGF,SIGT,SIGX,NU,SD,SDIN,CHI,NCMP, 0000010
1FUEL,XABS,XENCN,ICDINE,LR,IPL,IPR,PB,XL,XR,DR,WHZ,WZ,WPT,NX, 0000020
2NUSIGF,DNSCAT,UPSCAT,REGFR,WCOEF,WCOEFL,WCOEFR,D,CHANGE,CM,CP, 0000030
3SOR,SCRG,SRCEO,SRCE1,STPRN,RTAG,TAGC,TAGF,TAGT,TAGX,CCL,CCQ,CFL, 0000040
4CFQ,CTRL,CTRQ,CXL,CXQ,V,VINV,PSITCT,PCWREG,POWORG,POWER,PSISTC, 0000050
5SD,DL,DU,FF1,FF2,TI1,SIGCIN,SIGFIN,SIGTIN,SIGXIN,PSIB1,TD, 0000060
6WA,GA,DPSI,PSIBAR,DFFIN,DFTIN,DCFIN,DCCIN,DCTIN,DFXIN,CCXIN,ASUBH,0000070
7CLACK,HTCCEF,RFACT1,SPHTC,CFRAC,HCAPC,HCAPF,TEMPC,TEMFF,REGVCL,TSI0000080
8GFF,TSIGCF,TSIGFC,TSIGCC,TSIGTC,TSIGTF,TSIGXF,TSIGXC,DFCIN,TEMPP1,0000090
9TEMPC1,GAMA1,GAMA2,GAMA3,GAMA4,GAMA5,ZEN,VI)
CCCC2 IMPLICIT REAL*8 (A-F,C-Z) 0000110
CC03 REAL*8 IODINE 0000120
CCC4 REAL*8 LR,NU,NUSIGF,NX 0000130
CCC5 INTEGER GF,GRPLUS 0000140
CCC6 INTEGER RTAG 0000150
CC07 INTEGER BCL,BCR,CHANGE,DEL,DNSCAT,TAGX,TESTS,THG,XEN, 0000160
1 UPSCAT,WPT, FUEL,G,GEOM,GP,GPL,GPR,GD,GL,GU,GRP,GPU,OUT,0000170
2P,PL,PR,PB,PRBEND,PT,PUNBAL,PUNFRS,R,REG,SOR, 0000180
3 SCRCE , SCRG , SCZ , STEADY , STEP , TAGC , TAGF , TAGT 0000190
CCCC8 INTEGER THFEDB,GECM1 0000200
CCC9 COMMON /A1/GRP,REG,PT,GL,GU,DEL,THG,IDEL 0000210
CC10 COMMON /A2/NUM,NGMP,BCL,BCR,MTZ,NTZ,XEN,STEADY 0000220
CC11 COMMON /A3/PUNBAL,SCRCE,GEOM,NTAG,NUM2,PUNFRS 0000230
CC12 COMMON /A4/TIGHT1,TIGHT2,TIGHT3 0000240
CC13 COMMON/A5/IN,CUT,NERR 0000250
CC14 COMMON/A6/EP1,EP2,EP3,TSTINC,IEP4,IEP6 0000260
CC15 COMMON /A7/BETA(6),DECAY(6),BETDCY(6),DECH(6) 0000270
CC16 COMMON /A8/GAMAX,GAMA1 0000280
CC17 COMMON /A9/PCWTOT,PCWBAR 0000290
CC18 COMMON /B1/H,FP,TIME,TZ,ZERO,TZO,TIMZ 0000300
CC19 COMMON /B2/NPRT,NZ,ISX,STEP,NZSAVE,PRBEND,IPRN 0000310
CC20 COMMON /C2/GF,GRPLUS 0000320
CC21 COMMON /TH1/ THFEDB,NPASS,GEOM1,INDXTH,NTYPE 0000330
CC22 COMMON /TH2/TCOOL0,WFLCW,POWER0,THDIM1,THDIM2,CORVOL,WFLCW,PCWFAC0000340
CC23 DIMENSION PSI(PT,GU) 0000350
CC24 DIMENSION SIGC(REG,GRP),SIGF(REG,GRP),SIGT(REG,GRP), 0000360
1SIGX(REG,GRP,GRP) 0000370
0025 DIMENSION NU(CRP) 0000380
0026 DIMENSION SD(CRP,IDEL) 0000390
0027 DIMENSION SCIN(GRP,IDEL) 0000400
0028 DIMENSION CHI(GRP) 0000410
0029 DIMENSION NCMP(REG) 0000420
0030 DIMENSION FUEL(REG) 0000430
0031 DIMENSION XABS(REG,GRP) 0000440
0032 DIMENSION XENCN(REG),IODINE(REG) 0000450
0033 DIMENSION LR(REG),IPL(REG),IPR(REG),PB(REG),XL(REG),XR(REG) 0000460
0034 DIMENSION WHZ(PT) 0000470
0035 DIMENSION WZ(PT) 0000480
0036 DIMENSION WPT(NUM) 0000490
0037 DIMENSION NX(CRP),NUSIGF(REG,GRP) 0000500
0038 DIMENSION DNSCAT(REG,GRP),UPSCAT(REG,GRP) 0000510
0039 DIMENSION REGFR(REG),WCCF(PT),WCCFEL(REG),WCOEFR(REG) 0000520
CC40 DIMENSION D(REG,GRP) 0000530

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CC41      DIMENSION CHANGE(REG)                                00000540
CC42      DIMENSION CM(PT,GRP),CP(PT,GRP)                       00000550
CC43      DIMENSION SCR(REG),SCRG(REG,GRP),SRCEO(PT,GRP),SRCE1(PT,GRP) 00000560
CC44      DIMENSION STPRN(5C)                                   00000570
0045      DIMENSION RTAG(REG)                                   00000580
CC46      DIMENSION TAGC(REG),TAGF(REG),TAGT(REG),TAGX(REG)     00000590
CC47      DIMENSION CCL(REG,GRP),CCQ(REG,GRP),CFL(REG,GRP),CFQ(REG,GRP),
          1CTRL(REG,GRP),CTRQ(REG,GRP),CXL(REG),CXQ(REG)         00000610

CC48      DIMENSION VI(NCCMP,GRP)
CC49      DIMENSION V(REG,GRP)
CC50      DIMENSION VINV(REG,GRP)
0051      DIMENSION PSIPAR(REG,GRP)                             00000640
CC52      DIMENSION PSITOT(REG,GRP)                             00000650
CC53      DIMENSION PCWREG(REG)                                 00000660
CC54      DIMENSION PCWER(REG,GRP)                              00000670
0055      DIMENSION CR(REG)                                     00000680
CC56      DIMENSION PCWCRG(REG)                                 00000690
0057      DIMENSION PSISTO(NUM)                                 00000700
CC58      DIMENSION CC(PT),CL(PT),DU(PT)                       00000710
CC59      DIMENSION FF1(PT),FF2(PT)                            00000720
CC60      DIMENSION TII(REG)                                    00000730
0061      DIMENSION SIGCIN(GRP),SIGFIN(GRP),SIGTIN(GRP)        00000740
CC62      DIMENSION SIGXIN(GRPLUS,GRP)                         00000750
CC63      DIMENSION PSIBI(REG,GRP)                             00000760
CC64      DIMENSION TD(GRP)                                    00000770
CC65      DIMENSION WA(PT),GA(PT),DPSI(PT)                     00000780
CC66      DIMENSION TSIGFF(REG,GRP),TSIGCF(REG,GRP),TSIGXF(REG,GRP,GRP),
          1 TSIGFC(REG,GRP),TSIGCC(REG,GRP),TSIGXC(REG,GRP,GRP), 00000790
          2 TSIGTC(REG,GRP),TSIGTF(REG,GRP),ZEN(REG,GRP)        00000800
          DIMENSION DFFIN(GRP),DFCIN(GRP),DFTIN(GRP),DFXIN(GRPLLS,GRP),
          1 DCFIN(GRP),DCCIN(GRP),DCTIN(GRP),DCXIN(GRPLLS,GRP) 00000820
          DIMENSION ASUBH(REG),CLADK(REG),HTCOEF(REG),RFACT1(REG),SPHTC(REG) 00000830
          DIMENSION CFAC(REG),HCAPC(REG),HCAFF(REG)            00000840
          DIMENSION TEMPC(REG),TEMPP(REG),REGVCL(REG)          00000850
          DIMENSION TEMPF1(REG),TEMPC1(REG),GAMA1(REG),GAMA2(REG),GAMA3(REG) 00000860
          1,GAMA4(REG),GAMA5(REG)                                00000870
          POWFAC=1
          TIME=0.0
          TIMZ=0.
          TZ=0.0
          TZ0=0.0
          STEP=0
          NZ=1
          NZSAVE=1
          ZERO=1.0D-10
          PRENC=0
          POWBAR=0.000
          DO 30 R=1,REG
          30 POWORC(R)=0.000
          DO 50 P=1,PT
          0085 WZ(P)=0.0
          0086 WHZ(P)=1.0
          0087 DO 50 G=1,GU
          0088

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C089          50  PSI(P,G)=1.000                                0C0C1050
C09C          CALL      INPTA2(PSI,SIGF,SIGC,SIGT,SIGX,NU,SD,SDIN,CHI,VINV,V, 0C0C1060
1NCMP,FUEL,XABS,XENON,IODINE,PB,LR,WPT,SIGCIN,SIGFIN,SIGTIN,SIGXIN,0C0C1070
2ASUBH,CLACK,HTCOEF,RFACT1,SPHTC,CFRAC,HCAPC,HCAPF,TSIGFF,TSIGCF, 0C001080
3TSIGXF,TSIGFC,TSIGCC,TSIGXC,TSIGTC,TSIGTF,OFFIN,DFCIN,DFTIN,DFXIN,0C0C1090
4DCFIN,CCFIN,DCXIN,DCXIN,TEMPF,VI)
C091          CALL      CCEF1(NX,NUSIGF,CHI,NU,SIGF,SIGC,SIGX,PB,DR,LR,XL,XR, 0C001110
1      IFL,IPR,ONSCAT,UPSCAT,WCOEF,WCOEFL,WCOEFR,REGFR,TSIGFC,TSIGFF,0C001120
2TSIGCC,TSIGCF,TSIGXF,TSIGXC,REGVOL,GAMA1,GAMA2,GAMA3,GAMA4,GAMA5, 0C0C1130
3SPHTC,CFRAC,HCAPC,ASUBH,CLACK,HCAPF,HTCCEF,FUEL,TEMPC,ZEN)      0C001140
C092          DO 120 I=1,REG                                  0C001150
C093          120  CHANGE(I)=1                                0C0C1160
C094          CALL      COEF2(D,SIGT,CHANGE,PB,DR,LR,CM,CP)      0C0C1170
C095          CALL      INPUTB(SCR,SCRG,SRCEO,SRCE1,STPRN,IPL,IPR,RTAG,TAGX, 0C0C1180
1TAGT,TAGF,TAGC,CXL,CXC,CTRL,CTRC,CCL,CCQ,CFL,CFQ,CFLOWL,CFLOWQ, 0C0C1190
2CTINL,CTING)                                                    0C0C1200
C096          CALL      INEDA(PSI,WPT,PB,LR,DR,V,NU,CHI,SD,NCMP,D,SIGC,SIGF, 0C001210
1SIGX,XENON,IODINE,TSIGFF,TSIGCF,TSIGXF,TSIGFC,TSIGCC,TSIGXC,TSIGTC0C0C1220
2,TSIGTF,ASUBH,CLACK,HTCCEF,RFACT1,SPHTC,CFRAC,HCAPC,HCAPF,TEMPF) 0C001230
C097          CALL      INEDB(TAGX,TAGT,TAGC,TAGF,CXL,CXQ,CTRL,CTRC,CCL,CCC, 0C0C1240
1CFL,CFQ,SCR,SCRG,SRCEO,SRCE1,IPL,IPR,CFLOWL,CFLOWC,CTINL,CTING) 0C0C1250
C098          IF (NERR.EQ.1) CALL EXIT                          0C0C1260
C099          IF (STEADY.LT.1) GO TO 130                        00001270
C100          CALL      SETUP(PSI,WPT,NU,NUSIGF,CM,CP,SIGX,PB,IPR,IPL,XL,XR, 0C0C1280
1FUEL,NX,SDIN,UPSCAT,ONSCAT,PSISTO,DD,DL,DU,WA,GA,POWREG,REGVOL,ICDCC001290
2INE,XENON,PSIBAR,XABS,TEMPF1,TEMPF,TEMPC1,TEMPC,GAMA2,GAMA3,D,SIGT0C0C1300
3,CHANGE,DR,LR,TAGT,TAGX,TAGC,TAGF,CTRL,CTRC,CXL,CXQ,CCL,CCQ,CFL, 0C001310
4CFQ,SIGF,SIGC,PSIB1,TSIGTF,TSIGTC,TSIGCF,TSIGCC,TSIGFF,TSIGFC, 0C001320
5TSIGXF,TSIGXC,RFACT1,PSITCT,PCWER,WCOEF,WCOEFL,WCEFR,REGFR,PCWCRG00001330
6,ZEN,CTINL,CTING,CFLOWL,CFLOWC,GAMA1,GAMA4,HTCCEF,CLACK
7,VINV,WZ)
C101          130  CONTINUE                                    00001350
C102          DO 131 P=1,PT                                     00001360
C103          131  DPSI(P)=PSI(P,THG)                          0C001370
C104          CALL      AVRAGE(PSI,PSIBAR,PSITCT,PCWER,WCOEF,WCEFL,WCEFR, 0C0C1380
1REGFR, IPL,IPR,SIGF,PCWREG,PCWORG,REGVOL)                        0C0C1390
C105          132  DO 140 I=1,REG                                0C001400
C106          DO 135 G=1,GRP                                    0C0C1410
C107          135  PSIB1(I,G)=PSIBAR(I,G)                      00001420
C108          POWORG(I)=PCWREG(I)                               000C1430
C109          IF (PCWREG(I).EQ.0.000) GO TO 140                 00CC1440
C110          POWREG(I)=PCWREG(I)/PCWTOT                       00001450
C111          140  CONTINUE                                    0C0C1460
C112          POWBAR=PCWTOT                                     0C0C1470
C113          IF (PCWTOT.NE.0.000) PCWTOT=1.0                  0C0C1480
C114          IF ((XEN.NE.-1).AND.(THFEDB.EQ.0)) GO TO 145    0C0C1490
C115          IF (THFEDB.EQ.C) WRITE(CUT,129)                  0C0C1500
C116          IF (THFEDB.EQ.1) WRITE(CUT,126)                  0C0C1510
C117          DO 142 R=1,REG                                    0C0C1520
C118          XX=POWORG(R) * (.316755E-10)                     00001530
C119          IF (THFEDB.EQ.0) WRITE(OUT,127) R,POWREG(R),XX    0C0C1540
C120          IF (THFEDB.EQ.1) WRITE(CUT,127) R,POWREG(R),XX,TEMPF1(R),TEMPC1(R) 0C0C1550
C121          142  CONTINUE                                    0C0C1560

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0122          XX=PCWBAR*(.316755E-10)          CC001570
0123          WRITE(OUT,128) XX                CCCC1580
0124          GO TO 149                        CCCC1590
0125          145 WRITE(OUT,121)                CCCC1600
0126          WRITE(OUT,122)(R,POWREG(R),R=1,REG) 0CC01610
0127          WRITE(OUT,123)PCWTOT             000C1620
0128          149 IF(XEN.NE.-1) GO TO 150       0G001630
0129          WRITE(OUT,124)                  CC0C1640
0130          WRITE(OUT,125)(R,XENON(R),IODINE(R),R=1,REG) C00C1650
0131          121 FORMAT(1HC,10X,'REGION',10X,'FRACTIONAL PCWER',/) 00001660
0132          122 FORMAT(13X,I2,12X,E14.7)      CCCC1670
0133          123 FORMAT(1H0,10X,'TOTAL NORMALIZED POWER = ',E14.7) CCCC1680
0134          124 FORMAT(/11X'REGION',7X'STEADY STATE CCNTRATICNS',/1X,'NUMBER', 00001690
          111X,'XENON',8X,'IODINE')          CCCC1700
0135          125 FORMAT(13X,I2,11X,E10.5,3X,E10.5) CCCC1710
0136          126 FORMAT(/11X,'REGION',10X,'FRACTIONAL POWER',10X,'PCWER (WATTS)', 00001720
          110X,'FUEL TEMP',11X,'COOLANT TEMP',/) CCCC1730
0137          127 FORMAT(13X,I2,12X,E14.7,11X,E14.7,8X,E14.7,7X,E14.7) CCCC1740
0138          128 FORMAT(1H0,10X,'TCTAL PCWER = ',E14.7) CCCC1750
0139          129 FORMAT(/11X,'REGION',10X,'FRACTIONAL POWER',10X,'PCWER (WATTS)') CCCC1760
0140          150 IF((STEADY.LT.1).OR.(XEN.EQ.-1).OR.(TFEDB.EQ.1)) GO TO 300 0CC01770
0141          CALL UPDAT(TAGT,TAGX,TAGC,TAGF,CHANGE,NUSIGF,PSIBAR,IODINE, CCCC1780
          1XABS,XENON, CTRL,CTRQ,CXL,CXC,CCL,CCQ,CFL,CFQ,SIGT,SIGX,SIGF, CCCC1790
          2SIGC,PSIB1,NU,FUEL,TEMPF1,TEMPF,TEMPC1,TEMPC,TSIGTF,TSIGTC,TSIGCF,0CC01800
          3TSIGCC,TSIGFF,TSIGFC,TSIGXF,TSIGXC,ZEN,CTINL,CTINQ,CFLCWL,CFLCWC, CCCC1810
          4POWREG,REGVOL,GAMA1,GAMA2,GAMA3,GAMA4,PCWORG,RFACT1,HTCCEF,CLADK
          5,VINV,WZ,WPT)
0142          CALL COEF2(ID,SIGT,CHANGE,PB,DR,LR,CM,CP) CCCC1830
0143          GO TO 300                          00001840
0144          200 IF((DABS(TIME-TZ)).GT.ZERC) GO TO 220 0CC01850
0145          CALL INPUTR(SCR,SCRG,SRCEO,SRCE1,STPRN,IPL,IPR,RTAG,TAGX, CCCC1860
          1TAGT,TAGF,TAGC,CXL,CXC,CTRQ,CTRQ,CCL,CCQ,CFL,CFQ,CFLOWL,CFLOWC, 0
          2CTINL,CTINQ)                          00001870
0146          CALL INEDB(TAGX,TAGT,TAGC,TAGF,CXL,CXC,CTRL,CTRQ,CCL,CCQ, CCCC1880
          1CFL,CFQ,SOR,SCRG,SRCEO,SRCE1,IPL,IPR,CFLOWL,CFLOWC,CTINL,CTINQ) CCCC1890
0147          220 CALL UPDAT(TAGT,TAGX,TAGC,TAGF,CHANGE,NUSIGF,PSIBAR,IODINE, CCCC1900
          1XABS,XENON, CTRL,CTRQ,CXL,CXC,CCL,CCQ,CFL,CFQ,SIGT,SIGX,SIGF, 00001910
          2SIGC,PSIB1,NU,FUEL,TEMPF1,TEMPF,TEMPC1,TEMPC,TSIGTF,TSIGTC,TSIGCF, CCCC1920
          3TSIGCC,TSIGFF,TSIGFC,TSIGXF,TSIGXC,ZEN,CTINL,CTINQ,CFLCWL,CFLCWC, CCCC1930
          4POWREG,REGVOL,GAMA1,GAMA2,GAMA3,GAMA4,PCWORG,RFACT1,HTCCEF,CLADK
          5,VINV,WZ,WPT)
0148          CALL COEF2(ID,SIGT,CHANGE,PB,DR,LR,CM,CP) CCCC1950
0149          IF (NERR.EQ.1) CALL EXIT          CCCC1960
0150          300 CALL CALC(PSI,WHZ,WZ,NX,NUSIGF,SIGX,SD,SDIN,STPRN,FUEL,WPT, CCCC1970
          1XL,XR,PB,IPL,IPR,VINV,UPSCAT,DNSCAT,SGRG,SOR,SRCEO,SRCE1,CP,CM, CCCC1980
          2FF1,FF2,TI1,DU,DL,DC,TD,WA,GA,DPSI) CCCC1990
0151          CALL AVRAE(PSI,PSIBAR,PSITCT,POWER,WCOEF,WCOEFL,WCEFR, CCCC2000
          1REGFR, IPL,IPR,SIGF,PCWREG,PCWORG,REGVOL) CCCC2010
0152          CALL TEST(STPRN,PSI,PSITCT,POWREG,WPT,WZ,WHZ,TEMPF1,TEMPC1) CCCC2020
0153          IF (PRBEND.NE.1) GO TO 200       CCCC2030
0154          IF (PUNFRS.EQ.1) CALL PUN(PSI,NU,SIGF,SIGC,SIGT,SIGX,XENON,IODINE) CCCC2040
0155          RETURN                            CCCC2050
0156          END                              CCCC2060

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0001      SUBROUTINE SETUP (PSI,WPT,NU,NUSIGF,CM,CP,SIGX,PB,IPR,IPL,XL,XR, 00021870
1FUEL,NX,SDIN,UPSCAT,DNSCAT,PSISTO,DD,DL,DU,WA,GA,POWREG,REGVOL,IOD
2INE,XENON,PSIBAR,XABS,TEMPF1,TEMPP,TEMPC1,TEMPC,GAMA2,GAMA3,D,SIGT
3,CHANGE,DR,LR,TAGT,TAGX,TAGC,TAGF,CTRL,CTRQ,CXL,CXQ,CCL,CCQ,CFL,
4CFQ,SIGF,SIGC,PSIB1,TSIGTF,TSIGTC,TSIGCF,TSIGCC,TSIGFF,TSIGFC,
5TSIGXF,TSIGXC,RFAC1,PSITOT,POWER,WCOEF,WCOEFL,WCOEFR,REGFR,POWORG
6,ZEN,CTINL,CTINQ,CFLOWL,CFLOWQ,GAMA1,GAMA4,HTCOEF,CLADK
7,VINV,WZ)
0002      IMPLICIT REAL*8 (A-H,O-Z) 00021890
0003      INTEGER BCL,BCR,CHANGE,DEL,DNSCAT,TAGX,TESTS,THG,XEN, 00021900
1          UPSCAT,WPT, FUEL,G,GEOM,GP,GPL,GPR,GD,GL,GU,GRP,GPU,OUT,00021910
2P,PL,PR,PB,PRBEND,PT,PUNBAL,PUNFRS,R,REG,SOR, 00021920
3          SORCE , SORG , SOZ , STEADY , STEP , TAGC , TAGF , TAGT 00021930
0004      INTEGER THFEDB,GEOM1
0005      REAL*8 IODINE 00021940
0006      REAL*9 LR,NU,NUSIGF,NX 00021950
0007      REAL*8 KEFF 00021960
0008      COMMON /A1/GRP,REG,PT,GL,GU,DEL,THG,IDEL 00021970
0009      COMMON /A2/NUM,NCOMP,BCL,BCR,MTZ,NTZ,XEN,STEADY 00021980
0010      COMMON /A3/PUNBAL,SORCE,GEOM,NTAG,NUM2,PUNFRS 00021990
0011      COMMON /A4/TIGHT1,TIGHT2,TIGHT3 00022000
0012      COMMON/A5/IN,OUT,NERR 00022010
0013      COMMON /A9/ POWTOT,POWBAR
0014      COMMON /TH1/ THFEDB,NPASS,GEOM1,INDXTH,NTYPE
0015      COMMON /TH2/TCOOL0,WFLOW0,POWER0,THDIM1,THDIM2,CORVOL,WFLOW,POWFA
C      THIS ROUTINE CORRECTS THE INITIAL ESTIMATES TO AN EXACTLY CRITICAL 00022020
C      PROBLEM AND CALCULATES THE PRECURSOR CONCENTRATIONS 00022030
0016      DIMENSION PSI (PT,GU) 00022040
0017      DIMENSION WPT (NUM) 00022050
0018      DIMENSION PSISTO (NUM) 00022060
0019      DIMENSION NU (GRP) 00022070
0020      DIMENSION NUSIGF (REG,GRP) 00022080
0021      DIMENSION CM (PT,GRP),CP (PT,GRP) 00022090
0022      DIMENSION SIGX (REG,GRP,GRP) 00022100
0023      DIMENSION PB (REG),IPL (REG),IPR (REG),XL (REG),XR (REG) 00022110
0024      DIMENSION FU EL (REG) 00022120
0025      DIMENSION NX (GRP) 00022130
0026      DIMENSION SDIN (GRP,IDEL) 00022140
0027      DIMENSION UPSCAT (REG,GRP),DNSCAT (REG,GRP),ZEN (REG,GRP)
0028      DIMENSION DD (PT),DL (PT),DU (PT),WA (PT),GA (PT) 00022160
0029      DIMENSION TAGC (REG),TAGF (REG),TAGT (REG),TAGX (REG)
0030      DIMENSION SIGC (REG,GRP),SIGF (REG,GRP),SIGT (REG,GRP)
0031      DIMENSION PSITOT (REG,GRP),POWER (REG,GRP)
0032      DIMENSION CCL (REG,GRP),CCQ (REG,GRP),CFL (REG,GRP),CFQ (REG,GRP),
1CTRL (REG,GRP),CTRQ (REG,GRP),CXL (REG),CXQ (REG)
0033      DIMENSION PSIBAR (REG,GRP),PSIB1 (REG,GRP)
0034      DIMENSION WCOEF (PT),WCOEFL (REG),WCOEFR (REG),REGFR (REG),POWORG (REG)
0035      DIMENSION TEMPF1 (REG),TEMPP (REG),TEMPC1 (REG),TEMPC (REG)
0036      DIMENSION TSIGFF (REG,GRP),TSIGCF (REG,GRP),TSIGXF (REG,GRP,GRP),
1          TSIGFC (REG,GRP),TSIGCC (REG,GRP),TSIGXC (REG,GRP,GRP),
2          TSIGTC (REG,GRP),TSIGTF (REG,GRP)
0037      DIMENSION POWREG (REG),REGVOL (REG),IODINE (REG),XENON (REG),GAMA2 (REG
1),GAMA3 (REG),CHANGE (REG),DR (REG),LR (REG),RFAC1 (REG),GAMA1 (REG),

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2GAMA4 (REG),HTCOEF (REG),CLADK (REG)
0038 DIMENSION XABS (REG,GRP),D (REG,GRP)
0039 DIMENSION VINV (REG,GRP)
0040 DIMENSION WZ (PT)
0041 ABS (X)=DABS (X) 00022170
0042 SQRT (X)=DSQRT (X) 00022180
0043 FLOAT (I)=DFLOAT (I) 00022190
0044 POWFAC=1.0
0045 IF (STEADY.EQ.3) GO TO 201 00022200
0046 100 KEFF=0.0
0047 XKK=0.0 00022220
0048 Y=0. 00022230
0049 INDX=0 00022240
0050 CALL SCALE (X,PSI)
0051 110 CONTINUE 00022260
0052 DO 130 N=1,NUM 00022270
0053 P=WPT (N) 00022280
0054 PSISTO (N)=PSI (P,THG) 00022290
0055 130 CONTINUE 00022300
0056 CALL ITER (PSI,CM,CP,SIGX,PB,IPL,IPR,XL,XR,SDIN,FUEL,
INX,NUSIGF,UPSCAT,DNSCAT,DD,DL,DU,WA,GA) 00022310
CALL SCALE (Y,PSI) 00022330
0057 KEFF=Y/X 00022340
0058 CALL RESCAL (X,PSI) 00022350
0059 IF (XKK) 140,140,150 00022360
0060 140 XKK=KEFF 00022370
0061 INDX=1 00022390
0062 GO TO 110 00022390
0063 150 IF (ABS (KEFF/XKK-1.0)-TIGHT1) 160,160,140 00022400
0064 160 CONTINUE 00022410
0065 IF (ABS (KEFF-1.0)-TIGHT2) 190,190,170 00022420
0066 170 DO 180 G=1,GRP 00022430
0067 NU (G)=NU (G)/KEFF 00022440
0068 DO 130 R=1,REG 00022450
0069 NUSIGF (R,G)=NUSIGF (R,G)/KEFF 00022460
0070 180 CONTINUE 00022470
0071 INDX=2 00022480
0072 GO TO 110 00022490
0073 190 INDX=3
0074 DO 200 N=1,NUM 00022520
0075 P=WPT (N) 00022530
0076 IF (DABS (PSISTO (N)/PSI (P,THG)-1.0)-(10.*TIGHT3)) 191,191,110
0077 191 IF ((XEN.NE.-1).AND.((THFEDB.EQ.0).OR.(NTYPE.EQ.1))) GO TO 197
0078 CALL AVERAGE (PSI,PSIBAR,PSITOT,POWER,WCOEF,WCOEPL,WCOEPR,
0079 1REGFR,IPL,IPR,SIGF,POWREG,POWORG,REGVOL)
POWFAC=POWFAC*POWER0/(POWTOT*.316755E-10)
0080 DO 196 R=1,REG
0081 POWREG (R)=POWREG (R)*POWER0/(POWTOT*.316755E-10)
0082 CALL HTRAN0 (POWREG,REGVOL,IODINE,XENON,PSIBAR,XABS,TEMPP1,
0083 1TEMPP,TEMPC1,TEMPC,GAMA2,GAMA3,RFACT1,POWORG,GAMA1,GAMA4)
CALL UPDAT (TAGT,TAGX,TAGC,TAGP,CHANGE,NUSIGF,PSIBAR,IODINE,
0084 1XABS,XENON,CTRL,CTRQ,CXL,CXQ,CCL,CCQ,CPL,CPQ,SIGT,SIGX,SIGF,
2SIGC,PSIB1,NU,FUEL,TEMPP1,TEMPP,TEMPC1,TEMPC,TSIGT,TSIGTC,TSIGCF,

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3TSIGCC,TSIGPP,TSIGPC,TSIGXP,TSIGXC,ZEN,CTINL,CTINQ,CPLOWL,CPLOWQ,
4POWREG,REGVOL,GAMA1,GAMA2,GAMA3,GAMA4,POWORG,RFACT1,HTCOEF,CLADK
5,VINV,WZ,WPT)
0085 CALL COEF2(D,SIGT,CHANGE,PB,DR,LR,CH,CP)
0086 IF (DABS (PSISTO(N)/PSI(P,THG)-1.0)-TIGHT3) 200,200,100
0087 197 CONTINUE
0088 IF (DABS (PSISTO(N)/PSI(P,THG)-1.0)-TIGHT3) 200,200,110 00022540
0089 200 CONTINUE 00022550
0090 201 CONTINUE
0091 DO 205 G=1,GRP
0092 DO 205 P=1,PT
0093 205 PSI(P,G)=PSI(P,G)*POWFAC
0094 POWFAC=1
0095 IF (DEL.EQ.0) GO TO 202
0096 CALL EQPREC (PSI,FUEL,NUSIGF,IPL,IPR,XL,XR) 00022570
0097 II=GL 00022580
0098 IF (STEADY.EQ.3) WRITE (OUT,330) 00022590
0099 IF (STEADY.EQ.3) GO TO 210 00022600
0100 202 II=1
0101 WRITE (OUT,270) (G,NU(G),G=1,GRP) 00022620
0102 WRITE (OUT,280) 00022630
0103 210 CONTINUE 00022640
0104 DO 220 G=1I,GU 00022650
0105 220 WRITE (OUT,300) (P,PSI(P,G),P=1,PT) 00022660
0106 IF (PUNBAL.EQ.1) GO TO 225 00022670
0107 RETURN 00022680
0108 225 CONTINUE 00022690
0109 DO 230 G=1,GRP 00022700
0110 230 PUNCH 310,NU(G) 00022710
0111 WRITE (OUT,290) 00022720
0112 DO 240 G=1,GU 00022730
0113 240 PUNCH 310,(PSI(P,G),P=1,PT) 00022740
0114 RETURN 00022750
0115 270 FORMAT (19H0 EQUILIBRIUM NU(G),3X,4(1H(,I3,1H),E14.7)/22X,(4(1H(,I
13,1H),E14.7))) 00022760
0116 280 FORMAT (20H0 EQUILIBRIUM FLUXES) 00022780
0117 290 FORMAT (53H0 EQUILIBRIUM NU(G) AND FLUX DISTRIBUTION ARE PUNCHED) 00022790
0118 300 FORMAT (6(,I3,1H),E13.7) 00022800
0119 310 FORMAT (6F12.7) 00022810
0120 330 FORMAT (33H0INITIAL PRECURSOR CONCENTRATIONS) 00022820
0121 END 00022830

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0001      SUBROUTINE UPDAT (TAGT, TAGX, TAGC, TAGF, CHANGE, NUSIGP, PSIBAR, IODINE, 00024200
1XABS, XENON, CTRL, CTRQ, CXL, CXQ, CCL, CCQ, CPL, CPQ, SIGT, SIGX, SIGF, 00024210
2SIGC, PSIB1, NU, FUEL, TEMPF1, TEMPF, TEMPC1, TEMPC, TSIGTP, TSIGTC, TSIGCF,
3TSIGCC, TSIGFP, TSIGFC, TSIGXP, TSIGXC, ZEN, CTINL, CTINQ, CFLOWL, CFLOWQ,
4POWREG, REGVOL, GAMA1, GAMA2, GAMA3, GAMA4, POWORG, RFACT1, HTCOEF, CLADK
5, VINV, WZ, WPT)
0002      IMPLICIT REAL*8 (A-H, O-Z) 00024230
0003      INTEGER BCL, BCR, CHANGE, DEL, DNSCAT, TAGX, TESTS, THG, XEN, 00024240
1      UPSCAT, WPT, FUEL, G, GEOM, GP, GPL, GPR, GD, GL, GU, GRP, GPU, OUT, 00024250
2      P, PL, PR, PB, PRBEND, PT, PUNBAL, PUNFRS, R, REG, SOP, 00024260
3      SORCE, SORG, SOZ, STEADY, STEP, TAGC, TAGF, TAGT 00024270
0004      INTEGER THPEDB, GEOM1
0005      REAL*8 IODINE 00024280
0006      REAL*8 LR, NU, NUSIGP, NX 00024290
0007      COMMON /A1/GRP, REG, PT, GL, GU, DEL, THG, IDEL 00024300
0008      COMMON /A2/NUM, NCOMP, BCL, BCR, MTZ, NTZ, XEN, STEADY 00024310
0009      COMMON /B1/H, HP, TIME, TZ, ZERO, TZO, TIMZ 00024320
0010      COMMON /B2/NPRT, NZ, ISX, STEP, NZSAVE, PRBEND, IPRN 00024330
0011      COMMON /TH1/ THPEDB, NPASS, GEOM1, INDXTH, NTYPE
0012      COMMON /TH2/ TCOOLO, WFLOW0, POWER0, THDIM1, THDIM2, CORVOL, WFLOW, POWFAC
0013      DIMENSION CHANGE (REG) 00024340
0014      DIMENSION TAGC (REG), TAGF (REG), TAGT (REG), TAGX (REG) 00024350
0015      DIMENSION NUSIGP (REG, GRP) 00024360
0016      DIMENSION SIGC (REG, GRP), SIGF (REG, GRP), SIGT (REG, GRP), 00024370
1SIGX (REG, GRP, GRP) 00024380
0017      DIMENSION CCL (REG, GRP), CCQ (REG, GRP), CPL (REG, GRP), CPQ (REG, GRP), 00024390
1CTRL (REG, GRP), CTRQ (REG, GRP), CXL (REG), CXQ (REG) 00024400
0018      DIMENSION XENON (REG) 00024410
0019      DIMENSION NU (GRP) 00024420
0020      DIMENSION PSIBAR (REG, GRP), PSIB1 (REG, GRP), ZEN (REG, GRP)
0021      DIMENSION XABS (REG, GRP) 00024440
0022      DIMENSION POWREG (REG), REGVOL (REG), GAMA1 (REG), GAMA2 (REG), GAMA3 (REG)
0023      DIMENSION GAMA4 (REG), POWORG (REG), RFACT1 (REG)
0024      DIMENSION IODINE (REG) 00024450
0025      DIMENSION FUEL (REG) 00024460
0026      DIMENSION HTCOEF (REG), CLADK (REG)
0027      DIMENSION TEMPF1 (REG), TEMPF (REG), TEMPC1 (REG), TEMPC (REG)
0028      DIMENSION TSIGFP (REG, GRP), TSIGCF (REG, GRP), TSIGXP (REG, GRP, GRP),
1      TSIGFC (REG, GRP), TSIGCC (REG, GRP), TSIGXC (REG, GRP, GRP),
2      TSIGTC (REG, GRP), TSIGTP (REG, GRP)
0029      DIMENSION VINV (REG, GRP), WZ (PT), WPT (NUM)
0030      T=TZO 00024470
0031      IF (TIME.EQ.0.0) GO TO 360
0032      20 Y=(TIME-TIMZ)/(TZ-T) 00024480
0033      YSQ=Y*(TIME+TIMZ-2*T)/(TZ-T) 00024490
0034      TIMZ=TIME 00024500
0035      IF (XEN.EQ.0) GO TO 40 00024510
0036      CALL FEDBKX (PSIBAR, SIGF, XABS, XENON, IODINE, PSIB1, FUEL) 00024520
0037      40 IF (THPEDB.EQ.0) GO TO 50
0038      TCOOLO=TCOOL0+CTINL*Y+CTINQ*YSQ
0039      IF ((CFLOWL.EQ.0.0).AND.(CFLOWQ.EQ.0.0)) GO TO 46
0040      X=WFLOW
0041      WFLOW=WFLOW+CFLOWL*Y+CFLOWQ*YSQ

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0042      YX=(WFLOW/WFLOW0)**.8
0043      DO 45 R=1,REG
0044      GAMA3(R)=(GAMA3(R)*WFLOW)/X
0045      IF ((PJEL(R).NE.0).AND.(INDXTH.NE.1)) GAMA2(R)=GAMA2(R)*((HTCOEF(R)
1+CLADY(R))/HTCOEF(R))*((HTCOEF(R)*XX)/(HTCOEF(R)*XX+CLADK(R)))
0046      45 CONTINUE
0047      46 CALL HTRANO(POWREG,REGVOL,IODINE,XENON,PSIBAR,XABS,TEMPP1,
1TEMPP,TEMPC1,TEMPC,GAMA2,GAMA3,RFACT1,POWORG,GAMA1,GAMA4)
0048      50 CONTINUE
0049      DO 350 R=1,REG                                00024540

C
0050      IF (TAGT(R)-1) 160,110,130                    00024550
0051      110 DO 120 G=1,GRP                              00024560
0052      120 SIGT(R,G)=SIGT(R,G)+CTRL(R,G)*Y          00024570
0053      GO TO 150                                       00024580
C
0054      130 DO 140 G=1,GRP                              00024590
0055      140 SIGT(R,G)=SIGT(R,G)+CTRL(R,G)*Y+CTRQ(R,G)*YSQ 00024600
0056      150 CHANGE(R)=1                                00024610
0057      GO TO 170                                       00024620
0058      160 CHANGE(R)=0                                00024630
C
0059      170 IF (TAGX(R)-1) 220,180,210                00024640
0060      180 X=CXL(R)*Y                                  00024650
0061      190 DO 200 G=1,GRP                              00024660
0062      DO 200 GP=1,GRP                                  00024670
0063      200 SIGX(R,G,GP)=SIGX(R,G,GP)*(1.0+X)        00024680
0064      CHANGE(R)=2                                     00024690
0065      GO TO 220                                       00024700
C
0066      210 X=CXL(R)*Y+CXQ(R)*YSQ                    00024710
0067      GO TO 190                                       00024720
C
0068      220 IF (TAGC(R)-1) 270,230,250                00024730
0069      230 DO 240 G=1,GRP                              00024740
0070      240 SIGC(R,G)=SIGC(R,G)+CCL(R,G)*Y          00024750
0071      CHANGE(R)=2                                     00024760
0072      GO TO 270                                       00024770
C
0073      250 DO 260 G=1,GRP                              00024780
0074      260 SIGC(R,G)=SIGC(R,G)+CCL(R,G)*Y+CCQ(R,G)*YSQ 00024790
0075      CHANGE(R)=2                                     00024800
C
0076      270 IF (TAGF(R)-1) 320,280,300                00024810
0077      280 DO 290 G=1,GRP                              00024820
0078      SIGF(R,G)=SIGF(R,G)+CFL(R,G)*Y              00024830
0079      NUSIGF(R,G)=NU(G)*SIGF(R,G)                  00024840
0080      290 CONTINUE                                    00024850
0081      CHANGE(R)=2                                     00024860
0082      GO TO 320                                       00024870
C
0083      300 DO 310 G=1,GRP                              00024880
0084      310 SIGF(R,G)=SIGF(R,G)+CFL(R,G)*Y+CFQ(R,G)*YSQ 00024890

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0085      CHANGE(R)=2
0086      320 IF (((TAGF(R).EQ.0).AND.(TAGC(R).EQ.0)).AND.(TAGX(R).EQ.0)) GO TO 00024980
          1350
0087      DO 340 G=1,GRP
0088      SIGX(R,G,G)=SIGF(R,G)+SIGC(R,G)
0089      X=0.0
0090      DO 330 GP=1,GRP
0091      330 X=X+SIGX(R,GP,G)
0092      SIGX(R,G,G)=X
0093      340 CONTINUE

C
0094      IF (XEN.EQ.0) GO TO 350
0095      DO 345 G=1,GRP
0096      Z=ZEN(R,G)
0097      ZEN(R,G)=XABS(R,G)*XENON(R)
0098      SIGX(R,G,G)=SIGX(R,G,G)-Z+ZEN(R,G)
0099      345 SIGC(R,G)=SIGC(R,G)-Z+ZEN(R,G)
0100      350 CONTINUE
0101      360 IF ((XEN.EQ.0).OR.(TIME.NE.0.0)) GO TO 370
0102      DO 365 R=1,REG
0103      DO 365 G=1,GRP
0104      Z=ZEN(R,G)
0105      ZEN(R,G)=XABS(R,G)*XENON(R)
0106      SIGX(R,G,G)=SIGX(R,G,G)-Z+ZEN(R,G)
0107      SIGC(R,G)=SIGC(R,G)-Z+ZEN(R,G)
0108      365 CONTINUE
0109      370 IF (THPEDB.EQ.0) RETURN
0110      DO 420 R=1,REG
0111      X=TEMPP1(R)-TEMPP(R)
0112      Z=TEMPC1(R)-TEMPC(R)
0113      DO 390 G=1,GRP
0114      IF ((X.NE.0.0).OR.(Z.NE.0.0)) GO TO 375
0115      IF ((TIME).EQ.0.0) CHANGE(R)≠0
0116      GO TO 420
0117      375 CHANGE(R)=2
0118      IF (TIME.EQ.0.0) CHANGE(R)=1
0119      SIGT(R,G)=SIGT(R,G)+TSIGTF(R,G)*X+TSIGTC(R,G)*Z
0120      SIGC(R,G)=SIGC(R,G)+TSIGCF(R,G)*X+TSIGCC(R,G)*Z
0121      SIGF(R,G)=SIGF(R,G)+TSIGFF(R,G)*X+TSIGFC(R,G)*Z
0122      DO 380 GP=1,GRP
0123      380 SIGX(R,G,GP)=SIGX(R,G,GP)+TSIGXF(R,G,GP)*X+TSIGXC(R,G,GP)*Z
0124      NUSIGF(R,G)=NU(G)*SIGF(R,G)
0125      390 CONTINUE
0126      DO 410 G=1,GRP
0127      SIGX(R,G,G)=SIGF(R,G)+SIGC(R,G)
0128      Y=0.0
0129      DO 400 GP=1,GRP
0130      400 Y=Y+SIGX(R,GP,G)
0131      SIGX(R,G,G)=Y
0132      410 CONTINUE
0133      IF (TIME.GT.0.0) GO TO 420
0134      TEMPF(R)=TEMPP1(R)
0135      TEMPC(R)=TEMPC1(R)

```

0136
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0138

420 CONTINUE
RETURN
END

00025160

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0001      SUBROUTINE CALC (PSI,WHZ,WZ,NX,NUSIGF,SIGX,SD,SDIN,STPRN,FUEL,WPT, 00001280
1XL,XR,PB,IPL,IPR,VINV,UPSCAT,DNSCAT,SORG,SOR,SRCEO,SRCE1,CP,CM, 00001290
2PF1,PF2,TI1,DU,DL,DD,TD,WA,GA,DPSI) 00001300
0002      IMPLICIT REAL*8 (A-H,O-Z) 00001310
0003      REAL*8 LR,NU,NUSIGF,NX 00001320
0004      INTEGER BCL,BCR,CHANGE,DEL,DNSCAT,TAGX,TESTS,THG,XEN, 00001330
1          UPSCAT,WPT, FUEL,G,GEOM,GP,GPL,SPR,GD,GL,GU,GRP,GPU,OUT,00001340
2          P,PL,PR,PB, PREND , PT , PUNBAL , PUNFRS , R,REG,SOR, 00001350
3          SORCE , SORG , SOZ , STEADY , STEP , TAGC , TAGF , TAGT 00001360
0005      COMMON /A1/GRP,REG,PT,GL,GU,DEL,THG,IDEL 00001370
0006      COMMON /A2/NUM,NCOMP,BCL,BCR,MTZ,NTZ,XEN,STEADY 00001380
0007      COMMON /A3/PUNBAL,SORCE,GEOM,NTAG,NUM2,PUNFRS 00001390
0008      COMMON /A7/BETA(6),DECAY(6),BETDCY(6),DECH(6) 00001400
0009      COMMON /B1/H,HP,TIME,TZ,ZERO,TZO,TINZ 00001410
0010      DIMENSION PSI (PT,GU) 00001420
0011      DIMENSION WHZ (PT) 00001430
0012      DIMENSION SIGX (REG,GRP,GRP) 00001440
0013      DIMENSION NX (GRP) , NUSIGF (REG,GRP) 00001450
0014      DIMENSION SD (GRP,IDEL) 00001460
0015      DIMENSION SDIN (GRP,IDEL) 00001470
0016      DIMENSION STPRN (50) 00001480
0017      DIMENSION FUEL (REG) 00001490
0018      DIMENSION WPT (NUM) 00001500
0019      DIMENSION IPL (REG) , IPR (REG) , PB (REG) , XL (REG) , XR (REG) 00001510
0020      DIMENSION VINV (REG,GRP)
0021      DIMENSION SOR (REG) , SORG (REG,GRP) , SRCEO (PT,GRP) , SRCE1 (PT,GRP) 00001530
0022      DIMENSION CM (PT,GRP) , CP (PT,GRP) 00001540
0023      DIMENSION PF1 (PT) 00001550
0024      DIMENSION PF2 (PT) 00001560
0025      DIMENSION TI1 (REG) 00001570
0026      DIMENSION DD (PT) , DL (PT) , DU (PT) 00001580
0027      DIMENSION DNSCAT (REG,GRP) , UPSCAT (REG,GRP) 00001590
0028      DIMENSION WZ (PT) , WA (PT) , GA (PT) , TD (GRP) 00001600
0029      DIMENSION DPSI (PT) 00001610
0030      CALL      FREQ (PSI,WHZ,WZ,PF1,PF2,STPRN,WPT,DPSI,PB) 00001620
0031      IGONE=0 00001630
0032      IF (DEL.EQ.0) GO TO 24 00001640
0033      DO 23 II=1,DEL 00001650
0034      23 DECH (II) =DEXP (DECAY (II) *H) 00001660
0035      24 DO 150 G=1,GRP 00001670
0036      DO 115 R=1,REG 00001680
0037      TI1 (R) =NX (G) *NUSIGF (R,G) -SIGX (R,G,G) 00001690
0038      IF (GRP.EQ.1) TI1 (R) =-SIGX (R,G,G) 00001700
0039      115 CONTINUE 00001710
0040      CALL      RHS (G,PSI,PF1,PF2,TI1,NX,NUSIGF,VINV,SIGX ,FUEL,SD, 00001720
1XL,XR,PB,IPL,IPR) 00001730
0041      120 IF (SORCE) 130,140,130 00001740
0042      130 CALL      SOURCE (G,PSI,SORG,SOR,SRCEO,SRCE1,XL,XR,PB,IPL,IPR) 00001750
0043      140 CALL      LHS (G,DU,DL,DD,CP,CM,TI1,VINV,PF2,XL,XR,IPL,IPR,PB) 00001760
0044      CALL      MATINV (G,PT,GRP,PSI,DU,DL,DD,WA,GA) 00001770
0045      150 CONTINUE 00001780
0046      IF (DEL) 160,180,160 00001790
0047      160 DO 170 G=GL,GU 00001800

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0048
0049
0050
0051
0052

CALL
170 CONTINUE
180 CONTINUE
RETURN
END

PREC(G,PSI,NUSIGF,PF2,FUEL,XL,XR,PB,IPL,IPR,TD)

00001810
00001820
00001830
00001840
00001850

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0001      SUBROUTINE RHS(G,PSI,PF1,PF2,TI1,NX,NUSIGF,VINV,SIGX ,FUEL,SD,      00022310
        1XL,IP,PB,IPL,IPR)      00022320
0002      IMPLICIT REAL*8 (A-H,O-Z)      00022330
0003      INTEGER BCL,BCR,CHANGE,DEL,DKSCAT,TAGX,TESTS,THG,XEN,      00022340
        1 UPSCAT,WPT, FUEL,G,GEON,GP,GPL,GPR,GD,GL,GU,GRP,GPU,OUT,00022350
        2 P,PL,PR,PB, PRBEND , PT, PUNBAL , PUNFRS , R,REG,SOR, 00022360
        3 SORCE , SORG , SOZ , STEADY , STEP , TAGC , TAGF , TAGT 00022370
0004      REAL*8 LR,NU,NUSIGF,NX      00022380
0005      COMMON /A1/GRP,REG,PT,GL,GU,DEL,THG,IDEL      00022390
0006      COMMON /A2/NUM,NCOMP,BCL,BCR,MTZ,NTZ,XEN,STEADY      00022400
0007      DIMENSION PSI (PT,GI)      00022410
0008      DIMENSION FF1 (PT)      00022420
0009      DIMENSION FF2 (PT)      00022430
0010      DIMENSION VINV (REG,GRP)
0011      DIMENSION TI1 (REG)      00022450
0012      DIMENSION IPL (REG),IPR (REG),PB (REG),XL (REG),XR (REG)      00022460
0013      DIMENSION FUEL (REG)      00022470
0014      DIMENSION SD (GRP,IDEL)      00022480
0015      DIMENSION NX (GRP),NUSIGF (REG,GRP)      00022490
0016      DIMENSION SIGX (REG,GRP,GRP)      00022500
C      THIS ROUTINE EVALUATES THE RHS OF THE ALGORITHM AT ALL INTERIOR      00022510
C      POINTS OF EACH REGION IN A GIVEN GROUP      00022520
        X3=NX (G)      00022530
        PL=1      00022540
        IP (BCL.EQ.0) PL=2      00022550
        DO 20 R=1,REG      00022560
        PR=IPR (R)      00022570
        IF ((R.EQ.REG).AND.(BCR.EQ.1)) PR=PT      00022580
        DO 19 P=PL,PR      00022590
        T1=0.0      00022600
        T2=0.0      00022610
        IF (GRP.EQ.1) T2=X3*NUSIGF (R,G)*PSI (P,G)      00022620
        IF (G.EQ.1) GO TO 12      00022630
        GPU=G-1      00022640
        DO 11 GP=1,GPU      00022650
11      T1=T1+(X3*NUSIGF (R,GP)+SIGX (R,G,GP))      00022660
        1*PSI (P,GP)      00022670
0031      12 IF (G.EQ.GRI) GO TO 14      00022680
0032      GPL=G+1      00022690
0033      DO 13 GP=GPL,GRP      00022700
0034      13 T2=T2+(X3*NUSIGF (R,GP)+SIGX (R,G,GP))*      00022710
        1*PSI (P,GP)      00022720
C      NOW ADD DELAY CONTRIBUTIONS      00022730
14      T3=0.0      00022740
        IF (DEL) 18,18,15      00022750
15      IF (FUEL (R)) 16,18,16      00022760
16      DO 17 GP=GL,GU      00022770
        GD=GP-GRP      00022780
        T3=T3+SD (G,GD)*PSI (P,GP)      00022790
17      CONTINUE      00022800
18      T1=T1*FF2 (P)      00022810
        T2=T2*FF1 (P)      00022820
        T3=T3*FF1 (P)      00022830

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0045	T4=T1+T2+T3	00022840
0046	PSI (P,G)=VINV (R,G)*PSI (P,G)+T4	
0047	19 CONTINUE	00022860
0048	PL=PP+2	00022870
0049	20 CONTINUE	00022880
	C THIS ROUTINE EVALUATES THE RHS OF THE ALGORITHM AT ALL REGION	00022890
	C BOUNDARY POINTS IN GROUP G	00022900
0050	IP=REG-1	00022910
0051	IF (IP) 220,220,110	00022920
0052	110 DO 210 R=1,IP	00022930
0053	JRP=R+1	00022940
0054	P=PB (R)	00022950
0055	X1=XL (R)	00022960
0056	X2=XR (R)	00022970
0057	T1=0.0	00022980
0058	T2=0.0	00022990
0059	IF (GRP.EQ.1) T2=X3*(NUSIGF (R,G)*X1+NUSIGF (R+1,G)*X2)*PSI (P,G)	00023000
0060	IF (G.EQ.1) GO TO 130	00023010
0061	GPU=G-1	00023020
0062	DO 120 GP=1,GPU	00023030
0063	120 T1=T1+(X3*(NUSIGF (R,GP)*X1+NUSIGF (P+1,GP)	00023040
	1*X2)+SIGX (R,G,GP)*X1+SIGX (R+1,G,GP)*	00023050
	2X2)*PSI (P,GP)	00023060
0064	130 IF (G.EQ.GRP) GO TO 150	00023070
0065	GPL=G+1	00023080
0066	DO 140 GP=GPL,GRP	00023090
0067	140 T2=T2+(X3*(NUSIGF (R,GP)*X1+NUSIGF (R+1,GP)	00023100
	1*X2)+SIGX (R,G,GP)*X1+SIGX (P+1,G,GP)*	00023110
	2X2)*PSI (P,GP)	00023120
	C THEN ADD PRECURSOR CONTRIBUTIONS	00023130
0068	150 T3=0.	00023140
0069	IF (DEL) 200,200,160	00023150
	C WE CHECK FOR ANY FUEL AT THE BOUNDARY POINT	00023160
0070	160 IF (FUEL (R)) 180,170,180	00023170
0071	170 IF (FUEL (R+1)) 180,200,180	00023180
0072	180 DO 190 GP=GL,GU	00023190
0073	GD=GP-GRP	00023200
0074	T3=T3+SD (G,GD)*PSI (P,GP)	00023210
0075	190 CONTINUE	00023220
0076	200 T1=T1+PF2 (P)	00023230
0077	T2=T2+PF1 (P)	00023240
0078	T3=T3+PF1 (P)	00023250
0079	T4=T1+T2+T3	00023260
0080	PSI (P,G)=(VINV (R,G)*X1+VINV (R+1,G)*X2)*PSI (P,G)+T4	
0081	210 CONTINUE	00023280
0082	220 RETURN	00023290
0083	END	00023300

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0001          SUBROUTINE LHS(G,DU,DL,DD,CP,CM,TI1,VINV,PF2,XL,XR,IPL,IPR,PB) 00019250
C          THIS ROUTINE EVALUATES THE TRI-DIAGONAL MATRIX FOR THE LEFT-HAND 00019260
C          SIDE OF THE ALGORITHM FOR GROUP G 00019270
0002          IMPLICIT REAL*8 (A-H,O-Z) 00019280
0003          INTEGER BCL,BCR,CHANGE,DEL,DNSCAT,TAGX,TESTS,THG,XEN, 00019290
1          UPSCAT,WPT,PUEL,G,GEOM,GP,GPL,GPR,GD,GL,GU,GRP,GPU,OUT,00019300
2          P,PL,PR,PB,PRBEND,PT,PUNBAL,PUNFRS,R,REG,SOR, 00019310
3          SORCE,SORG,SOZ,STEADY,STEP,TAGC,TAGF,TAGT 00019320
0004          REAL*8 LR,NU,NUSIGF,NX 00019330
0005          COMMON /A1/GRP,REG,PT,GL,GU,DEL,THG,IDEL 00019340
0006          COMMON /A2/NUM,NCOMP,BCL,BCR,HTZ,NTZ,XEN,STEADY 00019350
0007          DIMENSION FF2(PT) 00019360
0008          DIMENSION VINV(REG,GRP)
0009          DIMENSION TI1(REG) 00019380
0010          DIMENSION IPL(REG),IPR(REG),XL(REG),XR(REG) 00019390
0011          DIMENSION PB(REG) 00019400
0012          DIMENSION CM(PT,GRP),CP(PT,GRP) 00019410
0013          DIMENSION DD(PT),DL(PT),DU(PT) 00019420
0014          PL=2 00019430
0015          DO 1 R=1,REG 00019440
0016          PR=IPR(R) 00019450
0017          T1=TI1(R) 00019460
0018          DO 2 P=PL,PR 00019470
0019          DU(P)=-CP(P,G)*PF2(P+1) 00019480
0020          DL(P)=-CM(P,G)*PF2(P-1) 00019490
0021          DD(P)=VINV(R,G)+(CM(P,G)+CP(P,G)-T1)*PF2(P)
0022          2 CONTINUE 00019520
0023          1 PL=PR+2 00019530
0024          DO 3 R=1,REG 00019540
0025          IF(R-1) 5,4,5 00019550
0026          4 IF(BCL.EQ.1) GO TO 65 00019560
0027          DD(1)=VINV(1,G)
0028          DU(1)=0.0 00019580
0029          GO TO 5 00019590
0030          65 DD(1)=VINV(1,G)+(CM(1,G)+CP(1,G)-TI1(1))*PF2(1)
0031          DU(1)=-CP(1,G)*PF2(2) 00019620
0032          5 IF(R.EQ.PEG) GO TO 3 00019630
0033          P=PB(R) 00019640
0034          T1=TI1(R)*XL(R)+TI1(R+1)*XR(R) 00019650
0035          DD(P)=VINV(R,G)*XL(R)+VINV(R+1,G)*XR(R)+(CM(P,G)+CP(P,G)-T1)
1*PF2(P)
0036          DU(P)=-CP(P,G)*PF2(P+1) 00019670
0037          DL(P)=-CM(P,G)*PF2(P-1) 00019680
0038          3 CONTINUE 00019690
0039          IF(BCR.EQ.1) GO TO 33 00019700
0040          DD(PT)=VINV(REG,G)
0041          DL(PT)=0.0 00019720
0042          GO TO 605 00019730
0043          33 DD(PT)=VINV(REG,G)+(CP(PT,G)+CM(PT,G)-TI1(REG))*PF2(PT)
0044          DL(PT)=-CM(PT,G)*PF2(PT-1)
0045          605 CONTINUE 00019770
0046          RETURN 00019780
0047          END 00019790
    
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0001      SUBRCLTINE INPTA2(PSI,SIGF,SIGC,SIGT,SIGX,NU,SD,SDIN,CHI,VINV,V, C0012800
INCMP,FUEL,XABS,XENON,ICDINE,PB,LR,WPT,SIGCIN,SIGFIN,SIGTIN,SIGXIN,
2ASUBH,CLACK,HTCDEF,RFACT1,SPHTC,CFRAC,HCAPC,HCAFP,TSIGFF,TSIGCF,
3TSIGXF,TSIGFC,TSIGCC,TSIGXC,TSIGTC,TSIGTF,DFFIN,DFCIN,DFTIN,DFXIN,
4CCFIN,CCCIN,DCTIN,DCXIN,TEMPF,VI)
0002      IMPLICIT REAL*8 (A-F,C-Z) C0012820
0003      INTEGER GF,GPLUS,GFPLUS,GRPLUS C0012830
0004      INTEGER BCL,BCR,CHANGE,DEL,CNSCAT,TAGX,TESTS,THG,XEN, C0012840
1          UPSCAT,WPT, FUEL,G,GEOM,GP,GPL,GPR,GD,GL,GU,GRP,GPU,CLT,C0012850
2          P,PL,PR,PE, PRBEND , PT , PUNBAL , PUNFRS , R,REG,SCR, C0012860
3          SCRCE , SCRG , SCZ , STEADY , STEP , TAGC , TAGF , TAGT C0012870
0005      INTEGER THFEDB,THXF,THXC,GECMI
0006      REAL*8 IOCINE C0012880
0007      REAL*8 LR,KU,NUSIGF,NX C0012890
0008      COMMON /A1/GRP,REG,PT,GL,GU,DEL,T+G,IDEL C0012900
0009      COMMON /A2/NUM,NCCMP,BCL,BCR,MTZ,NTZ,XEN,STEADY C0012910
0010      COMMON /A4/TIGHT1,TIGHT2,TIGHT3 C0012920
0011      COMMON/A5/IN,CUT,NERR C0012930
0012      COMMON/A6/EP1,EP2,EP3,TSTINC,IEP4,IEP6 C0012940
0013      COMMON /A7/BETA(6),DECAY(6),BETDCY(6),DECH(6) C0012950
0014      COMMON /A8/GAMAX,GAMA1 C0012960
0015      COMMON /B1/H,FP,TIME,TZ,ZERC,TZO,TIMZ C0012970
0016      COMMON /C2/GF,GRPLUS C0012980
0017      COMMON /TH1/ THFEDB,NPASS,GEOM1,INDXTH,NTYPE
0018      COMMON /TH2/TCGOLO,WFLCW,PCWERO,THDIM1,THDIM2,CCRVOL,WFLCW,PCWFAC
0019      DIMENSION PSI(PT,GU) C0012990
0020      DIMENSION XABS(REG,GRP) C0013000
0021      DIMENSION XENCN(REG),IOCINE(REG) C0013010
0022      DIMENSION VINV(REG,GRP)
0023      DIMENSION V(REG,GRP)
0024      DIMENSION VI(NCCMP,GRP)
0025      DIMENSION PB(REG),LR(REG) C0013040
0026      DIMENSION CFI(GRP) C0013050
0027      DIMENSION FUEL(REG) C0013060
0028      DIMENSION NCCMP(REG) C0013070
0029      DIMENSION SD(CRP,IDEL) C0013080
0030      DIMENSION SDIN(GRP,IDEL) C0013090
0031      DIMENSION WPT(NUM) C0013100
0032      DIMENSION NU(CRP) C0013110
0033      DIMENSION SIGC(REG,GRP),SIGF(REG,GRP),SIGT(REG,GRP), C0013120
1SIGX(REG,GRP,GRP) C0013130
0034      DIMENSION SIGCIN(GRP),SIGFIN(GRP),SIGTIN(GRP) C0013140
0035      DIMENSION SIGXIN(GRPLUS,GRP) C0013150
0036      DIMENSION ASUBH(REG),CLADK(REG),HTCDEF(REG),RFACT1(REG),SPHTC(REG)
0037      DIMENSION IC(14) C0013160
0038      DIMENSION CFRAC(REG),HCAPC(REG),HCAFP(REG),TEMPF(REG)
0039      DIMENSION TSIGFF(REG,GRP),TSIGCF(REG,GRP),TSIGXF(REG,GRP,GRP),
1          TSIGFC(REG,GRP),TSIGCC(REG,GRP),TSIGXC(REG,GRP,GRP),
2          TSIGTC(REG,GRP),TSIGTF(REG,GRP)
0040      DIMENSION DFFIN(GRP),DFCIN(GRP),DFTIN(GRP),DFXIN(GRPLLS,GRP),
1          CCFIN(GRP),CCCIN(GRP),DCTIN(GRP),DCXIN(GRPLLS,GRP)
0041      ABS(X)=DABS(X) C0013170
0042      FLOAT(I)=DFLOAT(I) C0013180

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C ***** CARD 4 *****
0043 READ (IN,350) (PB(R),R=1,REG)
0044 WRITE (OUT,420) (PB(R),R=1,REG)
0045 IF (REG.EQ.1) GO TO 120
0046 N=REG-1
0047 DO 110 R=1,N
0048 IF (PB(R).GE.PB(R+1)) CALL ERR (1,1,4,R)
0049 110 CONTINUE

C
C
0050 120 IF (PT.NE.PB(REG).CR.PT.LT.1) CALL ERR(1,1, 3,6)
C ***** CARD 5 *****
0051 READ (IN,360) (LR(R),R=1,REG)
0052 WRITE (OUT,430) (LR(R),R=1,REG)
0053 DO 130 R=1,REG
0054 IF (LR(R).LE.C.0) CALL ERR (1,1,5,R)
0055 130 CONTINUE
C ***** CARD 6 *****
0056 READ (IN,350) (WPT(N),N=1,NUM)
0057 WRITE (OUT,440) (WPT(N),N=1,NUM)
0058 DO 140 N=1,NUM
0059 140 IF (WPT(N).GT.PT) CALL ERR (1,2,WPT(N),0)
C
0060 IF (DEL.EQ.C) GO TO 180
C ***** CARD 7 *****
0061 READ (IN,360) (BETA(GP),GP=1,DEL)
0062 WRITE (OUT,450) (BETA(GP),GP=1,DEL)
C
C ***** CARD 8 *****
0063 DO 150 G=1,GRP
0064 READ (IN,360) (SDIN(G,I),I=1,DEL)
0065 WRITE (OUT,460) (SDIN(G,I),I=1,DEL)
0066 150 CONTINUE
C ***** CARD 9 *****
0067 READ (IN,360) (DECAY(GP),GP=1,DEL)
0068 WRITE (OUT,470) (DECAY(I),I=1,DEL)
0069 DO 170 GP=1,DEL
0070 DO 160 G=1,GRP
0071 160 SD(G,GP)=ABS(SDIN(G,GP)*DECAY(GP))
0072 170 DECAY(GP)=-ABS(DECAY(GP))
C
0073 180 CONTINUE
C ***** CARD 10 *****
0074 READ (IN,360) (CHI(G),G=1,GRP)
0075 WRITE (OUT,480) (CHI(G),G=1,GRP)
C
C ***** CARD 11 *****
0076 DO 999 I=1,NCCMP
0077 READ(IN,360) (VI(I,G),G=1,GRP)
0078 WRITE(OUT,490) (VI(I,G),G=1,GRP)
0079 999 CONTINUE
C ***** CARD 12 *****
0080 READ (IN ,660) EP1,EP2,EP3,IEP4,IEP6,TSTINC

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00013190
00013200
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00013700
00013710

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CC81      WRITE (OUT,70C) EP1,EP2,EP3,IEP4,IEP6,TSTINC      00013720
CC82      IF(EP1.LE.C.C) CALL ERR (1,1,12,1)                00013730
CC83      IF(EP2.LE.C.C) CALL ERR (1,1,12,2)                CC013740
CC84      IF(IEP4.NE.C.AND.IEP4.NE.1) CALL ERR(1,1,12,5)    CCC1375C
CC85      IF(IEP6.NE.C.AND.IEP6.NE.1) CALL ERR(1,1,12,6)    CC013760
CC86      GFPLUS=GF+1                                         00013770
          C ***** CARD 13 *****                          C0013780
CC87      READ (IN,35C) (NCMP(R),R=1,REG)                    CC013790
CC88      WRITE (OUT,51C) (NCMP(R),R=1,REG)                  0001380C
CC89      DO 310 I=1,ACCMP                                     CC01381C
CC90      DO 20C G=1,GRP                                       CC01382C
CC91      SIGCIN(G)=C.C                                         C001383C
CC92      SIGFIN(G)=G.O                                         CC013840
CC93      IF(THFEDB.EC.C) GC TO 198
CC94      DFFIN(G)=C.C
CC95      DFCIN(G)=C.C
CC96      DFTIN(G)=0.C
CC97      DCFIN(G)=0.C
CC98      DCCIN(G)=0.C
CC99      DCTIN(G)=0.O
0100      19E SIGTIN(G)=C.O
0101      DO 20C GP=1,GRP
0102      IF(THFEDB.EC.C) GC TO 199
0103      DFXIN(GP,G)=0.O
0104      DCXIN(GP,G)=0.O
0105      199 SIGXIN(GP,G)=C.O
0106      200 CONTINUE
          C ***** CARD 14 *****                          C0013880
0107      READ (IN,370) NUCNAM,(ID(K),K=1,14),I1,I2,I3      CC013890
0108      WRITE (OUT,520) NUCNAM,(ID(K),K=1,14),I1,I2,I3    00013900
          C ***** CARD 15 *****                          C0013910
0109      DO 21C G=1,GRP                                         0001392C
0110      READ (IN,360) NU(G),SIGFIN(G),SIGCIN(G),SIGTIN(G),XX,SIGXIN(G+1,G)00013930
0111      WRITE (OUT,530) NU(G),SIGFIN(G),SIGCIN(G),SIGTIN(G),XX,SIGXIN(G+1,00013940
          1G)                                                    CC01395C
0112      21C CONTINUE                                           00013960
0113      INDX=I2+1                                             CC013970
0114      GO TO (27C,22C,250), INDX                             00013980
0115      22C CONTINUE                                           00013990
          C ***** CARD 16 *****                          C0014000
0116      FAST MATRIX                                           00014010
0117      IF (GF.EQ.O) GO TC 270                                 0001402C
0118      DO 24C G=1,GF                                         00014030
0119      GPLUS=G+1                                             C0014040
          C ***** CARD 17 *****                          C0014050
0120      READ (IN,360) (SIGXIN(GP,G),GP=GPLUS,GFPLUS)      00014060
0121      WRITE (OUT,540) (SIGXIN(GP,G),GP=GPLUS,GFPLUS)    00014070
0122      GO TO 240                                             00014080
0123      230 READ (IN,360) XX                                   00014090
0124      240 CONTINUE                                           00014100
0125      GO TC 270                                             00014110
0126      25C DO 26C G=1,GRP                                     00014120
          C ***** CARD 17 *****                          C0014130

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0127      READ (IN,360) (SIGXIN(GP,G),GP=1,GRP)          00014140
0128      WRITE (OUT,550) (SIGXIN(GP,G),GP=1,GRP)        00014150
0129      26C CONTINUE                                   C0014160
0130      270 CONTINUE                                   00014170
0131      IF (THFEDB.EQ.0) GO TO 276
0132      DO 271 G=1,GRP
C*****
C133      READ (IN,360) DFFIN(G),DFCIN(G),DFTIN(G),DFXIN(G+1,G)
0134      WRITE (OUT,600) DFFIN(G),DFCIN(G),DFTIN(G),DFXIN(G+1,G)
0135      271 CONTINUE
0136      DO 272 G=1,GRP
C*****
0137      READ (IN,360) DCFIN(G),DCCIN(G),DCTIN(G),CCXIN(G+1,G)
0138      WRITE (OUT,610) DCFIN(G),DCCIN(G),DCTIN(G),CCXIN(G+1,G)
0139      272 CONTINUE
0140      IF (I2.EQ.0) GO TO 276
C*****
0141      READ (IN,350) THXF,THXC
0142      WRITE (OUT,590) THXF,THXC
0143      IF (THXF.EQ.0) GO TO 274
0144      DO 273 G=1,GRP
C*****
0145      READ (IN,360) (DFXIN(GP,G),GP=1,GRP)
0146      WRITE (OUT,620) (DFXIN(GP,G),GP=1,GRP)
0147      273 CONTINUE
0148      274 IF (THXC.EQ.0) GO TO 276
0149      DO 275 G=1,GRP
C*****
0150      READ (IN,360) (DCXIN(GP,G),GP=1,GRP)
0151      WRITE (OUT,630) (DCXIN(GP,G),GP=1,GRP)
0152      275 CONTINUE
0153      276 CONTINUE
C
C      ASSIGNMENT OF COMPOSITIONS TO REGIONS
C
0154      DO 300 R=1,REG
0155      IF (NCMP(R).NE.I) GO TO 300
0156      DO 290 G=1,GRP
0157      IF (THFEDB.EQ.C) GO TO 278
0158      TSIGFF(R,G)=DFFIN(G)
0159      TSIGCF(R,G)=DFCIN(G)
0160      TSIGTF(R,G)=DFTIN(G)
0161      TSIGFC(R,G)=DCFIN(G)
0162      TSIGCC(R,G)=DCCIN(G)
0163      TSIGTC(R,G)=DCTIN(G)
0164      278 SIGF(R,G)=SIGFIN(G)
0165      SIGC(R,G)=SIGCIN(G)          00014250
0166      SIGT(R,G)=SIGTIN(G)        00014260
0167      V(R,G)=VI(I,G)
0168      VINV(R,G)=1.0/V(R,G)
0169      DO 280 GP=1,GRP
0170      IF (THFEDB.EQ.C) GO TO 279
0171      TSIGXF(R,GP,G)=DFXIN(GP,G)

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0172          TSIGXC(R,GP,G)=DCXIN(GP,G)
0173          279 SIGX(R,GP,G)=SIGXIN(GP,G)
0174          28C CONTINUE
0175          29C CONTINUE
0176          30C CONTINUE
0177          31C CONTINUE
C
C          SET FLEL(R)=0 FOR NCN FISSION REGIONS
C
0178          DO 311 R=1,REG
0179          FUEL(R)=0
0180          DO 311 G=1,GRP
0181          IF( ABS(SIGF(R,G)).GT.ZERC ) FUEL(R)=1
0182          311 CONTINUE
C
C183          IF (XEN.EQ.0) GO TO 330
C          ***** CARD 18 *****
0184          READ (IN,20) GAMAX,GAMA1
0185          WRITE (OUT,56C) GAMAX,GAMA1
C          ***** CARD 19 *****
0186          DO 32C R=1,REG
0187          READ ( IN,360) XENON(R),IODINE(R),(XABS(R,G),G=1,GRP)
0188          WRITE(OUT,570) XENON(R),ICOINE(R),(XABS(R,G),G=1,GRP)
0189          32C CONTINUE
0190          330 CONTINUE
0191          IF (STEADY.EQ.2) GO TC 345
0192          IPP=GRP
0193          IF (STEADY.EQ.0) IPP=GU
0194          DO 340 G=1,IPP
C          ***** CARD 20 *****
0195          READ ( IN,360) (PSI(P,G),P=1,PT)
0196          WRITE (OUT,580) (PSI(P,G),P=1,PT)
0197          340 CONTINUE
0198          345 CONTINUE
0199          IF((XEN.GE.0).AND.(THFEDB.EQ.0)) GO TO 349
C***** CARD 20B *****
0200          READ(IN,360) TCCOLO,WFLCWO,POWERO,THDIM1,THDIM2
0201          WRITE(OUT,640) TCCOLO,WFLCWO,POWERO,THDIM1,THDIM2
0202          IF(THFEDB.EQ.0) GC TO 349
0203          DO 348 I=1,REG
C***** CARD 20C *****
0204          READ (IN,360) ASUBH(I),CLACK(I),HTCOEF(I),SPHTC(I)
0205          WRITE(OUT,650)ASUBH(I),CLACK(I),HTCOEF(I),SPHTC(I)
C***** CARD 20D *****
0206          347 READ (IN,360) TEMPF(I),HCAPF(I),HCAPC(I),RFACT1(I),CFRAC(I)
0207          WRITE(OUT,655)TEMPF(I),HCAPF(I),HCAPC(I),RFACT1(I),CFRAC(I)
0208          34E CONTINUE
0209          349 RETURN
C
0210          350 FORMAT (12I6)
0211          360 FORMAT (6E12.5)
0212          370 FORMAT(15A4,3I4)
0213          42C FORMAT (9HOCARD 04,2X,12I6/(12X,12I6))

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00014290
00014300
00014310
00014320
00014330
00014340
00014350
00014360
00014370
00014380
00014390
00014400
00014410
00014420
00014430
00014440
00014450
00014460
00014470
00014480
00014490
00014500
00014510
00014520
00014530
00014540
00014550
00014560
00014570
00014580
00014590
00014610
00014620
00014630
00014640

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0214	43C	FORMAT (10HCCARD	05 ,2X,6E12.6/(12X,6E12.6))	CC014660
0215	44C	FORMAT (10HCCARD	06 ,2X,12I6/(12X,12I6))	CC014670
0216	45C	FORMAT (10HCCARD	07 ,2X,6E12.6/(12X,6E12.6))	CC014680
0217	46C	FORMAT (10HCCARD	08 ,2X,6E12.6/(12X,6E12.6))	CC014690
0218	47C	FORMAT (10HCCARD	09 ,2X,6E12.6/(12X,6E12.6))	CC014700
0219	48C	FORMAT (10HCCARD	10 ,2X,6E12.6/(12X,6E12.6))	CC014710
0220	49C	FORMAT (10HCCARD	11 ,2X,6E12.6/(12X,6E12.6))	CC014720
0221	51C	FORMAT (10HCCARD	13 ,2X,12I6/(12X,12I6))	CC014730
0222	52C	FORMAT (10HCCARD	14 ,2X,15A4,3I4)	CC014740
0223	53C	FORMAT (10HCCARD	15 ,2X,6E12.6)	CC014750
0224	54C	FORMAT (10HCCARD	16 ,2X,6E12.6/(12X,6E12.6))	CC014760
0225	55C	FORMAT (10HCCARD	17 ,2X,6E12.6/(12X,6E12.6))	CC014770
0226	56C	FORMAT (10HCCARD	18 ,2X,6E12.6)	CC014780
0227	57C	FORMAT (10HCCARD	19 ,2X,6E12.6)	CC014790
0228	58C	FORMAT (10HCCARD	20 ,2X,6E12.6/(12X,6E12.6))	CC014800
0229	59C	FORMAT (/1X,'CARD	17D',2X,2I6)	
0230	60C	FORMAT (/1X,'CARD	17B',2X,4E12.6)	
0231	61C	FORMAT (/1X,'CARD	17C',2X,4E12.6)	
0232	62C	FORMAT (/1X,'CARD	17E',2X,6E12.6/(12X,6E12.6))	
0233	63C	FORMAT (/1X,'CARD	17F',2X,6E12.6/(12X,6E12.6))	
0234	64C	FORMAT (/1X,'CARD	2CB',2X,6E12.6)	
0235	65C	FORMAT (/1X,'CARD	2CC',2X,4E12.6)	
0236	655	FORMAT (/1X,'CARD	2CD',2X,6E12.6)	
0237	66C	FORMAT (3E12.5,2I12,E12.5)		CC014810
0238	70C	FORMAT (10HCCARD	12 ,2X,3E12.6,2I12,E12.6)	CC014820
	C			CC014830
0239	END			CC014840

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0001      SUBROUTINE INEDA (PSI, WPT, PB, LR, DR, V, NU, CHI, SD, NCOMP, D, SIGC, SIGF, 00012140
1SIGX, XENON, IODINE, TSIGPF, TSIGCF, TSIGXP, TSIGPC, TSIGCC, TSIGXC, TSIGTC) 00012150
2, TSIGTF, ASUBH, CLADK, HTCOEF, RFACT1, SPHTC, CPRAC, HCAPC, HCAPP, TEMPF) 00012160
0002      IMPLICIT REAL*8 (A-H, O-Z) 00012170
0003      INTEGER BCL, BCR, CHANGE, DEL, DNSCAT, TAGX, TESTS, THG, XEN, 00012180
1          UPSCAT, WPT, PUEL, G, GEOM, GP, SPL, GPR, GD, GL, GU, GRP, GPU, OUT, 00012190
2          P, PL, PR, PB, PRBEND, PT, PUNBAL, PUNFRS, R, REG, SOR, 00012200
3          SORCE, SORG, SOZ, STEADY, STEP, TAGC, TAGF, TAGT 00012210
0004      INTEGER RBOND 00012220
0005      INTEGER THFEDB, GEOM1 00012230
0006      REAL*8 IODINE 00012240
0007      REAL*8 LR, NU, NUSIGF, NX 00012250
0008      COMMON /A1/GRP, REG, PT, GL, GU, DEL, THG, IDEL 00012260
0009      COMMON /A2/NUM, NCOMP, BCL, BCR, MTZ, NTZ, XEN, STEADY 00012270
0010      COMMON /A3/PUNBAL, SORCE, GEOM, NTAG, NUM2, PUNFRS 00012280
0011      COMMON /A5/IN, OUT, NERR 00012290
0012      COMMON /A8/GAMAX, GAMAI 00012300
0013      COMMON /TH1/ THFEDB, NPASS, GEOM1, INDXTH, NTYPE 00012310
0014      COMMON /TH2/TCOOLO, WFLOW, POWERO, THDIM1, THDIM2, CORVOL, WFLOW, POWFAC 00012320
0015      DIMENSION PSI (PT, GU) 00012330
0016      DIMENSION XENON (REG), IODINE (REG) 00012340
0017      DIMENSION V (REG, GRP)
0018      DIMENSION PB (REG), DR (REG), LR (REG) 00012360
0019      DIMENSION CHI (GRP) 00012370
0020      DIMENSION D (REG, GRP) 00012380
0021      DIMENSION NCOMP (REG) 00012390
0022      DIMENSION SD (GRP, IDEL) 00012400
0023      DIMENSION WPT (NUM) 00012410
0024      DIMENSION NU (GRP) 00012420
0025      DIMENSION SIGC (REG, GRP), SIGF (REG, GRP), SIGX (REG, GRP, GRP) 00012430
0026      DIMENSION TSIGPF (REG, GRP), TSIGCF (REG, GRP), TSIGXP (REG, GRP, GRP), 00012440
1          TSIGPC (REG, GRP), TSIGCC (REG, GRP), TSIGXC (REG, GRP, GRP), 00012450
2          TSIGTC (REG, GRP), TSIGTF (REG, GRP) 00012460
0027      DIMENSION ASUBH (REG), CLADK (REG), HTCOEF (REG), RFACT1 (REG), SPHTC (REG) 00012470
0028      DIMENSION CPRAC (REG), HCAPC (REG), HCAPP (REG), TEMPF (REG) 00012480
0029      DIMENSION NOTE1 (9), NOTE2 (2), NOTE3 (6) 00012490
0030      DIMENSION NOTETH (13) 00012500
0031      DATA NOTE1/4H , 4H , 4HSLAB, 4H CYL, 4HINDR, 4HICAL, 00012510
14H S, 4HPHER, 4HICAL/ 00012520
0032      DATA NOTE4/4H I=/ 00012530
0033      DATA NOTE2/4H NO , 4H YES/ 00012540
0034      DATA NOTE3/4HZERO, 4H , 4H , 4HSYMM, 4HETRY, 4H / 00012550
0035      DATA NOTE5/4H GP=/ 00012560
0036      DATA NOTETH/4H S, 4HPHER, 4HICAL, 4H , 4H RA, 4HDIAL, 4H , 4H 00012570
1A, 4HXIAL, 4H , 4HPUEL, 4H COO, 4HLANT/ 00012580
00012590
0037      CALL TITLE (2) 00012600
0038      WRITE (6, 300) GRP, DEL, REG, NCOMP 00012610
0039      NG=GEOM1*3+1 00012620
0040      LBOND=1+3*BCL 00012630
0041      RBOND=1+3*BCR 00012640
0042      NPUN=1+PUNFRS 00012650
0043      NBAL=1+PUNBAL 00012660

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C

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0044      WRITE (6,310) NOTE1(NG),NOTE1(NG+1),NOTE1(NG+2),NOTE3(LBOND),
          1NOTE3(LBOND+1),NOTE3(LBOND+2),NOTE3(RBOND),NOTE3(RBOND+1),
          2NOTE3(RBOND+2),NOTE2(NPUN),NOTE2(NBAL)
0045      WRITE (6,320) (WPT(N),N=1,NUM)
0046      WRITE (6,330) THG
0047      WRITE (6,340)
0048      N1=1
0049      DO 110 R=1,REG
0050      WRITE (6,350) R,N1,PB(R)
0051      110 N1=PB(R)
0052      WRITE (6,360)
0053      WRITE (6,370) ( R,LR(R),DR(R) ,R=1,REG)
0054      WRITE (6,290)
0055      IF (DEL) 120,120,130
0056      120 WRITE (6,380)
0057      GO TO 150
0058      130 WRITE (6,390) ( NOTE4,I ,I=1,DEL)
0059      DO 140 G=1,GRP
0060      WRITE (6,400) G,(SD(G,GP),GP=1,DEL)
0061      140 CONTINUE
0062      WRITE (6,290)
0063      150 WRITE (6,410)
0064      WRITE(6,420) (G,NU(G),CHI(G),G=1,GRP)
0065      WRITE (6,290)
          C
          C CROSS SECTIONS BY COMPOSITION ORDER
          C
0066      N=1
0067      160 DO 200 R=1,REG
0068      IF (NCMP(R).NE.N) GO TO 200
0069      WRITE (6,430) N
0070      WRITE(6,440) (G,D(R,G),SIGC(R,G),SIGF(R,G),V(R,G),G=1,GRP)
0071      WRITE (6,290)
0072      WRITE (6,450)
0073      L1=1
0074      L2=GRP
0075      170 L3=GRP
0076      IF (L2.LE.9) GO TO 180
0077      L2=L2-9
0078      L3=L1+8
0079      180 WRITE (6,460) ( NOTE5,G ,G=L1,L3)
0080      DO 190 GP=1,GRP
0081      190 WRITE (6,520) GP,(SIGX(R,GP,G),G=L1,L3)
0082      IF (L3.EQ.GRP) GO TO 210
0083      L1=L3+1
0084      GO TO 170
0085      200 CONTINUE
0086      CALL ERR (3,0,0,0)
0087      210 IF (N.EQ.NCOMP) GO TO 220
0088      N=N+1
0089      GO TO 160
0090      220 CONTINUE
0091      WRITE (6,290)

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0092          WRITE (6,470)                                00013200
0093          WRITE (6,480) ( R,NCMP(R) ,R=1,REG)          00013210
0094          WRITE (6,290)                                00013220
0095          IF (XEN.NE.0) GO TO 230                       00013230
0096          WRITE (6,490)                                00013240
0097          GO TO 240                                     00013250
0098          230 CONTINUE                                  00013260
0099          WRITE (6,500)                                00013270
                C                                         00013280
0100          DO 239 R=1,REG                                00013290
0101          239 WRITE (6,510) R,XENON(R),IODINE(R),GAMAX,GAMAI 00013300
0102          240 CONTINUE                                  00013310
                C                                         00013320
                C THERMAL HYDRAULIC DATA - CORE DIMENSIONS 00013330
                C                                         00013340
0103          IF ((THPEDB.EQ.0).AND.(XEN.GE.0)) GO TO 253 00013350
0104          IHT=3*(NTYPE-1)                               00013360
0105          WRITE(OUT,590) (NOTETH(IHT+R),R=1,3),NPASS,POWER0,TCOOLO,WFLOW0
0106          GO TO (243,242,241),NTYPE                    00013370
0107          241 WRITE(OUT,590) THDIM1                     00013380
0108          GO TO 243                                     00013390
0109          242 WRITE(OUT,630) THDIM1                     00013400
0110          IF (GFOM.EQ.0) WRITE(OUT,610) THDIM2         00013410
0111          243 CONTINUE                                  00013420
0112          IF (THPEDB.EQ.0) GO TO 253                    00013430
                C                                         00013440
                C                                         00013450
                C CROSS SECTION VARIATIONS WITH TEMPERATURE 00013460
                C                                         00013470
                C                                         00013480
0113          N=1                                          00013490
0114          WRITE(OUT,620)                                00013500
0115          244 DO 250 R=1,REG                            00013510
0116          IF (NCMP(R).NE.N) GO TO 250                  00013520
0117          WRITE(OUT,630) N                              00013530
0118          WRITE(OUT,640) (G,TSIGTF(R,G),TSIGCF(R,G),TSIGPF(R,G),G,TSIGFC(R,G)
1,TSIGCC(R,G),TSIGPC(R,G),G=1,GRP) 00013540
0119          DO 249 I=1,2                                  00013550
0120          N1=2*(I-1)                                    00013560
0121          WRITE(OUT,650)                                00013570
0122          WRITE(OUT,450)                                00013580
0123          WRITE(OUT,655) NOTETH(10+N1),NOTETH(11+N1) 00013590
0124          L1=1                                          00013600
0125          L2=GHP                                        00013610
0126          245 L3=GRP                                    00013620
0127          IF (L2.LE.9) GO TO 246                       00013630
0128          L2=L2-9                                       00013640
0129          L3=L1+8                                       00013650
0130          246 WRITE(OUT,460) (NOTE5,G,G=L1,L3)          00013660
0131          DO 248 GP=1,GRP                                00013670
0132          IF (I.EQ.2) GO TO 247                        00013680
0133          WRITE(OUT,520) GP,(TSIGXF(R,GP,G),G=L1,L3) 00013690
0134          GO TO 248                                      00013700
0135          247 WRITE(OUT,520) GP,(TSIGXC(R,GP,G),G=L1,L3) 00013710
0136          248 CONTINUE                                  00013720

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0137          IF(L3.EQ.GRP) GO TO 249                00013730
0138          L1=L3+1                                00013740
0139          GO TO 245                                00013750
0140          249 CONTINUE                             00013760
0141          GO TO 251                                00013770
0142          250 CONTINUE                             00013780
0143          251 IF(N.EQ.NCOMP) GO TO 252            00013790
0144          N=N+1                                    00013800
0145          GO TO 244                                00013810
0146          252 WRITE(OUT,660)                       00013820
0147          DO 2521 R=1,REG                          00013830
0148          2521 WRITE(OUT,670) R,TEMPF(R),HCAPF(R),CLADK(R),HTCOEF(R),ASUBH(R),
1SPHFC(R),HCAPC(R),CFRAC(R),RFACT1(R)            00013840
0149          253 WRITE(OUT,290)                       00013860
0150          N1=1                                      00013870
0151          IF (STEADY.GT.0) N1=2                   00013880
0152          WRITE (6,530) NOTE2(N1)                  00013890
0153          IF (STEADY.EQ.2) GO TO 280               00013900
0154          WRITE (6,540)                             00013910
0155          DO 254 G=1,GRP                           00013920
0156          254 WRITE (6,550) (P,PSI(P,G),P=1,PT)   00013930
0157          IF (STEADY.EQ.0) GO TO 260               00013940
0158          WRITE (6,560)                             00013950
0159          GO TO 280                                 00013960
0160          260 WRITE (6,570)                         00013970
0161          IF(DEL.EQ.0) GO TO 280                   00013980
0162          DO 270 G=GL,GU                            00013990
0163          270 WRITE (6,550) (P,PSI(P,G),P=1,PT)   00014000
0164          280 CONTINUE                             00014010
C                                                    00014020
C                                                    00014030
0165          290 FORMAT (1H0)                         00014040
0166          300 FORMAT (1H0/25X,18H*** INPUT EDIT ***//3X,I2,19H NEUTRON GROUP(S) 00014050
1,,3X,I2,19H DELAYED GROUP(S) ,,3X,I2,12H REGION(S) ,,3X,I2,15H COM 00014060
2POSITION(S)/)                                     00014070
0167          310 FORMAT(2X,3A4,11H GEOMETRY ,,3X,14HLEFT BOUNDARY ,3A4,3X, 15HRIGHT 00014080
1 BOUNDARY ,3A4//2X,45HIS THERE TO BE END OF PROBLEM PUNCHED OUTPUT 00014090
2 ,A4,3X,1H,/43HOARE THE STEADY STATE FLUXES TO BE PUNCHED ,A4,2X) 00014100
0168          320 FORMAT (38H0TEST POINTS FOR FREQUENCY CALCULATION,3X,15I5/(48X,15I 00014110
15))                                               00014120
0169          330 FORMAT (8H0GROUP ,I3,61H IS SPECIFIED AS THE TEST GROUP FOR THE F 00014130
1REQUENCY CALCULATION/)                            00014140
0170          340 FORMAT (1H0/33H REGION MESH POINT BOUNDARIES/26H NUMBER 00014150
1 LEFT RIGHT)                                     00014160
0171          350 FORMAT (4X,I3,8X,I3,4X,I3)           00014170
0172          360 FORMAT (1H0/4X,6HREGION,4X,6HLENGTH,4X,12H MESH SPACING/4X,6HNUMBER 00014180
1,5X,4H(CM),9X,4H(CM))                            00014190
0173          370 FORMAT (5X,I3,4X,P10.4,4X,P8.4)      00014200
0174          380 FORMAT (19H0 NO DELAYED GROUPS)      00014210
0175          390 FORMAT('OFRAC TIONAL YIELD FROM DELAYED GROUP I INTO NEUTRON GROUP
1G TIMES THE DECAY CONSTANT FOR DELAYED GROUP I',/2X,'GROUP',3X,10(
23X,A4,I2,1X))
0176          400 FORMAT (3X,I3,4X,10(2X,P8.5))        00014240

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0177      410  FORMAT(4X,5HGROUP,5X,12HNEUTRONS PPR,6X,7HFISSION/4X,6HNUMBER,4X,
          17HFISSION,11X,5HYIELD)
0178      420  FORMAT(5X,I3,6X,E12.6,6X,E12.6)
0179      430  FORMAT(14H0COMPOSITION ,I2/6X,5HGROUP,4X,9HDIFFUSION,6X,30HGROUP
          1DEPENDENT CROSS SECTIONS,4X,15HAVERAGE NEUTRON/6X,19HNUMBER COEFF
          2ICIENT,6X,9H(CAPTURE),4X,9H(FISSION),11X,14HSPEED (CM/SEC))
0180      440  FORMAT(7X,I3,4X,E12.6,2X,E12.6,2X,E12.6,10X,E12.6)
0181      450  FORMAT (7X,97HSCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS 00014320
          1COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)) 00014330
0182      460  FORMAT (4H (G),1X,9(6X,A4,I2)) 00014340
0183      470  FORMAT (34H0COMPOSITION ASSIGNMENT TO REGIONS/22H REGION COMPOS00014350
          1ITION) 00014360
0184      480  FORMAT (5X,I2,8X,I2) 00014370
0185      490  FORMAT (43H0N KENON BUILDUP CONSIDERD IN THIS PROBLEM) 00014380
0186      500  FORMAT (7H0REGION,7X,14HCONCENTRATIONS,10X,13HFISSION YIELD/7H NUM00014390
          1BER,4X,5HXENON,8X,6HIODINE,7X,5HXENON,8X,6HIODINE) 00014400
0187      510  FORMAT (7X,I2,4X,E10.5,3X,E10.5,3X,E10.5,3X,E10.5)
0188      520  FORMAT (2X,I2,3X,9E12.6) 00014420
0189      530  FORMAT (48H0ARE STEADY STATE CONDITIONS TO BE CALCULATED ? ,A4) 00014430
0190      540  FORMAT (24H0INPUT FLUX DISTRIBUTION) 00014440
0191      550  FORMAT ((2X,6(1H(,I3,2H) ,1PE12.6))) 00014450
0192      560  FORMAT (92H0THE INITIAL PRECURSOR CONCENTRATIONS ARE CALCULATED FRO00014460
          1OM THE STEADY STATE FLUX DISTRIBUTION) 00014470
0193      570  FORMAT (60H0THE INITIAL PRECURSOR CONCENTRATIONS ARE READ IN FROM 00014480
          1CARDS) 00014490
0194      580  FORMAT(///1X'THERMAL HYDRAULIC FEEDBACK DATA'/2X'PROBLEM TYPE:',5X00014500
          13A4,', ',I2,' PASS', 00014510
          2 /2X,'NOMINAL POWER ',E12.6,' WATTS',/2X,'INITIAL COOLANT (INLO0014520
          3ET) TEMPERATURE ',E12.6,/2X,'INITIAL FLOW RATE ',E12.6) 00014530
0195      590  FORMAT(2X,'CORE CROSS SECTIONAL AREA ',E12.6) 00014540
0196      600  FORMAT(2X,'CORE HEIGHT ',E12.6) 00014550
0197      610  FORMAT(2X,'CORE WIDTH ',E12.6) 00014560
0198      620  FORMAT(//2X,'CROSS SECTION VARIATIONS WITH TEMPERATURE (DELTA SIG00014570
          1MA / DELTA TEMP) '/') 00014580
0199      630  FORMAT(/5X,'COMPOSITION ',I2/27X,'FUEL TEMP ',48X,'COOLANT TEMP 00014590
          1',/6X,2('GRP',4X,'TRANSPORT',6X,'CAPTURE',7X,'FISSION',18X)./) 00014600
0200      640  FORMAT(2(6X,I3,2X,E12.5,2X,E12.5,2X,E12.5,10X)) 00014610
0201      650  FORMAT(//7X,'VARIATIONS IN THE ') 00014620
0202      655  FORMAT(7X,'DUE TO CHANGES IN THE',2A4,' TEMPERAFURE') 00014630
0203      660  FORMAT(//2X,'HEAT TRANSPER DATA',//11X,'INITIAL',7X,'FUEL',3X,'CLA00014640
          1D',9X,'FILM',12X'H/T',6X,'COOLANT',6X,'COOLANT',6X,'COOLANT',3X,'C00014650
          2OOLANT FISS.',/1X,'REGION',5X,'PUEL T',3X,'HT. CAPACITY',1X,'CONDU00014660
          3CTIVITY',2X,'COFFPICIENT',7X,'AREA',5X,'SPEC. HT.',2X,'HT. CAPACIT00014670
          4Y',4X,'FRACTION',4X,'POW. FRAC.',/) 00014680
0204      670  FORMAT(1X,I4,3X,9(E12.6,1X)) 00014690
0205      RETURN 00014700
0206      END 00014710

```

Appendix B Sample Problem

The Safety Test Facility proposed by Argonne National Laboratory has been used as the model in the following sample problem. See reference 3 for more information concerning the Safety Test Facility model.

CARD C1
TEST REGION DEPENDENT VELOCITIES

CARD C2 3 3 0 1 10 10 10 1 1 0 -2 0

CARD C3 2 CC.10CCCCD-06C.10000CD-060.10000CD-06 92 1 1 2

CARD C4 29 36 39 41 43 45 56 71 76 92

CARD C5 0.556500D+020.139125D+020.556250D+C10.397500D+010.402860D+010.402860D+01
0.221573D+02C.302145D+02C.100715D+C20.320000D+02

CARD C6 15 33 37 40 42 44 50 64 73 84

CARD C7 0.650000D-02

CARD C8 0.100000D+01

CARD C8 0.0

CARD C8 0.0

CARD C9 0.800000D-01

CARD C10 0.100000D+01C.0 C.0

CARD C11 0.474861D+090.749517D+080.145580D+07

CARD C11 0.474861D+090.749517D+08C.143681D+07

CARD C11 0.474861D+090.749517D+080.123408D+C7

CARD C11 0.474861D+090.749517D+08C.767837D+06

CARD C11 0.474861D+090.749517D+08C.577536D+06

CARD C11 0.474861D+090.749517D+08C.533757D+06

CARD C11 0.474861D+090.749517D+080.487254D+06

CARD C11 0.474861D+090.749517D+08C.454566D+06

CARD C11 0.474861D+090.749517D+080.418868D+06

CARD C11 0.474861D+090.749517D+080.373624D+06

CARD C12 0.200000D-030.160000D-010.500000D-02 C 00.105000D+01

CARD C13 1 2 3 4 5 6 7 8 9 10

CARD C14 CONVERTER 1 0 2 0

CARD C15 0.250000D+010.925127D-030.106724D-020.294377D+000.0 0.164192D-02

CARD C15 0.242000D+010.309539D-020.384160D-020.499702D+000.0 0.119316D-04

CARD C15 0.242000D+010.301101D-010.344753D-010.874939D+000.0 0.0

CARD C17 0.0 0.164192D-020.0

CARD C17 0.0 C.0 0.119316D-04

CARD C17 0.0 0.0 0.0

CARD 17B	0.0	C.0	C.0	C.0	
CARD 17B	0.0	C.0	0.0	0.0	
CARD 17B	0.0	C.0	C.0	C.0	
CARC 17C	0.0	C.0	C.0	0.0	
CARD 17C	0.0	C.0	C.0	0.0	
CARD 17C	0.0	0.0	C.0	0.0	
CARD 17D	0	C			
CARD 14	CONVERTER 2				0 2 0
CARD 15	0.2500000+010.9251270-030.1067240-020.2543770+000.0				0.1641920-02
CARD 15	0.2420000+010.3095390-020.3841600-020.4997020+000.0				0.1193160-04
CARD 15	0.2420000+010.3102630-010.3506500-010.8762200+000.0				0.0
CARD 17	0.0	C.1641920-020.0			
CARD 17	0.0	0.0	0.1193160-04		
CARC 17	0.0	C.0	C.0		
CARD 17B	0.0	0.0	C.0	0.0	
CARD 17B	0.0	C.0	C.0	0.0	
CARD 17B	0.0	C.0	C.0	C.0	
CARC 17C	0.0	C.0	C.0	C.0	
CARD 17C	0.0	C.0	0.0	0.0	
CARD 17C	0.0	0.0	C.0	0.0	
CARD 17D	0	0			
CARD 14	CONVERTER 3				0 2 0
CARD 15	0.2500000+010.9251270-030.1067240-020.2543770+000.0				0.1641920-02
CARD 15	0.2420000+010.3095390-020.3841600-020.4997020+000.0				0.1193160-04
CARD 15	0.2420000+010.4195690-010.4212730-010.8513330+000.0				0.0
CARD 17	0.0	C.1641920-020.0			
CARD 17	0.0	0.0	0.1193160-04		
CARD 17	0.0	C.0	C.0		
CARD 17B	0.0	0.0	0.0	0.0	
CARD 17B	0.0	0.0	0.0	0.0	
CARD 17B	0.0	0.0	0.0	0.0	
CARD 17C	0.0	C.0	0.0	0.0	
CARD 17C	0.0	0.0	0.0	0.0	

CARD 17C	0.0	C.0	C.0	C.0	
CARD 17D	0	0			
CARD 14	CONVERTER 4				0 2 C
CARD 15	0.2500000+010.9251270-030.1067240-020.2543770+000.0				0.1641920-02
CARD 15	0.2420000+010.3095350-020.3E41600-020.4597020+000.0				0.1193160-04
CARD 15	0.2420000+010.8532860-010.7020350-010.9519760+000.0				0.0
CARD 17	0.0	0.1641920-020.0			
CARD 17	0.0	C.0	0.1193160-04		
CARD 17	0.0	0.0	C.0		
CARD 17B	0.0	C.0	C.0	C.0	
CARD 17B	0.0	C.0	0.0	0.0	
CARD 17B	0.0	C.0	C.0	0.0	
CARD 17C	0.0	0.0	C.0	0.0	
CARD 17C	0.0	C.0	0.0	C.0	
CARD 17C	0.0	0.0	0.0	0.0	
CARD 17D	0	C			
CARD 14	DRIVER 1				0 2 0
CARD 15	0.2500000+010.1779200-040.3368230-030.1862400+000.0				0.7393940-02
CARD 15	0.2420000+010.2478110-030.4353800-030.2751290+000.0				0.4084220-02
CARD 15	0.2420000+010.2573380-020.1517790-020.2988440+000.0				0.0
CARD 17	0.0	0.7393940-020.0			
CARD 17	0.0	C.0	0.4084220-02		
CARD 17	0.0	0.0	C.0		
CARD 17B	0.0	C.0	C.0	0.0	
CARD 17B	0.0	0.0	C.0	0.0	
CARD 17B	0.0	0.0	C.0	0.0	
CARD 17C	0.0	0.0	C.0	0.0	
CARD 17C	0.0	0.0	C.0	0.0	
CARD 17C	0.0	0.0	0.0	0.0	
CARD 17D	0	C			
CARD 14	DRIVER 2				0 2 C
CARD 15	0.2500000+010.1779200-040.3368230-030.1862400+000.0				0.7393940-02
CARD 15	0.2420000+010.2478110-030.4353800-030.2751290+000.0				0.4084220-02

CARD 15	0.242CC0C+01C.282CC0D-020.1E2683D-C20.259618D+CC0.0				0.0
CARD 17	0.0	C.739394D-020.0			
CARD 17	0.0	C.0	C.408422D-02		
CARD 17	0.0	C.0	C.0		
CARD 17B	0.0	C.0	0.0	C.0	
CARD 17B	0.0	C.0	C.0	C.0	
CARD 17B	0.0	C.0	0.0	0.0	
CARD 17C	0.0	C.0	C.0	0.0	
CARD 17C	0.0	C.0	C.0	0.0	
CARD 17C	0.0	C.0	C.0	0.0	
CARD 17D	0	C			
CARD 14	DRIVER 3				0 2 0
CARD 15	0.25CC0C0C+010.177920D-040.336823D-030.186240D+0C0.0				0.739394D-02
CARD 15	0.242CC0C+01C.247811D-030.435380D-030.275129D+0C0.0				0.408422D-02
CARD 15	0.242CC0C+010.312795D-020.176250D-020.300549D+CC0.0				0.0
CARD 17	0.0	0.739394D-020.0			
CARD 17	0.0	C.0	0.408422D-02		
CARD 17	0.0	C.0	0.0		
CARD 17B	0.0	C.0	0.0	0.0	
CARD 17B	0.0	C.0	0.0	0.0	
CARD 17B	0.0	C.0	0.0	0.0	
CARD 17C	0.0	0.0	0.0	0.0	
CARD 17C	0.0	0.0	0.0	0.0	
CARD 17C	0.0	C.0	0.0	0.0	
CARD 17D	0	0			
CARD 14	DRIVER 4				0 2 0
CARD 15	0.25CC0C0D+01C.177920D-040.336823D-030.186240D+0C0.0				0.739394D-02
CARD 15	0.242000D+010.247811D-030.435380D-030.275129D+0C0.0				0.408422D-02
CARD 15	0.242000D+010.338039D-020.187297D-020.301244D+0C0.0				0.0
CARD 17	0.0	0.739394D-020.0			
CARD 17	0.0	C.0	0.408422D-02		
CARD 17	0.0	C.0	C.0		
CARD 17B	0.0	0.0	C.0	0.0	

CARD 17B	0.0	C.0	C.0	0.0	
CARD 17B	0.0	C.0	C.0	0.0	
CARD 17C	0.0	C.0	0.0	C.0	
CARD 17C	0.0	C.0	C.0	C.0	
CARD 17C	0.0	C.0	C.0	C.0	
CARD 17D	0	C			
CARD 14	DRIVER 5				0 2 0
CARD 15	0.250CC0D+010.17792CD-04C.336823D-030.186240D+000.0				0.739394D-02
CARD 15	0.242CC0C+010.247811D-030.43538CD-030.275129D+000.0				0.408422D-02
CARD 15	0.2420C0D+010.369971D-020.201148D-020.302004D+000.0				0.0
CARD 17	0.0	C.739394D-02C.0			
CARD 17	0.0	C.0	C.408422D-02		
CARD 17	0.0	0.0	C.0		
CARD 17B	0.0	C.0	C.0	0.0	
CARD 17B	0.0	C.0	0.0	C.0	
CARD 17B	0.0	0.0	0.0	C.0	
CARD 17C	0.0	C.0	0.0	C.0	
CARD 17C	0.0	0.0	C.0	0.0	
CARD 17C	0.0	C.0	C.0	0.0	
CARD 17D	0	C			
CARD 14	REFLECTOR				0 2 0
CARD 15	0.250CC0D+010.0	0.315448D-030.185063D+000.0			0.804568D-02
CARD 15	0.2420C0D+010.0	0.230913D-030.266928D+000.0			0.484746D-02
CARD 15	0.242CC0D+010.0	0.636008D-030.288832D+000.0			0.0
CARD 17	0.0	0.804568D-020.0			
CARD 17	0.0	C.0	0.484746D-02		
CARD 17	0.0	C.0	0.0		
CARD 17B	0.0	C.0	0.0	0.0	
CARD 17B	0.0	0.0	C.0	0.0	
CARD 17B	0.0	0.0	0.0	0.0	
CARD 17C	0.0	0.0	C.0	0.0	
CARD 17C	0.0	0.0	0.0	0.0	
CARD 17C	0.0	0.0	0.0	0.0	

CARD	17D	0	:		
CARD	20B	0.8CCCC0C+02C.333333D+04C.1CCCC0C+C3C.36C000D+030.0			
CARD	2CC	0.4779C0D+02C.10CCCC0D+01C.1C0C00D+01C.240000D+00			
CARD	2CD	0.8CCCC0C+02C.933333D+03C.48CCCC0C-C2C.0		0.3CC000D+00	
CARD	2CC	0.4779C0D+02C.10C0C0D+010.1C0C00D+010.24C000D+0C			
CARD	2CD	0.8CCCC0C+02C.933333D+03C.48C000D-020.0		0.3CC000D+00	
CARD	2CC	0.4779C0D+02C.10CC0C0D+010.1C0C00D+01C.24C000D+0C			
CARD	20D	0.8CCCC0C+02C.933333D+03C.48CC00D-02C.0		0.3C0000D+00	
CARD	2CC	0.4779C0D+02C.10C0C0D+01C.1C0C00D+010.240000D+00			
CARD	20D	0.8CCCC0C+02C.933333D+03C.48CC00D-020.0		0.3C0C00D+00	
CARD	2CC	0.4779C0D+02C.10CCCC0D+01C.1C0C00D+010.240000D+00			
CARD	20D	0.8CCCC0C+C2C.933333D+03C.48C000D-020.0		0.3C0000D+00	
CARD	2CC	0.4779C0D+02C.10C000D+010.1C0C00D+01C.240000D+00			
CARD	20D	0.8CCCC0C+C2C.933333D+030.48CC00D-020.0		0.300C00D+00	
CARD	2CC	0.4779C0D+02C.10CCCC0D+01C.1C0C00D+01C.24C000D+0C			
CARD	2CD	0.8CCCC0D+02C.933333D+030.48C000D-020.0		0.300000D+00	
CARD	2CC	0.4779C0D+02C.10CC0C0D+01C.1C0C00D+010.240000D+00			
CARD	2CD	0.80C0C0C+020.933333D+03C.48C000D-020.0		0.3C0000D+00	
CARD	2CC	0.4779C0D+020.10C0C0D+010.1C0000D+010.24C000D+0C			
CARD	20D	0.8CC0C0D+020.933333D+030.48C000D-020.0		0.3C0000D+00	
CARD	2CC	0.0	C.0	C.0	0.240000D+0C
CARD	20D	0.0	0.0	0.480000D-020.0	0.3C0000D+00

*** INPUT ECIT FOR TIME ZONE 1 ***

CARD 21 0.1CCCCC00-03 1-.2CCCC00D-02 0 -2 5 0 0 0
CARD 22 0.18CCCC00-020.19CCCC00-02
CARD 23 5 C 0 1 0
CARD 27 -.5CCCCC00-04-.5CCCCC00-04-.5CCCCC00-04
CARD 23 6 C 0 1 0
CARD 27 -.5CCCCC00-04-.500000D-04-.500000D-04
CARD 23 7 C 0 1 0
CARD 27 -.5CCCCC00-04-.500000D-04-.500000D-04
CARD 23 8 C 0 1 0
CARD 27 -.5CCCCC00-04-.500000D-04-.500000D-04
CARD 23 9 C 0 1 0
CARD 27 -.5CCCCC00-04-.500000D-04-.500000D-04
CARD 34 0.0 0.0 0.0 0.0

TEST REGION DEPENDENT VELOCITIES

*** INPUT EDIT ***

3 NEUTRON GROUP(S) , 1 DELAYED GROUP(S) , 10 REGION(S) , 10 COMPOSITION(S)
 CYLINDRICAL GEOMETRY , LEFT BOUNDARY SYMMETRY RIGHT BOUNDARY ZERO
 IS THERE TO BE END OF PROBLEM PUNCHED OUTPUT NC ,
 ARE THE STEADY STATE FLUXES TO BE PUNCHED NC
 TEST POINTS FOR FREQUENCY CALCULATION 15 33 37 40 42 44 50 64 73 84
 GROUP 3 IS SPECIFIED AS THE TEST GROUP FOR THE FREQUENCY CALCULATION

REGION NUMBER	MESH POINT BOUNDARIES	
	LEFT	RIGHT
1	1	29
2	29	36
3	36	39
4	39	41
5	41	43
6	43	45
7	45	56
8	56	71
9	71	76
10	76	92

REGION NUMBER	LENGTH (CM)	MESH SPACING (CM)
1	55.6500	1.9875
2	13.9125	1.9875
3	5.9625	1.9875
4	3.9750	1.9875
5	4.0286	2.0143
6	4.0286	2.0143
7	22.1573	2.0143
8	30.2145	2.0143
9	10.0715	2.0143
10	32.0000	2.0000

FRACTIONAL YIELD FROM DELAYED GROUP 1 INTO NEUTRON GROUP 6 TIMES THE DECAY CONSTANT FOR DELAYED GROUP 1

GROUP	$\lambda = 1$
1	0.00000
2	0.0
3	0.0

GROUP NUMBER	NEUTRONS PER FISSION	FISSION YIELD
1	0.2500000+01	0.1000000+01
2	0.2420000+01	0.0
3	0.2420000+01	0.0

COMPOSITION	1	GROUP DEPENDENT CROSS SECTIONS		AVERAGE NEUTRON
GROUP	DIFFUSION	(CAPTURE)	(FISSION)	SPEED (CM/SEC)
NUMBER	Coefficient			
1	0.112233D+C1	0.106724D-02	0.925127D-03	0.474861D+09
2	0.667064D+CC	0.384160D-02	0.309539D-02	0.749517D+08
3	0.380979D+CC	0.344753D-01	0.301101D-01	0.145580D+07

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3

1	0.363429D-020.0	C.0	
2	0.164192D-020.694892D-020.0		
3	C.0	0.119316D-04C.645854E-01	

COMPOSITION	2	GROUP DEPENDENT CROSS SECTIONS		AVERAGE NEUTRON
GROUP	DIFFUSION	(CAPTURE)	(FISSION)	SPEED (CM/SEC)
NUMBER	Coefficient			
1	0.112233D+C1	0.106724D-C2	0.925127D-03	0.474861D+09
2	0.667064D+CC	0.384160D-02	0.309539D-02	0.749517D+08
3	0.380422D+CC	0.350650D-01	0.310263D-01	0.143681D+07

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3

1	0.363429D-020.0	C.0	
2	0.164192D-020.694892D-020.0		
3	C.0	0.119316D-04C.660913E-01	

COMPOSITION	3	GROUP DEPENDENT CROSS SECTIONS		AVERAGE NEUTRON
GROUP	DIFFUSION	(CAPTURE)	(FISSION)	SPEED (CM/SEC)
NUMBER	Coefficient			
1	0.112233D+C1	0.106724D-G2	0.925127D-03	0.474861D+09
2	0.667064D+CC	0.384160D-C2	0.309539D-02	0.749517D+08
3	0.373972D+CC	0.421273D-01	0.419569D-01	0.123408D+07

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3

1	0.363429D-C20.0	C.0	
2	0.164192D-020.694892D-020.0		
3	C.0	0.119316D-04C.840842E-01	

COMPOSITION	4	GROUP DEPENDENT CROSS SECTIONS		AVERAGE NEUTRON
GROUP	DIFFUSION	(CAPTURE)	(FISSION)	SPEED (CM/SEC)
NUMBER	Coefficient			
1	0.112233D+C1	0.106724D-02	0.925127D-03	0.474861D+09
2	0.667064D+CC	0.384160D-02	0.309539D-02	0.749517D+08
3	0.350149D+CC	0.702035D-01	0.853286D-01	0.767837D+06

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3

1	0.363429D-020.0	C.0	
2	0.164192D-020.694892D-020.0		
3	0.0	0.119316D-040.155532E+00	

COMPOSITION	5	GROUP DEPENDENT CROSS SECTIONS		AVERAGE NEUTRON
GROUP	DIFFUSION	(CAPTURE)	(FISSION)	SPEED (CM/SEC)
NUMBER	Coefficient			
1	0.178981D+01	0.336823D-03	0.177920D-04	0.474861D+09
2	0.121155D+01	0.435380D-03	0.247811D-03	0.749517D+08
3	0.111541D+C1	0.151779D-02	0.257338D-02	0.577536D+06

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3
 1 C.774855C-020.0 C.0
 2 C.739394C-020.476741D-020.0
 3 C.0 0.408422D-020.409117C-02

COMPOSITION 6
 GROUP DIFFUSION GROUP DEPENDENT CROSS SECTIONS AVERAGE NEUTRON
 NUMBER COEFFICIENT (CAPTURE) (FISSION) SPEED (CM/SEC)
 1 0.178981D+01 0.336823C-03 0.177920D-04 0.474861D+09
 2 0.121155D+01 0.435380C-03 0.247811D-03 0.749517D+08
 3 0.111253D+01 0.162683C-02 0.282000D-02 0.533757D+06

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3
 1 C.774855C-020.0 C.0
 2 C.739394C-020.476741D-020.0
 3 0.0 0.408422D-020.444683C-02

COMPOSITION 7
 GROUP DIFFUSION GROUP DEPENDENT CROSS SECTIONS AVERAGE NEUTRON
 NUMBER COEFFICIENT (CAPTURE) (FISSION) SPEED (CM/SEC)
 1 0.178981D+01 0.336823C-03 0.177920D-04 0.474861D+09
 2 0.121155D+01 0.435380C-03 0.247811D-03 0.749517D+08
 3 0.110908D+01 0.176250C-02 0.312795D-02 0.487254D+06

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3
 1 C.774855C-020.0 0.0
 2 C.739394C-020.476741D-020.0
 3 C.0 0.408422D-020.489045C-02

COMPOSITION 8
 GROUP DIFFUSION GROUP DEPENDENT CROSS SECTIONS AVERAGE NEUTRON
 NUMBER COEFFICIENT (CAPTURE) (FISSION) SPEED (CM/SEC)
 1 0.178981D+01 0.336823C-03 0.177920D-04 0.474861D+09
 2 0.121155D+01 0.435380C-03 0.247811D-03 0.749517D+08
 3 0.110652D+01 0.187297C-02 0.338039D-02 0.454566D+06

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3
 1 C.774855C-020.0 0.0
 2 C.739394C-020.476741D-020.0
 3 0.0 0.408422D-020.525336C-02

COMPOSITION 9
 GROUP DIFFUSION GROUP DEPENDENT CROSS SECTIONS AVERAGE NEUTRON
 NUMBER COEFFICIENT (CAPTURE) (FISSION) SPEED (CM/SEC)
 1 0.178981D+01 0.336823C-03 0.177920D-04 0.474861D+09
 2 0.121155D+01 0.435380C-03 0.247811D-03 0.749517D+08
 3 0.110374D+01 0.201148C-02 0.369971D-02 0.418868D+06

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G) GP= 1 GP= 2 GP= 3
 1 C.774855C-020.0 0.0
 2 C.739394C-020.476741D-020.0
 3 C.0 0.408422D-020.571119C-02

COMPOSITION 10
 GROUP DIFFUSION GROUP DEPENDENT CROSS SECTIONS AVERAGE NEUTRON
 NUMBER COEFFICIENT (CAPTURE) (FISSION) SPEED (CM/SEC)
 1 0.180119D+01 0.315448C-03 0.0 0.474861D+09
 2 0.124878D+01 0.230913D-03 0.0 0.749517D+08

SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

(G)	GP= 1	GP= 2	GP= 3
1	0.8361130-020.0	0.0	0.0
2	0.8045680-020.5079370-020.0		
3	0.0	0.4847460-020.6360080-03	

COMPOSITION ASSIGNMENT TO REGIONS

REGION	COMPOSITION
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

NO XENON BUILDUP CONSIDERED IN THIS PROBLEM

THERMAL HYDRAULIC FEEDBACK DATA

PROBLEM TYPE: RADIAL, 1 PASS
 NOMINAL POWER 0.1000000+03 WATTS
 INITIAL COOLANT (INLET) TEMPERATURE 0.8000000+02
 INITIAL FLOW RATE 0.3333330+04
 CORE HEIGHT 0.3600000+03

CROSS SECTION VARIATIONS WITH TEMPERATURE (DELTA SIGMA / DELTA TEMP)

COMPOSITION 1

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSION	GRP	TRANSPORT	COOLANT TEMP CAPTURE	FISSION
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)

DUE TO CHANGES IN THE COOLANT TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

COMPOSITION 2

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSICN	GRP	TRANSPORT	CCCLANT TEMP CAPTURE	FISSICN
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)
DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)
DUE TO CHANGES IN THE CCCLANT TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

COMPOSITION 3

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSICN	GRP	TRANSPORT	CCCLANT TEMP CAPTURE	FISSICN
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)
DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)
DUE TO CHANGES IN THE CCCLANT TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

COMPOSITION 4

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSICN	GRP	TRANSPORT	CCCLANT TEMP CAPTURE	FISSICN
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS)
DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3

1	C.O	C.O	C.O
2	C.O	C.O	C.O
3	C.O	C.O	C.O

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE COOLANT TEMPERATURE

(G)		GP= 1	GP= 2	GP= 3
1	C.O	0.0	C.O	C.O
2	C.O	0.0	C.O	C.O
3	C.O	0.0	C.O	C.O

COMPOSITION 5

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSION	GRP	TRANSPORT	COOLANT TEMP CAPTURE	FISSION
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)		GP= 1	GP= 2	GP= 3
1	C.O	0.0	C.O	C.O
2	C.O	0.0	C.O	C.O
3	C.O	0.0	C.O	C.O

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE COOLANT TEMPERATURE

(G)		GP= 1	GP= 2	GP= 3
1	C.O	0.0	C.O	C.O
2	C.O	0.0	C.O	C.O
3	C.O	0.0	C.O	C.O

COMPOSITION 6

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSION	GRP	TRANSPORT	COOLANT TEMP CAPTURE	FISSION
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)		GP= 1	GP= 2	GP= 3
1	C.O	0.0	C.O	C.O
2	C.O	0.0	C.O	C.O
3	C.O	0.0	C.O	C.O

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE COOLANT TEMPERATURE

(G)		GP= 1	GP= 2	GP= 3
1	C.O	0.0	C.O	C.O
2	C.O	0.0	C.O	C.O
3	C.O	0.0	C.O	C.O

COMPOSITION 7

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSION	GRP	TRANSPORT	COOLANT TEMP CAPTURE	FISSION
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE COOLANT TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

COMPOSITION 8

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSION	GRP	TRANSPORT	COOLANT TEMP CAPTURE	FISSION
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE COOLANT TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0

COMPOSITION 9

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSION	GRP	TRANSPORT	COOLANT TEMP CAPTURE	FISSION
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TOTAL REMOVAL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE FUEL TEMPERATURE

(G)	GP= 1	GP= 2	GP= 3
1	0.0	0.0	0.0
2	0.0	0.0	0.0

3 C.0 0.0 0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TCTAL REMCVL IS COMPUTED AND STORED AS THE DIAGCNAL ELEMENTS) DUE TO CHANGES IN THE CCCLANT TEMPERATLRE

(G)	GP= 1	GP= 2	GP= 3
1	C.0	0.0	C.0
2	C.0	0.0	C.0
3	C.0	0.0	0.0

CCMPOSITION 10

GRP	TRANSPORT	FUEL TEMP CAPTURE	FISSION	GRP	TRANSPGRT	CCCLANT TEMP CAPTURE	FISSION
1	0.0	0.0	0.0	1	0.0	0.0	0.0
2	0.0	0.0	0.0	2	0.0	0.0	0.0
3	0.0	0.0	0.0	3	0.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TCTAL REMCVL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE FUEL TEMPERATLRE

(G)	GP= 1	GP= 2	GP= 3
1	C.0	0.0	C.0
2	C.0	0.0	0.0
3	C.0	0.0	0.0

VARIATIONS IN THE SCATTERING MATRIX GP INTO G (THE TCTAL REMCVL IS COMPUTED AND STORED AS THE DIAGONAL ELEMENTS) DUE TO CHANGES IN THE CCCLANT TEMPERATLRE

(G)	GP= 1	GP= 2	GP= 3
1	C.0	0.0	0.0
2	C.0	0.0	C.0
3	C.0	0.0	C.0

HEAT TRANSFER DATA

REGION	INITIAL FUEL T	FUEL HT. CAPACITY	CLAD CONDUCTIVITY	FILM CCEFFICIENT	H/T AREA	CCOLANT SPEC. HT.	CCCLANT HT. CAPACITY	CCCLANT FRACTION	CCCLANT FISS. PCN. FRAC.
1	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
2	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
3	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
4	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
5	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
6	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
7	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
8	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
9	0.800000C+02	0.523333D+03	0.100000D+01	0.100000D+01	0.477900D+02	0.240000D+00	0.480000D-02	0.300000D+00	C.0
10	C.0	0.0	0.0	C.0	0.0	0.240000D+00	0.480000D-02	0.300000D+00	0.0

ARE STEADY STATE CONDITCNs TO BE CALCULATED ? YES

ARE THERE ANY TIME DEPENDENT CHANGES IN THE CROSS SECTION DATA YES

TIME ZONE	CROSS SECTION	GROUP	REGION	TOTAL LINEAR CHANGE	TOTAL QUADRATIC CHANGE
1	CAPTURE	1	5	-.500000-04	0.0
1	CAPTURE	2	5	-.500000-04	0.0
1	CAPTURE	3	5	-.500000-04	0.0

1	CAPTURE	1	6	-.500000-04	0.0
1	CAPTURE	2	6	-.500000-04	0.0
1	CAPTURE	3	6	-.500000-04	0.0
1	CAPTURE	1	7	-.500000-04	0.0
1	CAPTURE	2	7	-.500000-04	0.0
1	CAPTURE	3	7	-.500000-04	0.0
1	CAPTURE	1	8	-.500000-04	0.0
1	CAPTURE	2	8	-.500000-04	0.0
1	CAPTURE	3	8	-.500000-04	0.0
1	CAPTURE	1	9	-.500000-04	0.0
1	CAPTURE	2	9	-.500000-04	0.0
1	CAPTURE	3	9	-.500000-04	0.0

THEMAL HYDRAULIC TIME DEPENDENT CHANGES (TIME ZONE 1)

TOTAL LINEAR	FLCW RATE	INLET TEMPERATURE
TOTAL QUADRATIC	0.C	0.3
	0.C	0.G

ARE THERE ANY TIME DEPENDENT SOURCES ? NC

EQUILIBRIUM NU(G) (1) 0.2277015C+C1(2) 0.2204154D+C1(3) 0.2204154D+01(

EQUILIBRIUM FLUXES

110C.1449326D+C9(	210C.1449226D+09(	310C.1448924D+C9(	410C.1448419D+09(	510C.1447713D+C9(	610C.1446803D+C9(
710C.1445699D+09(	810C.1444369D+09(	910C.1442841D+09(	1010C.1441104D+09(	1110C.1439153D+C9(	1210C.1436985D+C9(
1310C.1434595D+C9(	1410C.1431980D+09(	1510C.1429129D+C9(	1610C.1426035D+09(	1710C.1422688D+C9(	1810C.1419074D+C9(
1910C.1415176D+C9(	2010C.1410975D+09(	2110C.1406446D+C9(	2210C.1401559D+09(	2310C.1396276D+C9(	2410C.1390552D+C9(
2510C.1384331D+C9(	2610C.1377543D+09(	2710C.1370105D+C9(	2810C.1361912D+09(	2910C.1352836D+C9(	3010C.1342721D+C9(
3110C.1331372D+C9(	3210C.1318552D+09(	3310C.1303963D+C9(	3410C.1287239D+09(	3510C.1267914D+C9(	3610C.1245390D+C9(
3710C.1218827D+C9(	3810C.1186927D+C9(	3910C.1147589D+09(	4010C.1094431D+09(	4110C.1005159D+C9(	4210C.9228366D+C8(
4310C.8548092D+C8(	4410C.7985813D+08(	4510C.7516593D+08(	4610C.7131449D+08(	4710C.6803387D+08(	4810C.6524217D+08(
4910C.6284366D+C8(	5010C.6075959D+08(	5110C.5892547D+08(	5210C.5728810D+08(	5310C.5580718D+C8(	5410C.5444677D+C8(
5510C.5318069D+C8(	5610C.5198861D+08(	5710C.5082386D+08(	5810C.4954484D+08(	5910C.4844360D+08(	6010C.4721375D+08(
6110C.4595014D+C8(	6210C.4464846D+08(	6310C.4330512D+08(	6410C.4191667D+08(	6510C.4047985D+C8(	6610C.3899118D+C8(
6710C.3744677D+C8(	6810C.3584202D+08(	6910C.3417141D+C8(	7010C.3242808D+08(	7110C.3060363D+C8(	7210C.2865939D+C8(
7310C.2655542D+C8(	7410C.2427513D+08(	7510C.2179624D+08(	7610C.1909001D+08(	7710C.1648494D+C8(	7810C.1421802D+08(
7910C.1224265D+C8(	8010C.1051832D+08(	8110C.9003274D+C7(	8210C.7686173D+07(	8310C.6520680D+C7(	8410C.5485657D+C7(
8510C.4572303D+07(	8610C.3750202D+07(	8710C.3006542D+C7(	8810C.2327785D+07(	8910C.1699365D+C7(	9010C.1109422D+C7(
9110C.5465552D+C6(	9210C.0				
110C.3408497D+C8(	210C.3408332D+08(	310C.3407840D+08(	410C.3407026D+08(	510C.3405903D+08(	610C.3404488D+C8(
710C.3402803D+08(	810C.3400879D+08(	910C.3398753D+08(	1010C.3396472D+08(	1110C.3394950D+08(	1210C.3391694D+08(
1310C.3389357D+C8(	1410C.3387192D+08(	1510C.3385333D+08(	1610C.3383940D+08(	1710C.3383213D+C8(	1810C.3383393D+C8(
1910C.3384775D+C8(	2010C.3387722D+08(	2110C.3392675D+08(	2210C.3400176D+08(	2310C.3410885D+C8(	2410C.3425612D+C8(
2510C.3445350D+C8(	2610C.3471312D+08(	2710C.3504985D+08(	2810C.3548194D+08(	2910C.3603172D+C8(	3010C.3672661D+C8(
3110C.3760021D+C8(	3210C.3869376D+08(	3310C.4005788D+08(	3410C.4175469D+08(	3510C.4386050D+C8(	3610C.4646902D+C8(
3710C.4969547D+C8(	3810C.5368162D+08(	3910C.5860234D+08(	4010C.6467408D+08(	4110C.7216908D+C8(	4210C.7612941D+C8(
4310C.7893647D+C8(	4410C.8083047D+08(	4510C.8200147D+08(	4610C.8259926D+08(	4710C.8274160D+08(	4810C.8252114D+C8(
4910C.8201065D+C8(	5010C.8126656D+08(	5110C.8033274D+08(	5210C.7924285D+08(	5310C.7802244D+08(	5410C.7669063D+C8(
5510C.7526135D+C8(	5610C.7374438D+08(	5710C.7214660D+08(	5810C.7047062D+08(	5910C.6872133D+C8(	6010C.6690073D+C8(
6110C.6501088D+C8(	6210C.6305352D+08(	6310C.6103020D+08(	6410C.5894239D+08(	6510C.5679164D+08(	6610C.5457962D+08(
6710C.5230829D+C8(	6810C.4997998D+08(	6910C.4759750D+08(	7010C.4516460D+08(	7110C.4268563D+08(	7210C.4016634D+08(
7310C.3761465D+C8(	7410C.3504181D+08(	7510C.3246288D+08(	7610C.2989754D+08(	7710C.2745870D+08(	7810C.2507342D+08(
7910C.2276010D+C8(	8010C.2053061D+08(	8110C.1839167D+C8(	8210C.1634586D+08(	8310C.1439255D+C8(	8410C.1252859D+C8(
8510C.1074889D+C8(	8610C.9046941D+07(	8710C.7415114D+07(	8810C.5845030D+07(	8910C.4327778D+07(	9010C.2854123D+C7(
9110C.1414670D+07(	9210C.0				
110C.6295140D+C4(	210C.6294845D+04(	310C.6293961D+04(	410C.6292504D+04(	510C.6290496D+04(	610C.6287971D+C4(
710C.6284974D+C4(	810C.6281565D+04(	910C.6277818D+04(	1010C.6273828D+04(	1110C.6269709D+C4(	1210C.6265605D+04(
1310C.6261692D+C4(	1410C.6258184D+04(	1510C.6255348D+04(	1610C.6253505D+04(	1710C.6253054D+04(	1810C.6254485D+04(
1910C.6258409D+C4(	2010C.6265592D+04(	2110C.6277016D+04(	2210C.6293985D+04(	2310C.6318309D+04(	2410C.6352678D+C4(
2510C.6401413D+C4(	2610C.6472052D+04(	2710C.6578723D+04(	2810C.6749410D+04(	2910C.7041719D+04(	3010C.7632529D+C4(
3110C.8879429D+04(	3210C.1149717D+05(	3310C.1707889D+05(	3410C.2914267D+05(	3510C.5545157D+05(	3610C.1131457D+C6(
3710C.2529588D+C6(	3810C.6043536D+06(	3910C.1469307D+07(	4010C.4325296D+07(	4110C.1459354D+C8(	4210C.2135121D+08(
4310C.2714057D+C8(	4410C.3206247D+C8(	4510C.3619378D+C8(	4610C.3964369D+C8(	4710C.4249782D+C8(	4810C.4481909D+C8(
4910C.4666439D+C8(	5010C.4808479D+C8(	5110C.4912585D+C8(	5210C.4982790D+C8(	5310C.5022652D+C8(	5410C.5035286D+C8(
5510C.5023411D+C8(	5610C.4989388D+C8(	5710C.4938434D+C8(	5810C.4875588D+C8(	5910C.4802329D+C8(	6010C.4720014D+C8(

61)C.4629505D+C8I	62)C.4533191D+C8I	63)C.4431017D+C8I	64)C.4324495D+C8I	65)C.4214736D+C8I	66)C.4102859D+C8I
67)C.3990021D+C8I	68)C.3877427D+C8I	69)C.3766356D+C8I	70)C.3658180D+C8I	71)C.3554380D+C8I	72)C.3459337D+C8I
73)C.3377909D+C8I	74)C.3311795D+C8I	75)C.3263469D+C8I	76)C.3235448D+C8I	77)C.3198547D+C8I	78)C.3123300D+C8I
79)C.3014011D+C8I	80)C.2874719D+C8I	81)C.2709200D+C8I	82)C.2520963D+C8I	83)C.2313265D+C8I	84)C.2089118D+C8I
85)C.1851309D+C8I	86)C.1602419D+C8I	87)C.1344841D+C8I	88)C.1080801D+C8I	89)C.8123843D+C7I	90)C.5415506D+C7I
91)C.2701616D+C7I	92)C.0				
1)C.4373486D+C5I	2)C.4373222D+C5I	3)C.4372431D+C5I	4)C.4371116D+C5I	5)C.4369283D+C5I	6)C.4366940D+C5I
7)C.4364098D+C5I	8)C.4360770D+C5I	9)C.4356975D+C5I	10)C.4352734D+C5I	11)C.4348075D+C5I	12)C.4343032D+C5I
13)C.4337645D+C5I	14)C.4331965D+C5I	15)C.4326054D+C5I	16)C.4319986D+C5I	17)C.4313854D+C5I	18)C.4307768D+C5I
19)C.4301865D+C5I	20)C.4296312D+C5I	21)C.4291313D+C5I	22)C.4287115D+C5I	23)C.4284023D+C5I	24)C.4282409D+C5I
25)C.4282728D+C5I	26)C.4285541D+C5I	27)C.4291534D+C5I	28)C.4301556D+C5I	29)C.4316715D+C5I	30)C.4338305D+C5I
31)C.4368095D+C5I	32)C.4408137D+C5I	33)C.4461889D+C5I	34)C.4534030D+C5I	35)C.4632306D+C5I	36)C.4781568D+C5I
37)C.5031011D+C5I	38)C.5461420D+C5I	39)C.6891176D+C5I	40)C.1206797D+C6I	41)C.1434979D+C6I	42)C.1352230D+C6I
43)C.1689554D+C5I	44)C.2004252D+C5I	45)C.2316936D+C5I	46)C.2610797D+C5I	47)C.2770230D+C5I	48)C.2898365D+C5I
49)C.2598679D+C5I	50)C.3074259D+C5I	51)C.3127828D+C5I	52)C.3161780D+C5I	53)C.3178206D+C5I	54)C.3178925D+C5I
55)C.3165513D+C5I	56)C.3252629D+C5I	57)C.3326570D+C5I	58)C.3280701D+C5I	59)C.3228192D+C5I	60)C.3169875D+C5I
61)C.3106521D+C5I	62)C.3038857D+C5I	63)C.2967580D+C5I	64)C.2893371D+C5I	65)C.2816906D+C5I	66)C.2738871D+C5I
67)C.2659971D+C5I	68)C.2580947D+C5I	69)C.2502584D+C5I	70)C.2425724D+C5I	71)C.2453280D+C5I	72)C.2479731D+C5I
73)C.2413716D+C5I	74)C.2357802D+C5I	75)C.2313527D+C5I	76)C.1141563D+C5I	77)C.C	(78)C.C
79)C.C	(80)C.C	(81)C.C	(82)C.C	(83)C.C	(84)C.C
85)C.C	(86)C.C	(87)C.C	(88)C.C	(89)C.C	(90)C.C
91)C.C	(92)C.C				

REGION	FRACTIONAL PCWER	POWER (WATTS)	FUEL TEMP	COOLANT TEMP
1	0.1667056D+C0	0.1667056D+C0	0.8044462D+02	0.8038043D+C2
2	0.9751056D-C1	0.9751059D+01	0.8046234D+02	0.8039560D+C2
3	0.5802641D-C1	0.5802641D+C1	0.8055403D+02	0.8047405D+C2
4	0.1161199D+C0	0.1161198D+02	0.8155645D+02	0.8133177D+C2
5	0.1114576D-C1	0.1114576D+01	0.8014017D+02	0.8011994D+C2
6	0.1740013D-C1	0.1740013D+01	0.8020852D+02	0.8017842D+C2
7	0.1672132D+C0	0.1672132D+02	0.8031598D+02	0.8027036D+C2
8	0.2769477D+C0	0.2769477D+02	0.8030327D+02	0.8025949D+C2
9	0.8893081D-C1	0.8893081D+01	0.8025155D+02	0.8021524D+C2
10	0.0	0.0	0.0	0.8000000D+C2
TOTAL PCWER = 0.1000000D+C3				

TEST REGION DEPENDENT VELOCITIES

TIME ZONE= 1 STEP NUMBER= 18 TIME=C.18C00D-C2 TIME STEP=0.815080D-04

TEST PCINT	MESH PCINT	FREQUENCY	EXP(M*H)
1	15	6.4810C+01	1.001357D+00
2	33	6.2618C+C1	1.001311C+00
3	37	6.0598C+C1	1.001277D+C0
4	40	6.1340C+01	1.001284D+00
5	42	6.1480C+01	1.001287D+00
6	44	6.1096C+01	1.001279D+00
7	50	5.9612C+C1	1.001248C+00
8	64	5.5072C+C1	1.001153D+00
9	73	4.9470C+01	1.001036D+00
10	84	4.1926C+01	1.000878D+00

PCINT-WISE FLUXES FOR GROUP 1

(1)	1.535289C+C8	(2)	1.536185D+08	(3)	1.535872D+08	(4)	1.535351D+08	(5)	1.534620C+08	(6)	1.533679C+08
(7)	1.532527C+C8	(8)	1.531162D+08	(9)	1.529592D+08	(10)	1.527784D+08	(11)	1.525765D+C8	(12)	1.523521C+08
(13)	1.521048C+C8	(14)	1.518339D+08	(15)	1.515386C+08	(16)	1.512180D+08	(17)	1.508709D+08	(18)	1.504561D+C8
(19)	1.500915C+C8	(20)	1.496553D+08	(21)	1.491846D+08	(22)	1.486763D+08	(23)	1.481264D+08	(24)	1.475295C+C8
(25)	1.468809C+C8	(26)	1.461721D+08	(27)	1.453942D+08	(28)	1.445362D+08	(29)	1.435844D+08	(30)	1.425218C+C8
(31)	1.413276C+C8	(32)	1.399762D+C8	(33)	1.384364D+08	(34)	1.366691D+08	(35)	1.346250D+08	(36)	1.322403C+C8
(37)	1.294252C+C8	(38)	1.260416D+08	(39)	1.218661D+08	(40)	1.162232D+08	(41)	1.067562C+08	(42)	9.803158C+C7
(43)	9.081637C+C7	(44)	8.484729D+C7	(45)	7.999707D+C7	(46)	7.576325D+C7	(47)	7.226858D+C7	(48)	6.929072C+C7
(49)	6.672863C+C7	(50)	6.445915D+07	(51)	6.253418C+07	(52)	6.077827D+07	(53)	5.918662D+07	(54)	5.772343D+C7
(55)	5.636051C+C7	(56)	5.507615D+07	(57)	5.382126C+C7	(58)	5.255207D+07	(59)	5.126017C+07	(60)	4.993883C+C7
(61)	4.858262C+C7	(62)	4.718702D+C7	(63)	4.574819D+C7	(64)	4.426260D+07	(65)	4.272686D+07	(66)	4.113736C+C7
(67)	3.947012C+C7	(68)	3.778043D+07	(69)	3.600261D+07	(70)	3.414970D+07	(71)	3.221309D+07	(72)	3.015265C+C7
(73)	2.792717C+C7	(74)	2.551559D+07	(75)	2.290716D+07	(76)	2.006040D+07	(77)	1.732274D+07	(78)	1.494047C+C7
(79)	1.286462C+07	(80)	1.105259D+C7	(81)	9.467330D+06	(82)	8.076481D+06	(83)	6.851764D+06	(84)	5.768360C+C6
(85)	4.804410C+C6	(86)	3.940560D+C6	(87)	3.159562D+06	(88)	2.445927D+06	(89)	1.785609D+06	(90)	1.165724D+06
(91)	5.742916C+C5	(92)	0.0	(93)		(94)		(95)		(96)	

TOTAL INTEGRATED FLUX FOR REGION 1	GROUP 1	= 0.331956D+15
TOTAL INTEGRATED FLUX FOR REGION 2	GROUP 1	= 0.173421D+15
TOTAL INTEGRATED FLUX FOR REGION 3	GROUP 1	= 0.790184D+14
TOTAL INTEGRATED FLUX FOR REGION 4	GROUP 1	= 0.507953D+14
TOTAL INTEGRATED FLUX FOR REGION 5	GROUP 1	= 0.462237D+14
TOTAL INTEGRATED FLUX FOR REGION 6	GROUP 1	= 0.419666D+14
TOTAL INTEGRATED FLUX FOR REGION 7	GROUP 1	= 0.202309D+15
TOTAL INTEGRATED FLUX FOR REGION 8	GROUP 1	= 0.239363D+15
TOTAL INTEGRATED FLUX FOR REGION 9	GROUP 1	= 0.555565D+14
TOTAL INTEGRATED FLUX FOR REGION 10	GROUP 1	= 0.523217D+14

PCINT-WISE FLUXES FOR GROUP 2

(1)	3.613128C+C7	(2)	3.612960D+C7	(3)	3.612459D+07	(4)	3.611630D+07	(5)	3.610488D+07	(6)	3.609051D+C7
(7)	3.607342C+07	(8)	3.605394D+07	(9)	3.603246D+07	(10)	3.600950D+07	(11)	3.598568D+07	(12)	3.596177D+C7
(13)	3.593871C+C7	(14)	3.591767D+07	(15)	3.590005D+07	(16)	3.588761D+07	(17)	3.588244D+07	(18)	3.588715C+07
(19)	3.590489C+C7	(20)	3.593953D+C7	(21)	3.599581D+07	(22)	3.607952D+07	(23)	3.619772D+07	(24)	3.635908C+C7
(25)	3.657423C+C7	(26)	3.685614D+C7	(27)	3.722073D+07	(28)	3.768751D+07	(29)	3.828037D+07	(30)	3.902861D+C7
(31)	3.996816C+C7	(32)	4.114314D+C7	(33)	4.260775D+07	(34)	4.442860D+07	(35)	4.668742D+07	(36)	4.948453D+C7

(43) 8.4276330+C7(44) 8.6312750+C7(45) 9.7574890+C7(46) 8.8222180+C7(47) 8.8380150+C7(48) 8.8147710+C7
 (49) 8.7602470+C7(50) 8.6805010+C7(51) 8.5822370+C7(52) 8.4630730+C7(53) 8.3317680+C7(54) 8.1883920+C7
 (55) 8.0344660+C7(56) 7.8710620+C7(57) 7.6988990+C7(58) 7.5184300+C7(59) 7.3300590+C7(60) 7.1340730+C7
 (61) 6.9307150+C7(62) 6.7201880+C7(63) 6.5026790+C7(64) 6.2783630+C7(65) 6.0474190+C7(66) 5.8100420+C7
 (67) 5.5664540+C7(68) 5.3169140+C7(69) 5.0617400+C7(70) 4.8013200+C7(71) 4.5361400+C7(72) 4.2668110+C7
 (73) 3.9941710+C7(74) 3.7194040+C7(75) 3.4440900+C7(76) 3.1702850+C7(77) 2.9102260+C7(78) 2.6562630+C7
 (79) 2.4102690+C7(80) 2.1734380+C7(81) 1.9464260+C7(82) 1.7294650+C7(83) 1.5224500+C7(84) 1.3250170+C7
 (85) 1.1366040+C7(86) 9.5649870+C6(87) 7.8387760+C6(88) 6.1783850+C6(89) 4.5742590+C6(90) 3.0165150+C6
 (91) 1.4951140+C6(92) 0.0

TCTAL INTEGRATED FLUX FCR REGION 1 GRUP 2 = 0.8101230+14
 TCTAL INTEGRATED FLUX FCR REGION 2 GRUP 2 = 0.5347180+14
 TCTAL INTEGRATED FLUX FCR REGION 3 GRUP 2 = 0.3438480+14
 TCTAL INTEGRATED FLUX FCR REGION 4 GRUP 2 = 0.3060160+14
 TCTAL INTEGRATED FLUX FCR REGION 5 GRUP 2 = 0.3805730+14
 TCTAL INTEGRATED FLUX FCR REGION 6 GRUP 2 = 0.4249040+14
 TCTAL INTEGRATED FLUX FCR REGION 7 GRUP 2 = 0.2676320+15
 TCTAL INTEGRATED FLUX FCR REGION 8 GRUP 2 = 0.3398350+15
 TCTAL INTEGRATED FLUX FCR REGION 9 GRUP 2 = 0.8078700+14
 TCTAL INTEGRATED FLUX FCR REGION 10 GRUP 2 = 0.1044530+15

PCINT-WISE FLUXES FOR GROUP 3

(1) 6.6678640+C3(2) 6.6675630+C3(3) 6.6666660+C3(4) 6.6651860+C3(5) 6.6631490+C3(6) 6.6605910+C3
 (7) 6.6575590+C3(8) 6.6541180+C3(9) 6.6503470+C3(10) 6.6463460+C3(11) 6.6422390+C3(12) 6.6381780+C3
 (13) 6.6343530+C3(14) 6.6309930+C3(15) 6.6283790+C3(16) 6.6268590+C3(17) 6.6268570+C3(18) 6.6288970+C3
 (19) 6.6336320+C3(20) 6.6418790+C3(21) 6.6546970+C3(22) 6.6734450+C3(23) 6.7000790+C3(24) 6.7374450+C3
 (25) 6.7901220+C3(26) 6.8660770+C3(27) 6.9802180+C3(28) 7.1620460+C3(29) 7.4722440+C3(30) 8.0975550+C3
 (31) 9.4153730+C3(32) 1.2179730+C4(33) 1.8071780+C4(34) 3.0804880+C4(35) 5.8574880+C4(36) 1.1948200+C5
 (37) 2.6711600+C5(38) 6.3826070+C5(39) 1.5520600+C6(40) 4.5701470+C6(41) 1.5424340+C7(42) 2.2565890+C7
 (43) 2.8677830+C7(44) 3.3868050+C7(45) 3.8219040+C7(46) 4.1847540+C7(47) 4.4845390+C7(48) 4.7279500+C7
 (49) 4.9210310+C7(50) 5.0692020+C7(51) 5.1772940+C7(52) 5.2495790+C7(53) 5.2898220+C7(54) 5.3013160+C7
 (55) 5.2869310+C7(56) 5.2491510+C7(57) 5.1535470+C7(58) 5.1254990+C7(59) 5.0465480+C7(60) 4.9581110+C7
 (61) 4.8615010+C7(62) 4.7579580+C7(63) 4.6486700+C7(64) 4.5347960+C7(65) 4.4174840+C7(66) 4.2978970+C7
 (67) 4.1772310+C7(68) 4.0567330+C7(69) 3.9377250+C7(70) 3.8216210+C7(71) 3.7095920+C7(72) 3.6072960+C7
 (73) 3.5187590+C7(74) 3.4462900+C7(75) 3.3521900+C7(76) 3.3591320+C7(77) 3.3172720+C7(78) 3.2361260+C7
 (79) 3.1201960+C7(80) 2.9736840+C7(81) 2.8005080+C7(82) 2.6042950+C7(83) 2.3883980+C7(84) 2.1559080+C7
 (85) 1.9096740+C7(86) 1.6523270+C7(87) 1.3862950+C7(88) 1.1138350+C7(89) 8.3705010+C6(90) 5.5791550+C6
 (91) 2.7830230+C6(92) 0.0

TCTAL INTEGRATED FLUX FCR REGION 1 GRUP 3 = 0.1505800+11
 TCTAL INTEGRATED FLUX FCR REGION 2 GRUP 3 = 0.3763940+11
 TCTAL INTEGRATED FLUX FCR REGION 3 GRUP 3 = 0.3642500+12
 TCTAL INTEGRATED FLUX FCR REGION 4 GRUP 3 = 0.2892460+13
 TCTAL INTEGRATED FLUX FCR REGION 5 GRUP 3 = 0.1050420+14
 TCTAL INTEGRATED FLUX FCR REGION 6 GRUP 3 = 0.1661910+14
 TCTAL INTEGRATED FLUX FCR REGION 7 GRUP 3 = 0.1557940+15
 TCTAL INTEGRATED FLUX FCR REGION 8 GRUP 3 = 0.2454550+15
 TCTAL INTEGRATED FLUX FCR REGION 9 GRUP 3 = 0.7343600+14

TOTAL INTEGRATED FLUX FOR REGION 10 GROUP 3 = 0.148648D+15

REGION	NORMALIZED POWER	AVG. FUEL TEMP	AVG. COOLANT TEMP
1	0.1060956C+01	0.8044462D+02	0.8036865C+02
2	0.1062624C+01	0.8046234C+02	0.8039759C+02
3	0.1063481C+01	0.8055403C+02	0.8048767C+02
4	0.1059831C+01	0.8155645C+02	0.8134552C+02
5	0.1059603C+01	0.8014017D+02	0.8013349C+02
6	0.1058430C+01	0.8020852D+02	0.8018035C+02
7	0.1055586C+01	0.8031598D+02	0.8025933C+02
8	0.1050186C+01	0.8030327D+02	0.8027307C+02
9	0.1042544C+01	0.8025155D+02	0.8021444C+02
10	0.0	0.0	0.8000000C+02

TOTAL NORMALIZED POWER = 0.1055541D+01

TEST REGION DEPENDENT VELOCITIES

TIME ZONE= 1 STEP NUMBER= 20 TIME=C.19C0C0D-02 TIME STEP=0.665879D-04

TEST PCINT	MESH PCINT	FREQUENCY	EXP(W*H)
1	15	7.7451C+01	1.002591D+00
2	33	6.9916C+C1	1.002339D+00
3	37	6.5955C+C1	1.002206D+00
4	40	6.65C8C+01	1.002225D+00
5	42	6.6812C+C1	1.002235D+00
6	44	6.6213C+01	1.002215D+00
7	50	6.4247C+01	1.002149D+00
8	64	5.9251C+01	1.001982D+00
9	73	5.3387C+01	1.001785D+00
10	84	4.5513C+01	1.001522D+00

PCINT-WISE FLUXES FOR GRUP 1

(1)	1.548427C+C8	(2)	1.549322D+08	(3)	1.548006D+08	(4)	1.547479D+08	(5)	1.54674CD+08	(6)	1.545785C+0E
(7)	1.544624C+C8	(8)	1.543243D+08	(9)	1.541645D+08	(10)	1.539827D+08	(11)	1.53786D+08	(12)	1.535517C+0E
(13)	1.533016C+C8	(14)	1.530275D+C8	(15)	1.527290D+08	(16)	1.524048D+08	(17)	1.520539C+08	(18)	1.516748C+0E
(19)	1.512657C+C8	(20)	1.508246D+08	(21)	1.503487C+08	(22)	1.498347D+08	(23)	1.492787C+C8	(24)	1.486756C+0E
(25)	1.480195C+C8	(26)	1.473029D+08	(27)	1.465165D+08	(28)	1.456490D+08	(29)	1.446865D+08	(30)	1.436116C+0E
(31)	1.424029C+C8	(32)	1.410349D+C8	(33)	1.394765D+08	(34)	1.376895D+08	(35)	1.356247C+08	(36)	1.332178C+0E
(37)	1.303781C+C8	(38)	1.269659D+C8	(39)	1.227563C+08	(40)	1.170688D+08	(41)	1.075307D+08	(42)	9.874199C+C7
(43)	9.147310C+C7	(44)	8.545906D+C7	(45)	8.047109C+C7	(46)	7.630530C+C7	(47)	7.278327C+C7	(48)	6.978176C+C7
(49)	6.719904C+C7	(50)	6.495136D+C7	(51)	6.297015D+C7	(52)	6.119956D+C7	(53)	5.959447D+C7	(54)	5.811884C+C7
(55)	5.674426C+C7	(56)	5.544897D+C7	(57)	5.418327D+C7	(58)	5.290340D+C7	(59)	5.180090D+C7	(60)	5.026867C+C7
(61)	4.890155C+C7	(62)	4.749491D+C7	(63)	4.604484D+C7	(64)	4.454783D+C7	(65)	4.300044C+C7	(66)	4.139506C+C7
(67)	3.973969C+C7	(68)	3.801758D+C7	(69)	3.622706D+C7	(70)	3.436112D+C7	(71)	3.241113C+C7	(72)	3.033680C+C7
(73)	2.809659C+C7	(74)	2.567352D+C7	(75)	2.304470C+C7	(76)	2.018054D+C7	(77)	1.742638D+C7	(78)	1.502975C+C7
(79)	1.294146C+C7	(80)	1.111857D+C7	(81)	9.523809D+06	(82)	8.124637D+06	(83)	6.892597C+06	(84)	5.802721C+0E
(85)	4.833019C+C6	(86)	3.964016D+C6	(87)	3.178364D+06	(88)	2.460479D+06	(89)	1.796231D+06	(90)	1.172658C+0E
(91)	5.777071C+C5	(92)	0.0	(93)		(94)		(95)		(96)	

TOTAL INTEGRATED FLUX FOR REGION 1 GRUP 1	= 0.334546D+15
TOTAL INTEGRATED FLUX FOR REGION 2 GRUP 1	= 0.174728D+15
TOTAL INTEGRATED FLUX FOR REGION 3 GRUP 1	= 0.795990D+14
TOTAL INTEGRATED FLUX FOR REGION 4 GRUP 1	= 0.511650D+14
TOTAL INTEGRATED FLUX FOR REGION 5 GRUP 1	= 0.465586D+14
TOTAL INTEGRATED FLUX FOR REGION 6 GRUP 1	= 0.422691D+14
TOTAL INTEGRATED FLUX FOR REGION 7 GRUP 1	= 0.203724D+15
TOTAL INTEGRATED FLUX FOR REGION 8 GRUP 1	= 0.240913D+15
TOTAL INTEGRATED FLUX FOR REGION 9 GRUP 1	= 0.558932D+14
TOTAL INTEGRATED FLUX FOR REGION 10 GRUP 1	= 0.526341D+14

PCINT-WISE FLUXES FOR GRUP 2

(1)	3.641604C+C7	(2)	3.641434D+C7	(3)	3.640926D+C7	(4)	3.640087D+C7	(5)	3.638930D+C7	(6)	3.637474C+C7
(7)	3.635742C+C7	(8)	3.633767D+C7	(9)	3.631590D+C7	(10)	3.629261D+C7	(11)	3.626844D+C7	(12)	3.624415C+C7
(13)	3.622071C+C7	(14)	3.619928D+C7	(15)	3.618128D+C7	(16)	3.616847D+C7	(17)	3.616297D+C7	(18)	3.616740C+C7
(19)	3.618494C+C7	(20)	3.621950D+C7	(21)	3.627583D+C7	(22)	3.635977D+C7	(23)	3.647846D+C7	(24)	3.664061C+C7
(25)	3.685692C+C7	(26)	3.714047D+C7	(27)	3.750730D+C7	(28)	3.797703D+C7	(29)	3.857369D+C7	(30)	3.932672C+C7
(31)	4.027222C+C7	(32)	4.145460D+C7	(33)	4.292862D+C7	(34)	4.476165D+C7	(35)	4.703625D+C7	(36)	4.985345D+C7

(37) 5.333751E+07(38) 5.764108D+07(39) 6.295264D+07(40) 6.950556D+07(41) 7.759323E+07(42) 8.186923E+07
 (43) 8.490416E+07(44) 8.695518E+07(45) 8.822595D+07(46) 8.887710D+07(47) 8.903514E+07(48) 8.875710E+07
 (49) 8.824902E+07(50) 8.744413D+07(51) 8.643243D+07(52) 8.529041D+07(53) 8.392589E+07(54) 8.247973E+07
 (55) 8.092728E+07(56) 7.927935D+07(57) 7.754312D+07(58) 7.572349D+07(59) 7.362422D+07(60) 7.184834E+07
 (61) 6.979828E+07(62) 6.767613D+07(63) 6.548377D+07(64) 6.322296D+07(65) 6.089554E+07(66) 5.850346E+07
 (67) 5.604897E+07(68) 5.353469D+07(69) 5.096382D+07(70) 4.834028D+07(71) 4.566898D+07(72) 4.295604E+07
 (73) 4.020995E+07(74) 3.744258D+07(75) 3.466986D+07(76) 3.191244D+07(77) 2.929365D+07(78) 2.673652E+07
 (79) 2.425934E+07(80) 2.187559E+07(81) 1.959033E+07(82) 1.740636D+07(83) 1.532260E+07(84) 1.333537D+07
 (85) 1.143899E+07(86) 9.6262E8D+06(87) 7.888950E+06(88) 6.217891D+06(89) 4.603485E+06(90) 3.035777E+06
 (91) 1.504658E+06(92) 0.0

TOTAL INTEGRATED FLUX FOR REGION 1 GROUP 2 = 0.816424D+14
 TOTAL INTEGRATED FLUX FOR REGION 2 GROUP 2 = 0.538752D+14
 TOTAL INTEGRATED FLUX FOR REGION 3 GROUP 2 = 0.346409D+14
 TOTAL INTEGRATED FLUX FOR REGION 4 GROUP 2 = 0.308295D+14
 TOTAL INTEGRATED FLUX FOR REGION 5 GROUP 2 = 0.3E3409D+14
 TOTAL INTEGRATED FLUX FOR REGION 6 GROUP 2 = 0.428067D+14
 TOTAL INTEGRATED FLUX FOR REGION 7 GROUP 2 = 0.269597D+15
 TOTAL INTEGRATED FLUX FOR REGION 8 GROUP 2 = 0.342221D+15
 TOTAL INTEGRATED FLUX FOR REGION 9 GROUP 2 = 0.813285D+14
 TOTAL INTEGRATED FLUX FOR REGION 10 GROUP 2 = 0.105131D+15

POINT-WISE FLUXES FOR GROUP 3

(1) 6.720101E+03(2) 6.719797D+03(3) 6.718889D+03(4) 6.717391D+03(5) 6.715330E+03(6) 6.712740E+03
 (7) 6.709670E+03(8) 6.706185D+03(9) 6.702365D+03(10) 6.698311D+03(11) 6.694147E+03(12) 6.690027E+03
 (13) 6.686142E+03(14) 6.682721D+03(15) 6.680051D+03(16) 6.678479D+03(17) 6.678435E+03(18) 6.680445E+03
 (19) 6.685168E+03(20) 6.693426D+03(21) 6.706277D+03(22) 6.725120D+03(23) 6.751895E+03(24) 6.789479E+03
 (25) 6.842481E+03(26) 6.918923D+03(27) 7.033810E+03(28) 7.216833D+03(29) 7.529063D+03(30) 8.158506E+03
 (31) 9.485077E+03(32) 1.226779D+04(33) 1.819898D+04(34) 3.101673D+04(35) 5.897173D+04(36) 1.202856D+05
 (37) 2.689092E+05(38) 6.425502D+05(39) 1.562515D+06(40) 4.601031D+06(41) 1.552892E+07(42) 2.271875E+07
 (43) 2.887140E+07(44) 3.409561D+07(45) 3.847456D+07(46) 4.212589D+07(47) 4.514221D+07(48) 4.759091D+07
 (49) 4.953289E+07(50) 5.102274D+07(51) 5.210909D+07(52) 5.283500D+07(53) 5.323833D+07(54) 5.335228E+07
 (55) 5.320571E+07(56) 5.282365D+07(57) 5.226220E+07(58) 5.157557D+07(59) 5.077928D+07(60) 4.988755E+07
 (61) 4.891366E+07(62) 4.786991D+07(63) 4.676840D+07(64) 4.562074D+07(65) 4.443848E+07(66) 4.323330E+07
 (67) 4.201721E+07(68) 4.080277D+07(69) 3.960323D+07(70) 3.843284D+07(71) 3.730696D+07(72) 3.627168E+07
 (73) 3.537835E+07(74) 3.464657D+07(75) 3.409946D+07(76) 3.376391D+07(77) 3.334023D+07(78) 3.252205E+07
 (79) 3.135474E+07(80) 2.988047D+07(81) 2.813866D+07(82) 2.616576D+07(83) 2.399544D+07(84) 2.165876E+07
 (85) 1.918431E+07(86) 1.659E49D+07(87) 1.392568D+07(88) 1.118850D+07(89) 8.408040D+06(90) 5.604106E+06
 (91) 2.795448E+06(92) 0.0

TOTAL INTEGRATED FLUX FOR REGION 1 GROUP 3 = 0.151746D+11
 TOTAL INTEGRATED FLUX FOR REGION 2 GROUP 3 = 0.378988D+11
 TOTAL INTEGRATED FLUX FOR REGION 3 GROUP 3 = 0.366700D+12
 TOTAL INTEGRATED FLUX FOR REGION 4 GROUP 3 = 0.291204D+13
 TOTAL INTEGRATED FLUX FOR REGION 5 GROUP 3 = 0.105752D+14
 TOTAL INTEGRATED FLUX FOR REGION 6 GROUP 3 = 0.167307D+14
 TOTAL INTEGRATED FLUX FOR REGION 7 GROUP 3 = 0.156806D+15
 TOTAL INTEGRATED FLUX FOR REGION 8 GROUP 3 = 0.246932D+15
 TOTAL INTEGRATED FLUX FOR REGION 9 GROUP 3 = 0.738306D+14

TOTAL INTEGRATED FLUX FOR REGION 10 GROUP 3 = 0.149357D+15

REGION	NORMALIZED POWER	AVG. FUEL TEMP	AVG. COOLANT TEMP
1	0.10691210+C1	0.80444620+02	0.80368640+C2
2	0.10706320+C1	0.80462340+C2	0.80397580+C2
3	0.10713010+C1	0.80554030+C2	0.80487660+C2
4	0.10672460+C1	0.81556450+C2	0.81345520+C2
5	0.10669690+C1	0.80140170+C2	0.80133490+C2
6	0.10656850+C1	0.80208520+C2	0.80180350+C2
7	0.10625510+C1	0.80315980+C2	0.80259310+C2
8	0.10566060+C1	0.80303270+C2	0.80273060+C2
9	0.10482430+C1	0.80251550+C2	0.80214440+C2
10	0.0	0.0	0.80000000+C2

TOTAL NORMALIZED POWER = 0.10626720+01

TEST REGION DEPENDENT VELOCITIES

TIME ZONE= 1 STEP NUMBER= 22 TIME=0.2000000-02 TIME STEP=0.6342560-04

TEST PCINT	MESH PCINT	FREQUENCY	EXP(W*H)
1	15	7.6744C+01	1.0028110+00
2	33	7.13030C+01	1.0026110+00
3	37	7.00020C+01	1.0025640+00
4	40	7.00960C+01	1.0025670+00
5	42	6.99860C+01	1.0025630+00
6	44	6.96110C+01	1.0025490+00
7	50	6.78880C+01	1.0024860+00
8	64	6.27500C+01	1.0022980+00
9	73	5.68250C+01	1.0020800+00
10	84	4.90040C+01	1.0017940+00

PCINT-WISE FLUXES FOR GRUP 1

(1)	1.5601440C+08(2)	1.5600370+08(3)	1.5597180+08(4)	1.5591850+08(5)	1.5584370+08(6)	1.5574750+08(7)
(7)	1.5552960C+08(8)	1.5549000+08(9)	1.5532840+08(10)	1.5514450+08(11)	1.5493810+08(12)	1.5470860+08(13)
(13)	1.5445570C+08(14)	1.5417870+08(15)	1.5387690+08(16)	1.5354920+08(17)	1.5319450+08(18)	1.5281140+08(19)
(19)	1.5239810C+08(20)	1.5195240+08(21)	1.5147170+08(22)	1.5095270+08(23)	1.5039130+08(24)	1.4978250+08(25)
(25)	1.4912030C+08(26)	1.4835720+08(27)	1.4760390+08(28)	1.4672910+08(29)	1.4575890+08(30)	1.4467610+08(31)
(31)	1.4345940C+08(32)	1.4208310+08(33)	1.4051560+08(34)	1.3871750+08(35)	1.3663860+08(36)	1.3421400+08(37)
(37)	1.3135250C+08(38)	1.2791370+08(39)	1.2367100+08(40)	1.1793920+08(41)	1.0832870+08(42)	9.9474950+07(43)
(43)	9.2152040C+07(44)	8.6092900+07(45)	8.1067090+07(46)	7.6869300+07(47)	7.3319820+07(48)	7.0294550+07(49)
(49)	6.7691140C+07(50)	6.5425160+07(51)	6.3427570+07(52)	6.1642160+07(53)	6.0023470+07(54)	5.8535200+07(55)
(55)	5.7148760C+07(56)	5.5842130+07(57)	5.4565570+07(58)	5.3274720+07(59)	5.1961050+07(60)	5.0617750+07(61)
(61)	4.9239290C+07(62)	4.7821120+07(63)	4.6359330+07(64)	4.4850360+07(65)	4.3290760+07(66)	4.1676930+07(67)
(67)	4.0004810C+07(68)	3.8265670+07(69)	3.6465750+07(70)	3.4586140+07(71)	3.2622070+07(72)	3.0533050+07(73)
(73)	2.8277340C+07(74)	2.5837880+07(75)	2.3191690+07(76)	2.0309050+07(77)	1.7537340+07(78)	1.5125470+07(79)
(79)	1.3023830C+07(80)	1.1189330+07(81)	9.5844070+06(82)	8.1763240+06(83)	6.9364350+06(84)	5.8396270+06(85)
(85)	4.8637540C+06(86)	3.9892230+06(87)	3.1985730+06(88)	2.4761230+06(89)	1.8076510+06(90)	1.1801130+06(91)
(91)	5.8137970C+05(92)	0.0				

TOTAL INTEGRATED FLUX FOR REGION 1 GRUP 1 = 0.3370480+15

TOTAL INTEGRATED FLUX FOR REGION 2 GRUP 1 = 0.1760280+15

TOTAL INTEGRATED FLUX FOR REGION 3 GRUP 1 = 0.8019350+14

TOTAL INTEGRATED FLUX FOR REGION 4 GRUP 1 = 0.5154550+14

TOTAL INTEGRATED FLUX FOR REGION 5 GRUP 1 = 0.4690420+14

TOTAL INTEGRATED FLUX FOR REGION 6 GRUP 1 = 0.4258260+14

TOTAL INTEGRATED FLUX FOR REGION 7 GRUP 1 = 0.2052060+15

TOTAL INTEGRATED FLUX FOR REGION 8 GRUP 1 = 0.2425560+15

TOTAL INTEGRATED FLUX FOR REGION 9 GRUP 1 = 0.5625250+14

TOTAL INTEGRATED FLUX FOR REGION 10 GRUP 1 = 0.5296900+14

PCINT-WISE FLUXES FOR GRUP 2

(1)	3.6691420C+07(2)	3.6685700+07(3)	3.6684550+07(4)	3.6676060+07(5)	3.6664340+07(6)	3.6649580+07(7)
(7)	3.6632040C+07(8)	3.6612030+07(9)	3.6589960+07(10)	3.6566350+07(11)	3.6541840+07(12)	3.6517200+07(13)
(13)	3.6493400C+07(14)	3.6471600+07(15)	3.6453270+07(16)	3.6440140+07(17)	3.6434350+07(18)	3.6438620+07(19)
(19)	3.6456080C+07(20)	3.6490660+07(21)	3.6547200+07(22)	3.6631550+07(23)	3.6750910+07(24)	3.6914080+07(25)
(25)	3.7131830C+07(26)	3.7417360+07(27)	3.7786820+07(28)	3.8260010+07(29)	3.8861190+07(30)	3.9620050+07(31)
(31)	4.0573200C+07(32)	4.1765320+07(33)	4.3251550+07(34)	4.5099600+07(35)	4.7392450+07(36)	5.0231930+07(37)

(37) 5.3743170+C7(38) 5.8090170+C7(39) 6.3432870+07(40) 7.0036420+07(41) 7.8186430+C7(42) 8.2495630+C7
 (43) 8.5554320+C7(44) 9.7621430+07(45) 8.8902070+07(46) 8.9558110+07(47) 8.9716990+07(48) 8.9475170+C7
 (49) 8.9923460+C7(50) 8.8111440+C7(51) 8.7090870+C7(52) 8.5878550+07(53) 8.4562530+C7(54) 8.3103870+C7
 (55) 8.1539050+C7(56) 7.9876010+C7(57) 7.8124980+07(58) 7.6289910+07(59) 7.4374630+07(60) 7.2382200+C7
 (61) 7.0315100+C7(62) 6.8175450+C7(63) 6.5965140+07(64) 6.3685980+07(65) 6.1339810+07(66) 5.8928640+C7
 (67) 5.6454710+C7(68) 5.3920700+C7(69) 5.1329820+07(70) 4.8686050+07(71) 4.5994310+07(72) 4.3260750+C7
 (73) 4.0494010+C7(74) 3.7705950+07(75) 3.4912610+07(76) 3.2134800+07(77) 2.9496820+07(78) 2.6921200+C7
 (79) 2.4426810+C7(80) 2.2025660+07(81) 1.9724340+07(82) 1.7525130+07(83) 1.5426920+07(84) 1.3425950+C7
 (85) 1.1516800+C7(86) 9.6915040+C6(87) 7.9423330+06(88) 6.2599270+06(89) 4.6345840+C6(90) 3.0562750+C6
 (91) 1.5148140+C6(92) 0.0

TOTAL INTEGRATED FLUX FCR REGION 1 GRUP 2 = 0.8225390+14
 TOTAL INTEGRATED FLUX FCR REGION 2 GRUP 2 = 0.5428030+14
 TOTAL INTEGRATED FLUX FCR REGION 3 GRUP 2 = 0.3490460+14
 TOTAL INTEGRATED FLUX FCR REGION 4 GRUP 2 = 0.3106500+14
 TOTAL INTEGRATED FLUX FCR REGION 5 GRUP 2 = 0.3863420+14
 TOTAL INTEGRATED FLUX FCR REGION 6 GRUP 2 = 0.4313460+14
 TOTAL INTEGRATED FLUX FCR REGION 7 GRUP 2 = 0.2716500+15
 TOTAL INTEGRATED FLUX FCR REGION 8 GRUP 2 = 0.3447340+15
 TOTAL INTEGRATED FLUX FCR REGION 9 GRUP 2 = 0.8190200+14
 TOTAL INTEGRATED FLUX FCR REGION 10 GRUP 2 = 0.1058510+15

POINT-WISE FLUXES FOR GRUP 3

(1) 6.7713160+C3(2) 6.7710070+C3(3) 6.7700970+C3(4) 6.7685690+03(5) 6.7664780+03(6) 6.7638520+03
 (7) 6.7607390+C3(8) 6.7572040+C3(9) 6.7533270+03(10) 6.7492120+03(11) 6.7449820+03(12) 6.7407950+C3
 (13) 6.7368400+C3(14) 6.7233510+C3(15) 6.7206160+03(16) 6.7289850+03(17) 6.7288900+03(18) 6.7308640+C3
 (19) 6.7355690+C3(20) 6.7438350+C3(21) 6.7567280+03(22) 6.7756560+03(23) 6.8025760+03(24) 6.8403840+C3
 (25) 6.8937240+C3(26) 6.9706730+C3(27) 7.0863440+03(28) 7.2706330+03(29) 7.5850370+03(30) 8.2188930+C3
 (31) 9.5548020+C3(32) 1.2357120+04(33) 1.8330110+04(34) 3.1238280+04(35) 5.9390660+C4(36) 1.2113750+C5
 (37) 2.7081340+C5(38) 6.4710170+C5(39) 1.5735900+06(40) 4.6336730+06(41) 1.5639180+07(42) 2.2875930+C7
 (43) 2.9075770+C7(44) 3.4336220+C7(45) 3.8745100+07(46) 4.2420960+07(47) 4.5457140+07(48) 4.7921540+C7
 (49) 4.9875540+C7(50) 5.1374160+07(51) 5.2466390+07(52) 5.3195610+07(53) 5.3599990+07(54) 5.3712940+C7
 (55) 5.3563560+C7(56) 5.3177050+C7(57) 5.2609930+07(58) 5.1916820+07(59) 5.1113350+07(60) 5.0213830+07
 (61) 4.9231570+C7(62) 4.8179110+C7(63) 4.7068480+07(64) 4.5911370+07(65) 4.4719420+07(66) 4.3504380+C7
 (67) 4.2278340+C7(68) 4.1053890+07(69) 3.9844390+07(70) 3.8664150+07(71) 3.7528620+C7(72) 3.6484150+C7
 (73) 3.5582540+C7(74) 3.4843380+07(75) 3.4289970+07(76) 3.3949330+07(77) 3.3520450+07(78) 3.2695310+07
 (79) 3.1519460+C7(80) 3.0035480+07(81) 2.8282930+07(82) 2.6298490+07(83) 2.4115980+C7(84) 2.1766610+C7
 (85) 1.9279110+C7(86) 1.6679960+07(87) 1.3593640+07(88) 1.1242850+07(89) 8.4487320+06(90) 5.6311560+C6
 (91) 2.8089200+C6(92) 0.0

TOTAL INTEGRATED FLUX FCR REGION 1 GRUP 3 = 0.1528890+11
 TOTAL INTEGRATED FLUX FCR REGION 2 GRUP 3 = 0.3816970+11
 TOTAL INTEGRATED FLUX FCR REGION 3 GRUP 3 = 0.3692990+12
 TOTAL INTEGRATED FLUX FCR REGION 4 GRUP 3 = 0.2932710+13
 TOTAL INTEGRATED FLUX FCR REGION 5 GRUP 3 = 0.1065020+14
 TOTAL INTEGRATED FLUX FCR REGION 6 GRUP 3 = 0.1684880+14
 TOTAL INTEGRATED FLUX FCR REGION 7 GRUP 3 = 0.1578810+15
 TOTAL INTEGRATED FLUX FCR REGION 8 GRUP 3 = 0.2485070+15
 TOTAL INTEGRATED FLUX FCR REGION 9 GRUP 3 = 0.7425320+14

TOTAL INTEGRATED FLUX FOR REGION 10 GROUP 3 = 0.150122D+15

PRECURSOR CONCENTRATION FOR DELAYED GROUP 1

(1) 4.373502D+04	(2) 4.373238D+04	(3) 4.372447D+04	(4) 4.371133D+04	(5) 4.369300D+04	(6) 4.366957D+04
(7) 4.364115D+04	(8) 4.350787D+04	(9) 4.356992D+04	(10) 4.352751D+04	(11) 4.348092D+04	(12) 4.343C48D+04
(13) 4.337662D+04	(14) 4.331952D+04	(15) 4.326C71D+04	(16) 4.320C03D+04	(17) 4.31387C0D+04	(18) 4.307785D+04
(19) 4.301882D+04	(20) 4.296329D+04	(21) 4.291329D+04	(22) 4.287131D+04	(23) 4.284035D+04	(24) 4.282425D+04
(25) 4.282745D+04	(26) 4.285558D+04	(27) 4.291551D+04	(28) 4.301573D+04	(29) 4.316732D+04	(30) 4.338326D+04
(31) 4.368023D+04	(32) 4.408155D+04	(33) 4.461907D+04	(34) 4.534C48D+04	(35) 4.632325D+04	(36) 4.781588D+04
(37) 5.031032D+04	(38) 5.461443D+04	(39) 6.891204D+04	(40) 1.206802D+05	(41) 1.434985D+05	(42) 1.352236D+04
(43) 1.689561D+04	(44) 2.0C04260D+04	(45) 2.316945D+04	(46) 2.610806D+04	(47) 2.770241D+04	(48) 2.898376D+04
(49) 2.998690D+04	(50) 3.074270D+04	(51) 3.127840D+04	(52) 3.161791D+04	(53) 3.178217D+04	(54) 3.178936D+04
(55) 3.165524D+04	(56) 3.252641D+04	(57) 3.326581D+04	(58) 3.280712D+04	(59) 3.228203D+04	(60) 3.169886D+04
(61) 3.106531D+04	(62) 3.038867D+04	(63) 2.967590D+04	(64) 2.893380D+04	(65) 2.816915D+04	(66) 2.738879D+04
(67) 2.659980D+04	(68) 2.58C955D+04	(69) 2.502591C+04	(70) 2.425731D+04	(71) 2.453287D+04	(72) 2.479738D+04
(73) 2.413723D+04	(74) 2.357808D+04	(75) 2.313533D+04	(76) 1.141566D+04	(77) 0.0	(78) 0.0
(79) 0.0	(80) 0.0	(81) 0.0	(82) 0.0	(83) 0.0	(84) 0.0
(85) 0.0	(86) 0.0	(87) 0.0	(88) 0.0	(89) 0.0	(90) 0.0
(91) 0.0	(92) 0.0				

REGION	NORMALIZED POWER	AVG. FUEL TEMP	AVG. COOLANT TEMP
1	C.1C77121C+01	0.8044462D+02	0.8C36864C+02
2	0.1C78642D+01	0.8046234D+02	0.8C39758C+02
3	C.1C79354C+01	0.8C55403C+02	0.8C48766C+02
4	C.1C75C05D+01	0.8155645D+02	0.8134552C+02
5	0.1C74693D+01	0.8014017D+02	0.8013348C+02
6	0.1C73325C+01	0.8020852D+02	0.8018035C+02
7	C.1C69934D+01	0.8C31598D+02	0.8C25929C+02
8	C.1C63435D+01	0.8C30327D+02	0.8C27306C+02
9	0.1054341C+01	0.8025155D+02	0.8C21443C+02
10	0.0	0.0	0.8C0C0C0C+02

TOTAL NORMALIZED POWER = C.107C043D+01

*** INPUT ECIT FOR TIME ZONE 2 ***

CARD 21 0.1CCCCOD-03 0-.5CCCCOD+CC 0 -1 0 0 0 0

CARD 22 0.2500COD+0C

CARD 34 0.0 C.C 0.C 0.0

ARE THERE ANY TIME DEPENDENT CHANGES IN THE
CRCS SECTION DATA NC

TPERMAL HYDRAULIC TIME DEPENDENT CHANGES (TIME ZONE 2)

	FLCW RATE	INLET TEMPERATURE
TOTAL LINEAR	0.C	0.C
TOTAL QUADRATIC	0.C	0.C

ARE THERE ANY TIME DEPENDENT SCURCES ? NC

TEST REGION DEPENDENT VELOCITIES

TIME ZONE= 2 STEP NUMBER= 202 TIME=C.250000D+00 TIME STEP=0.875757D-02

TEST PCINT	MESH PCINT	FREQUENCY	EXPI(W*H)
1	15	3.2437C+01	1.317235D+00
2	33	3.2437C+01	1.317242D+00
3	37	3.2437C+01	1.317245D+00
4	40	3.2437C+01	1.317245D+00
5	42	3.2437C+01	1.317245D+00
6	44	3.2438C+01	1.317245D+00
7	50	3.2438C+01	1.317246D+00
8	64	3.2438C+01	1.317249D+00
9	73	3.2438C+01	1.317251D+00
10	84	3.2438C+01	1.317253D+00

PCINT-WISE FLUXES FOR GRUP 1

(1)	9.603232D+11	(2)	9.599741D+11	(3)	9.598271D+11	(4)	9.595816D+11	(5)	9.592374D+11	(6)	9.587939D+11
(7)	9.582501D+11	(8)	9.576051D+11	(9)	9.568573D+11	(10)	9.560052D+11	(11)	9.550465D+11	(12)	9.539787D+11
(13)	9.527980D+11	(14)	9.515007D+11	(15)	9.500817D+11	(16)	9.485348D+11	(17)	9.468524D+11	(18)	9.450252D+11
(19)	9.430416D+11	(20)	9.408879D+11	(21)	9.385466D+11	(22)	9.359968D+11	(23)	9.332125D+11	(24)	9.301622D+11
(25)	9.268068D+11	(26)	9.230988D+11	(27)	9.189796D+11	(28)	9.143774D+11	(29)	9.092041D+11	(30)	9.033513D+11
(31)	8.966855D+11	(32)	8.890424D+11	(33)	8.802182D+11	(34)	8.699592D+11	(35)	8.579456D+11	(36)	8.437663D+11
(37)	8.268436D+11	(38)	8.042872D+11	(39)	7.806551D+11	(40)	7.455731D+11	(41)	6.857707D+11	(42)	6.301777D+11
(43)	5.842553D+11	(44)	5.463134D+11	(45)	5.148929D+11	(46)	4.886925D+11	(47)	4.665727D+11	(48)	4.477481D+11
(49)	4.315704D+11	(50)	4.175059D+11	(51)	4.051179D+11	(52)	3.940508D+11	(53)	3.840173D+11	(54)	3.747883D+11
(55)	3.661833D+11	(56)	3.580637D+11	(57)	3.501117D+11	(58)	3.420433D+11	(59)	3.338068D+11	(60)	3.253582D+11
(61)	3.166640D+11	(62)	3.076958D+11	(63)	2.984297D+11	(64)	2.888437D+11	(65)	2.789162D+11	(66)	2.686247D+11
(67)	2.579437D+11	(68)	2.468431D+11	(69)	2.352863D+11	(70)	2.232282D+11	(71)	2.106130D+11	(72)	1.971783D+11
(73)	1.826536D+11	(74)	1.669284D+11	(75)	1.498534D+11	(76)	1.312359D+11	(77)	1.133271D+11	(78)	9.774296D+10
(79)	8.416306D+10	(80)	7.230896D+10	(81)	6.193817D+10	(82)	5.283914D+10	(83)	4.482687D+10	(84)	3.773901D+10
(85)	3.143259D+10	(86)	2.578100D+10	(87)	2.067141D+10	(88)	1.600250D+10	(89)	1.168239D+10	(90)	7.626786D+09
(91)	3.757325D+09	(92)	0.0	(93)		(94)		(95)		(96)	

TOTAL INTEGRATED FLUX FOR REGION 1	GRUP 1 = 0.208799D+19
TOTAL INTEGRATED FLUX FOR REGION 2	GRUP 1 = 0.110225D+19
TOTAL INTEGRATED FLUX FOR REGION 3	GRUP 1 = 0.505154D+18
TOTAL INTEGRATED FLUX FOR REGION 4	GRUP 1 = 0.325835D+18
TOTAL INTEGRATED FLUX FOR REGION 5	GRUP 1 = 0.297138D+18
TOTAL INTEGRATED FLUX FOR REGION 6	GRUP 1 = 0.270210D+18
TOTAL INTEGRATED FLUX FOR REGION 7	GRUP 1 = 0.130975D+19
TOTAL INTEGRATED FLUX FOR REGION 8	GRUP 1 = 0.156115D+19
TOTAL INTEGRATED FLUX FOR REGION 9	GRUP 1 = 0.363362D+18
TOTAL INTEGRATED FLUX FOR REGION 10	GRUP 1 = 0.342303D+18

PCINT-WISE FLUXES FOR GRUP 2

(1)	2.261846D+11	(2)	2.261781D+11	(3)	2.261585D+11	(4)	2.261263D+11	(5)	2.260824D+11	(6)	2.260279D+11
(7)	2.259645D+11	(8)	2.258940D+11	(9)	2.258191D+11	(10)	2.257431D+11	(11)	2.256700D+11	(12)	2.256047D+11
(13)	2.255533D+11	(14)	2.255232D+11	(15)	2.255236D+11	(16)	2.255656D+11	(17)	2.256629D+11	(18)	2.258322D+11
(19)	2.260937D+11	(20)	2.264726D+11	(21)	2.269920D+11	(22)	2.277108D+11	(23)	2.286532D+11	(24)	2.298822D+11
(25)	2.314662D+11	(26)	2.334891D+11	(27)	2.360535D+11	(28)	2.392854D+11	(29)	2.433389D+11	(30)	2.484034D+11
(31)	2.547109D+11	(32)	2.625461D+11	(33)	2.722585D+11	(34)	2.842771D+11	(35)	2.991284D+11	(36)	3.174597D+11

(37) 3.400664C+11(38) 3.673271D+11(39) 4.022490D+11(40) 4.445261D+11(41) 4.96637CC+11(42) 5.242297C+11
 (43) 5.439182C+11(44) 5.573357D+11(45) 5.657757D+11(46) 5.702582D+11(47) 5.715861C+11(48) 5.70392CC+11
 (49) 5.671722C+11(50) 5.823139C+11(51) 5.561176C+11(52) 5.488145D+11(53) 5.4C5808C+11(54) 5.315485C+11
 (55) 5.218145C+11(56) 5.114473D+11(57) 5.004919D+11(58) 4.889787D+11(59) 4.769318C+11(60) 4.6437C2C+11
 (61) 4.513096C+11(62) 4.377634D+11(63) 4.237440C+11(64) 4.092632D+11(65) 3.943329C+11(66) 3.789664C+11
 (67) 3.631786C+11(68) 3.469872D+11(69) 3.304133D+11(70) 3.134831D+11(71) 2.962289D+11(72) 2.786911C+11
 (73) 2.609255C+11(74) 2.43C10D+11(75) 2.250489C+11(76) 2.071774D+11(77) 1.9C1971C+11(78) 1.736111C+11
 (79) 1.575425C+11(80) 1.429701D+11(81) 1.272371D+11(82) 1.130592D+11(83) 9.952974D+10(84) 8.662542C+10
 (85) 7.430966C+10(86) 6.253611D+10(87) 5.125112D+10(88) 4.039588D+10(89) 2.9908C7D+10(90) 1.972318D+10
 (91) 9.7757C3C+C9(92) 0.C

TCTAL INTEGRATED FLUX FOR REGION 1 GRUP 2 = 0.510927D+18
 TCTAL INTEGRATED FLUX FOR REGION 2 GRUP 2 = 0.341585D+18
 TCTAL INTEGRATED FLUX FOR REGION 3 GRUP 2 = 0.221004D+18
 TCTAL INTEGRATED FLUX FOR REGION 4 GRUP 2 = 0.197175D+18
 TCTAL INTEGRATED FLUX FOR REGION 5 GRUP 2 = 0.245512D+18
 TCTAL INTEGRATED FLUX FOR REGION 6 GRUP 2 = 0.274371D+18
 TCTAL INTEGRATED FLUX FOR REGION 7 GRUP 2 = 0.173420D+19
 TCTAL INTEGRATED FLUX FOR REGION 8 GRUP 2 = 0.221423D+19
 TCTAL INTEGRATED FLUX FOR REGION 9 GRUP 2 = 0.527770D+18
 TCTAL INTEGRATED FLUX FOR REGION 10 GRUP 2 = 0.682786D+18

PCINT-WISE FLUXES FOR GRUP 3
 (1) 4.176438C+C7(2) 4.176323D+C7(3) 4.175979C+07(4) 4.175417D+07(5) 4.174652D+07(6) 4.173707C+C7
 (7) 4.172614C+C7(8) 4.171412D+07(9) 4.170154D+07(10) 4.168903D+07(11) 4.16774CC+07(12) 4.166762C+C7
 (13) 4.166090C+C7(14) 4.165873D+C7(15) 4.166292D+C7(16) 4.167570D+07(17) 4.165982C+07(18) 4.173865C+C7
 (19) 4.179640C+C7(20) 4.187835D+07(21) 4.159128D+07(22) 4.214418D+07(23) 4.234954C+C7(24) 4.262593C+C7
 (25) 4.300319C+C7(26) 4.352339D+C7(27) 4.431413D+07(28) 4.553882D+07(29) 4.760565C+C7(30) 5.172928C+C7
 (31) 6.036957C+C7(32) 7.845135D+C7(33) 1.169498D+08(34) 2.0C1028D+08(35) 3.813998C+08(36) 7.789558C+C8
 (37) 1.742363C+C9(38) 4.163874D+C9(39) 1.012507D+10(40) 2.9810C69D+10(41) 1.0C5970C+11(42) 1.471958D+11
 (43) 1.871315C+11(44) 2.210971D+11(45) 2.456204D+11(46) 2.734535D+11(47) 2.931860C+11(48) 3.092487C+11
 (49) 3.220310C+11(50) 3.318825D+11(51) 3.391149D+11(52) 3.440C43D+11(53) 3.467941D+11(54) 3.476975C+11
 (55) 3.4690J7C+11(56) 3.445651D+11(57) 3.410526D+11(58) 3.367130D+11(59) 3.316474D+11(60) 3.259485D+11
 (61) 3.197026C+11(62) 3.129914D+11(63) 3.058932D+11(64) 2.984844D+11(65) 2.908409C+11(66) 2.830398D+11
 (67) 2.751603C+11(68) 2.672849D+11(69) 2.555C14D+11(70) 2.519036D+11(71) 2.445929D+11(72) 2.378702C+11
 (73) 2.320709C+11(74) 2.273243D+11(75) 2.237826D+11(76) 2.216225D+11(77) 2.188766D+11(78) 2.135366C+11
 (79) 2.058990C+11(80) 1.962412D+11(81) 1.848215D+11(82) 1.718793D+11(83) 1.57636C+11(84) 1.422957C+11
 (85) 1.260469C+11(86) 1.090631D+11(87) 9.150506D+10(88) 7.352182D+10(89) 5.525241D+10(90) 3.682742C+10
 (91) 1.837052C+10(92) 0.0

TOTAL INTEGRATED FLUX FOR REGION 1 GRUP 3 = 0.950442D+14
 TCTAL INTEGRATED FLUX FOR REGION 2 GRUP 3 = 0.244396D+15
 TCTAL INTEGRATED FLUX FOR REGION 3 GRUP 3 = 0.237616D+16
 TCTAL INTEGRATED FLUX FOR REGION 4 GRUP 3 = 0.188658D+17
 TCTAL INTEGRATED FLUX FOR REGION 5 GRUP 3 = 0.685243D+17
 TCTAL INTEGRATED FLUX FOR REGION 6 GRUP 3 = 0.108498D+18
 TCTAL INTEGRATED FLUX FOR REGION 7 GRUP 3 = 0.192039D+19
 TCTAL INTEGRATED FLUX FOR REGION 8 GRUP 3 = 0.161510D+19
 TCTAL INTEGRATED FLUX FOR REGION 9 GRUP 3 = 0.484351D+18

TOTAL INTEGRATED FLUX FOR REGION 10 GROUP 3 = 0.9810050+18

REGION	NORMALIZED POWER	AVG. FUEL TEMP	AVG. COOLANT TEMP
1	0.66807650+04	0.80444700+02	0.80372230+02
2	0.67717750+04	0.80462430+02	0.80396920+02
3	0.68296270+04	0.80554130+02	0.80483280+02
4	0.68793860+04	0.81556730+02	0.81341110+02
5	0.68907260+04	0.80140200+02	0.80129100+02
6	0.68950650+04	0.80208560+02	0.80179690+02
7	0.69043980+04	0.80316040+02	0.80262540+02
8	0.69037610+04	0.80303330+02	0.80268680+02
9	0.68714860+04	0.80251600+02	0.80214640+02
10	0.0	0.0	0.80000000+02

TOTAL NORMALIZED POWER = 0.68434080+04

TEST REGION DEPENDENT VELOCITIES

TIME ZONE= 2 STEP NUMBER= 221 TIME=C.500000D+00 TIME STEP=C.210761D-01

TEST PCINT	MESH PCINT	FREQUENCY	EXP(W*H)
1	15	3.2343C+01	1.124522D+00
2	33	3.2343C+01	1.124522D+00
3	37	3.2343C+01	1.124522D+00
4	40	3.2343C+01	1.124522D+00
5	42	3.2343C+01	1.124522D+00
6	44	3.2343C+01	1.124522D+00
7	50	3.2343C+01	1.124522D+00
8	64	3.2343C+01	1.124523D+00
9	73	3.2343C+01	1.124523D+00
10	84	3.2343C+01	1.124523D+00

PCINT-WISE FLUXES FOR GRUP 1

(1)	3.137936C+15(2)	3.137776D+15(3)	3.137295D+15(4)	3.136494D+15(5)	3.135369C+15(6)	3.133920C+15
(7)	3.132143C+15(8)	3.130036D+15(9)	3.127593C+15(10)	3.124809D+15(11)	3.121677C+15(12)	3.118188C+15
(13)	3.114330C+15(14)	3.110092D+15(15)	3.105456C+15(16)	3.100402D+15(17)	3.094905C+15(18)	3.088935C+15
(19)	3.082454C+15(20)	3.075417D+15(21)	3.067767D+15(22)	3.059435D+15(23)	3.050338C+15(24)	3.040370C+15
(25)	3.029426C+15(26)	3.017290D+15(27)	3.003829C+15(28)	2.988789D+15(29)	2.971883C+15(30)	2.952756C+15
(31)	2.930071C+15(32)	2.905992D+15(33)	2.877152C+15(34)	2.843622D+15(35)	2.804358C+15(36)	2.758015C+15
(37)	2.702726C+15(38)	2.635519D+15(39)	2.551741D+15(40)	2.437074D+15(41)	2.241602C+15(42)	2.057886C+15
(43)	1.907791C+15(44)	1.785761D+15(45)	1.683058C+15(46)	1.597419D+15(47)	1.525117D+15(48)	1.463587C+15
(49)	1.410708C+15(50)	1.364737D+15(51)	1.324246C+15(52)	1.288072D+15(53)	1.255277D+15(54)	1.225111C+15
(55)	1.196985C+15(56)	1.170445D+15(57)	1.144454C+15(58)	1.118083D+15(59)	1.091159D+15(60)	1.063544C+15
(61)	1.035125C+15(62)	1.005811D+15(63)	9.755227D+14(64)	9.441885D+14(65)	9.117382D+14(66)	8.780978C+14
(67)	8.431840C+14(68)	8.068985D+14(69)	7.691216C+14(70)	7.297060D+14(71)	6.884691D+14(72)	6.445533C+14
(73)	5.970742C+14(74)	5.456704D+14(75)	4.898543D+14(76)	4.285960D+14(77)	3.704541D+14(78)	3.195111C+14
(79)	2.751199C+14(80)	2.363701D+14(81)	2.024691D+14(82)	1.727254D+14(83)	1.465341D+14(84)	1.233647C+14
(85)	1.027497C+14(86)	8.427524D+13(87)	6.757255C+13(88)	5.231041D+13(89)	3.818844D+13(90)	2.493113C+13
(91)	1.228228C+13(92)	0.0				

TOTAL INTEGRATED FLUX FOR REGION 1 GRUP 1 = 0.682487D+22

TOTAL INTEGRATED FLUX FOR REGION 2 GRUP 1 = 0.360289D+22

TOTAL INTEGRATED FLUX FOR REGION 3 GRUP 1 = 0.165120D+22

TOTAL INTEGRATED FLUX FOR REGION 4 GRUP 1 = 0.106506D+22

TOTAL INTEGRATED FLUX FOR REGION 5 GRUP 1 = 0.971266D+21

TOTAL INTEGRATED FLUX FOR REGION 6 GRUP 1 = 0.883249D+21

TOTAL INTEGRATED FLUX FOR REGION 7 GRUP 1 = 0.428130D+22

TOTAL INTEGRATED FLUX FOR REGION 8 GRUP 1 = 0.510317D+22

TOTAL INTEGRATED FLUX FOR REGION 9 GRUP 1 = 0.118779D+22

TOTAL INTEGRATED FLUX FOR REGION 10 GRUP 1 = 0.111895D+22

PCINT-WISE FLUXES FOR GRUP 2

(1)	7.393102C+14(2)	7.392887D+14(3)	7.352247D+14(4)	7.391197D+14(5)	7.389764D+14(6)	7.387985D+14
(7)	7.385911C+14(8)	7.383610D+14(9)	7.381166D+14(10)	7.378686D+14(11)	7.376299C+14(12)	7.374168C+14
(13)	7.372492C+14(14)	7.371513D+14(15)	7.371532D+14(16)	7.372911D+14(17)	7.376098D+14(18)	7.381636C+14
(19)	7.390193C+14(20)	7.402584D+14(21)	7.419805D+14(22)	7.443075D+14(23)	7.473888C+14(24)	7.514070C+14
(25)	7.565857C+14(26)	7.631989D+14(27)	7.715824D+14(28)	7.821476D+14(29)	7.953987D+14(30)	8.119544C+14
(31)	8.325731D+14(32)	8.581856D+14(33)	8.859342D+14(34)	9.292209D+14(35)	9.777678D+14(36)	1.037690C+15

(37) 1.111587C+15(38) 1.202659D+15(39) 1.314851D+15(40) 1.453046D+15(41) 1.623387D+15(42) 1.713582D+15
 (43) 1.777940C+15(44) 1.821871D+15(45) 1.849391D+15(46) 1.864045D+15(47) 1.868388C+15(48) 1.864487D+15
 (49) 1.853964C+15(50) 1.838085D+15(51) 1.817833D+15(52) 1.793963D+15(53) 1.767051C+15(54) 1.737528C+15
 (55) 1.705711C+15(56) 1.671825D+15(57) 1.636C16D+15(58) 1.598383D+15(59) 1.559CC6C+15(60) 1.517946C+15
 (61) 1.475254C+15(62) 1.430976D+15(63) 1.385150D+15(64) 1.337816D+15(65) 1.289C12C+15(66) 1.238783D+15
 (67) 1.187176C+15(68) 1.134253D+15(69) 1.08CC73D+15(70) 1.024731D+15(71) 9.6833C4C+14(72) 9.110G26C+14
 (73) 8.529297C+14(74) 7.943669D+14(75) 7.356547D+14(76) 6.772354D+14(77) 6.217291D+14(78) 5.67512CC+14
 (79) 5.149861C+14(80) 4.644C87D+14(81) 4.159218D+14(82) 3.695759D+14(83) 3.2535C0D+14(84) 2.831675C+14
 (85) 2.429089C+14(86) 2.044226D+14(87) 1.675334D+14(88) 1.320491D+14(89) 9.776570D+13(90) 6.447259C+13
 (91) 3.195554C+13(92) 0.0

TCTAL INTEGRATED FLUX FCR REGION 1 GRUP 2 = 0.167004D+22
 TCTAL INTEGRATED FLUX FCR REGION 2 GRUP 2 = 0.111654D+22
 TCTAL INTEGRATED FLUX FCR REGION 3 GRUP 2 = 0.722404D+21
 TCTAL INTEGRATED FLUX FCR REGION 4 GRUP 2 = 0.644516D+21
 TCTAL INTEGRATED FLUX FCR REGION 5 GRUP 2 = 0.802521D+21
 TCTAL INTEGRATED FLUX FCR REGION 6 GRUP 2 = 0.896856D+21
 TOTAL INTEGRATED FLUX FCR REGION 7 GRUP 2 = 0.566874D+22
 TCTAL INTEGRATED FLUX FCR REGION 8 GRUP 2 = 0.723797D+22
 TCTAL INTEGRATED FLUX FCR REGION 9 GRUP 2 = 0.172521D+22
 TCTAL INTEGRATED FLUX FCR REGION 10 GRUP 2 = 0.223194D+22

POINT-WISE FLUXES FOR GRUP 3

(1) 1.365118C+11(2) 1.365080D+11(3) 1.364968D+11(4) 1.364784D+11(5) 1.364535C+11(6) 1.364226D+11
 (7) 1.363869C+11(8) 1.363477D+11(9) 1.363066D+11(10) 1.362658D+11(11) 1.362278C+11(12) 1.361955C+11
 (13) 1.361741C+11(14) 1.361670D+11(15) 1.361808D+11(16) 1.362227D+11(17) 1.363017C+11(18) 1.364287C+11
 (19) 1.365176C+11(20) 1.368856D+11(21) 1.372549D+11(22) 1.377548D+11(23) 1.384263C+11(24) 1.393295C+11
 (25) 1.405633C+11(26) 1.422566D+11(27) 1.448488D+11(28) 1.488524D+11(29) 1.556088C+11(30) 1.690885C+11
 (31) 1.973327C+11(32) 2.564399D+11(33) 3.822867D+11(34) 6.541C33D+11(35) 1.246740D+12(36) 2.546295D+12
 (37) 5.695550C+12(38) 1.361115D+13(39) 3.309749D+13(40) 9.744713D+13(41) 3.28838C+14(42) 4.811634C+14
 (43) 6.117082C+14(44) 7.227382D+14(45) 8.159785D+14(46) 8.938870D+14(47) 9.583917D+14(48) 1.0109C0D+15
 (49) 1.052686C+15(50) 1.084891D+15(51) 1.108534D+15(52) 1.124519D+15(53) 1.133640D+15(54) 1.136595C+15
 (55) 1.133992C+15(56) 1.126358D+15(57) 1.114878D+15(58) 1.100694D+15(59) 1.084136D+15(60) 1.065508C+15
 (61) 1.045092C+15(62) 1.023155D+15(63) 9.999530D+14(64) 9.757352D+14(65) 9.507506D+14(66) 9.252505C+14
 (67) 8.994938C+14(68) 8.737510D+14(69) 8.483083D+14(70) 8.234726D+14(71) 7.995755C+14(72) 7.776004D+14
 (73) 7.586439C+14(74) 7.431287D+14(75) 7.315525D+14(76) 7.244923D+14(77) 7.155169D+14(78) 6.980614C+14
 (79) 6.730947C+14(80) 6.415237D+14(81) 6.041927C+14(82) 5.618845D+14(83) 5.153228D+14(84) 4.651745D+14
 (85) 4.120566C+14(86) 3.565356D+14(87) 2.991372D+14(88) 2.403487D+14(89) 1.806246D+14(90) 1.20215D+14
 (91) 6.005477C+13(92) 0.0

TCTAL INTEGRATED FLUX FCR REGION 1 GRUP 3 = 0.310667D+18
 TOTAL INTEGRATED FLUX FCR REGION 2 GRUP 3 = 0.798891D+18
 TCTAL INTEGRATED FLUX FCR REGION 3 GRUP 3 = 0.776736D+19
 TCTAL INTEGRATED FLUX FCR REGION 4 GRUP 3 = 0.616696D+20
 TOTAL INTEGRATED FLUX FCR REGION 5 GRUP 3 = 0.223997D+21
 TCTAL INTEGRATED FLUX FCR REGION 6 GRUP 3 = 0.354665D+21
 TCTAL INTEGRATED FLUX FCR REGION 7 GRUP 3 = 0.333556D+22
 TCTAL INTEGRATED FLUX FCR REGION 8 GRUP 3 = 0.527970D+22
 TCTAL INTEGRATED FLUX FCR REGION 9 GRUP 3 = 0.158335D+22

TOTAL INTEGRATED FLUX FOR REGION 10 GROUP 3 = 0.320697D+22

PRECURSOR CONCENTRATION FOR DELAYED GROUP 1

(1)	2.339577C+C9	(2)	2.339480D+C9	(3)	2.339189D+C9	(4)	2.338706D+C9	(5)	2.338034C+C9	(6)	2.337178C+C9
(7)	2.336143C+C9	(8)	2.334937D+C9	(9)	2.333570C+C9	(10)	2.332C53D+C9	(11)	2.330403D+C9	(12)	2.328636C+C9
(13)	2.326776C+C9	(14)	2.324851D+C9	(15)	2.322895D+C9	(16)	2.320949D+C9	(17)	2.319063D+C9	(18)	2.317300C+C9
(19)	2.315735C+C9	(20)	2.314460C+C9	(21)	2.313589D+C9	(22)	2.313260D+C9	(23)	2.313642C+C9	(24)	2.314541C+C9
(25)	2.317412C+C9	(26)	2.321366D+C9	(27)	2.327185D+C9	(28)	2.335343D+C9	(29)	2.346456D+C9	(30)	2.361247C+C9
(31)	2.380647C+C9	(32)	2.4C5956D+C9	(33)	2.438946D+C9	(34)	2.482273D+C9	(35)	2.540252D+C9	(36)	2.626701C+C9
(37)	2.768974C+C9	(38)	3.012C82D+C9	(39)	3.811135D+C9	(40)	6.694764D+C9	(41)	7.975793D+C9	(42)	7.519475C+C9
(43)	9.398613C+C8	(44)	1.115242D+C9	(45)	1.2E9553D+C9	(46)	1.453438D+C9	(47)	1.542534D+C9	(48)	1.614224C+C9
(49)	1.670429C+C9	(50)	1.712E55D+C9	(51)	1.743005C+C9	(52)	1.762201D+C9	(53)	1.771600D+C9	(54)	1.772207D+C9
(55)	1.764892C+C9	(56)	1.813553D+C9	(57)	1.854828D+C9	(58)	1.829291D+C9	(59)	1.8C0011D+C9	(60)	1.767444C+C9
(61)	1.732025C+C9	(62)	1.694148D+C9	(63)	1.654203D+C9	(64)	1.612567D+C9	(65)	1.569614C+C9	(66)	1.525725C+C9
(67)	1.481291C+C9	(68)	1.436722D+C9	(69)	1.392453D+C9	(70)	1.348550D+C9	(71)	1.363365D+C9	(72)	1.37702CC+C9
(73)	1.339263C+C9	(74)	1.3C7C49D+C9	(75)	1.2E1227D+C9	(76)	6.315131D+C8	(77)	C.C	(78)	0.0
(79)	0.0	(80)	0.0	(81)	0.0	(82)	0.0	(83)	0.0	(84)	0.0
(85)	0.0	(86)	0.0	(87)	0.0	(88)	0.0	(89)	0.0	(90)	0.0
(91)	0.0	(92)	0.0								

REGION	NORMALIZED POWER	AVG. FUEL TEMP	AVG. COOLANT TEMP
1	0.21837C2C+C8	0.8081152D+C2	0.8039210C+C2
2	0.2213487C+C8	0.8084908D+C2	0.8041450C+C2
3	0.2232426C+C8	0.8102143D+C2	0.8050195C+C2
4	0.2248421C+C8	0.8287892D+C2	0.8139956C+C2
5	0.2252466D+C8	0.8025948D+C2	0.8013157C+C2
6	0.2253895C+C8	0.803E613D+C2	0.8018754C+C2
7	0.2256972C+C8	0.805E547D+C2	0.8027775C+C2
8	0.2256806C+C8	0.805E191D+C2	0.80277E3C+C2
9	0.2246296C+C8	0.80465C9D+C2	0.80224E0C+C2
10	0.0	0.0	0.800000C+C2

TOTAL NORMALIZED POWER = 0.2237C01D+C8

TEST REGION DEPENDENT VELOCITIES
END OF PROBLEM