50
8-5-75
UC-79p, e, d, b
plus 2/58
Germany
Japan

Dr: 1550

HEDL-TME 74-47
UC-79p, e, d, b

MELT-III
A NEUTRONICS, THERMAL-HYDRAULICS
COMPUTER PROGRAM
FOR FAST REACTOR SAFETY ANALYSIS
VOLUME II

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Operated by Westinghouse Hanford Company
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Prepared for the U.S. Energy Research and Development
Administration under Contract No. AT(45-1)-2170

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VOLUME II

by

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and

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December 1974

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APPENDIX C - PROGRAM LISTING	480
C-1 Steady State	480
A. SIEX	481
B. COM	485
C. TERP	486
D. T	487
E. S	488
F. FSINTR	490
G. OUTPUT	493
H. FISGAS	497
I. INPUT	499
J. HGAP	505
K. CSINTR	508
L. SPAGE	510
M. STRESS	511
N. FDELD	513
O. FSVEL	515
P. PPRES	516
O. RFIND	518
R. AFP	519
S. CDELP	524
T. STRUCT	526
U. STEADY	528
V. DRAW	561
W. TPUT	564
X. CURVE	568
Y. LINE	569
Z. CSCALE	571

	<u>Page No.</u>
AA. HEDD	719
BB. NLEACH.	721
CC. CHAR	722
DD. STEP	728
EE. GEEPER.	735
FF. HOPPER.	736

APPENDIX C

APPENDIX C - PROGRAM LISTING

C-1. STEADY STATE

SUBROUTINE SIEX (GAPR,GAPM)	SIEXII	2
REAL KRFIL	COM	2
COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
+DENLO,DENHI,TD,SEGNM,PBU,EFPD,STEPS,Z1,Z2,Z3,	COM	4
+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
+YMOD0,YMODS,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
+TIINCR(10),PRATIO(10),CRATIO(10)	COM	7
+ ,ISIEX	COM	8
COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
COMMON/RBX/R0,RM,R02,RM2,RIOP,RB2,RC2,NSEG,OELR,TMTM,NSEGM1,HIGHT,	COM1	2
+PTERM1,PI,PIT2,	COM1	3
+R(10),X(22),REX(22),RBX(22),RCX(22),RBSAV(22),RESAV(22),RMLT(22),	COM1	4
+RROSQ(22),	COM1	5
+P(22),HGP(22),RT(10,22),CLOOT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
+TCL(22),TEG(22),TCG(22),	COM1	7
+RISWEL(22),DELTA0(22),DPSWEL(22),DFSWEL(22),COLOGP(22),	COM1	8
+VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VWV,VVFG,PLENP,PGR,EPV,	COM1	9
+RETFG(22),VFGD(22),VFGRD(3,22),VFGI(22),	COM1	10
+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
+FLUENC(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
DIMENSION GAPR(20),GAPM(20)	COM1	13
C	COM1	14
DATA PI,PIT2/3.1415927,6.28318/	COM1	15
C-----	SIEXII	5
C INPUT	SIEXII	6
C-----	SIEXII	7
CALL INPUT	SIEXII	8
C-----	SIEXII	9
C TIME INCREMENT CONTROL -- INCREMENT TIME,FLUENCE,AND BURNUP	SIEXII	10
C-----	SIEXII	11
W=PI*.25*(FD**2-VOID**2)*FLEN*DENLO*TD	SIEXII	12
BURAT=0.0	SIEXII	13
SECINC=0.0	SIEXII	14
PBU=0.0	SIEXII	15
ISTEP=ABS(STEPS)+1.	SIEXII	16
DO 300 K=1,ISTEP	SIEXII	17
IF (ISTEP.EQ.1) GO TO 120	SIEXII	18
IF (K.EQ.1) EFPD=0.0	SIEXII	19
IF (K.EQ.1) GO TO 160	SIEXII	20
IF (K.GT.1.) EFPD=EFPD+TIINCR(K-1)	SIEXII	21
IF (K.GT.1.) PM=PM*PRATIO(K-1)	SIEXII	22
IF (K.GT.1.) CMF=CMF*CRATIO(K-1)	SIEXII	23
IF (K.GT.2) PM=PM/PRATIO(K-2)	SIEXII	24
IF (K.GT.2) CMF=CMF/CRATIO(K-2)	SIEXII	25

GO TO 140	SIEXII	26
120 EFPD=EFPD	SIEXII	27
PBU=PM*FLEN/(W*.8815)*EFPD	SIEXII	28
BURAT=PBU	SIEXII	29
SECINC=EFPD*8.64E4	SIEXII	30
GO TO 160	SIEXII	31
140 PBU=PBU+PM*FLEN/(W*.8815)*TIINCR(K-1)	SIEXII	32
SECINC=TIINCR(K-1)*8.64E4	SIEXII	33
BURAT=PM*FLEN*TIINCR(K-1)/(W*.8815)	SIEXII	34
160 DO 180 J=1,NSEG	SIEXII	35
BUI(J)=BURAT*PMP(X(J),E,FLEN)	SIEXII	36
BU(J)=BU(J)+BUI(J)	SIEXII	37
FLUENCI(J)=PFLUX*SECINC*AFP(X(J),E,FLEN)	SIEXII	38
FLUENC(J)=FLUENC(J)+FLUENCI(J)	SIEXII	39
P(J)=PM*PMP(X(J),E,FLEN)	SIEXII	40
180 CONTINUE	SIEXII	41
C-----	SIEXII	42
C CLADDING TEMPERATURE CALCULATIONS	SIEXII	43
C-----	SIEXII	44
CALL CSINTR	SIEXII	45
C-----	SIEXII	46
C CLADDING DEFORMATIONS--THERMAL EXPANSION AND IRRADIATION SWELLING	SIEXII	47
C-----	SIEXII	48
CALL COELD	SIEXII	49
IF (ITAB1.EQ.0) GO TO 200	SIEXII	50
IF (ITAB2.EQ.0) GO TO 200	SIEXII	51
IF (ITAB3.EQ.0) GO TO 200	SIEXII	52
C-----	SIEXII	53
C FUEL - CLADDING HEAT TRANSFER COEFFICIENT	SIEXII	54
C-----	SIEXII	55
CALL HGAP	SIEXII	56
C-----	SIEXII	57
C FUEL TEMPERATURE CALCULATIONS	SIEXII	58
C-----	SIEXII	59
200 CALL FSINTR (1)	SIEXII	60
IF (ITAB2.EQ.0) GO TO 220	SIEXII	61
C-----	SIEXII	62
C FUEL DIMENSIONAL CHANGES	SIEXII	63
C-----	SIEXII	64
CALL FOELD (1)	SIEXII	65
220 IF (ITAB1.EQ.0) GO TO 240	SIEXII	66
C-----	SIEXII	67
C FISSION GAS RELEASE AND FORMATION	SIEXII	68
C-----	SIEXII	69

CALL F1SGAS (1)	SIEXII	70
C-----	SIEXII	71
C PLENUM PRESSURE	SIEXII	72
C-----	SIEXII	73
CALL PPRES	SIEXII	74
240 IF (ITAB4.EQ.0) GO TO 260	SIEXII	75
C-----	SIEXII	76
C ELASTIC STRESS CALCULATIONS	SIEXII	77
C-----	SIEXII	78
CALL STRESS	SIEXII	79
260 CALL OUTPUT	SIEXII	80
DO 280 I=1,20	SIEXII	81
GAPR(I)=HGP(I)*PI*RISHL(I)*2.54	SIEXII	82
IF (GAPM(I).EQ.0.0) GAPM(I)=GAPR(I)	SIEXII	83
GAPM(I)=AMIN1(GAPM(I),GAPR(I))	SIEXII	84
280 CONTINUE	SIEXII	85
300 CONTINUE	SIEXII	86
RETURN	SIEXII	87
END	SIEXII	88

	FUNCTION CONMIX (T,GMOL,TMOL)	CONMIX	2
C		CONMIX	3
C	CALCULATES THE THERMAL CONDUCTIVITY OF A THREE GAS MIXTURE AT TEMP	CONMIX	4
C	T USING BROKAW'S EQUATION	CONMIX	5
C		CONMIX	6
	DIMENSION GMOL(5)	CONMIX	7
	XK=0.	CONMIX	8
	XOVK=0.	CONMIX	9
	NGAS=5	CONMIX	10
	DO 120 I=1,NGAS	CONMIX	11
	C=CON(I,T)	CONMIX	12
	XK=XK+C*GMOL(I)	CONMIX	13
	XOVK=XOVK+GMOL(I)/C	CONMIX	14
120	CONTINUE	CONMIX	15
	CONMIX=.5*XK+.5/XOVK	CONMIX	16
	RETURN	CONMIX	17
	END	CONMIX	18

	FUNCTION CON (K,T)	CON	2
C		CON	3
C	EVALUATES CONDUCTIVITY EQUATIONS FOR THE GAS CALLED BY INDEX K	CON	4
C		CON	5
	COMMON/HCOM/A(5,3),GMOL(5)	CON	6
C		CON	7
C	GAS CONDUCTIVITIES	CON	8
	DATA (A(1,J),J=1,3)/1.3084E-3,3.6961E-6,-5.848E-10/	CON	9
	DATA (A(2,J),J=1,3)/5.7392E-5,1.4509E-7,-2.3229E-11/	CON	10
	DATA (A(3,J),J=1,3)/9.5598E-5,2.1357E-7,-3.5057E-11/	CON	11
	DATA (A(4,J),J=1,3)/2.570E-4,5.651E-7,-7.336E-11/	CON	12
	DATA (A(5,J),J=1,3)/1.716E-4,4.122E-7,-8.015E-11/	CON	13
C		CON	14
	CON=A(K,1)+A(K,2)*T+A(K,3)*T**2	CON	15
	RETURN	CON	16
	END	CON	17

	FUNCTION TERP (X,Y,XX,N)	TERP	2
C		TERP	3
C	ROUTINE TO LINEARLY INTERPOLATE FOR A VALUE CORRESPONDING TO XX,	TERP	4
C	GIVEN THE VECTORS X(INDEPENDENT VARIABLES) AND Y(DEPENDENT	TERP	5
C	VARIABLES) EACH OF LENGTH N	TERP	6
C		TERP	7
	DIMENSION X(N),Y(N)	TERP	8
C		TERP	9
	DO 120 I=1,N	TERP	10
	II=I	TERP	11
	IF (XX.LE.X(I)) GO TO 140	TERP	12
120	CONTINUE	TERP	13
	TERP=Y(II)+((Y(II)-Y(II-1))*(XX-X(II)))/(X(II)-X(II-1))	TERP	14
	RETURN	TERP	15
140	IF (II.EQ.1) GO TO 160	TERP	16
	TERP=Y(II)+(Y(II-1)-Y(II))*(XX-X(II))/(X(II-1)-X(II))	TERP	17
	RETURN	TERP	18
160	TERP=Y(1)	TERP	19
	RETURN	TERP	20
	END	TERP	21

```

      FUNCTION T (S,IO)
      COMMON/TBLS2/ST(2,18),NT(2),TCENT(17)
C
C      INTERPOLATE ON ST (INTEGRAL K DT) TABLES TO DETERMINE T(S)
C      IO IS 1 FOR LOW, 2 FOR HIGH DENSITY
C
      I=NT(IO)
      IF (S-ST(IO,I)) 140,180,120
120  T=TCENT(I)
      STAR=STAR2
      GO TO 260
C
140  N=I
      DO 160 J=1,N
      I=J
      IF (S-ST(IO,I)) 200,180,160
160  CONTINUE
180  T=TCENT(I)
      GO TO 220
C
200  TL=TCENT(I-1)
      SL=ST(IO,I-1)
      T=TL+(S-SL)*(TCENT(I)-TL)/(ST(IO,I)-SL)
220  IF (T-2680.) 260,260,240
240  STAR=STAR1
260  RETURN
      END

```

T	2
T	3
T	4
T	5
T	6
T	7
T	8
T	9
T	10
T	11
T	12
T	13
T	14
T	15
T	16
T	17
T	18
T	19
T	20
T	21
T	22
T	23
T	24
T	25
T	26
T	27
T	28

	FUNCTION S (T,IO)	S	2
C		S	3
C	CALCULATE INTEGRAL (K DT) FOR DENSITIES DL, DH AND TEMPERATURE T	S	4
C	S CALLED WHEN INTEGRAL EVALUATION DESIRED	S	5
C	T IS TEMPERATURE, DEGREES CENTEGRADE	S	6
C	IO IS 1 FOR LOW, 2 FOR HIGH DENSITY	S	7
C		S	8
	DIMENSION C(2,4)	S	9
	COMMON/TBLS2/ST(2,19),NT1,NT2,TCENT(17)	S	10
	REAL KRFIL	COM	2
	COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
	+DENLO,DENHI,TD,SEGNUM,PBU,EFPO,STEPS,Z1,Z2,Z3,	COM	4
	+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
	+YMOD0,YMODS,PNU,PFLCX,TMSWG,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
	+TIINCR(10),PRATIO(10),CRATIO(10)	COM	7
	+ ,ISIEX	COM	8
	COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
	DATA TCENT/0.,100.,200.,400.,600.,800.,1000.,1200.,1400.,	S	12
	+1600.,1800.,2000.,2200.,2400.,2600.,2800.,3000./,NT1,NT2/17,17/	S	13
	+ ,BLANK/6H /	S	14
C		S	15
C	FUNCTIONAL FORM OF INTEGRAL (K DT)	S	16
C		S	17
	SF(X)=C(I,1)*(ALOG(C(I,3)+C(I,2)*(X+273.)))/C(I,2)+C(I,4)*(X+273.)*	S	18
	+*4)	S	19
C		S	20
C		S	21
C		S	22
	IF (T-3000.) 140,140,120	S	23
	120 WRITE (6,280) T	S	24
	GO TO 200	S	25
	140 IF (T-2680) 180,180,160	S	26
	160 CONTINUE	S	27
C	TEMPERATURE IN NORMAL RANGE	S	28
	180 I=IO	S	29
	S=SF(T)	S	30
	200 RETURN	S	31
C		S	32
C		S	33
C	SINPUT CALLED TO INITIALIZE DL,DH VALUES	S	34
C		S	35
	ENTRY SINPUT	S	36
	DO 220 I=1,2	S	37
	IF (I.EQ.1) D=DENLO	S	38

IF (I.EQ.2) D=DENHI	S	39
C(I,1)=1.133*Q/(12.-21.*Q+10.*Q**2)	S	40
C(I,2)=0.02935	S	41
C(I,3)=.78	S	42
C(I,4)=6.6E-13/4.	S	43
220 CONTINUE	S	44
C	S	45
C GENERATE TABLE TO GIVE T AS FUNCTION OF INTEGRAL K DT	S	46
C	S	47
NTM1=NT1-1	S	48
DO 260 II=1,2	S	49
I=II	S	50
DO 240 J=1,NTM1	S	51
240 ST(I,J)=SF(TCENT(J))	S	52
ST(I,NT1)=SF(TCENT(NT1))	S	53
260 ST(I,NT1+1)=-1000.	S	54
C	S	55
280 FORMAT ('0MELTING -- INTEGRAL (K DT) SET TO -1000. '//,E12.4)	S	56
END	S	57

SUBROUTINE FSINTR (ISAV)	FSINTR	2
REAL KRFIL	COM	2
COMMON/INPT/FLEN,E,FD,VOID,DP,CT,FM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
+JENLO,DENHI,TD,SEGNUM,PBU,EFPJ,STEPS,Z1,Z2,Z3,	COM	4
+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
+YMOD0,YMODS,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
+TIINCR(10),PRATIO(10),CRATIO(10)	COM	7
+ ,ISIEX	COM	8
COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
COMMON/RBX/RO,RM,R02,RM2,RIDP,RB2,RC2,NSEG,DELR,TMTM,NSEGM1,HIGHT,	COM1	2
+PTERM1,PI,PIT2,	COM1	3
+R(10),X(22),RcX(22),R3X(22),RCX(22),RBSAV(22),RcSAV(22),RMLT(22),	COM1	4
+RROSQ(22),	COM1	5
+P(22),HGP(22),RT(10,22),CLOOT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
+TCL(22),TcG(22),TCG(22),	COM1	7
+RISHWL(22),DELTA0(22),OPSWEL(22),OFSWEL(22),COLDGP(22),	COM1	8
+VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VWV,VVFG,PLENP,PGR,EPV,	COM1	9
+RETFG(22),VFG0(22),VFGRD(3,22),VFGI(22),	COM1	10
+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
+FLUENC(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
DIMENSION GAPR(20),GAPH(20)	COM1	13
C	COM1	14
DATA PI,PIT2/3.1415927,6.28318/	COM1	15
C	FSINTR	5
C-----	FSINTR	6
C PERFORM SOME INITIAL CALCULATIONS	FSINTR	7
C-----	FSINTR	8
RO=FD/2.	FSINTR	9
RM=VOID*.5	FSINTR	10
RMOP=2.*RM/OP	FSINTR	11
RMRO=AMAX1(RM/RO,1.E-6)	FSINTR	12
RM2=(RM)**2	FSINTR	13
R02=RC**2	FSINTR	14
RORM=1./RMRC	FSINTR	15
O4=1./(PIT2*(R02-RM2))	FSINTR	16
DELR=.1*RO	FSINTR	17
R(1)=RO	FSINTR	18
DO 120 K=2,10	FSINTR	19
120 R(K)=R(K-1)-DELR	FSINTR	20
C	FSINTR	21
C LOOP THRU EACH SEGMENT - PERFORMING NECESSARY CALCULATIONS	FSINTR	22
DO 280 J=1,NSEG	FSINTR	23
PTERM1=P(J)*O4	FSINTR	24
I=J	FSINTR	25

STAR=BLANK	FSINTR	26
C-----	FSINTR	27
C FUEL SURFACE TEMPERATURE	FSINTR	28
C-----	FSINTR	29
TZ=CLIDT(J)*P(J)/(HGP(J)*PI*RIDP)	FSINTR	30
C	FSINTR	31
C EVALUATE INTEGRAL K DT AT FUEL SURFACE TEMP STEP 5	FSINTR	32
SLOT0=S(TZ,1)	FSINTR	33
C CALCULATE CENTER LINE TEMP WITHOUT SINTERING STEP 6	FSINTR	34
SLOTCL=SLOT0+PTERM1*(.5*RO2-.5*RM2-RM2*ALOG(RCRM))	FSINTR	35
TCL(J)=T(SLOTCL,1)	FSINTR	36
C-----	FSINTR	37
C DETERMINE THE FUEL MICROSTRUCTURE	FSINTR	38
C-----	FSINTR	39
CALL STRUCT (SLOT0,SHOTB,SHTBTC,J,ISAV)	FSINTR	40
TC(J)=TCL(J)	FSINTR	41
IF (RBX(J).LE.RM) GO TO 140	FSINTR	42
C-----	FSINTR	43
C DETERMINE THE FUEL CENTER TEMPERATURE WITH RESTRUCTURING	FSINTR	44
C-----	FSINTR	45
PTERM2=PTERM1*DENHI/DENLO	FSINTR	46
SHTBTC=PTERM2*(.5*RBX(J)**2-.5*RCX(J)**2-(RCX(J)**2)*ALOG(RBX(J)/R	FSINTR	47
+CX(J)))	FSINTR	48
SHOTC=SHOTB+SHTBTC	FSINTR	49
TC(I)=T(SHOTC,2)	FSINTR	50
C	FSINTR	51
C DETERMINE THE EXTENT OF MELTING (IF IT OCCURS)	FSINTR	52
C-----	FSINTR	53
IF (TC(I).LT.2760.) GO TO 140	FSINTR	54
SLOTM=S(2760.,2)-SHOTB	FSINTR	55
RMLT(J)=RFIND(SLOTM/PTERM2,RBX(J),RCX(J))	FSINTR	56
GO TO 160	FSINTR	57
140 RMLT(I)=RM	FSINTR	58
160 CONTINUE	FSINTR	59
C-----	FSINTR	60
C COMPUTE THE COMPLETE RADIAL TEMPERATURE DISTRIBUTIONS AT TEN	FSINTR	61
C EQUALLY SPACE NODES	FSINTR	62
C-----	FSINTR	63
KUP=9-AINT(RCX(J)/DELR)	FSINTR	64
TR=TZ	FSINTR	65
DO 240 K=1,KUP	FSINTR	66
RT(K,I)=TR	FSINTR	67
IF (RBX(J)-R(K+1)) 180,200,220	FSINTR	68
180 TR=T((.5*RO2-.5*R(K+1)**2-RM2*ALOG(RO/R(K+1)))*PTERM1+SLOT0,1)	FSINTR	69

GO TO 240	FSINTR	70
200 TR=TB	FSINTR	71
GO TO 240	FSINTR	72
220 TR=T((.5*RBX(J)**2-.5*R(K+1)**2-(RCX(J)**2)*ALOG(RBX(J)/R(K+1)))*P	FSINTR	73
+TERM2+SHOTB,2)	FSINTR	74
240 CONTINUE	FSINTR	75
KUP=KUP+1	FSINTR	76
GO 260 K=KUP,10	FSINTR	77
RT(K,I)=TR	FSINTR	78
260 TR=TC(I)	FSINTR	79
280 CONTINUE	FSINTR	80
C	FSINTR	81
RETURN	FSINTR	82
END	FSINTR	83

SUBROUTINE OUTPUT	OUTPUT	2
COMMON/HCOM/A(5,3),GMOL(5)	OUTPUT	3
REAL KRFIL	COM	2
COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
+DENLO,DENHI,TD,SEGNUM,PBU,EFPD,STEPS,Z1,Z2,Z3,	COM	4
+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
+YMOD0,YMOD5,PNU,PFLX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
+TIINCR(10),PRATIO(10),CRATIO(10)	COM	7
+ISIEX	COM	8
COMMON/PROFC/DATAX(30),DATAFP(30),READE8(20),READTF(21),READP(21)	COM	9
COMMON/RBX/RO,RM,RO2,RM2,RIDP,RB2,RC2,NSEG,DELR,TMTM,NSEGM1,HIGHT,	COM1	2
+PTERM1,PI,PIT2,	COM1	3
+R(10),X(22),REX(22),RBX(22),RCX(22),RBSAV(22),RESAV(22),RMLT(22),	COM1	4
+RROSQ(22),	COM1	5
+P(22),HGP(22),RT(10,22),CLOOT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
+TCL(22),TEG(22),TCG(22),	COM1	7
+RISWEL(22),DELTAD(22),DPSWEL(22),DPSWEL(22),COLDGP(22),	COM1	8
+VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VHV,VVFG,PLENP,PGR,EPV,	COM1	9
+RETFG(22),VFGD(22),VFGRD(3,22),VFGI(22),	COM1	10
+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
+FLUENC(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
DIMENSION GAPR(20),GAPH(20)	COM1	13
	COM1	14
	COM1	15
DATA PI,PIT2/3.1415927,6.28318/	OUTPUT	6
IF (ISIEX.EQ.0) GO TO 120	OUTPUT	7
CALL SPAGE	OUTPUT	8
WRITE (6,680)	OUTPUT	9
120 CONTINUE	OUTPUT	10
	OUTPUT	11
	OUTPUT	12
	OUTPUT	13
	OUTPUT	14
	OUTPUT	15
	OUTPUT	16
	OUTPUT	17
	OUTPUT	18
	OUTPUT	19
	OUTPUT	20
	OUTPUT	21
	OUTPUT	22
	OUTPUT	23
	OUTPUT	24
	OUTPUT	25

REX(I)=REX(I)/2.54	OUTPUT	26
RCX(I)=RCX(I)/2.54	OUTPUT	27
RBX(I)=RBX(I)/2.54	OUTPUT	28
RMLT(I)=RMLT(I)/2.54	OUTPUT	29
COLDGP(I)=COLDGP(I)/2.54	OUTPUT	30
OFSWEL(I)=OFSWEL(I)/2.54	OUTPUT	31
DPSWEL(I)=DPSWEL(I)/2.54	OUTPUT	32
RISWEL(I)=RISWEL(I)/2.54	OUTPUT	33
X(I)=X(I)/2.54	OUTPUT	34
P(I)=(P(I)*12.*2.54/1000.)*3413.	OUTPUT	35
HGP(I)=HGP(I)*1761.8	OUTPUT	36
CLIDT(I)=CLIDT(I)*1.8+32.	OUTPUT	37
IF (ISIEX.EQ.0) GO TO 160	OUTPUT	38
WRITE (6,500) I,STAR,X(I),TCOOL(I),CLOOT(I),CLIDT(I),RT(1,I),TCL(I	OUTPUT	39
+I),TC(I),P(I),HGP(I)	OUTPUT	40
160 CONTINUE	OUTPUT	41
C EXPLAIN PRESENCE OF STARS, IF ANY APPEARED	OUTPUT	42
IF (ISTARK) 200,230,180	OUTPUT	43
180 WRITE (6,660) STAR1,SINGLY,STAR2,DOUBLY	OUTPUT	44
ISTARK=0	OUTPUT	45
200 CONTINUE	OUTPUT	46
IF (ISIEX.EQ.0) GO TO 240	OUTPUT	47
CALL SPAGE	OUTPUT	48
WRITE (6,520)	OUTPUT	49
DO 220 I=1,NSEG	OUTPUT	50
WRITE (6,540) I,STAR,X(I),REX(I),TEG(I),RBX(I),TCG(I),RMLT(I),RCX(I	OUTPUT	51
+I)	OUTPUT	52
220 CONTINUE	OUTPUT	53
C WRITE OUT RADII AND TEMPERATURES FOR EACH SEGMENT	OUTPUT	54
C 240 IF (ISIEX.EQ.1) CALL SPAGE	OUTPUT	55
DO 260 I=1,10	OUTPUT	56
R(I)=R(I)/2.54	OUTPUT	57
260 CONTINUE	OUTPUT	58
IF (ISIEX.EQ.0) GO TO 280	OUTPUT	59
WRITE (6,560)	OUTPUT	60
WRITE (6,580) (R(K),K=1,10)	OUTPUT	61
WRITE (6,600)	OUTPUT	62
280 CONTINUE	OUTPUT	63
DO 300 I=1,10	OUTPUT	64
RROSQ(I)=(R(I)/R(1))**2	OUTPUT	65
300 CONTINUE	OUTPUT	66
IF (ISIEX.EQ.0) GO TO 420	OUTPUT	67
WRITE (6,580) (RROSQ(K),K=1,10)	OUTPUT	68
	OUTPUT	69

WRITE (6,620)	OUTPUT	70
DO 320 J=1,NSEG	OUTPUT	71
WRITE (6,640) J,X(J),(RT(K,J),K=1,10)	OUTPUT	72
320 CONTINUE	OUTPUT	73
C IF (ITAB1.EQ.0) GO TO 360	OUTPUT	74
CALL SPAGE	OUTPUT	75
WRITE (6,700)	OUTPUT	76
DO 340 J=1,NSEGM1	OUTPUT	77
WRITE (6,720) J,X(J),VFG(J),(VFGR(I,J),I=1,3),TVFGR(J),RETFG(J)	OUTPUT	78
340 CONTINUE	OUTPUT	79
WRITE (6,740) PGR	OUTPUT	80
WRITE (6,760) TOTFGR,VSG,VWV,EPV,VOFG,PLENP,EXTERP	OUTPUT	81
WRITE (6,780) GMOL	OUTPUT	82
360 IF (ITAB2.EQ.0) GO TO 400	OUTPUT	83
CALL SPAGE	OUTPUT	84
WRITE (6,800)	OUTPUT	85
DO 380 J=1,NSEG	OUTPUT	86
GAP=RISHEL(J)-OFSHEL(J)	OUTPUT	87
WRITE (6,820) J,FLUENG(J),DELTAD(J),DPSHEL(J),DPSHEL(J),RISHEL(J),	OUTPUT	88
+GAP,COLOGP(J)	OUTPUT	89
380 CONTINUE	OUTPUT	90
400 IF (ITAB4.EQ.0) GO TO 460	OUTPUT	91
CALL SPAGE	OUTPUT	92
WRITE (6,840)	OUTPUT	93
420 CONTINUE	OUTPUT	94
DO 440 J=1,NSEG	OUTPUT	95
STI(J)=STI(J)/6.8947E4	OUTPUT	96
SZI(J)=SZI(J)/6.8947E4	OUTPUT	97
STRSI(J)=STRSI(J)/6.8947E4	OUTPUT	98
STO(J)=STO(J)/6.8947E4	OUTPUT	99
SZO(J)=SZO(J)/6.8947E4	OUTPUT	100
STRSO(J)=STRSO(J)/6.8947E4	OUTPUT	101
IF (ISIEX.EQ.0) GO TO 440	OUTPUT	102
WRITE (6,860) J,STI(J),SZI(J),STRSI(J),STO(J),SZO(J),STRSO(J)	OUTPUT	103
440 CONTINUE	OUTPUT	104
460 CONTINUE	OUTPUT	105
DO 480 J=1,NSEG	OUTPUT	106
X(J)=X(J)*2.54	OUTPUT	107
R3X(J)=R3X(J)*2.54	OUTPUT	108
REX(J)=REX(J)*2.54	OUTPUT	109
480 HGP(J)=HGP(J)/1761.8	OUTPUT	110
EXTERP=EXTERP*6.8947E4	OUTPUT	111
RETURN	OUTPUT	112
	OUTPUT	113

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C
500 FORMAT (/I5,A2,3XF7.4,5(6XF7.2),8XF7.2,2(5X1PE9.3)) OUTPUT 114
520 FORMAT (/I1X," AXIAL DIST FROM FUEL EQUIAXED EQUIAXED FUEL OUTPUT 115
+COLUMNAR COLUMNAR RADIUS OF FUEL CENTRAL",/,," SEGMENT BOT OUTPUT 116
+TOM OF ZONE RADIUS, TEMP, ZONE RADIUS, TEMP, MELT OUTPUT 118
+ED FUEL, VOID RADIUS",/,," NUMBER FUEL, IN INCHES OUTPUT 119
+ DEG C INCHES DEG C INCHES INCHES") OUTPUT 120
540 FORMAT (/I5,A2,3XF7.4,6XE9.3,6XF7.2,5XE9.3,6XF7.2,4XE9.3,6XE9.3) OUTPUT 121
560 FORMAT ("G"21X,"RADIUS (INCHES)") OUTPUT 122
580 FORMAT (21X,F7.3,9F10.3) OUTPUT 123
600 FORMAT ("J"57X,"(RADIUS/OUTER RADIUS)--2") OUTPUT 124
620 FORMAT ("JSEG"5X,"INCH"45X,"TEMPERATURE (FAHRENHEIT)") OUTPUT 125
640 FORMAT ("J"12,F10.4,F15.2,9F10.2) OUTPUT 126
660 FORMAT (1XA3,15HTEMPERATURE IN A6,26H STARRED ROWS HAS EXCELEDA6, OUTPUT 127
+18HDEGREES FAHRENHEIT) OUTPUT 128
680 FORMAT (/I1X," AXIAL DIST FROM COOLANT CLAD OD CLAD OUTPUT 129
+ID FUEL OUTER NON-RESTRUC RESTRUC FUEL SEGMENT FUEL OUTPUT 130
+CLAD",/,," SEGMENT BOTTOM OF TEMP, TEMP, TEMP, OUTPUT 131
+ SURF TEMP, FUEL CNTRLIN INNER SURFACE POWER, GAP CO OUTPUT 132
+EF",/,," NUMBER FUEL, IN DEG F DEG F DEG F DEG F OUTPUT 133
+ DEG F TEMP, DEG F TEMP, DEG F BTU/FT-HR BTU/FT--2- OUTPUT 134
+HR-F") OUTPUT 135
700 FORMAT (22X"- - - VOLUME OF FISSION GAS RELEASED (CC) - - -",8X,"R OUTPUT 136
+ETAINED"/" SEG INCH VFG ZONE 1 ZONE 2 ZON OUTPUT 137
+E 3 TOTAL CC/GM OXIDE") OUTPUT 138
720 FORMAT (/I3,F8.4,3X,9(1PE12.4)) OUTPUT 139
740 FORMAT (//" PERCENT FISSION GAS RELEASED ",1PE18.6) OUTPUT 140
760 FORMAT (" VOLUME OF RELEASED FISSION GAS",1PE18.6/" VOLUME OF SORJ OUTPUT 141
+ED GAS ",1PE18.6/" VOLUME OF WATER VAPOR ",1PE18. OUTPUT 142
+b/" EFFECTIVE PLENUM VOLUME ",1PE18.6/" VOLUME OF FILL GAS OUTPUT 143
+ ",1PE18.6/" PLENUM PRESSURE ",1PE18.6/" EX OUTPUT 144
+TERNAL PRESSURE ",1PE18.6) OUTPUT 145
780 FORMAT (" MOLES OF HELIUM ",1PE18.6/" MOLES OF ZENON OUTPUT 146
+ ",1PE18.6/" MOLES OF KRIPTON ",1PE18. OUTPUT 147
+b/" MOLES OF NITROGEN ",1PE18.6/" MOLES OF ARGON OUTPUT 148
+ ",1PE18.6) OUTPUT 149
800 FORMAT (" CLADDING CLAD OUTER FUEL OUTER CLAD OUTPUT 150
+ INNER FUEL-CLAD FUEL-CLAD",/,," SEG FLUENCE SWELLING, RA OUTPUT 151
+DIUS,HOT RADIUS,HOT RADIUS,HOT HOT GAP COLD GAP") OUTPUT 152
820 FORMAT (/I3,7(1PE12.4)) OUTPUT 153
840 FORMAT (16X,"INSIDE STRESS",22X,"OUTSIDE STRESS"/" SEG TANGENTIAL OUTPUT 154
+ AXIAL EFFECTIVE TANGENTIAL AXIAL EFFECTIVE") OUTPUT 155
860 FORMAT (/I3,6(1PE12.4)) OUTPUT 156
END OUTPUT 157

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	SUBROUTINE FISGAS (IS)	FISGAS	2
	COMMON BUNCH(7890),CCPERC(3,20),POROS(3,20)	FISGAS	3
	REAL KRFIL	COM	2
	COMMON/INPT/FLEN,E,FD,VOID,OP,CT,PM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
	+DENLO,DENHI,TD,SEGNUM,PBU,EFPD,STEPS,Z1,Z2,Z3,	COM	4
	+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
	+YMOD0,YMODS,PNU,PFLX,TSMC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
	+TIINGR(10),FRATIO(10),CRATIO(10)	COM	7
	+ISIEX	COM	8
	COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
	COMMON/RBX/RO,RM,RO2,RM2,RIOP,RB2,RC2,NSEG,DELR,TMTM,NSEGM1,HIGHT,	COM1	2
	+PTERM1,PI,PIT2,	COM1	3
	+R(10),X(22),REX(22),RBX(22),RCX(22),RBSAV(22),RESAV(22),RHLT(22),	COM1	4
	+RROSQ(22),	COM1	5
	+P(22),HGP(22),RT(10,22),CLOUT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
	+TCL(22),TEG(22),TCG(22),	COM1	7
	+RISHEL(22),DELTAD(22),OPSWEL(22),DFSWEL(22),COLOGP(22),	COM1	8
	+VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VHV,VVFG,PLENP,PGR,EPV,	COM1	9
	+RETFG(22),VFGD(22),VFGRO(3,22),VFGI(22),	COM1	10
	+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
	+FLUENC(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
	DIMENSION GAPR(20),GAPM(20)	COM1	13
C	DATA PI,PIT2/3.1415927,6.28318/	COM1	14
	DATA X1,X2,X3/.4888E-4,.6614,.000241/	COM1	15
	IF (IS.LT.0) GO TO 200	FISGAS	6
C	CALCULATE METRIC TONS METAL	FISGAS	7
	TMTM=PI*.25*(FD**2-VOID**2)*FLEN*DENLO*TD*.8815E-6	FISGAS	8
C	METRIC TONS METAL PER SEGMENT	FISGAS	9
	RMTM=TMTM/SEGNUM	FISGAS	10
	RMTM6=1./(RMTM*1.E6)	FISGAS	11
	TOTFGR=0	FISGAS	12
	TOTFG=0.0	FISGAS	13
	DO 180 J=1,NSEGM1	FISGAS	14
C	CALCULATE VOLUME OF FISSION GAS GENERATED	FISGAS	15
	VFGI(J)=BUI(J)*RMTM*24.6655	FISGAS	16
	VFG(J)=VFGD(J)+VFGI(J)	FISGAS	17
C	CALCULATE VOLUME OF FISSION GAS RELEASED	FISGAS	18
	PZ1=(RBX(J)**2-RM**2)/(RO**2-RM**2)	FISGAS	19
	PZ2=(REX(J)**2-RBX(J)**2)/(RO**2-RM**2)	FISGAS	20
	PZ3=1.-PZ2-PZ1	FISGAS	21
	PCT1=PZ1*Z1	FISGAS	22
	IF (BU(J).LE.0.0) GO TO 120	FISGAS	23
	DGAS=1.-(1.-EXP(-X1*BU(J)))/(X1*BU(J)*X2*EXP(X3*P(J)))	FISGAS	24
		FISGAS	25

IF (DGAS.LT.0.0) GO TO 120	FISGAS	26
GO TO 140	FISGAS	27
120 DGAS=0.0	FISGAS	28
140 CONTINUE	FISGAS	29
PCT2=PZ2*Z2	FISGAS	30
PCT3=PZ3*Z3	FISGAS	31
IF (Z3.LT.0.0) PCT3=PZ3*DGAS	FISGAS	32
VFGR(1,J)=VFGRD(1,J)+VFGI(J)*PCT1	FISGAS	33
VFGR(2,J)=VFGRD(2,J)+VFGI(J)*PCT2	FISGAS	34
VFGR(3,J)=VFGRD(3,J)+VFGI(J)*PCT3	FISGAS	35
TVFGR(J)=VFGR(1,J)+VFGR(2,J)+VFGR(3,J)	FISGAS	36
TOTFGR=TOTFGR+TVFGR(J)	FISGAS	37
TOTFG=TOTFG+VFG(J)	FISGAS	38
RTFGR(J)=(VFG(J)-TVFGR(J))*RMTM6	FISGAS	39
ABLE=VFG(J)*TD/(RMTM*1.E+6)	FISGAS	40
CCPERC(2,J)=ABLE*DENHI*(1.-Z1)	FISGAS	41
CCPERC(3,J)=ABLE*DENLO*(1.-Z2)	FISGAS	42
BAKER=Z3	FISGAS	43
IF (BAKER.LT.0.0) BAKER=DGAS	FISGAS	44
CCPERC(1,J)=ABLE*DENLO*(1.-BAKER)	FISGAS	45
POROS(1,J)=1.-DENLO	FISGAS	46
POROS(2,J)=1.-DENHI	FISGAS	47
POROS(3,J)=1.-DENLO	FISGAS	48
IF (IS.NE.1) GO TO 180	FISGAS	49
VFGD(J)=VFG(J)	FISGAS	50
DO 160 L=1,3	FISGAS	51
160 VFGRD(L,J)=VFGR(L,J)	FISGAS	52
180 CONTINUE	FISGAS	53
IF (TOTFG.LE.0.0) PGR=0.0	FISGAS	54
IF (TOTFG.LE.0.0) RETURN	FISGAS	55
PGR=TOTFGR/TOTFG*100.	FISGAS	56
RETURN	FISGAS	57
200 DO 220 J=1,NSEG	FISGAS	58
VFGD(J)=0.0	FISGAS	59
DO 220 L=1,3	FISGAS	60
220 VFGRD(L,J)=0.0	FISGAS	61
RETURN	FISGAS	62
END	FISGAS	63

SUBROUTINE INPUT	INPUT	2
DIMENSION C(51)	INPUT	3
EQUIVALENCE (C(1),FLEN)	INPUT	4
COMMON/ALFA/ALFA(14),IFIRST	INPUT	5
REAL KRFIL	COM	2
COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
+DENLO,DENHI,TD,SEGNUM,PBU,EFPD,STEPS,Z1,Z2,Z3,	COM	4
+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
+YMOD0,YMODS,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
+TIINCR(10),PRATIO(10),CRATIO(10)	COM	7
+ ,ISIEX	COM	8
COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
COMMON/RBX/RO,R4,R02,RM2,RIDP,RB2,RC2,NSEG,DELR,TMTM,NSEGM1,HIGHT,	COM1	2
+PTERM1,PI,PIT2,	COM1	3
+R(10),X(22),REX(22),R3X(22),RCX(22),RBSAV(22),RESAV(22),RMLT(22),	COM1	4
+RROSQ(22),	COM1	5
+P(22),HGP(22),RT(10,22),CLOOT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
+TCL(22),TEG(22),TCG(22),	COM1	7
+RISWEL(22),DELTAD(22),DPSWEL(22),DFSWEL(22),COLDGP(22),	COM1	8
+VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VHV,VOFG,PLENP,PGR,EPV,	COM1	9
+RETFG(22),VFGD(22),VFGRO(3,22),VFGI(22),	COM1	10
+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
+FLUENC(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
DIMENSION GAPR(20),GAPM(20)	COM1	13
	COM1	14
C DATA PI,PIT2/3.1415927,6.28318/	COM1	15
C ASSIGN TAPE UNITS	INPUT	8
C	INPUT	9
IFIRST=0	INPUT	10
EFPD=EFPD	INPUT	11
PBUS=PBU	INPUT	12
EFPD=0.0	INPUT	13
PBU=0.0	INPUT	14
IF (ISIEX.EQ.1) CALL SPAGE	INPUT	15
C-----	INPUT	16
C REINITILIZE INPUT PARAMETERS TO PROPER UNITS FOR THE NEXT CASE	INPUT	17
C-----	INPUT	18
FLEN=FLEN/2.54/12.	INPUT	19
E=E/2.54/12.	INPUT	20
FD=FD/2.54	INPUT	21
VOID=VOID/2.54	INPUT	22
DP=DP/2.54	INPUT	23
CT=CT/2.54	INPUT	24
PM=PM/1000.*(2.54*12.)	INPUT	25

GMF=GMF/.1260	INPUT	26
CP=CP/4.186	INPUT	27
MF=MF/5.6761E-4	INPUT	28
HG=HG/5.6761E-4	INPUT	29
CK=CK/.0173	INPUT	30
TI=TI*1.8+32.	INPUT	31
EPL=EPL/2.54	INPUT	32
ALPHA0=ALPHA0/1.8	INPUT	33
ALPHAS=ALPHAS/3.24	INPUT	34
YMODS=YMODS/6.8947E4	INPUT	35
YMOD0=YMOD0/6.8947E4	INPUT	36
EXTERP=EXTERP/6.8947E4	INPUT	37
C	INPUT	38
EFPD=EFPD	INPUT	39
PBU=PBU	INPUT	40
C	INPUT	41
C	INPUT	42
C	INPUT	43
DO 120 J=1,NSLG	INPUT	44
DELTA0(J)=0.0	INPUT	45
BU(J)=0.0	INPUT	46
BU(J)=0.0	INPUT	47
FLUENCI(J)=0.0	INPUT	48
120 FLUENC(J)=0.0	INPUT	49
CALL FDEL0 (-1)	INPUT	50
CALL FISGAS (-1)	INPUT	51
C	INPUT	52
IF (ISIEX.EQ.0) GO TO 140	INPUT	53
WRITE (6,360)	INPUT	54
C	INPUT	55
WRITE (6,380) (C(I),I=1,9)	INPUT	56
WRITE (6,400) (C(I),I=10,18)	INPUT	57
WRITE (6,420) (C(I),I=19,25)	INPUT	58
WRITE (6,440) (C(I),I=26,35)	INPUT	59
WRITE (6,460) (C(I),I=36,38)	INPUT	60
DTAB1=ITA31	INPUT	61
DTAB2=ITA32	INPUT	62
DTAB3=ITA33	INPUT	63
DTAB4=ITA34	INPUT	64
WRITE (6,480) DTAB1,DTAB2,DTAB3,DTAB4	INPUT	65
140 CONTINUE	INPUT	66
C	INPUT	67
C	INPUT	68
C	INPUT	69
CONVERSION OF INPUT VALUES TO CGS UNITS		

EFPOS=EFPO	INPUT	70
P3US=P3U	INPUT	71
FLEN=FLEN*12.*2.54	INPUT	72
E=E*12.*2.54	INPUT	73
FD=FD*2.54	INPUT	74
VOID=VOID*2.54	INPUT	75
DP=DP*2.54	INPUT	76
CT=CT*2.54	INPUT	77
PM=PM*(1000./(12.*2.54))	INPUT	78
CMF=CMF*.1260	INPUT	79
CP=CP*4.186	INPUT	80
HF=HF*5.6761E-4	INPUT	81
HG=HG*5.6761E-4	INPUT	82
CK=CK*.0173	INPUT	83
TI=(TI-.32.)/1.8	INPUT	84
EPL=EPL*2.54	INPUT	85
ALPHA0=ALPHA0*1.8	INPUT	86
ALPHAS=ALPHAS*3.24	INPUT	87
YMODS=YMODS*6.8947E4	INPUT	88
YMOD0=YMOD0*6.8947E4	INPUT	89
EXTERP=EXTERP*6.8947E4	INPUT	90
NSEG=SEGNUM+1	INPUT	91
HIGHT=FLEN/SEGNUM	INPUT	92
DO 160 J=1,NSEG	INPUT	93
160 X(J)=HIGHT*(FLOAT(J)-.5)	INPUT	94
X(NSEG)=FLEN	INPUT	95
C	INPUT	96
C INPUT FORMATS	INPUT	97
C	INPUT	98
L=-SEGNUM	INPUT	99
NSEG=SEGNUM+1	INPUT	100
NSEGM1=NSEG-1	INPUT	101
DO 180 J=1,NSEG	INPUT	102
RESAV(J)=0.0	INPUT	103
RBSAV(J)=0.0	INPUT	104
180 HGP(J)=HG	INPUT	105
NSTEP=ABS(STEPS)	INPUT	106
IF (STEPS) 200,260,260	INPUT	107
C	INPUT	108
C IF STEPS IS NEGATIVE THE VALUES FOR TIME INCREMENTS, POWER RATIO	INPUT	109
C AND COOLANT FLOW RATE RATIO WILL BE USED IN THE CALCULATIONS AND	INPUT	110
C PRINTED IN THE OUTPUT	INPUT	111
C	INPUT	112
200 IF (ISIEX.EQ.0) GO TO 220	INPUT	113

CALL SPAGE	INPUT	114
WRITE (6,500)	INPUT	115
220 CONTINUE	INPUT	116
DAYS=0.0	INPUT	117
DO 240 I=1,NSTEP	INPUT	118
DAYS=DAYS+TIINCR(I)	INPUT	119
POWER=PM*PRATIO(I)*12.*2.54*1.E-3	INPUT	120
FLOW=CMF*CRATIO(I)/.126	INPUT	121
IF (ISIEX.EQ.0) GO TO 240	INPUT	122
WRITE (6,520) I, TIINCR(I), DAYS, PRATIO(I), POWER, CRATIO(I), FLOW	INPUT	123
240 CONTINUE	INPUT	124
GO TO 320	INPUT	125
260 CONTINUE	INPUT	126
C	INPUT	127
C IF BURN UP ,INDICATED BY ZERO FOR EFPO, IS THE TIME STEP INDICATOR	INPUT	128
C THE APPROPRIATE FULL POWER DAYS TO ACHIEVE THIS BURN UP FOR THE PR	INPUT	129
C	INPUT	130
IF (EFPO.GT.0.0) GO TO 280	INPUT	131
W=PI*.25*(FD**2-VOID**2)*FLEN*DENLO*TO	INPUT	132
EFPO=PBW*.8815*W/(PM*FLEN)	INPUT	133
280 CONTINUE	INPUT	134
DO 300 I=1,NSTEP	INPUT	135
TIINCR(I)=EFPO/STEPS	INPUT	136
PRATIO(I)=1.	INPUT	137
CRATIO(I)=1.	INPUT	138
300 CONTINUE	INPUT	139
320 CONTINUE	INPUT	140
RETURN	INPUT	141
WRITE (INT0,340)	INPUT	142
STOP	INPUT	143
C	INPUT	144
340 FORMAT (" FINAL PLOBLEM HAS BEEN COMPLETED")	INPUT	145
360 FORMAT (5,X,"INPUT VALUES"/)	INPUT	146
380 FORMAT (20X," FUEL FIN LENGTH FLEN "1P	INPUT	147
+E18.6," FT ",/,20X," EXTRAPOLATION DISTANCE(SEE INP	INPUT	148
+UT DESCR.) E "1PE18.6," FT ",/,20X," FUEL DIA	INPUT	149
+METER FD "1PE18.6," IN	INPUT	150
+ ",/,20X," FUEL CENTRAL ANNULUS DIAMETER VOID "1P	INPUT	151
+E18.6," IN ",/,20X," PIN DIAMETER	INPUT	152
+ OP "1PE18.6," IN ",/,20X," CLADDING	INPUT	153
+ THICKNESS CT "1PE18.6," IN	INPUT	154
+ ",/,20X," MAXIMUM PIN HEATING RATE PM "1P	INPUT	155
+E18.6," KW/FT ",/,20X," COOLANT MASS FLOW RATE	INPUT	156
+ CMF "1PE18.6," LB/HR ",/,20X," COOLANT	INPUT	157

+SPECIFIC HEAT	CP	"1PE18.6," BTU/LB-DEG F	INPUT	158
+			INPUT	159
400 FORMAT (20X," FILM COEFFICIENT	HF	"1P	INPUT	160
+E18.6," BTU/FT--2-DEG F-HR",/,20X," GAP COEFFICIENT			INPUT	161
+	HG	"1PE18.6," BTU/FT**2-DEG F-HR",/,20X," CLADDING	INPUT	162
+ CONDUCTIVITY	CK	"1PE18.6," BTU/FT-DEG F-H	INPUT	163
+R ".,/,20X," INLET COOLANT TEMPERATURE	TI	"1P	INPUT	164
+E18.6," DEG F		".,/,20X," COLUMNAR TEMPERATURE ZONE(SINT	INPUT	165
+ERING TEMP) TB	"1PE18.6," DEG C	".,/,20X," EQUIAXED	INPUT	166
+ TEMPERATURE ZONE	TEMP2	"1PE18.6," DEG C	INPUT	167
+	".,/,20X," FRACTION OF THEORETICAL DENSITY-UNSI	TRD DENLO	"1P	INPUT
+E18.6," FRACTION	".,/,20X," FRACTION OF THEORETICAL DENSITY-SINT		INPUT	169
+ERED DENHI	"1PE18.6," FRACTION	".,/,20X," FUEL THEORETICAL DEN	INPUT	170
+SITY	TD	"1PE18.6," GM/CC")	INPUT	171
420 FORMAT (20X," NUMBER OF SEGMENTS		SEGNUM	"1P	INPUT
+E18.6,"	".,/,20X," PEAK BURN UP		INPUT	173
+	PBU	"1PE18.6," MWD/MTM	".,/,20X," OPERATIN	INPUT
+G TIME-EFFECTIVE FULL POWER DAYS	EFPD	"1PE18.6," DAYS",/,20X,"	INPUT	175
+STEPS		STEPS	"1PE18.6,"	INPUT
+	".,/,20X," FRACTION OF RELEASE - COLUMNAR ZONE	Z1	INPUT	177
+	"1PE18.6," FRACTION	".,/,20X," FRACTION OF RELEASE - EQUIAX	INPUT	178
+ED ZONE	Z2	"1PE18.6," FRACTION	".,/,20X," RELEASE-UNRE	INPUT
+STRUC ZONE(SEE INPUT DESCR.)	Z3	"1PE18.6," FRACTION	"	INPUT
440 FORMAT (20X," SORBED GAS PER GRAM OF FUEL		CCPGM	"1P	INPUT
+E18.6," CC/GM	".,/,20X," PARTS PER MILLION WATER VAPOR		INPUT	182
+	PPM	"1PE18.6,"	".,/,20X," EFFECTIV	INPUT
+E PLENUM LENGTH	EPL	"1PE18.6," IN	".,/,20X,"	INPUT
+PERCENT OF XENON IN THE TAG GAS	XEFIL	"1PE18.6,/20X,"	P	INPUT
+PERCENT OF KRYPTON IN THE TAG GAS	KRFIL	"1PE18.6,/20X,"	CO	INPUT
+EF LINEAR EXPAN - INTERCEPT	ALPHA0	"1PE18.6," IN/IN DE	INPUT	187
+G F	".,/,20X," COEF LINEAR EXPAN - SLOPE	ALPH	INPUT	188
+AS "1PE18.6," IN/IN (DEG F)--2	".,/,20X," YOUNGS MODULUS - INTERCE		INPUT	189
+PT	YMOD0	"1PE18.6," LB/IN--2	".,/,20X," YO	INPUT
+UNGS MODULUS - SLOPE	YMODS	"1PE18.6," LB/IN--2	INPUT	191
+	".,/,20X," POISSONS RATIO	PNU	INPUT	192
+	"1PE18.6)		INPUT	193
460 FORMAT (20X," PEAK FLUX		PFLUX	"1P	INPUT
+E18.6," NEUT/CM--2SEC	".,/,20X," MATERIAL(1=304X316ST,		INPUT	195
+	TMSWC	"1PE18.6,"	".,/,20X,"	INPUT
+ 2=316 20_ CH, ".,/,20X,"	3=304ST CLADDING EQ.)	".,/,20X,"	INPUT	197
+EXTERNAL PRESSURE	EXTERP	"1PE18.6," PSIG	INPUT	198
+	"		INPUT	199
480 FORMAT (20X," FISSION GAS RELEASE/PLENUM PRESS. OPTION	ITAB1	"1P	INPUT	200
+E18.6," 1=CALC 0=8YPASS	".,/,20X," PIN DELTA D/D OPTION		INPUT	201

+	ITAB2	"1PE18.6,"	1=CALC	0=BYPASS	"/,20X,"	HOT GAP	INPUT	202
+COEFFICIENT OPTION	ITAB3	"1PE18.6,"	1=CALC	0=CONS		INPUT	203	
+TANT"/,20X,"	ELASTIC STRESS OPTION	ITAB4	"1P			INPUT	204	
+E18.6,"	1=CALC	0=BYPASS				INPUT	205	
500	FORMAT	(///,2X,"---	SUMMARY TABULATION OF PIN POWER AND COOLANT FL			INPUT	206	
+OWRATE VERSUS TIME INCREMENT FOR THIS ANALYSIS ---"	///,33X,"ANALYS		INPUT	207				
+IS",8X,"TIMESTEP",22X,"TIMESTEP",7X,"TIMESTEP",/,16X,"ELAPSED TIME		INPUT	208					
+",4X,"CUMULATIVE",5X,"POWER RATIO",6X,"TIMESTEP",6X,"FLOW RATIO",6		INPUT	209					
+X,"COOLANT",/,16X,"WITHIN STEP",6X,"TIME",8X,"TO INPUT PH",6X,"		INPUT	210					
+POWER",6X,"TO INPUT CMF",3X,"FLOWRATE",/,4X,"TIMESTEP",5X,"DAYS		INPUT	211					
+(EFPD)",5X,"DAYS(EFPD)",8X,"RATIO",11X,"KW/FT",9X,"RATIO",10X,"LB/		INPUT	212					
+HR",/)		INPUT	213					
520	FORMAT	(6XF3.0,9XF7.2,8XF7.2,10XF5.2,11XF5.2,9XF5.2,9XF7.2)		INPUT	214			
END			INPUT	215				

		SUBROUTINE HGAP		HGAP	2
	C			HGAP	3
	C			HGAP	4
	C	SUBROUTINE HGAP CALCULATES AN EFFECTIVE FUEL-CLAD GAP CONDUCTANCE		HGAP	5
5	C	WHICH IS DEPENDENT ON THE GAP'S WIDTH AND GAS COMPOSITION		HGAP	6
	C			HGAP	7
	C	*** GLOSSARY ***		HGAP	8
	C	RISHWL(I) = VECTOR OF DEFORMED INNER CLADDING RADII		HGAP	9
	C	CLIDT(I) = VECTOR OF INNER CLADDING TEMPERATURES		HGAP	10
10	C	GMOL(1) = FFACTION OF HELIUM IN PLENUM GAS		HGAP	11
	C	GMOL(2) = FFACTION OF XENON IN PLENUM GAS		HGAP	12
	C	GMOL(3) = FFACTION OF KRYPTON IN PLENUM GAS		HGAP	13
	C	TMOLE = TOTAL MOLES OF GAS IN THE PLENUM AREA		HGAP	14
	C	DEFWL(J) = VECTOR OF DEFORMED FUEL RADII		HGAP	15
15	C			HGAP	16
	C			HGAP	17
	C	DIMENSION GMW(5),HSAV1(22)		HGAP	18
	C	LOGICAL TGO		HGAP	19
20	C	COMMON/TRGAP/DJUMP(20),RFG1(20),FMOL(5),ACCN(5,3),CLADOP,CLADIF,		HGAP	20
	C	+POISSN,ALFAF1,ALFAF2,ALFAC1,ALFAC2,YMODF1,YMODF2,YMODC1,YMODC2,		HGAP	21
	C	+NTGAP		HGAP	22
	C	COMMON/HCOM/A(5,3),GMOL(5)		HGAP	23
	C	REAL KPFIL		COM	24
25	C	COMMON/INPT/FLEN,E,FO,VOID,DP,CT,PY,CYF,CP,HF,HG,CK,TI,TB,TEMP2,		COM	25
	C	+DFNLO,DENHI,TQ,SEGNM,PNU,LFPO,STEPS,71,Z2,Z3,		COM	26
	C	+CCPGY,PPM,EPL,XEFIL,KPFIL,ALPHA0,ALPHAS,		COM	27
	C	+YMODS,YMODS,PNU,FFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,		COM	28
	C	+TIINC(10),PRATIO(10),CPATIO(10)		COM	29
	C	+ISICX		COM	30
30	C	COMMON/PROFC/DATAX(30),DATAFP(30),PEAOEB(20),RTADTF(21),READP(21)		COM	31
	C	COMMON/RBX/PO,PM,PO2,FH2,FIDP,F82,PC2,NSCG,DFLE,THTM,NSEGM1,HIGHT,		COM	32
	C	+FTEPM1,PI,FIT2,		COM	33
	C	+F(10),X(22),FX(22),FX(22),PCX(22),PBSAV(22),PESAV(22),PMLT(22),		COM	34
	C	+PEOS1(22),		COM	35
35	C	+F(22),HGP(22),PT(10,22),CLODT(22),CLIDT(22),TCOOL(22),TC(22),		COM	36
	C	+TCL(22),TFG(22),TLC(22),		COM	37
	C	+PSWEL(22),DELTA(22),PSWEL(22),DESWEL(22),COLDGP(22),		COM	38
	C	+VFG(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VWV,VVFG,PIENP,PGR,EPV,		COM	39
	C	+RLTFG(22),VFG(22),VFG(3,22),VFG(22),		COM	40
40	C	+STI(22),SZI(22),STPSI(22),STO(22),SZO(22),STRSC(22),		COM	41
	C	+FLUENC(22),FLUENCI(22),RU(22),RUI(22)		COM	42
	C	DIMENSION GAPR(20),GAPM(20)		COM	43
	C			COM	44
45	C	DATA PI,PIT2/3.1415927,6.28318/		COM	45
	C			COM	46
	C	DATA STATEMENTS		HGAP	47
	C			HGAP	48
	C	DATA GMW/4.,131.3,83.7,14.,33.94/		HGAP	49
50	C	DATA IT1/50/		HGAP	50
	C	NGAS=5		HGAP	51
	C	IT13=0		HGAP	52
	C	DO 120 J=1,NSFG		HGAP	53
	C	120 HSAV1(J)=0.0		HGAP	54
	C	140 CALL FSINTR (0)		HGAP	55
55	C	CALL FISGAS (0)		HGAP	56
	C	CALL PFRFS		HGAP	57
	C	CALL FOELD (0)		HGAP	58

Line	Code	Statement	Column
115		U=.5*(T+CLIDT(J))	95
		HGAS=CONMIX(U,GMOL,TMOL)/(AMAX1(GAP,0.0)+EPS)	97
		HS=0.0	98
		IF (GAP.GT.0.0) GO TO 240	99
120	C	-----	100
	C	CLOSED GAP -- TEMPERATURE DROP ACROSS FUEL CLADDING INTERFACE IS	101
	C	CALCULATE BY A METHOD SIMILAR TO THAT PROPOSED BY ROSS AND STOUT	102
	C	-----	103
		NUMB=0	104
125		XKF=(S(T+5.,1)-S(T-5.,1))/10.	105
		XKF=2.*XKF*.2/(XKF+.2)	106
		HS=1+.XKM*(PGAP-PFMX)/YIELD	107
	240	HGP(J)=HGAS+HS+HRAD	108
		T=CLIDT(J)+P(J)/(HGP(J)*6.2832*RISHEL(J))	109
130		IF (ABS(T-TCHK).GT.10.) GO TO 220	110
	260	CONTINUE	111
	C	-----	112
	C	CALCULATED GAP CONDUCTANCE CONVERGENCE CRITERIA	113
135	C	-----	114
	C	-----	115
	C	-----	116
	C	-----	117
		ITT3=ITT3+1	118
		IF (ITT3.GT.25) GO TO 300	119
		TGC=.FALSE.	120
140		DO 230 J=1,NSEG	121
		IF (ABS(HGP(J)-HSAV1(J))/HGP(J).GT..01) TGC=.TRUE.	122
		FRACT=.5	123
		IF (ITT3.GT.10) FRACT=.01	124
		HGF(J)=HSAV1(J)+FRACT*(HGP(J)-HSAV1(J))	125
145		HSAV1(J)=HGP(J)	126
	240	CONTINUE	127
		IF (TGC) GO TO 140	128
		RETURN	129
	300	WRITE (6,320)	130
150		RETURN	131
	C	-----	132
	320	FORMAT (' HGAP HAS FAILED TO CONVERGE IN 25 ITERATIONS')	133
		END	134

REGISTER ALLOCATION

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1 REGISTERS ASSIGNED OVER THE LOOP BEGINNING AT LINE 64
2 REGISTERS ASSIGNED OVER THE LOOP BEGINNING AT LINE 67
2 REGISTERS ASSIGNED OVER THE LOOP BEGINNING AT LINE 73

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	SUBROUTINE CSINTR	CSINTR	2
	EQUIVALENCE(TB,TEMP1)	CSINTR	3
	REAL KRFIL	COM	2
	COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PH,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
	+DENLO,DENHI,TD,SEGNUM,PBU,EFPD,STEPS,Z1,Z2,Z3,	COM	4
	+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
	+YMOD0,YMOD5,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
	+TIINCR(10),PRATIO(10),CRATIO(10)	COM	7
	+ ,ISIEX	COM	8
	COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
	COMMON/RBX/RO,RM,RO2,RM2,RIOP,RB2,RC2,NSEG,DELR,TMTM,NSEGM1,HIGHT,	COM1	2
	+FTERM1,PI,PIT2,	COM1	3
	+R(10),X(22),REX(22),R3X(22),RCX(22),R3SAV(22),RESAV(22),RMLT(22),	COM1	4
	+PROSQ(22),	COM1	5
	+P(22),HGP(22),RT(10,22),CLODT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
	+TCL(22),TcG(22),TCG(22),	COM1	7
	+RISWEL(22),DELTA0(22),OPSWEL(22),DFSWEL(22),COLDGP(22),	COM1	8
	+VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VHV,VOFG,PLENP,PGR,EPV,	COM1	9
	+RETFG(22),VFG0(22),VFGRO(3,22),VFGI(22),	COM1	10
	+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
	+FLUENC(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
	DIMENSION GAPR(20),GAPM(20)	COM1	13
C		COM1	14
	DATA PI,PIT2/3.1415927,6.28318/	COM1	15
C		CSINTR	6
	RIOP=DP-2.*CT	CSINTR	7
C	CONVERT AND WRITE OUT INTEGRAL K DT TABLES	CSINTR	8
	X1=INPUT(DUM,IDUM)	CSINTR	9
C	PERFORM INITIAL CALCULATIONS	CSINTR	10
	D1=HF*PI*DP	CSINTR	11
	D2=CT/(CK*PI*(DP-CT))	CSINTR	12
	D3=1.	CSINTR	13
	D4=PIT2*05	CSINTR	14
C		CSINTR	15
C	LOOP THRU EACH SEGMENT - PERFORMING NECESSARY CALCULATIONS	CSINTR	16
C		CSINTR	17
	ISTARK=0	CSINTR	18
	FQ=PM*PMP(0.0,E,FLEN)	CSINTR	19
	DO 120 J=1,NSEG	CSINTR	20
	STAR=BLANK	CSINTR	21
C		CSINTR	22
C	DETERMINE COOLANT TEMPERATURE ALONG THE PIN STEP 2	CSINTR	23
	IF (J.EQ.NSEG) TCOOL(J)=TCOOL(J-1)+(P(J)+P(J-1))* .25*HIGHT/(CMF*CP	CSINTR	24
	*)	CSINTR	25

	IF (J.EQ.1) TCOOL(J)=TI+(P0+P(J))*0.25*HIGHT/(CMF*CP)	CSINTR	26
	IF ((J.GT.1).AND.(J.LT.NSEG)) TCOOL(J)=TCOOL(J-1)+(P(J)+P(J-1))*0.5	CSINTR	27
	+*HIGHT/(CMF*CP)	CSINTR	28
C		CSINTR	29
C	DTF=P(J)/D1	CSINTR	30
C	DTC=P(J)*D2	CSINTR	31
		CSINTR	32
C		CSINTR	33
C	DTF=P(J)/D1	CSINTR	34
C	DTC=P(J)*D2	CSINTR	35
		CSINTR	36
	CLOOT(J)=TCOOL(J)+DTF	CSINTR	37
	CLIDT(J)=CLOOT(J)+DTC	CSINTR	38
120	CONTINUE	CSINTR	39
	RETURN	CSINTR	40
	END	CSINTR	41

	SUBROUTINE SPAGE	SPAGE	2
C		SPAGE	3
C	ROUTINE TO WRITE PAGE HEADINGS	SPAGE	4
C		SPAGE	5
	REAL KRFIL	COM	2
	COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
	+DENLO,JENHI,TD,SEGNUM,PBU,EFPJ,STEPS,Z1,Z2,Z3,	COM	4
	+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
	+YMOD0,YMOJS,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
	+TIINCR(10),PRATIO(10),CRATIO(10)	COM	7
	*,ISIEX	COM	8
	COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
	PRINT 120, EFPD,PBU	SPAGE	7
	RETURN	SPAGE	8
C		SPAGE	9
	120 FORMAT (7H1 TIMEF8.2,13H PEAK BURNUPF8.0)	SPAGE	10
	END	SPAGE	11

	SUBROUTINE STRESS	STRESS	2
	REAL KRFIL	COM	2
	COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PH,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
	*DENLO,DENHI,TD,SEGNUM,PBU,EFPO,STEPS,Z1,Z2,Z3,	COM	4
	*CCPGM,PFM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
	*YMOD0,YMODS,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
	*TIINC(10),PRATIO(10),CRATIO(10)	COM	7
	*,ISIEX	COM	8
	COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
	COMMON/RBX/RD,RM,R02,RM2,RIDP,RB2,RC2,NSEG,DELR,TMTM,NSEGM1,HIGHT,	COM1	2
	*PTERM1,PI,PIT2,	COM1	3
	*R(10),X(22),RcX(22),RBX(22),RCX(22),RBSAV(22),RESAV(22),RMLT(22),	COM1	4
	*RROSQ(22),	COM1	5
	*P(22),HGP(22),RT(10,22),CLOOT(22),CLIOT(22),TCOOL(22),TC(22),	COM1	6
	*TCL(22),TEG(22),TCG(22),	COM1	7
	*RISWEL(22),DELTA0(22),DPSWEL(22),DPSWEL(22),COLDGP(22),	COM1	8
	*VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VWV,VVFG,PLENP,PGR,EPV,	COM1	9
	*RETFG(22),VFGJ(22),VFGJ(3,22),VFGI(22),	COM1	10
	*STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
	*FLUENG(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
	DIMENSION GAPR(20),GAPM(20)	COM1	13
		COM1	14
	DATA PI,FIT2/3.1415927,6.28318/	COM1	15
	RPI=RIDF/2.	STRESS	5
	RP=DP/2.	STRESS	6
	DO 120 J=1,NSEG	STRESS	7
	AVTEMP=(CLOOT(J)+CLIOT(J))/2.0	STRESS	8
	YOUNGS=YMOD0+YMODS*AVTEMP	STRESS	9
	TERM00=CLOOT(J)-CLIOT(J)	STRESS	10
	TERM01=PLENP*((RP**2)+RPI**2)	STRESS	11
	TERM02=(RP**2)-RPI**2	STRESS	12
	TERM03=YOUNGS/(1.-PNU)	STRESS	13
	TERM04=(ALPHA0-20.*ALPHAS+2.*ALPHAS*CLIOT(J))*TERM00	STRESS	14
	TERM05=RP**2/TERM02-1./(2.*ALOG(RP/RPI))	STRESS	15
	TERM06=ALPHAS*TERM00**2	STRESS	16
	TERM07=RP**2/TERM02*(1.-1./ALOG(RP/RPI))+1./(2.*(ALOG(RP/RPI))**2)	STRESS	17
	TERM08=-ALPHA0*TERM00+ALPHAS*TERM00*(20.-CLOOT(J)-CLIOT(J))	STRESS	18
	SRI=-PLENP	STRESS	19
	SRO=-EXTERP	STRESS	20
C	STRESS TANGENTIAL INSIDE SURFACE	STRESS	21
	STI(J)=(PLENP*(RP**2+RPI**2)-2.*EXTERP*RP**2)/TERM02+TERM03*(TERM0	STRESS	22
	*4*TERM05+TERM06*TERM07)	STRESS	23
C	STRESS TANGENTIAL OUTSIDE SURFACE	STRESS	24
	STO(J)=(2.*PLENP*RP**2-EXTERP*(RP**2+RPI**2))/TERM02+TERM03*(TERM	STRESS	25

	+04*TERM05+TERM06*TERM07+TERM08)	STRESS	26
C	AXIAL STRESS INSIDE	STRESS	27
	SZI(J)=.5*(SKI+STI(J))+TERM03*(TERM04*TERM05+TERM06*TERM07)	STRESS	28
C	AXIAL STRESS OUTSIDE	STRESS	29
	SZO(J)=.5*(SRO+STO(J))+TERM03*(TERM04*TERM05+TERM06*TERM07+TERM08)	STRESS	30
C	EFFECTIVE STRESS INSIDE	STRESS	31
	STRSI(J)=SQRT(.5*((SRI-STI(J))**2+(STI(J)-SZI(J))**2+(SZI(J)-SRI)*	STRESS	32
	+*2))	STRESS	33
C	EFFECTIVE STRESS OUTSIDE	STRESS	34
	STRSO(J)=SQRT(.5*((SRO-STO(J))**2+(STO(J)-SZO(J))**2+(SZO(J)-SRO)*	STRESS	35
	+*2))	STRESS	36
120	CONTINUE	STRESS	37
	RETURN	STRESS	38
	END	STRESS	39

-513-

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      SUBROUTINE FDFLD (IS)
      REAL K,FIL
      COMMON/INPT/FLCN,F,FD,VVID,DP,CT,PM,CMF,CP,HF,HG,CK,II,TJ,TEMP2,
      +DMLD,ICMHI,TD,TFGNU,PNU,FDC,STEPS,71,22,Z3,
      +GCPGA,PM,FCL,XEFIL,KFIL,ALPHA3,ALPHAS,
      +YHCOJ,YMODS,PNU,PFLUX,TMSWC,XT,P,ITARI,ITAP2,ITAB3,ITAB4,
      +TIINC,(10),PATIO(10),PATIO(10)
      +,ISILX
      COMMON/PROFC/DATAX(30),DATAF(30),CTCOTB(20),PSACTF(21),FFACTF(21)
      COMMON/RZX/PC,PM,RO2,PM2,PII2,PII2,PC2,NSFG,CLLR,TMTM,NCGM1,HIGHT,
      +PT=PM1,PI,PII2,
      +F(10),X(22),PEX(22),PMX(22),RCX(22),PESAV(22),RESAV(22),PMLT(22),
      +WFCSD(22),
      +P(22),HGP(22),PT(10,22),CLOOT(22),CLIDT(22),TCOGL(22),TC(22),
      +TCL(22),TFG(22),TCG(22),
      +PISW L(22),DLTAQ(22),DPSWEL(22),DFSWEL(22),COLOGP(22),
      +VFG(3,22),VFG(22),TVFG(22),TOTFGF,VSG,VHV,VVFG,PLENP,PGR,EPV,
      +PETF(22),VFGD(22),VFGRO(3,22),VFGI(22),
      +STI(22),SZI(22),STPSI(22),STO(22),SZI(22),STJSC(22),
      +FLUENG(22),FLUENGI(22),RU(22),RUI(22)
      DIMENSION GAPR(20),GAPM(20)
      C
      DATA PI,PII2/3.1415927,6.28318/
      C
      C      FUNCTIONAL FORM OF THE THERMAL EXPANSION
      C
      DO (T)=(.6579E-5+.2.937E-3)*T
      IF (LS.LT.0.0) GO TO 130
      DO 130 J=1,NSFG
      SUM2=0.0
      SUM3=0.0
      AFLL=.
      DO 120 L=1,10
      IF (R(L).LE.PCX(J)) GO TO 140
      LL=L
      SUM2=SUM2+P(LL)*DELPA*APLE
      SUM3=SUM3+P(LL)*DELP*ABLE*DD(RT(LL,J))
      120 APLE=1.
      140 CONTINUE
      SUM2=SUM2+.5*(P(LL)-PCX(J))*(RCX(J)+P(LL))-DELP*R(LL)
      SUM3=SUM3+.5*(P(LL)-PCX(J))*(RCX(J)*DD(TC(J))+P(LL)*DD(PT(LL,J)))
      +DELP*P(LL)*DD(RT(LL,J))
      C
      SUM3=SUM3/SUM2
      ABLE=1.+SUM3
      C
      C      DEFORMIT=RO*ABLE
      C-----
      C      FUEL HOT RADIUS AND FUEL-CLADDING COOLD GAP
      C-----
      0
      PUL=.3J*P(J)/PM
      IF (PUL.LT.60.) PUL=60.
      ICY=PUL*.1E-3
      CY=ICY
      IF (CY.LT.1.) CY=1.
      CFSW L(J)=(RO+FSWEL(P(J),PUL,.5*PIIDP-RO,CY))*ABLE
      CCLDGP(J)=FIDP*.5*(1+.01*CLLTAQ(J))-(RO+FSWEL(P(J),PUL,.5*PIIDP-RO

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SUBROUTINE FDFLD 74/74 OPT=2

FTN 4.2+74351

03/21/75 19.58.51.

PAGE 2

20
+CY3/
100 CONTINUE
RETURN
100 RETURN
END

FDFLD 33
FDFLD 40
FDFLD 41
FDFLD 42
FDFLD 43

FUNCTION FSWEL

74/74 OPT=2

FTN 4.2+74351

03/21/75 13.59.01.

PAGE 1

		FUNCTION FSWEL (P,BUL,GAP,CYCLES)	FDL0	44
	C	PORTION OF GAP CLOSURE DUE TO CRACKING	FDL0	45
		O1=4.E-6*P*(P-100.)*(1.-EXP(-.5*CYCLES))	FDL0	46
		IF (O1.LE.0.0) O1=0.0	FDL0	47
5	C	PORTION OF GAP CLOSURE DUE TO TRANSIENT SWELLING	FDL0	48
		O4=.4*(1.-EXP(-.02*P*BUL*1.E-4))	FDL0	49
	C	O0=GAP	FDL0	50
			FDL0	51
10	C	FSWEL=O0*(O1+O4)	FDL0	52
		RETURN	FDL0	53
		END	FDL0	54
			FDL0	55

```

      SUBROUTINE PPF5
      COMMON/HCOMMON/ (F,3),GMOL(5)
      COMMON/COMMON(4653),VPLEN,PLEN(2),FLEN(2),WHAT(1327),GAMMA,
5      +NHPR (1524)
      +L4L K-FIL
      COMMON/INPUT/ELFN,C,F,D,VOLU,DP,CT,P1,TMF,CP,HE,HG,CK,TI,TB,TMP2,
      +D,NL1,ENHI,TF,SEGNUM,PPU,EF,D,STEPS,71,72,73,
      +CCFGM,PPM,CPL,XFIL,KFIL,ALPHA,ALPHAS,
      +Y1CDL,YMCDL,ZNU,FFLUX,TMSHC,XTDRP,ITAB1,ITAB2,ITAB3,ITAB4,
10      +TIINCR(10),P-RATIO(10),CRATIO(10)
      +IPI-X
      COMMON/PEOFC/DATAX(30),DAT4FP(30),-TAD-B(20),PEACTF(21),PEAPF(21)
      COMMON/PRX/FC,XH,F02,F42,FIDP,F92,F02,NSEG,DCLF,TMTM,NSEGM1,HIGHT,
      +PTERM1,PI,FIT2,
15      +F(10),X(22),YX(22),FX(22),GX(22),-PSAV(22),RESAV(22),RMLT(22),
      +PFGS(22),
      +P(22),HGR(22),-T(19,22),CLOOT(22),CLIT(22),TCOOL(22),TC(22),
      +TCL(22),TEF(22),TCG(22),
      +KISHL(22),DLTAF(22),PCWL(22),DFSHL(22),COLDGP(22),
20      +VFG(3,22),VFG(22),TVFG(22),TCFV,VSG,VWV,VDFG,PLEND,PGF,EFV,
      +ETFG(22),VFG(22),VFGD(3,22),VFGI(22),
      +STI(22),77I(22),STASI(22),STO(22),Z(22),STRSQ(22),
      +FLUHC(22),FLUHCI(22),RU(22),JI(22)
      DIMENSION GAF(20),GAPM(20)
25      C
      DATA PT,PT2/3.1415927,6.28318/
      DATA FU,FPU/.77,.25/
      C
      VOLUME OF SO3 D GAS
      VSG=LD-GH*TMT/.881E-5
30      C
      VOLUME OF WATER VAPOR
      VWV=PPM*TMT/1.5*2.24E4/(18.*.831)
      C
      FFG,TVL PL NUM VOLUME
      FV=PI*PIDP**2*EF/4.
      C
      VOLUME OF FILL GAS
      VCFG=PV*(273./293.)
45      C
      PL NUM PFGSUS
      FLEN=(TOTFG+VFG+VWV+VDFG)*(TOTOL(NSEG)+273.)*1013521./(273.*EFV
      +1)-1013521.
      PFLN(1)=PFLNF+1013521.
49      C
      PLEN(2)=PFLN(1)
      NCLES OF HELIUM IN THE FLENUM AREA (HELIUM COMPOSITION OF THE FILL
      GFL(1)=VDFG*(1.-.01*(XFIL+KFIL))/2.24E4
      C
      MOLES OF FISSION GAS IN THE PL NUM AREA
      FGM=TOTFG/2.24E4
55      C
      MOLES OF XENON (FISSION PRODUCT AND TAG GAS)
      GMOL(2)=FGM*(.2497*FU+.2262*FPU)/(1.27131*FU+.2767*FPU)+VDFG/2.24E4
      +X*FIL*.01
      C
      MOLES OF KRYPTON (FISSION PRODUCT AND TAG GAS)
      GMOL(3)=FGM*(1.02161*FU+.09*FPU)/(1.27131*FU+.2767*FPU)+VDFG/2.24E4
70      C
      +KFIL*.01
      PFLN(1)=(GMOL(1)*4.+GMOL(2)*131.+GMOL(3)*84.)/VPLEN
      PFLN(2)=PLEN(1)
      GAMMA=1.67
      C
      MOLES OF NITROGEN FROM THE OFF GAS
      GMOL(4)=1*VSG/2.24E4
75      C
      MOLES OF ARGON FROM THE OFF GAS
      GMOL(5)=.01*VSG/2.24E4

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      PPF5 3
      PPF5 4
      PPF5 5
      COM 2
      COM 3
      COM 4
      COM 5
      COM 6
      COM 7
      COM 8
      COM 9
      COM1 2
      COM1 3
      COM1 4
      COM1 5
      COM1 6
      COM1 7
      COM1 8
      COM1 9
      COM1 10
      COM1 11
      COM1 12
      COM1 13
      COM1 14
      COM1 15
      PPF5 16
      PPF5 17
      PPF5 18
      PPF5 19
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      PPF5 36
      PPF5 37
      PPF5 38

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SUBROUTINE PPRES 74/74 OPT=2

FTN 4.2+74351

03/21/75 19.59.03.

PAGE 2

RETURN
END

PPRES 39
PPRES 40

-517-

	FUNCTION RFIND (XINT,RR,RV)	RFIND	2
	REAL KRFIL	COM	2
	COMMON/INPT/FLEN,E,FD,VOID,OP,CT,PM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
	+DENLO,DENHI,TD,SEGNUM,PBU,EFPD,STEPS,Z1,Z2,Z3,	COM	4
	+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
	+YMOD0,YMOJS,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
	+TIINCR(10),PRATIO(10),GRATIO(10)	COM	7
	+ISIEX	COM	8
	COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
	COMMON/RBX/R0,RM,R02,RM2,RIDP,RB2,RC2,NSEG,DELR,TMTM,NSEGM1,HIGHT,	COM1	2
	+PTERM1,PI,PIT2,	COM1	3
	+R(10),X(22),REX(22),RBX(22),RCX(22),RBSAV(22),RESAV(22),RMLT(22),	COM1	4
	+RROSQ(22),	COM1	5
	+P(22),HGP(22),RT(10,22),CLOOT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
	+TCL(22),TcG(22),TCG(22),	COM1	7
	+RISWEL(22),DELTA0(22),OPSWEL(22),DFSWEL(22),COLOGP(22),	COM1	8
	+VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VHV,V0FG,PLENP,PGR,EPV,	COM1	9
	+RETFG(22),VFGD(22),VFGRD(3,22),VFGE(22),	COM1	10
	+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
	+FLUENC(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
	DIMENSION GAPR(20),GAPM(20)	COM1	13
C		COM1	14
	DATA PI,PIT2/3.1415927,6.28318/	COM1	15
	IF (ABS(RR-RV).LE..001) GO TO 140	RFIND	5
	T=RR**2-2.*XINT	RFIND	6
C	INITIAL ESTIMATE	RFIND	7
	AF=.5*(RR-RV)	RFIND	8
	DO 120 K=1,50	RFIND	9
	APP=AP-(AP**2-T+2.*RV**2*ALOG(RR/AP))/(AP-RV**2/AP)*.5	RFIND	10
	IF (APP.LE.RV) APP=RV+.00000001	RFIND	11
	IF (ABS(APP-AP)/AP.LE..00001) GO TO 160	RFIND	12
	AP=APP	RFIND	13
120	CONTINUE	RFIND	14
	WRITE (6,180) XINT,RR,RV	RFIND	15
	STOP	RFIND	16
140	APP=RR	RFIND	17
160	RFIND=APP	RFIND	18
	RETURN	RFIND	19
C		RFIND	20
180	FORMAT ('*1 FAILURE TO CONVERGE IN RFIND',3E12.6)	RFIND	21
	END	RFIND	22

```

      FUNCTION AFP (X,E,FLEN)
C-----
C THIS FUNCTION PROVIDES SIXXII WITH AN AXIAL FLUX PROFILE FROM ONE OF
C THREE USER SELECTED ORIGINS DEPENDING ON THE INPUT VALUE FOR THE
C EXTRAPOLATION DISTANCE (E) AS FOLLOWS -----
C   IF (E.LT.0) USE A SPECIFIED EQUATION (SEE LABEL 300 BELOW)
C   IF (E.EQ.0) USE INTERPOLATION FROM INPUTTED DATA TABLES
C   IF (E.GT.0) USE CHOPPED COSINE CURVE WITH EXTRAPOLATION DISTANCE E
C-----
      DIMENSION DATA(21),DATAFP(21)
      COMMON/PROFC/READX(30),READFP(30),READEB(20),READTF(21),READP(21)
      DATA (DATA(I),I=1,21)/0.,.05,.1,.15,.2,.25,.3,.35,.4,.45,.5,
+ .55,.6,.65,.7,.75,.8,.85,.9,.95,1./
      DATA (DATAFP(I),I=1,21)/.781,.819,.857,.890,.924,.951,.970,.988,
+ .997,1.,.995,.987,.970,.948,.923,.894,.860,.827,.788,.762,.751/
      IF (E) 160,140,120
      120 CONTINUE
C-----
C FUNCTION FOR A CHOPPED COSINE CURVE WITH EXTRAPOLATION DISTANCE E
C-----
      XMLT=3.14159/(FLEN+2.*E)
      XTERM=(X+E)*XMLT
      AFP=SIN(XTERM)
      RETURN
      140 CONTINUE
C-----
C FUNCTION FOR INTERPOLATION FROM INPUTTED TABLES
C-----
      NOFP=21
      XX=X/FLEN
      AFP=TERP(DATA,DATAFP,XX,NOFP)
      RETURN
      160 CONTINUE
      IF (E.LT.-1) GO TO 180
C-----
C FUNCTION FOR USER SPECIFIED EQUATION
C-----
      AFP=.7246+.03236*X-.00095*X**2
      RETURN
      180 CONTINUE
C-----
C FUNCTION FOR INTERPOLATION FROM A SET OF INPUTTED DATA
C-----
      NOFP=-E+.001

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AFP	2
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AFP	45

XX=X/FLen
AFP=TERP(READX,READFP,XX,NOFP)
RETURN
END

AFP	46
AFP	47
AFP	48
AFP	49

FUNCTION EBR (X,E,FLEN)	AFP	50
COMMON/PROFC/READX(30),READOP(30),READEB(20),READTF(21),READP(21)	AFP	51
IF (E) 160,140,120	AFP	52
120 CONTINUE	AFP	53
C-----	AFP	54
C FUNCTION FOR EBAR FOLLOWING A CHOPPED COSINE WITH EXTRAPOLATION OI	AFP	55
C-----	AFP	56
EBR=.88	AFP	57
RETURN	AFP	58
140 CONTINUE	AFP	59
C-----	AFP	60
C FUNCTION FOR INTERPOLATION FROM DATA TABLES	AFP	61
C-----	AFP	62
EBR=.633316+.057894*(X/2.54)-.0042851*(X/2.54)**2	AFP	63
RETURN	AFP	64
160 CONTINUE	AFP	65
IF (E.LT.-1) GO TO 180	AFP	66
C-----	AFP	67
C FUNCTION FOR USE OF A USER SPECIFIED EQUATION	AFP	68
C-----	AFP	69
EBR=.88	AFP	70
RETURN	AFP	71
180 CONTINUE	AFP	72
C-----	AFP	73
C FUNCTION TO INTERPOLATE FROM A SET OF INPUTTED DATA	AFP	74
C-----	AFP	75
NOFP=-E+.001	AFP	76
XX=X/FLEN	AFP	77
EBR=TERP(READX,READEB,XX,NOFP)	AFP	78
RETURN	AFP	79
END	AFP	80

FUNCTION TFX (X,E,FLEN)	AFP	81
COMMON/PROFC/READX(30),READFP(30),READEB(20),READTF(21),READP(21)	AFP	82
IF (E) 160,140,120	AFP	83
120 CONTINUE	AFP	84
C-----	AFP	85
C FUNCTION FOR A CHOPPED COSINE WITH EXTRAPOLATION DISTANCE E	AFP	86
C-----	AFP	87
TFX=.85	AFP	88
RETURN	AFP	89
140 CONTINUE	AFP	90
C-----	AFP	91
C FUNCTION FOR INTERPCLATION FROM A SET OF DATA VALUES	AFP	92
C-----	AFP	93
TFX=.85	AFP	94
RETURN	AFP	95
160 CONTINUE	AFP	96
IF (E.LT.-1) GO TO 180	AFP	97
C-----	AFP	98
C FUNCTION FOR USER SPECIFIED EQUATION	AFP	99
C-----	AFP	100
TFX=.85	AFP	101
RETURN	AFP	102
180 CONTINUE	AFP	103
C-----	AFP	104
C FUNCTION FOR INTERPOLATION FROM AN INPUTTED DATA SET	AFP	105
C-----	AFP	106
NOFP=-E+.001	AFP	107
XX=X/FLEN	AFP	108
TFX=TERP(READX,READTF,XX,NOFP)	AFP	109
RETURN	AFP	110
END	AFP	111

FUNCTION PMP (X,E,FLEN)	AFP	112
COMMON/PROFC/READX(30),READFP(30),READEB(20),READTF(21),READP(21)	AFP	113
IF (E) 160,140,120	AFP	114
120 CONTINUE	AFP	115
C-----	AFP	116
C FUNCTION FOR A CHOPPED COSINE WITH EXTRAPOLATION DISTANCE E	AFP	117
C-----	AFP	118
PMP=AFP(X,E,FLEN)	AFP	119
RETURN	AFP	120
140 CONTINUE	AFP	121
C-----	AFP	122
C FUNCTION FOR INTERPOLATION FROM A SET OF DATA VALUES	AFP	123
C-----	AFP	124
PMP=AFP(X,E,FLEN)	AFP	125
RETURN	AFP	126
160 CONTINUE	AFP	127
IF (E.LT.-1) GO TO 180	AFP	128
C-----	AFP	129
C FUNCTION FOR USER SPECIFIED EQUATION	AFP	130
C-----	AFP	131
PMP=AFP(X,E,FLEN)	AFP	132
RETURN	AFP	133
180 CONTINUE	AFP	134
C-----	AFP	135
C-----	AFP	136
C-----	AFP	137
PMP=AFP(X,E,FLEN)	AFP	138
RETURN	AFP	139
END	AFP	140

SUBROUTINE CDELO	CDELO	2
REAL KRFIL	COM	2
COMMON/INPT/FLEN,E,FD,VOID,OP,CT,PM,CMF,CP,HF,HG,CK,TT,TB,TEMP2,	COM	3
+DENLO,DENHI,TD,SEGNM,PBU,EFPD,STEPS,Z1,Z2,Z3,	COM	4
+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
+YMOD0,YMODS,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
+TIINC(10),PRATIO(10),CRATIO(10)	COM	7
+ISIEX	COM	8
COMMON/PROFC/DATA(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
COMMON/RBX/RO,RM,RO2,RM2,RIOP,RB2,RC2,NSEG,DELR,TMTM,NSEGM1,HIGHT,	COM1	2
+PTERM1,PI,PIT2,	COM1	3
+R(10),X(22),REX(22),RBX(22),RCX(22),RBSAV(22),RESAV(22),RMLT(22),	COM1	4
+RROSQ(22),	COM1	5
+P(22),HGP(22),RT(10,22),CLOOT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
+TCL(22),TEG(22),TCG(22),	COM1	7
+RISWEL(22),DELTA0(22),DPSWEL(22),DFSWE(22),COLOGP(22),	COM1	8
+VFGP(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VHV,VOFG,PLENP,PGR,EPV,	COM1	9
+RETFG(22),VFG0(22),VFG0(3,22),VFGI(22),	COM1	10
+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
+FLUENC(22),FLUENCI(22),BUI(22)	COM1	12
DIMENSION GAPR(20),GAPM(20)	COM1	13
C	COM1	14
DATA PI,PIT2/3.1415927,6.28318/	COM1	15
C-----	CDELO	5
C COMPUTE THE CLADDING AVERAGE TEMPERATURE AND THERMAL EXPANSION	CDELO	6
C-----	CDELO	7
DO 200 J=1,NSEG	CDELO	8
CLMTG=(CLOOT(J)+CLIDT(J))/2.0	CDELO	9
DELTAT=CLMTG-20.0	CDELO	10
AVTEMP=(CLIDT(J)+CLOOT(J))/2.0	CDELO	11
ALPHA=ALPHA0+ALPHAS*(AVTEMP-20.)	CDELO	12
C	CDELO	13
IF (FLUENC(J).LT.100.) GO TO 180	CDELO	14
C-----	CDELO	15
C COMPUTE THE CLADDING IRRADIATION SWELLING,PERCENT	CDELO	16
C-----	CDELO	17
C** CONVERT CLADDING MIDWALL TEMP TO KELVIN	CDELO	18
CLMTK=CLMTG+273.	CDELO	19
ITRAN=TMSWC+.00001	CDELO	20
GO TO (120,140,160), ITRAN	CDELO	21
C	CDELO	22
C REF--	CDELO	23
C	CDELO	24
120 COEF=20.4E-12/3.*10.**((1.55E4/CLMTK-5.99E6/CLMTK**2)	CDELO	25

	DELTAO(J)=DELTAO(J)+(COEF*((FLUENC(J)*1.E-22)**1.71-((FLUENC(J)-FLUENCI(J))*1.E-22)**1.71))	COELD	26
	GO TO 180	COELD	27
C		COELD	28
C	REF--	COELD	29
C		COELD	30
	140 A=.05*(CLMTC-600.)	COELD	31
	B=.06*(CLMTC-400.)	COELD	32
	C=.09*(CLMTC-340.)	COELD	33
	D=.05*(CLMTC-475.)	COELD	34
	PONET=(2.+3.*EXP(D))/(1.+EXP(D))	COELD	35
	COEF1=EXP(C)/(1.+EXP(C))	COELD	36
	COEF2=.0022/(1.+EXP(A))+.006/(1.+EXP(B))	COELD	37
	DELTAO(J)=DELTAO(J)+COEF1*COEF2/3.*((FLUENC(J)*1.E-22)**PONET-((FLUENC(J)-FLUENCI(J))*1.E-22)**PONET)	COELD	38
		COELD	39
C		COELD	40
C	REF--	COELD	41
C		COELD	42
	GO TO 180	COELD	43
C		COELD	44
	160 EBAR=.633316+.057849*(X(J)/2.54)-.0042851*(X(J)/2.54)**2	COELD	45
	E3FLU=FLUENC(J)*EBAR*1.E-22	COELD	46
	E3FLUQ=(FLUENC(J)-FLUENCI(J))*1.E-22	COELD	47
	PON=-1.107+.9E-5*CLMTK+.45E-5*CLMTK**2	COELD	48
	COEF=6.9*EXP(-2620./CLMTK)-566900.*EXP(-12000./CLMTK)	COELD	49
	DELTAO(J)=DELTAO(J)+COEF*(E3FLU**PON-E3FLUQ**PON)	COELD	50
	180 CONTINUE	COELD	51
C	-----	COELD	52
C	COMPUTE THE CLADDING DIMENSIONAL CHANGES	COELD	53
C	-----	COELD	54
	OPSWEL(J)=RO*(1.+0.01*DELTAO(J))*(1.+ALPHA*DELTAT)	COELD	55
	OPSWEL(J)=OP*.5*(1.+0.01*DELTAO(J))*(1.+ALPHA*DELTAT)	COELD	56
	RISWEL(J)=RIOP/2.*(1.+0.01*DELTAO(J))*(1.+ALPHA*DELTAT)	COELD	57
	200 CONTINUE	COELD	58
C		COELD	59
	RETURN	COELD	60
	END	COELD	61

SUBROUTINE STRUCT (SLOTO,SHOTJ,SHTBTC,J,ISAV)	STRUCT	2
REAL KRFIL	COM	2
COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PM,CMF,CP,HF,HG,CK,TI,TB,TEMP2,	COM	3
+DENLO,DENHI,TD,SEGNUM,PBU,EFPO,STEPS,Z1,Z2,Z3,	COM	4
+CCPGM,PPM,EPL,XEFIL,KRFIL,ALPHA0,ALPHAS,	COM	5
+YMOD0,YMODS,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4,	COM	6
+TIINCR(10),PRATIO(10),CRATIO(10)	COM	7
*,ISIEX	COM	8
COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21)	COM	9
COMMON/RBX/RO,RM,RO2,RM2,RIDP,RB2,RC2,NSEG,DELTA,TMTM,NSEGM1,HIGHT,	COM1	2
+PTERM1,PI,PIT2,	COM1	3
+R(10),X(22),REX(22),RBX(22),RCX(22),RBSAV(22),RESAV(22),RMLT(22),	COM1	4
+RROSQ(22),	COM1	5
+P(22),HGP(22),RT(10,22),CLOUT(22),CLIDT(22),TCOOL(22),TC(22),	COM1	6
+TCL(22),TEG(22),TCG(22),	COM1	7
+RISHEL(22),DELTAD(22),DPSHEL(22),DFSHEL(22),COLOGP(22),	COM1	8
+VFGR(3,22),VFG(22),TVFGR(22),TOTFGR,VSG,VWV,V0FG,PLENP,PGR,EPV,	COM1	9
+RETFG(22),VFGD(22),VFGRD(3,22),VFGI(22),	COM1	10
+STI(22),SZI(22),STRSI(22),STO(22),SZO(22),STRSO(22),	COM1	11
+FLUENC(22),FLUENCI(22),BU(22),BUI(22)	COM1	12
DIMENSION GAPR(20),GAPM(20)	COM1	13
C DATA PI,PIT2/3.1415927,6.28318/	COM1	14
C - - - - -	COM1	15
C EVALUATE THE COLUMNAR AND EQUIAXED GRAIN GROWTH TEMPERATURES	STRUCT	5
C - - - - -	STRUCT	6
C I=J	STRUCT	7
TCG(J)=1730.0	STRUCT	8
IF (TB.GT.0.0) TCG(J)=TB	STRUCT	9
TEG(J)=1500.	STRUCT	10
IF (TEMP2.GT.0.0) TEG(J)=TEMP2	STRUCT	11
C - - - - -	STRUCT	12
C CALCULATE THE RADIUS OF THE EQUIAXED GRAIN GROWTH ZONE	STRUCT	13
C - - - - -	STRUCT	14
C RE=RM	STRUCT	15
IF (TCL(J).LT.TEG(J)) GO TO 120.	STRUCT	16
SLOTE=S(TEG(I),1)-SLOTO	STRUCT	17
RE=RFIND(SLOTE/PTERM1,RO,RM)	STRUCT	18
120 IF (RESAV(J).LE.RM) GO TO 140	STRUCT	19
IF (RE.LT.RESAV(J)) RE=RESAV(J)	STRUCT	20
140 RE2=RE*RE	STRUCT	21
C - - - - -	STRUCT	22
C CALCULATE THE COLUMNAR GRAIN GROWTH RADIUS	STRUCT	23
C - - - - -	STRUCT	24
C	STRUCT	25

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      R3=RM
      IF (TCL(J).LT.TCG(J)) GO TO 160
      SHOTB=S(TCG(I),1)
      SLTOTB=SHOTB-SLOT0
      SHOTB=S(TCG(J),2)
      R3=RFIND(SLTOTB/PTERM1,R0,RM)
160  IF (RBSAV(J).LE.RM) GO TO 180
      IF (R3.GT.RBSAV(J)) GO TO 180
      R3=RBSAV(J)
      XTB=T((.5*R02-.5*R3**2-RM2*ALOG(R0/R3))*PTERM1+SLOT0,1)
      SHOTB=S(XTB,2)
180  R32=R3*R3
      RC=SQRT(R32-(DENLO/DENHI)*(R32-RM2))
      RC2=RC**2
C
C      SAVE THE VALUES COMPUTED FOR RB,RC , AND RE
C
      REX(I)=RE
      RBX(I)=RB
      RCX(I)=RC
      IF (ISAV,NE.1) GO TO 200
      RBSAV(J)=RB
      RESAV(J)=RE
200  RETURN
      END

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STRUCT 26
STRUCT 27
STRUCT 28
STRUCT 29
STRUCT 30
STRUCT 31
STRUCT 32
STRUCT 33
STRUCT 34
STRUCT 35
STRUCT 36
STRUCT 37
STRUCT 38
STRUCT 39
STRUCT 40
STRUCT 41
STRUCT 42
STRUCT 43
STRUCT 44
STRUCT 45
STRUCT 46
STRUCT 47
STRUCT 48
STRUCT 49
STRUCT 50

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PROGRAM STEADY (INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE12,START STEADY      2
+,TAPE14=START) STEADY      3
LOGICAL FIRST STEADY      4
INTEGER SMELP STEADY      5
REAL KRFIL COM      2
COMMON/INPT/FLEN,E,FD,VOID,DP,CT,PM,CMF,CP,HF,HG,CK,TI,T8,TEMP2, COM      3
+DENLO,DENHI,T0,SEGNUM,PBU,EFPD,STEPS,Z1,Z2,Z3, COM      4
+CCPGM,PPM,EPL,XFIL,KRFIL,ALPHA0,ALPHAS, COM      5
+YMOD0,YMOD5,PNU,PFLUX,TMSWC,EXTERP,ITAB1,ITAB2,ITAB3,ITAB4, COM      6
+TIINCR(10),PRATIO(10),CRATIO(10) COM      7
+,ISIEX COM      8
COMMON/PROFC/DATAX(30),DATAFP(30),READEB(20),READTF(21),READP(21) COM      9
COMMON/TRGAP/OJUMP(20),RFO1(20),FMOL(5),ACON(5,3),CLADOR,CLADIR, STEADY      7
+POISSN,ALFAF1,ALFAF2,ALFAC1,ALFAC2,YMOCF1,YMOCF2,YMOC1,YMOC2, STEADY      8
+NTGAP STEADY      9
DIMENSION TGAP(72) STEADY     10
DIMENSION BUFFER(1024) STEADY     11
DIMENSION BINGO(400) STEADY     12
DIMENSION GAPM(20) STEADY     13
DIMENSION CORE(8437) STEADY     14
DIMENSION HELP(75),SMELP(75) STEADY     15
DIMENSION TCOOL(75,2),RLOG(22,20),UU(3),ULIQ(75),UVAP(75),DELX(75) STEADY     16
+,AFLOW(75),US(4,55),HCAPS(4,55),OSAVE1(4,55,2),OSAVE2(75,2), STEADY     17
+OSAVE3(15,20,2),OSAVE4(75,2),POW(16,20),VOLUME(15,20),HCAPF(15,20) STEADY     18
+,TEMPER(15,20,2),TSINK(4,55,2),VOIDV(20),FPLEN(2),RPLEN(2), STEADY     19
+,G(75,2),RHOO(75,2), VOLG(2),VOLF(2),GASBO(2,2), STEADY     20
+,GASBU(2,2), FUELBD(2),FUELBU(2),FANN(75), STEADY     21
+,P(75,2),RHOG(75,2),RHOF(75,2),WF(75),WG(75),NTOP(75),MTYPE(15,20), STEADY     22
+,IGAS(2),IFUEL(2),IBOIL(2),IBOILD(2,2),IBOILU(2,2),NBOIL(2), STEADY     23
+, IGASO(2,2),IGASU(2,2),IFUEL(2),IFUEL(2), STEADY     24
+,HGAS(2),BASICT(50),CONDUCT(50,2),STEMP(60),ST1(60,2),TSEMP(30), STEADY     25
+,ST2(30),DENSE(2),PINTEN(20,2),GAPR(20),DOPCOE(40),TW(11), STEADY     26
+,RHOONA(75,2),UOLD(75) STEADY     27
+,WHO(4),OKNA(20,2),WALTAR(75),PARTAN(35) STEADY     28
+,CAPS(75),TSTRUK(75,2),USTL(75),USTV(75),OSAVE6(75,2),CLIQ(15), STEADY     29
+,CLIQT(15),CVAF(10),CVAPT(10) STEADY     30
DIMENSION CHANPF(20),NOPINS(20),CH(100),CH(100),FW(100),FH(100), STEADY     31
+,NPERZ(10),AXPF(20),RADPF(11),R(14,10),VOL(14),KTOP(10),RM(13), STEADY     32
+,RRLOG(22),DELL(10),FLOWA(10),CON(4,10),CAP(4,10),UZ(4),VZ(4), STEADY     33
+,TERM5(75),D2(75),D1(15,75),A2(75),PN(2),DELP(10), STEADY     34
+,AAPF(20),DC(100),DH(100),U(15,20), STEADY     35
+,TERMO(75),TERMU(75),LIST(75),RN(14),FRICT(10),TITLE(12) STEADY     36
+,LISTS(20,20),NTHRE(20),NBL0T(20) STEADY     37
+,ICK(15),ETAD(2) STEADY     38

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+.RAUS(2,10),CONS(75),SCAP(75)	STEADY	39
DIMENSION RMQ(11,20),RZ(12,20)	STEADY	40
+.EPYTM(15,20)	STEADY	41
COMMON	STEADY	42
+TCOOL,RLOG,UU,ULIQ,UVAP,DELX,AFLOW,US,HGAPS,DSAVE1,DSAVE2,DSAVE3,	STEADY	43
+DSAVE4,POW,VOLUME,HCAFF,TEMPER,TSINK,VOIDV,VPLEN,PPLEN,RPLEN,G,	STEADY	44
+RHOO,VOLG,VOLF,GT0,GT1,GT2,GT3,GASB0,GASBU,	STEADY	45
+FUELBU,FANN,P,RHOG,RHOF,WF,WC,KOPINS,NAXIAL,NBCORE,NTCORE,NTOP,	STEADY	46
+MTYPE,IGAS,NBPLEN,IFUEL,IBOIL,IGASD,IGASU,IFUELD,IFUELU,IBOILD,	STEADY	47
+IBOILU,NBOIL,NGAS,RLC,RLV,CLC,CLV,CVC,CVV,BASICT,CONDOC,IPAIR1,	STEADY	48
+CGAPA,CGAPB,CGAPC,CGAPD,STEMP,ST1,TSEMP,ST2,DENSEE,DENSE,TMAGIC,	STEADY	49
+TSAT,AHOLE,HAXF,HAXL,HAXV,PSAT,RLIQ,RVAP,RHCFG,PVOIC,IFUELS,JFUELS	STEADY	50
+,TGASS,TSUPER,TFUELS,TMELTH,TMELTL,GAMMA,PINTEM,GAPR,GAPRE,CLVC,	STEADY	51
+DOPCOE,BASENA,WHO,HFUSE,DKNA,WALTAR,PARTAN	STEADY	52
COMMON HI(75),CLADKT,RLV2,CLV2,CVV2,HAXL1,HAXL2,CGAPB2,CLADK	STEADY	53
+,CAPS,TSTRUK,USTL,USTV,DSAVE6,CLIQ,CLIQT,CVAP,CVAPT	STEADY	54
+,HELP,SMELP,RHOONA,TW,UOLD	STEADY	55
+,BOX(102),CGPERC(3,20),POROS(3,20)	STEADY	56
+,YEHYEH(11,20)	STEADY	57
EQUIVALENCE (CORE,TCOOL)	STEADY	58
EQUIVALENCE (DOPCOE(21),DOPPO),(PARTAN(21),IGAP),(WHO(1),DOPPH),	STEADY	59
+(WHO(2),RJASEC)	STEADY	60
+, (DOPCOE(30),WAIT)	STEADY	61
EQUIVALENCE (ULIQ(75),ORIFIC),(UVAP(75),GTOL)	STEADY	62
EQUIVALENCE (PARTAN(22),KFUELS)	STEADY	63
EQUIVALENCE (RMQ,BINGO),(RZ,BINGO(221))	STEADY	64
EQUIVALENCE (CGAPA,LAXIAL)	STEADY	65
+. (MTYPE,EPYTM)	STEADY	66
EQUIVALENCE (TGAP,DJUMP)	STEADY	67
C SPECIFY PARAMETERS FOR TRANSIENT GAP CONDUCTANCE MODEL	STEADY	68
DATA NTGAP/72/	STEADY	69
DATA (RFO1(I),I=1,20)/20*0./	STEADY	70
DATA ALFAF1,ALFAF2/.6578E-5,2.997E-9/	STEADY	71
DATA YMODF1,YMODF2/2.184E12,-2.475E4/	STEADY	72
DATA (ACON(1,J),J=1,3)/1.3084E-3,3.6961E-6,-5.848E-10/	STEADY	73
DATA (ACON(2,J),J=1,3)/5.7392E-5,1.4509E-7,-2.3229E-11/	STEADY	74
DATA (ACON(3,J),J=1,3)/9.5598E-5,2.1357E-7,-3.5057E-11/	STEADY	75
DATA (ACON(4,J),J=1,3)/2.570E-4,5.651E-7,-7.336E-11/	STEADY	76
DATA (ACON(5,J),J=1,3)/1.716E-4,4.122E-7,-8.015E-11/	STEADY	77
C	STEADY	78
DATA IBLANK/1H /,ISTAR/1HS/,ITIC/1HE/	STEADY	79
NAMLIST/ALL/ NCHANS,CHANPF,NOPINS,POWER,LISTS	STEADY	80
+,IPLOT	STEADY	81
+,ITRGAP	STEADY	82

NAMLIST/CHAN/ISETP,TMELTL,TMELTH,FVS,FCS,HFUSEF,FVL,FCL,DENSE,	STEADY	83
+TMELTE,EVS,ECS,DENSEE,HFUSEE,EVL,ECL,NZONE,S,NPERZ,IGOREZ,IPLNZ,	STEADY	84
+AXPF,KTOP,POWF,POWE,POWC,RADPF,R,CGAPA,CGAPB,CLADK,HTCLIQ,VAPHTC,	STEADY	85
+DELL,FLOWA,CON,CAP,CLC,CLV,TINLET,FLOW,TSINT,RLC,RLV,GAMMA,PLENP,	STEADY	86
+WGTMOI,DELP,CW,CH,FW,FH,FILM,CONLIQ,CONVAP,CONFUL,CGAPC,CGAPD	STEADY	87
+,BASICT,CONDOC,IPAIR1,RVAP,RLIQ	STEADY	88
+,CLADKT,EV2L,RLV2,CLV2,CVV2,CONLI1,CONLI2,FV2S,CGAPB2,PEXIT	STEADY	89
+,HVAPC,DC,DH,RBASEC	STEADY	90
+,TSAT,PSAT,AHOLE,TGASS,TSUPER,HAXF,IFUELS,JFUELS,TFUELS,CVC,CVV	STEADY	91
+,SCAP,GUNS,RAOS,ORIFIC,GTOL	STEADY	92
+,PLENA,GAPR,IGAP	STEADY	93
+,DOPPH,DOPPC,KFUELS	STEADY	94
+,PBUI,EFFD,STCPS,Z1,Z2,Z3,CCPGM,PPM,YMODS,YMODS,PNU,PFLUX,ISIEX	STEADY	95
+,TEMP2,IBREAK,WAIT,FV3S	STEADY	96
+,CGAPC2	STEADY	97
C	STEADY	98
DO 120 I=1,8,37	STEADY	99
120 CORE(I)=0.0	STEADY	100
CALL DATE (ETAQ)	STEADY	101
CALL TIME (ETAQ(2))	STEADY	102
KARUS=5	STEADY	103
C GET STARTED	STEADY	104
DO 160 I=1,20	STEADY	105
DO 140 J=1,11	STEADY	106
140 YEHYEH(J,I)=1.	STEADY	107
DO 160 J=1,15	STEADY	108
160 TEMPER(J,I,1)=600.	STEADY	109
DO 180 I=2,54	STEADY	110
DO 180 J=1,4	STEADY	111
180 TSINK(J,I,1)=600.	STEADY	112
DO 200 I=1,102	STEADY	113
200 BOX(I)=0.0	STEADY	114
TW(1)=1.	STEADY	115
TW(3)=0.0	STEADY	116
TW(4)=0.0	STEADY	117
TW(5)=0.0	STEADY	118
TW(6)=0.0	STEADY	119
TW(7)=0.0	STEADY	120
TW(8)=1200.	STEADY	121
C	STEADY	122
NFRINT=6	STEADY	123
NEW=1	STEADY	124
IOLD=2	STEADY	125
C READ TITLE	STEADY	126

PEAD (KARD,3720) (TITLE(I),I=1,8)	STEADY	127
C READ GENERAL DATA	STEADY	128
READ (KARDS,ALL)	STEADY	129
WRITE (NPRINT,3740) ETAD(1),(TITLE(I),I=1,8),ETAD(2)	STEADY	130
WRITE (NPRINT,3760)	STEADY	131
WRITE (NPRINT,3760)	STEADY	132
WRITE (NPRINT,3760)	STEADY	133
WRITE (NPRINT,3760)	STEADY	134
WRITE (NPRINT,3800) NCHANS	STEADY	135
WRITE (NPRINT,3820) POWER	STEADY	136
WRITE (NPRINT,3840) IPLOT	STEADY	137
WRITE (NPRINT,3860)	STEADY	138
WRITE (NPRINT,3880) (I,CHANPF(I),NOPINS(I),(LISTS(J,I),J=1,20),I=1	STEADY	139
*,NCHANS)	STEADY	140
NSKIP=0	STEADY	141
DO 260 I=1,NCHANS	STEADY	142
NTHERE(I)=0	STEADY	143
DO 240 J=1,20	STEADY	144
IF (LISTS(J,I)) 260,260,220	STEADY	145
220 NSKIP=NSKIP+1	STEADY	146
NBLCT(NSKIP)=LISTS(J,I)	STEADY	147
240 NTHERE(I)=NTHERE(I)+1	STEADY	148
260 CONTINUE	STEADY	149
C NORMALIZE CHANNEL POWER FACTORS	STEADY	150
SUM=0.0	STEADY	151
DO 280 ICHAN=1,NCHANS	STEADY	152
280 SUM=SUM+CHANPF(ICHAN)*NOPINS(ICHAN)	STEADY	153
SUM=.5E+6/SUM	STEADY	154
DO 300 ICHAN=1,NCHANS	STEADY	155
300 CHANPF(ICHAN)=CHANPF(ICHAN)*SUM	STEADY	156
PN(NEW)=POWER	STEADY	157
FN(IOLD)=POWER	STEADY	158
DOPSUM=0.0	STEADY	159
IF (IPLOT.EQ.0) GO TO 320	STEADY	160
CALL PLOTS (BUFFER,1024,7)	STEADY	161
CALL PLOT (3.,0,-3)	STEADY	162
320 CONTINUE	STEADY	163
C * * * * *	STEADY	164
C DO FOR EACH CHANNEL	STEADY	165
C * * * * *	STEADY	166
DO 350 ICHAN=1,NCHANS	STEADY	167
READ (KARDS,CHAN)	STEADY	168
IF (NSKIP) 380,380,340	STEADY	169
340 DO 360 I=1,NSKIP	STEADY	170

IF (NBL0T(I)-ICHAN) 360,560,360	STEADY	171
360 CONTINUE	STEADY	172
380 WRITE (NPRINT,3740) ETAD(1),(TITLE(I),I=1,8),ETAD(2)	STEADY	173
WRITE (NPRINT,3760)	STEADY	174
WRITE (NPRINT,3900) ICHAN	STEADY	175
IF (NTHERE(ICHAN)) 420,420,400	STEADY	176
400 K=NTHERE(ICHAN)	STEADY	177
WRITE (NPRINT,3920) (LISTS(J,ICHAN),J=1,K)	STEADY	178
420 WRITE (NPRINT,3940) ICHAN	STEADY	179
WRITE (NPRINT,3960) NZONES	STEADY	180
WRITE (NPRINT,3980) ICOREZ	STEADY	181
WRITE (NPRINT,4000) IPLENZ	STEADY	182
WRITE (NPRINT,4020)	STEADY	183
DO 440 I921X=1,NZONES	STEADY	184
I=NZONES+1-I921X	STEADY	185
WRITE (NPRINT,4040) I,NPERZ(I),KTOP(I),DELL(I),FLOWA(I)	STEADY	186
440 CONTINUE	STEADY	187
WRITE (NPRINT,4060)	STEADY	188
DO 460 I921X=1,NZONES	STEADY	189
I=NZONES+1-I921X	STEADY	190
K=KTOP(I)+1	STEADY	191
IF (I.EQ.ICOREZ) K=K-2	STEADY	192
WRITE (NPRINT,4080) I,(R(J,I),J=1,K)	STEADY	193
460 CONTINUE	STEADY	194
WRITE (NPRINT,3740) ETAD(1),(TITLE(I),I=1,8),ETAD(2)	STEADY	195
WRITE (NPRINT,4100) ICHAN	STEADY	196
WRITE (NPRINT,4120) FCS	STEADY	197
WRITE (NPRINT,4140) FVS	STEADY	198
WRITE (NPRINT,4160) FV2S	STEADY	199
WRITE (NPRINT,4180) FV3S	STEADY	200
WRITE (NPRINT,4200) FCL	STEADY	201
WRITE (NPRINT,4220) FVL	STEADY	202
WRITE (NPRINT,4240) ECS	STEADY	203
WRITE (NPRINT,4260) EVS	STEADY	204
WRITE (NPRINT,4280) ECL	STEADY	205
WRITE (NPRINT,4300) EVL	STEADY	206
WRITE (NPRINT,4320) EV2L	STEADY	207
WRITE (NPRINT,4340) CLC	STEADY	208
WRITE (NPRINT,4360) CLV	STEADY	209
WRITE (NPRINT,4380) CLV2	STEADY	210
WRITE (NPRINT,4400) CVC	STEADY	211
WRITE (NPRINT,4420) CVV	STEADY	212
WRITE (NPRINT,4440) CVV2	STEADY	213
WRITE (NPRINT,4460) DENSE(1)	STEADY	214

WRITE (NPRINT,4480) DENSE(2)	STEADY	215
WRITE (NPRINT,4500) DENSEE	STEADY	216
WRITE (NPRINT,4520) RLIQ	STEADY	217
WRITE (NPRINT,4540) RVAP	STEADY	218
WRITE (NPRINT,4560) TMELTL	STEADY	219
WRITE (NPRINT,4580) TMELTH	STEADY	220
WRITE (NPRINT,4600) TSINT	STEADY	221
WRITE (NPRINT,4620) TMELTE	STEADY	222
WRITE (NPRINT,4640) HFUSEF	STEADY	223
WRITE (NPRINT,4660) HFUSEE	STEADY	224
WRITE (NPRINT,4680) HVAPC	STEADY	225
WRITE (NPRINT,4700) CLADK	STEADY	226
WRITE (NPRINT,4720) CLADKT	STEADY	227
WRITE (NPRINT,4740) CONLIQ	STEADY	228
WRITE (NPRINT,4760) CONLI1	STEADY	229
WRITE (NPRINT,4780) CONLI2	STEADY	230
WRITE (NPRINT,4800) CONVAP	STEADY	231
WRITE (NPRINT,4820) CONFUL	STEADY	232
WRITE (NPRINT,3740) ETAD(1), (TITLE(I), I=1,8), ETAD(2)	STEADY	233
WRITE (NPRINT,4100) ICHAN	STEADY	234
WRITE (NPRINT,4640) RLC	STEADY	235
WRITE (NPRINT,4860) RLV	STEADY	236
WRITE (NPRINT,4880) RLV2	STEADY	237
WRITE (NPRINT,4900) IPAIR1	STEADY	238
DO 480 I=1,IPAIR1,16	STEADY	239
J=I+15	STEADY	240
WRITE (NPRINT,4920) (JASICT(K), K=I,J)	STEADY	241
WRITE (NPRINT,4940) (CONDUCT(K,1), K=I,J)	STEADY	242
WRITE (NPRINT,4960) (CONDUCT(K,2), K=I,J)	STEADY	243
WRITE (NPRINT,4980)	STEADY	244
480 CONTINUE	STEADY	245
WRITE (NPRINT,5000)	STEADY	246
J=NZONES	STEADY	247
DO 500 I921X=1,NZONES	STEADY	248
I=NZONES+1-I921X	STEADY	249
IF (I.EQ.ICOREZ) GO TO 500	STEADY	250
L=KTOP(I)	STEADY	251
J=J-1	STEADY	252
WRITE (NPRINT,5020) I, (CON(K,J), K=1,L)	STEADY	253
500 CONTINUE	STEADY	254
WRITE (NPRINT,5040)	STEADY	255
J=NZONES	STEADY	256
DO 520 I921X=1,NZONES	STEADY	257
I=NZONES+1-I921X	STEADY	258

IF (I.EQ.1CCREZ) GO TO 520	STEADY	259
L=KTOP(I)	STEADY	260
J=J-1	STEADY	261
WRITE (NPRINT,5020) I,(CAP(K,J),K=1,L)	STEADY	262
520 CONTINUE	STEADY	263
WRITE (NPRINT,3740) ETAD(1),(TITLE(I),I=1,8),ETAD(2)	STEADY	264
WRITE (NPRINT,5060) ICHAN	STEADY	265
WRITE (NPRINT,5080) HTCLIQ	STEADY	266
WRITE (NPRINT,5100) VAPHTC	STEADY	267
WRITE (NPRINT,5120) CGAPC	STEADY	268
WRITE (NPRINT,5140) CGAPC2	STEADY	269
WRITE (NPRINT,5160) ICHAN	STEADY	270
WRITE (NPRINT,5180) PCWF	STEADY	271
WRITE (NPRINT,5200) POWE	STEADY	272
WRITE (NPRINT,5220) POWC	STEADY	273
K=KTOP(ICCREZ)-4	STEADY	274
WRITE (NPRINT,5240) (RADPF(I),I=1,K)	STEADY	275
WRITE (NPRINT,5260) ICHAN	STEADY	276
WRITE (NPRINT,5280)	STEADY	277
DO 540 I921X=1,NZONES	STEADY	278
I=NZONES+1-I921X	STEADY	279
IF (RAUS(1,I).LE.0.0) GO TO 540	STEADY	280
WRITE (NPRINT,5300) I,RADS(1,I),RADS(2,I),CONS(I),SCAP(I)	STEADY	281
540 CONTINUE	STEADY	282
560 WRITE (NPRINT,3740) ETAD(1),(TITLE(I),I=1,8),ETAD(2)	STEADY	283
WRITE (NPRINT,5320) ICHAN	STEADY	284
WRITE (NPRINT,5340) FLOW	STEADY	285
WRITE (NPRINT,5360) TINLET	STEADY	286
WRITE (NPRINT,5380) PSAT	STEADY	287
WRITE (NPRINT,5400) TSAT	STEADY	288
WRITE (NPRINT,5420) TSUPER	STEADY	289
WRITE (NPRINT,5440) FEXIT	STEADY	290
WRITE (NPRINT,5460) IBREAK	STEADY	291
LAXIAL=IBREAK+1	STEADY	292
WRITE (NPRINT,5480) ISETP	STEADY	293
IF (ISETP.GT.0) GO TO 580	STEADY	294
WRITE (NPRINT,5500) (DELP(I),I=1,NZONES)	STEADY	295
580 WRITE (NPRINT,5520) ICHAN	STEADY	296
WRITE (NPRINT,5540) TGASS	STEADY	297
WRITE (NPRINT,5560) AHOLE	STEADY	298
WRITE (NPRINT,5580) PLENA	STEADY	299
WRITE (NPRINT,5600) ICHAN	STEADY	300
WRITE (NPRINT,5620) IFUELS	STEADY	301
WRITE (NPRINT,5640) JFUELS	STEADY	302

WRITE (NPRINT,5660) KFUELS	STEADY	303
WRITE (NPRINT,5680) TFUELS	STEADY	304
WRITE (NPRINT,5700) ORIFIC	STEADY	305
WRITE (NPRINT,5720) GTOL	STEADY	306
WRITE (NPRINT,5740) WAIT	STEADY	307
WRITE (NPRINT,3740) ETAD(1),(TITLE(I),I=1,8),ETAD(2)	STEADY	308
WRITE (NPRINT,5760) ICHAN	STEADY	309
WRITE (NPRINT,5780) DOPPW,DOPPD,RBASEC	STEADY	310
GOPCO=(22)=(DOPPW-DOPPD)/RBASEC	STEADY	311
KOPINS=NOPINS(ICHAN)	STEADY	312
C DEVELOP ENTHALPY - TEMPERATURE TABLES FOR FUELS	STEADY	313
DELT=TMELTL/29.	STEADY	314
ABLE=.5*FVS	STEADY	315
BAKER=.333333*FV2S	STEADY	316
CHARLY=.25*FV3S	STEADY	317
ST1(1,1)=0.0	STEADY	318
STEMP(1)=0.0	STEADY	319
DO 600 I=2,30	STEADY	320
STEMP(I)=STEMP(I-1)+DELT	STEADY	321
600 ST1(I,1)=STEMP(I)*(FCS+STEMP(I)*(ABLE+STEMP(I)*(BAKER+STEMP(I)*CHARLY)))*DENSE(1)	STEADY	322
ABLE=298.*(FCS+298.*(ABLE+298.*(BAKER+298.*CHARLY)))*DENSE(1)	STEADY	323
DO 620 I=1,30	STEADY	324
620 ST1(I,1)=ST1(I,1)-ABLE	STEADY	325
STEMP(31)=TMELTH	STEADY	326
ST1(31,1)=ST1(30,1)+HFUSEF*DENSE(1)	STEADY	327
DELT=(6000.-TMELTH)/29.	STEADY	328
ABLE=FVL*.5	STEADY	329
DO 640 I=32,60	STEADY	330
STEMP(I)=STEMP(I-1)+DELT	STEADY	331
640 ST1(I,1)=ST1(31,1)+(STEMP(I)-TMELTH)*(FCL+ABLE*(STEMP(I)-TMELTH))*DENSE(1)	STEADY	332
ABLE=DENSE(2)/DENSE(1)	STEADY	333
DO 660 I=1,60	STEADY	334
660 ST1(I,2)=ABLE*ST1(I,1)	STEADY	335
C DEVELOP ENTHALPY - TEMPERATURE TABLE FOR CLAD	STEADY	336
DELT=TMELTE/15.	STEADY	337
ST2(1)=0.0	STEADY	338
TSEMP(1)=0.0	STEADY	339
ABLE=EVS*.5	STEADY	340
DO 680 I=2,16	STEADY	341
TSEMP(I)=TSEMP(I-1)+DELT	STEADY	342
680 ST2(I)=TSEMP(I)*(ECS+ABLE*TSEMP(I))*DENSEE	STEADY	343
ST2(17)=ST2(16)+HFUSEE*DENSEE	STEADY	344
	STEADY	345
	STEADY	346

TSEMP(17)=TSEMP(16)+10.	STEADY	347
ABLE=.5*EVL	STEADY	348
BAKER=.333333*EV2L	STEADY	349
DELT=(6000.-TSEMP(17))/13.	STEADY	350
DO 700 I=18,30	STEADY	351
TSEMP(I)=TSEMP(I-1)+DELT	STEADY	352
700 ST2(I)=ST2(17)+(TSEMP(I)-TSEMP(17))*(ECL+(TSEMP(I)-TSEMP(17))*(ABL	STEADY	353
+E+(TSEMP(I)-TSEMP(17))*BAKER))*DENSEE	STEADY	354
C DEVELOP SPECIFIC HEATS FOR COOLANT	STEADY	355
ABLE=200.	STEADY	356
BAKER=.5*CLV	STEADY	357
CHARLY=CLV2/3.	STEADY	358
DO 720 I=1,14	STEADY	359
CLIQT(I)=ABLE	STEADY	360
CLIQ(I)=CLC+ABLE*(BAKER+ABLE*CHARLY)	STEADY	361
720 ABLE=ABLE+100.	STEADY	362
CLIQT(15)=10000.	STEADY	363
CLIQ(15)=CLIQ(14)	STEADY	364
GVAP(1)=CLC+TSAT*(BAKER+TSAT*CHARLY)	STEADY	365
CVAPT(1)=0.0	STEADY	366
GVAPT(2)=TSAT	STEADY	367
GVAP(2)=GVAP(1)	STEADY	368
GVAPT(3)=TSAT+10.	STEADY	369
DOG=TSAT*GVAP(1)+HVAPC	STEADY	370
GVAP(3)=DOG/CVAPT(3)	STEADY	371
BAKER=.5*CVV	STEADY	372
CHARLY=CVV2/3.	STEADY	373
DOG=DOG-CVAPT(3)*(CVC+GVAPT(3)*(BAKER+GVAPT(3)*CHARLY))	STEADY	374
ABLE=TSAT+500.	STEADY	375
GO 740 I=4,9	STEADY	376
CVAPT(I)=ABLE	STEADY	377
GVAP(I)=DOG/ABLE+CVC+ABLE*(BAKER+ABLE*CHARLY)	STEADY	378
740 ABLE=ABLE+500.	STEADY	379
GVAPT(10)=10000.	STEADY	380
GVAP(10)=GVAP(9)	STEADY	381
C SIGNAL UNSINTERED FUEL TEMPERATURE CALCULATION	STEADY	382
FIRST=.TRUE.	STEADY	383
C NAXIAL IS TOP NODE	STEADY	384
NAXIAL=1	STEADY	385
DO 760 I=1,NZONES	STEADY	386
760 NAXIAL=NAXIAL+NPERZ(I)	STEADY	387
C NTCORE IS TOP CORE NODE	STEADY	388
NTCORE=1	STEADY	389
GO 780 I=1,ICOREZ	STEADY	390

780 NTCORE=NTCORE+NPZRZ(I)	STEADY	391
C N3CORE IS BOTTOM CORE NODE	STEADY	392
N3CORE=NTCORE+1-NPZRZ(ICOREZ)	STEADY	393
NAXP1=NAXIAL+1	STEADY	394
DO 800 I=1,NAXP1	STEADY	395
LIST(I)=1	STEADY	396
800 TCOOL(I,NLW)=TINLET	STEADY	397
C NBPLEN IS ONE NODE BELOW PLENUM	STEADY	398
NBPLEN=1	STEADY	399
N=IPLNZ-1	STEADY	400
DO 820 I=1,N	STEADY	401
820 NBPLEN=NBPLEN+NPZRZ(I)	STEADY	402
C NORMALIZE AXIAL AND RADIAL POWER FACTORS	STEADY	403
NCOREN=NTCORE-N3CORE+1	STEADY	404
SUM=0.0	STEADY	405
DO 840 IAXIAL=1,NCOREN	STEADY	406
840 SUM=SUM+AXPF(IAXIAL)*DELL(ICOREZ)	STEADY	407
SUM=CHANPF(ICHAN)/SUM	STEADY	408
DO 860 IAXIAL=1,NCOREN	STEADY	409
860 AAPF(IAXIAL)=AXPF(IAXIAL)*SUM	STEADY	410
N=KTOP(ICOREZ)+1	STEADY	411
DO 880 IAXIAL=1,NCOREN	STEADY	412
POW(N,IAXIAL)=POWC*AAPF(IAXIAL)	STEADY	413
POW(N-1,IAXIAL)=0.0	STEADY	414
POW(N-2,IAXIAL)=POWE*AAPF(IAXIAL)	STEADY	415
POW(N-3,IAXIAL)=0.0	STEADY	416
880 POW(N-4,IAXIAL)=0.0	STEADY	417
N=N-5	STEADY	418
ABLE=R(1,ICOREZ)**2	STEADY	419
SUM=0.0	STEADY	420
DO 900 I=1,N	STEADY	421
BAKER=R(I+1,ICOREZ)**2	STEADY	422
VOL(I)=(BAKER-ABLE)*RADPF(I)	STEADY	423
ABLE=BAKER	STEADY	424
900 SUM=SUM+VOL(I)	STEADY	425
SUM=POWF/SUM	STEADY	426
DO 920 I=1,N	STEADY	427
920 VOL(I)=VOL(I)*SUM	STEADY	428
USTL(75)=0.0	STEADY	429
DO 940 IAXIAL=1,NCOREN	STEADY	430
DO 940 IRAD=1,N	STEADY	431
POW(IRAD,IAXIAL)=AAPF(IAXIAL)*VOL(IRAD)	STEADY	432
940 USTL(75)=USTL(75)+POW(IRAD,IAXIAL)	STEADY	433
C CORF ZONE HEAT TRANSFER STUFF	STEADY	434

J=ICOREZ	STEADY	435
M=KTOP(J)-2	STEADY	436
MM1=M-1	STEADY	437
ABLE=R(MM1,J)-R(1,J)	STEADY	438
MM2=MM1-1	STEADY	439
DO 960 I=1,M	STEADY	440
960 RM(I)=SQRT(.5*(R(I,J)**2+R(I+1,J)**2))	STEADY	441
M=M-2	STEADY	442
DO 1000 I=1,M	STEADY	443
DO 980 K=1,NCOREN	STEADY	444
980 RMQ(I,K)=RM(I)	STEADY	445
RRLOG(2*I-1)=ALOG(R(I+1,J)/RM(I))/3.14159	STEADY	446
RRLOG(2*I)=ALOG(RM(I+1)/R(I+1,J))/3.14159	STEADY	447
1000 CONTINUE	STEADY	448
UU(1)=CGAPA*3.14159*R(M+1,J)	STEADY	449
UU(2)=3.14159/ALOG(RM(M+2)/R(M+2,J))	STEADY	450
UU(3)=3.14159/ALOG(R(M+3,J)/RM(M+2,J))	STEADY	451
HTLIQ=HTCLIQ*3.14159*R(M+3,J)	STEADY	452
HTVAP=VAPHTC*3.14159*R(M+3,J)	STEADY	453
K=NBCORE-1	STEADY	454
N=KTOP(ICOREZ)-2	STEADY	455
GAPRE=R(N,ICOREZ)	STEADY	456
DO 1040 J=1,NCOREN	STEADY	457
DO 1020 I=1,M	STEADY	458
VOLUME(I,J)=3.14159*(R(I+1,ICOREZ)**2-R(I,ICOREZ)**2)	STEADY	459
MTYPE(I,J)=1	STEADY	460
HCAPF(I,J)=0.0	STEADY	461
RLOG(2*I-1,J)=RRLOG(2*I-1)	STEADY	462
1020 RLOG(2*I,J)=RRLOG(2*I)	STEADY	463
K=K+1	STEADY	464
ULIQ(K)=HTLIQ	STEADY	465
UVAP(K)=HTVAP	STEADY	466
DELX(K)=DELL(ICOREZ)	STEADY	467
NTOP(K)=KTOP(ICOREZ)	STEADY	468
1040 AFLCH(K)=FLOWA(ICOREZ)	STEADY	469
HAXL=.5*CONLIQ	STEADY	470
HAXL1=.5*CONLI1	STEADY	471
HAXL2=.5*CONLI2	STEADY	472
HAXV=.5*CONVAP	STEADY	473
HAXF=.5*CONFUL	STEADY	474
C NON CORE ZONE HEAT TRANSFER STUFF	STEADY	475
K=2	STEADY	476
KK=2	STEADY	477
LK=0	STEADY	478

DO 1200 I=1,NZONES	STEADY	479
IF (I.NE.1)CCREZ) GO TO 1060	STEADY	480
K=K+NCOREN	STEADY	481
LK=1	STEADY	482
GO TO 1200	STEADY	483
1060 KL=I-LK	STEADY	484
N=KTOP(I)	STEADY	485
ONE=3.14159	STEADY	486
IF (R(2,I).LT.R(1,I)) ONE=-3.14159	STEADY	487
DO 1080 J=1,N	STEADY	488
VZ(J)=ONE*(R(J+1,I)**2-R(J,I)**2)	STEADY	489
1080 RM(J)=SQRT(.5*(R(J,I)**2+R(J+1,I)**2))	STEADY	490
M=N-1	STEADY	491
IF (M) 1140,1140,1100	STEADY	492
1100 DO 1120 J=1,M	STEADY	493
1120 UZ(J)=ONE/(ALOG(R(J+1,I)/RM(J))/CON(J,KL)+ALOG(RM(J+1)/R(J+1,I))/C	STEADY	494
+UN(J+1,KL))	STEADY	495
1140 A3LE=ONE/(ALOG(R(N+1,I)/RM(N))/CON(N,KL)+ONE/(3.14159*R(N+1,I)*HTC	STEADY	496
+LIQ))	STEADY	497
BAKER=ONE/(ALOG(R(N+1,I)/RM(N))/CON(N,KL)+ONE/(3.14159*R(N+1,I)*VA	STEADY	498
+PHTC))	STEADY	499
M=NPLERZ(I)	STEADY	500
DO 1130 L=1,M	STEADY	501
DELX(K)=DELL(I)	STEADY	502
AFLOW(K)=FLOWA(I)	STEADY	503
NTOP(K)=KTOP(I)	STEADY	504
HLIQ(K)=A3LE	STEADY	505
UVAP(K)=BAKER	STEADY	506
DO 1160 J=1,N	STEADY	507
HCAPS(J,KK)=VZ(J)*CAP(J,KL)	STEADY	508
1160 US(J,KK)=UZ(J)	STEADY	509
KK=KK+1	STEADY	510
1180 K=K+1	STEADY	511
1200 CONTINUE	STEADY	512
DELX(1)=DELX(2)	STEADY	513
DELX(NAXIAL+1)=DELX(NAXIAL)	STEADY	514
AFLOW(1)=AFLOW(2)	STEADY	515
AFLOW(NAXIAL+1)=AFLOW(NAXIAL)	STEADY	516
M1=NTCORE	STEADY	517
DO 1220 I921X=1,100	STEADY	518
I=101-I921X	STEADY	519
IF (CH(I)) 1220,1220,1240	STEADY	520
1220 CONTINUE	STEADY	521
L=0	STEADY	522

1240	M2=1	STEADY	523
	DO 1260 I921X=1,100	STEADY	524
	I=101-I921X	STEADY	525
	IF (FH(I)) 1260,1260,1280	STEADY	526
1260	CONTINUE	STEADY	527
	I=0	STEADY	528
1280	M3=1	STEADY	529
	DO 1300 I921X=1,100	STEADY	530
	I=101-I921X	STEADY	531
	IF (DH(I)) 1300,1300,1320	STEADY	532
1300	CONTINUE	STEADY	533
	I=0	STEADY	534
1320	M4=1	STEADY	535
	MMAX=MAX0(M2,M3,M4,NTCORE-NBCORE+1)	STEADY	536
	DO 1400 I921X=1,MMAX	STEADY	537
	I=MMAX+1-I921X	STEADY	538
	WRITE (NPRINT,5800)	STEADY	539
	IF (M2.EQ.0) GO TO 1340	STEADY	540
	WRITE (NPRINT,5820) CH(M2),CW(M2)	STEADY	541
	M2=M2-1	STEADY	542
1340	IF (M3.EQ.0) GO TO 1360	STEADY	543
	WRITE (NPRINT,5840) FH(M3),FW(M3)	STEADY	544
	M3=M3-1	STEADY	545
1360	IF (M4.EQ.0) GO TO 1380	STEADY	546
	WRITE (NPRINT,5860) DH(M4),DC(M4)	STEADY	547
	M4=M4-1	STEADY	548
1380	IF (M1.LT.NBCORE) GO TO 1400	STEADY	549
	J=M1-NBCORE+1	STEADY	550
	WRITE (NPRINT,5880) J,AXPF(J)	STEADY	551
	M1=M1-1	STEADY	552
1400	CONTINUE	STEADY	553
	WRITE (NPRINT,5900) ICHAN	STEADY	554
	WRITE (NPRINT,5920) P8U,EFPD,STEPS,Z1,Z2,Z3	STEADY	555
	WRITE (NPRINT,5940) CCPGM,PPM,YMOD0,YMODS,PNU,PFLUX,TEMP2,ISIEX	STEADY	556
	WRITE (NPRINT,5960) ITRGAP	STEADY	557
C	STRUCTURAL JAZZ	STEADY	558
	K=2	STEADY	559
	DO 1500 I=1,NZONES	STEADY	560
	IF (RADS(I,I)) 1420,1420,1460	STEADY	561
1420	M=NPERZ(I)	STEADY	562
	DO 1440 J=1,M	STEADY	563
	CAPS(K)=0.0	STEADY	564
	USTL(K)=0.0	STEADY	565
	USTV(K)=0.0	STEADY	566

1440	K=K+1	STEADY	567
	GO TO 1500	STEADY	568
1460	ABLE=SQRT(.5*(RAJS(1,I)**2+RAJS(2,I)**2))	STEADY	569
	ABLE=ALOG(ABLE/RAJS(1,I))/CONS(I)	STEADY	570
	DOG=3.14159*(RAJS(2,I)**2-RAJS(1,I)**2)	STEADY	571
	BAKER=3.14159/(ABLE+1./(RAJS(1,I)*HTCLIQ))	STEADY	572
	ABLE=3.14159/(ABLE+1./(RAJS(1,I)*VAPHTC))	STEADY	573
	M=NPERZ(I)	STEADY	574
	DO 1480 J=1,M	STEADY	575
	USTL(K)=BAKER	STEADY	576
	USTV(K)=ABLE	STEADY	577
	CAPS(K)=SCAP(I)*DOG	STEADY	578
1480	K=K+1	STEADY	579
1500	CONTINUE	STEADY	580
	RHOIN=RLC+TINLET*(RLV+TINLET*RLV2)	STEADY	581
	LOOP=0	STEADY	582
	LAP=0	STEADY	583
C		STEADY	584
C	CONVERSION TO SIEX INPUT DATA	STEADY	585
C		STEADY	586
	FLEN=DELL(ICOREZ)*NPERZ(ICOREZ)	STEADY	587
	E=0.0	STEADY	588
	NPER=KTOP(ICOREZ)-3	STEADY	589
	FD=2.0*R(NPER,ICOREZ)	STEADY	590
	VOID=2.0*R(1,ICOREZ)	STEADY	591
	NPER=KTOP(ICOREZ)-1	STEADY	592
	DP=2.0*R(NPER,ICOREZ)	STEADY	593
	NPE=KTOP(ICOREZ)-2	STEADY	594
	CT=(R(NPER,ICOREZ)-R(NPE,ICOREZ))	STEADY	595
	CLADOR=R(NPER,ICOREZ)	STEADY	596
	CLADIR=R(NPE,ICOREZ)	STEADY	597
	BARF=0.0	STEADY	598
	P1AX3=0.0	STEADY	599
	ABLE=0.0	STEADY	600
	DO 1520 I=1,NCOREN	STEADY	601
	ABLE=ABLE+AAPF(I)	STEADY	602
	IF (AAPF(I).LT.PMAX3) GO TO 1520	STEADY	603
	PMAX3=AAPF(I)	STEADY	604
1520	CONTINUE	STEADY	605
	AVEPOW=ABLE/NCOREN	STEADY	606
	M=NPERZ(ICOREZ)	STEADY	607
	DO 1560 I=1,M	STEADY	608
	N=KTOP(ICOREZ)	STEADY	609
	UO 1540 IRAD=1,N	STEADY	610

	BARF=BARF+(PN(NEW)*POW(IRAD,I))	STEADY	611
1540	CONTINUE	STEADY	612
	BARF=BARF+(PN(NEW)*POW(N+1,I))	STEADY	613
1560	CONTINUE	STEADY	614
	BARF=BARF*DELL(ICOREZ)	STEADY	615
	AVEKWF=.001*BARF*2./(NPERZ(ICOREZ)*DELL(ICOREZ))*30.48	STEADY	616
	PM=(PMAX3/AVEPOW)*AVEKWF*(1000.0/30.48)	STEADY	617
	HF=AVEKWF/AVEPOW	STEADY	618
	DO 1580 I=1,NCOREN	STEADY	619
1580	EPYTM(14,I)=HF*AAPF(I)	STEADY	620
	CMF=FLOW	STEADY	621
	CP=CLC+CLV*(TINLET+100.0)+CLV2*(TINLET+100.0)**2.	STEADY	622
	HF=HTCLIQ	STEADY	623
	HG=1500.0*5.6761E-4	STEADY	624
	CK=CLADK+CLADKT*(TINLET+120.0)	STEADY	625
	TI=TINLET-273.0	STEADY	626
	TB=TSINT-273.0	STEADY	627
	TD=10.95	STEADY	628
	DENLO=DENSE(1)/TD	STEADY	629
	DENHI=DENSE(2)/TD	STEADY	630
	SEGNUY=NPERZ(ICOREZ)	STEADY	631
	EPL=NPERZ(IPLCNZ)*DELL(IPLCNZ)	STEADY	632
	VPLEN=PLENA*EPL	STEADY	633
	ALPHA0=CGAPC	STEADY	634
	ALPHAS=CGAPC2	STEADY	635
	ALFAC1=ALPHA0	STEADY	636
	ALFAC2=ALPHAS	STEADY	637
	YMODC1=YMOD0	STEADY	638
	YMODC2=YMODS	STEADY	639
	POISSN=PNU	STEADY	640
	YMSWC=2.0	STEADY	641
	EXTERP=58.43*6.8947E+04	STEADY	642
	ITAB1=1.0	STEADY	643
	ITAB2=1.0	STEADY	644
	ITAB3=1.0	STEADY	645
	ITAB4=1.0	STEADY	646
	DATA1(1)=DELL(ICOREZ)/2.0	STEADY	647
	NPER=NPERZ(ICOREZ)	STEADY	648
	DO 1600 I=2,NPER	STEADY	649
	J=I-1	STEADY	650
	DATAFP(J)=AXPF(J)	STEADY	651
1600	DATA1(I)=DATA1(J)+DELL(ICOREZ)	STEADY	652
	DATAFP(NPER)=AXPF(NPER)	STEADY	653
	UAFP=DATAFP(1)	STEADY	654

DO 1620 I=1,NPER	STEADY	655
IF (DAFP.GT.DATAFP(I)) GO TO 1620	STEADY	656
DAFP=DATAFP(I)	STEADY	657
1620 CONTINUE	STEADY	658
DO 1640 I=1,NPER	STEADY	659
DATAX(I)=DATAX(I)/FLEN	STEADY	660
1640 DATAFP(I)=DATAFP(I)/DAFP	STEADY	661
HUMP=0	STEADY	662
DO 1660 I=1,20	STEADY	663
1660 GAPM(I)=0.0	STEADY	664
CALL SILEX (GAPR,GAPM)	STEADY	665
C SOLVE FOR TEMPERATURES	STEADY	666
C GO FORWARD, ELIMINATING VARIABLES	STEADY	667
1680 CONTINUE	STEADY	668
CALL CURVE (C1,TINLET,CLIQT,CLIQ,15,I19)	STEADY	669
IF (I19.GT.0) GO TO 3700	STEADY	670
APRE=0.0	STEADY	671
UPRE=TINLET	STEADY	672
DO 1860 IAXIAL=2,NAXIAL	STEADY	673
TERMS (IAXIAL)=ULIQ(IAXIAL)*DELX(IAXIAL)	STEADY	674
CALL CURVE (C2,TCOOL(IAXIAL,NEW),CLIQT,CLIQ,15,I19)	STEADY	675
IF (I19.GT.0) GO TO 3700	STEADY	676
M=NTOP(IAXIAL)	STEADY	677
IF (IAXIAL-NBCORE) 1700,1740,1820	STEADY	678
1700 DO 1720 IRAO=1,M	STEADY	679
1720 J1(IRA0,IAXIAL)=0.0	STEADY	680
J2(IAXIAL)=0.0	STEADY	681
GO TO 1840	STEADY	682
1740 CONTINUE	STEADY	683
I=IAXIAL-NBCORE+1	STEADY	684
MM5=M-5	STEADY	685
K=MIN0(2,MOD(MTYPE(1,I),6))	STEADY	686
CALL CURVE (CON1,TEMPER(1,I,NEW),BASICT,CONDUCT(1,K),IPAIR1,I19)	STEADY	687
IF (I19.GT.0) GO TO 1800	STEADY	688
DO 1760 IRAO=1,MM5	STEADY	689
K=MIN0(2,MOD(MTYPE(IRA0+1,I),6))	STEADY	690
CALL CURVE (CON2,TEMPER(IRA0+1,I,NEW),BASICT,CONDUCT(1,K),IPAIR1,I19)	STEADY	691
*9)	STEADY	692
IF (I19.GT.0) GO TO 1800	STEADY	693
U(IRA0,I)=1./(RLOG(2*IRA0-1,I)/CON1+RLOG(2*IRA0,I)/CON2)	STEADY	694
IF (MTYPE(IRA0+1,I).EQ.3) CALL CURVE (CON2,TEMPER(IRA0+1,I,NEW),BASICT,CONDUCT,IPAIR1,I19)	STEADY	695
*SICT,CONDUCT,IPAIR1,I19)	STEADY	696
IF (I19.GT.0) GO TO 1800	STEADY	697
1760 CON1=CON2	STEADY	698

U(M-4,I)=CON2/RLOG(2*M-9,I)	STEADY	699
U(M-3,I)=GAPM(I)	STEADY	700
U(M-2,I)=UU(2)*(CLADK+CLADKT*TEMPER(M-1,I,NEW))	STEADY	701
U(M-1,I)=UU(3)*(CLADK+CLADKT*TEMPER(M-1,I,NEW))	STEADY	702
U(M,I)=TERM5(IAXIAL)/DELX(IAXIAL)	STEADY	703
DPREV=0.0	STEADY	704
DO 1790 IRAD=1,M	STEADY	705
U1(IRAD,IAXIAL)=(DPREV+PN(NEW)*POW(IRAD,I))/U(IRAD,I)	STEADY	706
1780 DPREV=D1(IRAD,IAXIAL)*U(IRAD,I)	STEADY	707
D2(IAXIAL)=PN(NEW)*POW(M+1,I)*DELX(IAXIAL)	STEADY	708
GO TO 1840	STEADY	709
1800 WRITE(NPRINT,5980) IAXIAL,ICHAN	STEADY	710
STOP	STEADY	711
1820 IF(IAXIAL-NTCORE) 1740,1740,1700	STEADY	712
1840 ABLE=AFLOW(IAXIAL-1)/DELX(IAXIAL-1)*(HAXL+TCOOL(IAXIAL-1,NEW)*(HAXL1+TCOOL(IAXIAL-1,NEW)*HAXL2))	STEADY	713
BAKER=AFLOW(IAXIAL)/DELX(IAXIAL)*(HAXL+TCOOL(IAXIAL,NEW)*(HAXL1+TCOOL(IAXIAL,NEW)*HAXL2))	STEADY	714
TERMD(IAXIAL)=ABLE*BAKER/(ABLE+BAKER)	STEADY	715
ABLE=AFLOW(IAXIAL+1)/DELX(IAXIAL+1)*(HAXL+TCOOL(IAXIAL+1,NEW)*(HAXL1+TCOOL(IAXIAL+1,NEW)*HAXL2))	STEADY	716
TERMU(IAXIAL)=ABLE*BAKER/(ABLE+BAKER)	STEADY	717
DENOM=.5*FLOW*C2+TERMU(IAXIAL)+TERMD(IAXIAL)-APRE*(.5*FLOW*C1+TERMD(IAXIAL))	STEADY	718
A2(IAXIAL)=TERMU(IAXIAL)/DENOM	STEADY	719
D2(IAXIAL)=(D2(IAXIAL)+D1(M,IAXIAL)*TERM5(IAXIAL)+DPRE*(.5*FLOW*C1+TERMD(IAXIAL)))/DENOM	STEADY	720
C1=C2	STEADY	721
APRE=A2(IAXIAL)	STEADY	722
1860 DPRE=D2(IAXIAL)	STEADY	723
TCOOL(NAXIAL+1,NEW)=D2(NAXIAL)/(1.-A2(NAXIAL))	STEADY	724
C GO BACKWARDS, SUBSTITUTING	STEADY	725
DO 2140 I921X=2,NAXIAL	STEADY	726
IAXIAL=NAXIAL+2-I921X	STEADY	727
CHARLY=TCOOL(IAXIAL,NEW)	STEADY	728
TCOOL(IAXIAL,NEW)=A2(IAXIAL)*TCOOL(IAXIAL+1,NEW)+D2(IAXIAL)	STEADY	729
IF(IAXIAL-NBCORE) 1880,1960,2080	STEADY	730
1880 I=IAXIAL	STEADY	731
GO TO 1920	STEADY	732
1900 I=IAXIAL-NTCORE+NBCORE-1	STEADY	733
1920 J=NTOP(IAXIAL)	STEADY	734
DO 1940 IRAD=1,J	STEADY	735
TSINK(IRAD,I,NEW)=TCOOL(IAXIAL,NEW)	STEADY	736
1940 USAVE1(IRAD,I,NEW)=0.0	STEADY	737
	STEADY	738
	STEADY	739
	STEADY	740
	STEADY	741
	STEADY	742

LIST(IAXIAL)=0	STEADY	743
GO TO 2100	STEADY	744
1960 CONTINUE	STEADY	745
LIST(IAXIAL)=0	STEADY	746
M=NTOP(IAXIAL)	STEADY	747
I=IAXIAL-NBCORE+1	STEADY	748
BAKER=TCOOL(IAXIAL,NEW)	STEADY	749
DO 2020 I931X=1,M	STEADY	750
IRAD=M+1-I931X	STEADY	751
ABLE=BAKER+D1(IRAD,IAXIAL)	STEADY	752
IF (ABS(ABLE-TEMPER(IRAD,I,NEW))-.4) 1980,1980,2000	STEADY	753
1980 IF (LAP.GT.10) ABLE=.5*(ABLE+TEMPER(IRAD,I,NEW))	STEADY	754
TEMPER(IRAD,I,NEW)=ABLE	STEADY	755
GO TO 2020	STEADY	756
2000 LIST(IAXIAL)=1	STEADY	757
GO TO 1980	STEADY	758
2020 BAKER=TEMPER(IRAD,I,NEW)	STEADY	759
IF (LIST(IAXIAL)) 2040,2040,2100	STEADY	760
2040 TSTART=0.0	STEADY	761
MM1=M-1	STEADY	762
DO 2060 IRAD=1,MM1	STEADY	763
2060 DSAVE3(IRAD,I,NEW)=0.0	STEADY	764
DSAVE3(M,I,NEW)=0.0	STEADY	765
GO TO 2100	STEADY	766
2080 IF (IAXIAL-NTCORE) 1960,1960,1900	STEADY	767
2100 IF (ABS(TCOOL(IAXIAL,NEW)-CHARLY)-.4) 2140,2140,2120	STEADY	768
2120 LIST(IAXIAL)=1	STEADY	769
2140 CONTINUE	STEADY	770
C GET AVERAGE AXIAL FUEL TEMPERATURE	STEADY	771
M=KTOP(ICOREZ)-4	STEADY	772
DO 2180 I=1,NCOREN	STEADY	773
PINTEM(I,NEW)=0.0	STEADY	774
SUM=0.0	STEADY	775
DO 2160 J=1,M	STEADY	776
N=1+MOD(MTYPE(J,I)-1,2)	STEADY	777
ABLE=VOLUME(J,I)*DENSE(N)	STEADY	778
SUM=SUM+ABLE	STEADY	779
2160 PINTEM(I,NEW)=PINTEM(I,NEW)+ABLE*TEMPER(J,I,NEW)	STEADY	780
2180 PINTEM(I,NEW)=PINTEM(I,NEW)/SUM	STEADY	781
LAP=LAP+1	STEADY	782
IF (LAP.GT.40) STOP	STEADY	783
C CHECK IF TEMPERATURES OKAY	STEADY	784
DO 2200 IAXIAL=2,NAXIAL	STEADY	785
IF (LIST(IAXIAL)) 2200,2200,1680	STEADY	786

2200 CONTINUE	STEADY	787
LAP=0	STEADY	788
FIRST=.FALSE.	STEADY	789
IF (JUMP.GT.1) GO TO 2400	STEADY	790
C REDO SINTERED NODES	STEADY	791
I=0	STEADY	792
DO 2340 IAXIAL=NBCORE,NTCORE	STEADY	793
I=I+1	STEADY	794
M=NTOP(IAXIAL)	STEADY	795
VOLUME(M,I)=0.0	STEADY	796
VOLUME(M-2,I)=0.0	STEADY	797
VOLUME(M-3,I)=0.0	STEADY	798
VOLUME(M-1,I)=3.14159*(R(M-1,ICOREZ)**2-R(M-2,ICOREZ)**2)	STEADY	799
HCAPF(M,I)=0.0	STEADY	800
HCAPF(M-2,I)=0.0	STEADY	801
HCAPF(M-3,I)=0.0	STEADY	802
M=M-4	STEADY	803
RN(M+1)=R(M+1,ICOREZ)	STEADY	804
RZ(M+1,I)=RN(M+1)	STEADY	805
DO 2320 I921X=1,M	STEADY	806
IRAD=M+1-I921X	STEADY	807
IF (TEMPER(IRAD,I,NEW).GE.TEMP2+273.) MTYPE(IRAD,I)=7	STEADY	808
IF (.5*(TEMPER(IRAD,I,NEW)+TEMPER(IRAD+1,I,NEW))-TSINT) 2240,2220,	STEADY	809
+2220	STEADY	810
2220 RN(IRAD)=SQRT(RN(IRAD+1)**2-DENSE(1)/DENSE(2)*(R(IRAD+1,ICOREZ)**2	STEADY	811
+R(IRAD,ICOREZ)**2))	STEADY	812
MTYPE(IRAD,I)=2	STEADY	813
RQ=SQRT(.5*(RN(IRAD)**2+RN(IRAD+1)**2))	STEADY	814
R4Q(IRAD,I)=RQ	STEADY	815
RLOG(2*IRAD-1,I)=ALOG(RN(IRAD+1)/RQ)/3.14159	STEADY	816
IF (IRAD.EQ.1) GO TO 2300	STEADY	817
RLOG(2*IRAD-2,I)=ALOG(RQ/RN(IRAD))/3.14159	STEADY	818
GO TO 2300	STEADY	819
2240 IF (TEMPER(IRAD,I,NEW)-TSINT) 2280,2280,2260	STEADY	820
2260 MTYPE(IRAD,I)=3	STEADY	821
2280 RN(IRAD)=R(IRAD,ICOREZ)	STEADY	822
2300 ABLE=3.14159*(RN(IRAD+1)**2-RN(IRAD)**2)	STEADY	823
RZ(IRAD,I)=RN(IRAD)	STEADY	824
IF (ABS(VOLUME(IRAD,I)-ABLE)/ABLE.GT..001) FIRST=.TRUE.	STEADY	825
2320 VOLUME(IRAD,I)=ABLE	STEADY	826
2340 VOIDV(I)=3.14159*RN(1)**2	STEADY	827
LOOP=LOOP+1	STEADY	828
IF (LOOP.GT.3) GO TO 2360	STEADY	829
IF (FIRST) GO TO 1680	STEADY	830

2300 JUMP=100	STEADY	831
DO 2380 I=1,20	STEADY	832
2380 GAPM(I)=GAPR(I)	STEADY	833
GO TO 1690	STEADY	834
C ALL STEADY STATE TEMPERATURES FINISHED	STEADY	835
2400 I=0	STEADY	836
C GET FUEL HEAT CAPACITIES	STEADY	837
DO 2440 IAXIAL=NBCORE,NTCORE	STEADY	838
I=I+1	STEADY	839
M=NTOP(IAXIAL)-4	STEADY	840
DO 2420 IRAD=1,M	STEADY	841
K=1+MOD(MTYPE(IRAD,I)-1,2)	STEADY	842
CALL CURVE (ABLE,TEMPER(IRAD,I,NEW),STEMP,ST1(1,K),60,I19)	STEADY	843
IF (I19.GT.0) GO TO 3060	STEADY	844
2420 HCAPF(IRAD,I)=ABLE*VOLUME(IRAD,I)/(TEMPER(IRAD,I,NEW)-298.)	STEADY	845
CALL CURVE (ABLE,TEMPER(M+3,I,NEW),TSEMP,ST2,30,I19)	STEADY	846
IF (I19.GT.0) GO TO 3080	STEADY	847
2440 HCAPF(M+3,I)=ABLE*VOLUME(M+3,I)/TEMPER(M+3,I,NEW)	STEADY	848
C MASS FLOWS AND DENSITIES	STEADY	849
DO 2460 IAXIAL=1,NAXIAL	STEADY	850
G(IAXIAL,NEW)=FLOW/AFLOW(IAXIAL)	STEADY	851
RHOO(IAXIAL,NEW)=RLV+TCOOL(IAXIAL,NEW)*(RLV+TCOOL(IAXIAL,NEW)*RLV2	STEADY	852
*)	STEADY	853
UOLD(IAXIAL)=G(IAXIAL,NEW)/RHOO(IAXIAL,NEW)	STEADY	854
2460 CONTINUE	STEADY	855
TCOOL(NAXIAL+1,NEW)=TCOOL(NAXIAL,NEW)	STEADY	856
RHOO(NAXIAL+1,NEW)=RHOO(NAXIAL,NEW)	STEADY	857
C HEAT STORAGE RATES IN COOLANT NODES	STEADY	858
DO 2480 IAXIAL=2,NAXIAL	STEADY	859
CALL CURVE (ABLE,TCOOL(IAXIAL,NEW),CLIQT,CLIQ,15,I19)	STEADY	860
IF (I19.GT.0) GO TO 3700	STEADY	861
HELP(IAXIAL)=ABLE*TCOOL(IAXIAL,NEW)	STEADY	862
WALTAR(IAXIAL)=DELX(IAXIAL)*AFLOW(IAXIAL)*RHOO(IAXIAL,NEW)	STEADY	863
OSAVE4(IAXIAL,NEW)=WALTAR(IAXIAL)*HELP(IAXIAL)	STEADY	864
OSAVE4(IAXIAL,IOLD)=OSAVE4(IAXIAL,NEW)	STEADY	865
OSAVE2(IAXIAL,NEW)=TERMD(IAXIAL)*(TCOOL(IAXIAL-1,NEW)-TCOOL(IAXIAL	STEADY	866
,NEW))+TERMU(IAXIAL)(TCOOL(IAXIAL+1,NEW)-TCOOL(IAXIAL,NEW))	STEADY	867
IF (IAXIAL.LT.NBCORE.OR.IAXIAL.GT.NTCORE) GO TO 2480	STEADY	868
I=IAXIAL-NBCORE+1	STEADY	869
M=NTOP(IAXIAL)	STEADY	870
OSAVE2(IAXIAL,NEW)=OSAVE2(IAXIAL,NEW)+TERMS(IAXIAL)*(TEMPER(M,I,NE	STEADY	871
W)-TCOOL(IAXIAL,NEW))	STEADY	872
2480 OSAVE2(IAXIAL,IOLD)=OSAVE2(IAXIAL,NEW)	STEADY	873
C PUT NEWS IN OLDS	STEADY	874

N=NAXIAL+1	STEADY	875
DO 2500 IAXIAL=1,N	STEADY	876
SMELP(IAXIAL)=1	STEADY	877
TSTRUK(IAXIAL,NEW)=TCOOL(IAXIAL,NEW)	STEADY	878
TSTRUK(IAXIAL,IOLD)=TCOOL(IAXIAL,NEW)	STEADY	879
OSAVE6(IAXIAL,NEW)=0.0	STEADY	880
OSAVE6(IAXIAL,IOLD)=0.0	STEADY	881
TCOOL(IAXIAL,IOLD)=TCOOL(IAXIAL,NEW)	STEADY	882
G(IAXIAL,IOLD)=G(IAXIAL,NEW)	STEADY	883
RHOONA(IAXIAL,NEW)=RHO(IAXIAL,NEW)	STEADY	884
RHOONA(IAXIAL,IOLD)=RHO(IAXIAL,NEW)	STEADY	885
2500 RHO(IAXIAL,IOLD)=RHO(IAXIAL,NEW)	STEADY	886
HELP(1)=HELP(2)	STEADY	887
HELP(NAXIAL+1)=HELP(NAXIAL)	STEADY	888
DO 2680 IAXIAL=2,NAXIAL	STEADY	889
M=NTOP(IAXIAL)	STEADY	890
IF (IAXIAL-NBCORE) 2520,2540,2560	STEADY	891
2520 I=IAXIAL	STEADY	892
GO TO 2600	STEADY	893
2540 I=IAXIAL-NBCORE+1	STEADY	894
GO TO 2640	STEADY	895
2560 IF (IAXIAL-NTCORE) 2540,2540,2580	STEADY	896
2580 I=IAXIAL-NTCORE+NBCORE-1	STEADY	897
2600 DO 2620 J=1,M	STEADY	898
OSAVE1(J,I,IOLD)=0.0	STEADY	899
2620 TSINK(J,I,IOLD)=TSINK(J,I,NEW)	STEADY	900
GO TO 2680	STEADY	901
2640 DO 2660 J=1,M	STEADY	902
OSAVE3(J,I,IOLD)=0.0	STEADY	903
2660 TEMPER(J,I,IOLD)=TEMPER(J,I,NEW)	STEADY	904
PINTEM(I,IOLD)=PINTEM(I,NEW)	STEADY	905
DKNA(I,NEW)=0.0	STEADY	906
DKNA(I,IOLD)=0.0	STEADY	907
PARTAN(I)=RHOONA(IAXIAL,NEW)	STEADY	908
2680 CONTINUE	STEADY	909
C FUEL SQUIRTING INITIALIZATION	STEADY	910
VOLG(NEW)=0.0	STEADY	911
VOLG(IOLD)=0.0	STEADY	912
JOLF(NEW)=0.0	STEADY	913
JOLF(IOLD)=0.0	STEADY	914
C PLENUM PRESSURE,VOLUME,DENSITY, AND EXPANSION TERMS	STEADY	915
GT2=(GAMMA-1.)/GAMMA	STEADY	916
GT1=2./GT2	STEADY	917
GT0=(2./(GAMMA+1.))**(1./GT2)	STEADY	918

GT3=1./GAMMA	STEADY	919
PVOID=PPL-N(1)	STEADY	920
C INTERFACE JAZZ	STEADY	921
DO 2700 I=1,2	STEADY	922
IGAS(I)=0	STEADY	923
IFUEL(I)=0	STEADY	924
IBOIL(I)=0	STEADY	925
NGAS(I)=0	STEADY	926
NBOIL(I)=0	STEADY	927
IFUEL(I)=0	STEADY	928
IFUEL(I)=NAXIAL+1	STEADY	929
FUELBO(I)=0.0	STEADY	930
FUELBU(I)=0.0	STEADY	931
DO 2700 J=1,2	STEADY	932
IGASU(J,I)=0	STEADY	933
IGASD(J,I)=NAXIAL+1	STEADY	934
IBOILU(J,I)=0	STEADY	935
GASBO(J,I)=0.0	STEADY	936
GASBU(J,I)=0.0	STEADY	937
2700 IBOILO(J,I)=NAXIAL+1	STEADY	938
IF (ISETP) 2720,2720,2800	STEADY	939
C CALCULATE FRICTION FACTORS BASED ON EACH ZONE DELP	STEADY	940
2720 SUM1=0.0	STEADY	941
SUM7=0.0	STEADY	942
K=1	STEADY	943
DO 2700 I=1,NZONES	STEADY	944
M=NPERZ(I)	STEADY	945
SUM=0.0	STEADY	946
DO 2740 J=1,M	STEADY	947
K=K+1	STEADY	948
SUM=SUM+G(K,NEW)**2*DELX(K)/RHOO(K,NEW)	STEADY	949
SUM7=SUM7+980.6*DELX(K)*RHOIN	STEADY	950
2740 SUM1=SUM1+980.6*DELX(K)*RHOO(K,NEW)	STEADY	951
FRICT(I)=DELP(I)/SUM	STEADY	952
2760 SUM1=SUM1+DELP(I)	STEADY	953
SUM1=SUM1+(G(NAXIAL,NEW)**2/RHOO(NAXIAL,NEW)-G(1,NEW)**2/RHOO(1,NEW)+K)	STEADY	954
K=2	STEADY	955
DO 2780 I=1,NZONES	STEADY	956
M=NPERZ(I)	STEADY	957
DO 2780 J=1,M	STEADY	958
FANN(K)=FRICT(I)	STEADY	959
2780 K=K+1	STEADY	960
GO TO 2880	STEADY	961
	STEADY	962

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C USE PREVIOUSLY CALCULATED FRICTION FACTORS FOR ALL ZONES EXCEPT FIRST STEADY 963
2800 SUM2=0.0 STEADY 964
      K=1+NPZRZ(1) STEADY 965
      UO 2820 I=2,NZONES STEADY 966
      M=NPZRZ(I) STEADY 967
      DO 2820 J=1,M STEADY 968
      K=K+1 STEADY 969
      FANN(K)=FRICT(I) STEADY 970
2820 SUM2=SUM2+(980.6*RHO0(K,NEW)+G(K,NEW)**2/RHO0(K,NEW)*FANN(K))*DELX STEADY 971
      +(K) STEADY 972
      SUM=0.0 STEADY 973
      M=NPZRZ(1) STEADY 974
      K=1 STEADY 975
      DO 2840 J=1,M STEADY 976
      K=K+1 STEADY 977
      SUM=SUM+G(K,NEW)**2*DELX(K)/RHO0(K,NEW) STEADY 978
2840 SUM2=SUM2+980.6*DELX(K)*RHO0(K,NEW) STEADY 979
      SUM2=SUM2+(G(NAXIAL,NEW)**2/RHO0(NAXIAL,NEW)-G(1,NEW)**2/RHO0(1,NEW) STEADY 980
      +1)) STEADY 981
      ABLE=(SUM1-SUM2)/SUM STEADY 982
      K=1 STEADY 983
      DO 2860 J=1,M STEADY 984
      K=K+1 STEADY 985
2860 FANN(K)=ABLE STEADY 986
2830 CONTINUE STEADY 987
C INTERPOLATE COOLANT WEIGHTING FACTORS FOR EACH COOLANT NODE STEADY 988
      HIGH=0.0 STEADY 989
      J1=1 STEADY 990
      J2=2 STEADY 991
      DO 3000 IAXIAL=2,NAXIAL STEADY 992
      HIGH=HIGH+.5*DELX(IAXIAL) STEADY 993
2900 IF (HIGH=CH(J2)) 2920,2940,2960 STEADY 994
2920 WC(IAXIAL)=((CH(J2)-CH(J1))/(CH(J2)-CH(J1))*(HIGH-CH(J1))+CH(J1))* STEADY 995
      +1.E-3*AFLOW(IAXIAL)*DELX(IAXIAL) STEADY 996
      GO TO 3000 STEADY 997
2940 WC(IAXIAL)=CH(J2)*1.E-3*AFLOW(IAXIAL)*DELX(IAXIAL) STEADY 998
      GO TO 3000 STEADY 999
2960 IF (CH(J2)) 2940,2940,2980 STEADY 1000
2980 J1=J1+1 STEADY 1001
      J2=J2+1 STEADY 1002
      GO TO 2900 STEADY 1003
3000 HIGH=HIGH+.5*DELX(IAXIAL) STEADY 1004
C INTERPOLATE FUEL WEIGHTING FACTORS FOR EACH AXIAL POSITION STEADY 1005
      HIGH=0.0 STEADY 1006

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J1=1	STEADY	1007
J2=2	STEADY	1008
DO 3120 IAXIAL=2,NAXIAL	STEADY	1009
HIGH=HIGH+.5*DELX(IAXIAL)	STEADY	1010
3020 IF (HIGH-FH(J2)) 3040,3060,3080	STEADY	1011
3040 WF(IAXIAL)=((FW(J2)-FW(J1))/(FH(J2)-FH(J1))*(HIGH-FH(J1))+FW(J1))*	STEADY	1012
+1.E-3*DELX(IAXIAL)	STEADY	1013
GO TO 3120	STEADY	1014
3060 WF(IAXIAL)=FW(J2)*1.E-3*DELX(IAXIAL)	STEADY	1015
GO TO 3120	STEADY	1016
3080 IF (FH(J2)) 3060,3060,3100	STEADY	1017
3100 J1=J1+1	STEADY	1018
J2=J2+1	STEADY	1019
GO TO 3020	STEADY	1020
3120 HIGH=HIGH+.5*DELX(IAXIAL)	STEADY	1021
C STEADY STATE SODIUM WORTH	STEADY	1022
BASENA=0.0	STEADY	1023
DO 3140 IAXIAL=2,NAXIAL	STEADY	1024
3140 BASENA=BASENA+WG(IAXIAL)*RHOO(IAXIAL,NEW)	STEADY	1025
RHOFG=RVAP-RLIQ	STEADY	1026
C CALCULATE COOLANT TEMPERATURE CORRESPONDING TO INITIAL FILM THICKNESS	STEADY	1027
TMAGIC=TSAT+10./(1.+FILM*RLIQ/(RVAP*(1.-FILM)))	STEADY	1028
ULVC=.1*HVAPC	STEADY	1029
C INTERPOLATE DOPPLER COEFFICIENTS	STEADY	1030
J1=1	STEADY	1031
J2=2	STEADY	1032
HI(1)=0.0	STEADY	1033
MM=KTOP(ICOREZ)-3	STEADY	1034
BAKER=DELL(ICOREZ)*DENSE(1)*(R(MM,ICOREZ)**2-R(1,ICOREZ)**2)*KOPIN	STEADY	1035
+5	STEADY	1036
DO 3160 I=2,NAXIAL	STEADY	1037
3160 HI(I)=HI(I-1)+DELX(I)	STEADY	1038
HIGH=HI(NBCORE)-DELX(NBCORE)	STEADY	1039
K=NBCORE	STEADY	1040
DO 3300 IAXIAL=1,NCOREN	STEADY	1041
HIGH=HIGH+.5*DELX(K)	STEADY	1042
3180 IF (HIGH-DH(J2)) 3200,3220,3240	STEADY	1043
3200 ABLE=(HIGH-DH(J1))/(DH(J2)-DH(J1))	STEADY	1044
DOPCOE(IAXIAL)=(DC(J1)+ABLE*(DC(J2)-DC(J1)))*BAKER	STEADY	1045
DOPSUM=DOPSUM+DOPCOE(IAXIAL)	STEADY	1046
GO TO 3280	STEADY	1047
3220 DOPCOE(IAXIAL)=DC(J2)*BAKER	STEADY	1048
DOPSUM=DOPSUM+DOPCOE(IAXIAL)	STEADY	1049
GO TO 3280	STEADY	1050

3240 IF (DH(J2)) 3220,3220,3260	STEADY	1051
3260 J1=J1+1	STEADY	1052
J2=J2+1	STEADY	1053
GO TO 3180	STEADY	1054
3280 HIGH=HIGH+.5*DELX(K)	STEADY	1055
3300 K=K+1	STEADY	1056
P(1,NEW)=SUM1+PEXIT	STEADY	1057
P(1,IOLD)=P(1,NEW)	STEADY	1058
CHARLY=F(1,NEW)	STEADY	1059
ABLE=G(1,NEW)**2/RHOO(1,NEW)	STEADY	1060
DO 3320 I=2,NAXIAL	STEADY	1061
BAKER=G(I,NEW)**2/RHOO(I,NEW)	STEADY	1062
DP=(FANN(I)*BAKER+980.6*RHOO(I,NEW))*DELX(I)+(BAKER-ABLE)	STEADY	1063
ABLE=BAKER*(AFLOW(I)/AFLOW(I+1))**2	STEADY	1064
DOG=CHARLY-DP	STEADY	1065
P(I,NEW)=CHARLY	STEADY	1066
CHARLY=DOG+.5*BAKER*(1.-(AFLOW(I)/AFLOW(I+1))**2)	STEADY	1067
3320 F(I,IOLD)=P(I,NEW)	STEADY	1068
CGAPB=P(LAXIAL,NEW)	STEADY	1069
VVC=CVV	STEADY	1070
CVV=0.0	STEADY	1071
CALL TPUT (NPRINT)	STEADY	1072
C	STEADY	1073
C PUT INFO ON DRUM	STEADY	1074
C	STEADY	1075
WRITE (12) (CORE(I),I=1,8437)	STEADY	1076
IF (ITRGAP.NE.0) WRITE (12) TGAP	STEADY	1077
CVV=VVC	STEADY	1078
LINESL=0	STEADY	1079
J=NAXIAL	STEADY	1080
N=NAXIAL-NTCORE+NBCORE-1	STEADY	1081
NN=NTCORE-NBCORE+1	STEADY	1082
DO 3480 I921X=1,NZONES	STEADY	1083
I=NZONES+1-I921X	STEADY	1084
M=NPERZ(I)	STEADY	1085
NNN=KTOP(I)	STEADY	1086
N03=NNN-3	STEADY	1087
DO 3480 MM=1,M	STEADY	1088
IF (LINESL) 3340,3340,3360	STEADY	1089
3340 WRITE (NPRINT,6000) ETAD(1),(TITLE(L),L=1,8),ETAD(2),ICHAN,(LL,LL=	STEADY	1090
+1,15)	STEADY	1091
LINESL=57	STEADY	1092
3360 ABLE=.5*(HI(J)+HI(J-1))	STEADY	1093
VEL=G(J,NEW)/RHOO(J,NEW)	STEADY	1094

J=J-1	STEADY	1095
WRITE (NPRINT,6020)	STEADY	1096
IF (I.EQ.ICOREZ) GO TO 3380	STEADY	1097
WRITE (NPRINT,6040) I,J,ABLE,(TSINK(L,N,NEW),L=1,NNN)	STEADY	1098
N=N-1	STEADY	1099
GO TO 3460	STEADY	1100
3380 WRITE (NPRINT,6040) I,J,ABLE,(TEMPER(L,NN,NEW),L=1,NNN)	STEADY	1101
DO 3440 II=1,NNN	STEADY	1102
IF (MTYPE(II,NN)-2) 3400,3420,3420	STEADY	1103
3400 ICK(II)=IBLANK	STEADY	1104
GO TO 3440	STEADY	1105
3420 ICK(II)=ISTAR	STEADY	1106
IF (MTYPE(II,NN).GT.3) ICK(II)=ITIC	STEADY	1107
3440 CONTINUE	STEADY	1108
WRITE (NPRINT,6060) (ICK(II),II=1,N03)	STEADY	1109
NN=NN-1	STEADY	1110
3460 WRITE (NPRINT,6080) TCOOL(J+1,NEW),P(J+1,NEW),VEL	STEADY	1111
3480 LINLSL=LINESL-1	STEADY	1112
ABLE=SUM1-SUM7	STEADY	1113
WRITE (NPRINT,6100) SUM7,ABLE	STEADY	1114
M=KTOP(ICOREZ)-3	STEADY	1115
WRITE (NPRINT,6120)	STEADY	1116
DO 3500 I921X=1,NCOREN	STEADY	1117
I=NCOREN+1-I921X	STEADY	1118
WRITE (NPRINT,6140) I,(RZ(K,I),K=1,M)	STEADY	1119
3500 CONTINUE	STEADY	1120
M=M-1	STEADY	1121
WRITE (NPRINT,6160)	STEADY	1122
DO 3520 I921X=1,NCOREN	STEADY	1123
I=NCOREN+1-I921X	STEADY	1124
WRITE (NPRINT,6180) I,(RMQ(K,I),K=1,M)	STEADY	1125
3520 CONTINUE	STEADY	1126
PRINT 6200, BARF	STEADY	1127
PMAX3=AAPF(1)	STEADY	1128
DO 3540 I=2,NCOREN	STEADY	1129
IF (AAPF(I).LT.PMAX3) GO TO 3540	STEADY	1130
FMAX3=AAPF(I)	STEADY	1131
3540 CONTINUE	STEADY	1132
ABLE=0.	STEADY	1133
DO 3560 I=1,NCOREN	STEADY	1134
ABLE=ABLE+AAPF(I)	STEADY	1135
3560 CONTINUE	STEADY	1136
AVEPOW=ABLE/NCOREN	STEADY	1137
AVEKWC=.001*BARF*2./((NPERZ(ICOREZ)*DELL(ICOREZ))	STEADY	1138


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3800 FORMAT (1H0/1H0,5X,6HCHANNELS,5X,28HNUMBER OF DIFFERENT CHANNELS,5X, STEADY 1183
      +1H=,I2) STEADY 1184
3820 FORMAT (1H0,5X,5HPOWER,6X,18HREACTOR POWER (MW),15X,1H=,1PE8.2) STEADY 1185
3840 FORMAT (1H0,5X,5HPILOT,6X,24HPLOT SIGNAL (0/1=NO/YES),9X,1H=,I2) STEADY 1186
3860 FORMAT (1H0,/1H0,4X,35HCHANPF(CHAN) RELATIVE CHANNEL POWER,/5X,44H STEADY 1187
      +NOPINS(CHAN) NUMBER OF FUEL PINS PER CHANNEL,/5X,86HLISTS(CHANS,CH STEADY 1188
      +AN) .LIST OF CHANNELS HAVING SAME BASIC INPUT (EFFECTS OUTPUT PAGES STEADY 1189
      + ONLY),/15X,11HCHANNEL NO.,5X,12HCHANPF(CHAN),5X,12HNOPINS(CHAN),6 STEADY 1190
      +X,17HLISTS(CHANS,CHAN)) STEADY 1191
3880 FORMAT (13X,I2,10X,F8.3,12X,15,4X,20I3) STEADY 1192
3900 FORMAT (1H+,56X,15HCHANNEL NUMBER ,I2) STEADY 1193
3920 FORMAT (50H CHANNELS HAVING SAME BASIC INPUT INCLUDE CHANNELS,20I3 STEADY 1194
      +) STEADY 1195
3940 FORMAT (23H * * * GEOMETRY FOR CHANNEL,I3) STEADY 1196
3960 FORMAT (1H0,4X,6HNZONES,10X,21HNUMBER OF AXIAL ZONES,24X,1H=,I2) STEADY 1197
3980 FORMAT (5X,6HICOREZ,10X,24HZONE NUMBER OF CORE ZONE,21X,1H=,I2) STEADY 1198
4000 FORMAT (5X,6HPLENZ,10X,26HZONE NUMBER OF PLENUM ZONE,19X,1H=,I2) STEADY 1199
4020 FORMAT (5X,11HNPERZ(ZONE),5X,20HAXIAL NODES PER ZONE,/5X,10HKTOP(Z STEADY 1200
      +ONE),6X,40HNUMBER OF RADIAL NODES EXCLUDING COOLANT,/5X,10HDELL(ZO STEADY 1201
      +NE),6X,36HNODAL AXIAL LENGTH IN EACH ZONE (CM),/5X,11HFLOWA(ZONE), STEADY 1202
      +5X,33HCOOLANT FLOW AREA IN ZONE (CM**2),/1H0,20X,8HZONE NO.,5X,11H STEADY 1203
      +NPERZ(ZONE),5X,10HKTOP(ZONE),5X,10HDELL(ZONE),5X,11HFLOWA(ZONE)) STEADY 1204
4040 FORMAT (25X,I2,11X,I2,14X,I2,10X,F6.2,10X,F6.4) STEADY 1205
4060 FORMAT (1H0,4X,74HR(RADIAL,ZONE) RADIUS (CM), (STARTING WITH ADIA3 STEADY 1206
      +ATIC, ENDING WITH COOLANT),/1H0,20X,8HZONE NO.) STEADY 1207
4080 FORMAT (24X,I2,5X,15F6.3) STEADY 1208
4100 FORMAT (38H0* * * MATERIAL PROPERTIES FOR CHANNEL,I3) STEADY 1209
4120 FORMAT (5X,3HFCS,11X,58HCONSTANT TERM FOR FUEL HEAT CAPACITY BELOW STEADY 1210
      + MELTING (J/G-K),22X,1H=,1PE10.3) STEADY 1211
4140 FORMAT (5X,3HFVS,11X,61HT COEFFICIENT FOR FUEL HEAT CAPACITY BELOW STEADY 1212
      + MELTING (J/G-K**2),19X,1H=,1PE10.3) STEADY 1213
4160 FORMAT (5X,4HFV2S,10X,64HT**2 COEFFICIENT FOR FUEL HEAT CAPACITY B STEADY 1214
      +ELOW MELTING (J/G-K**3),16X,1H=,1PE10.3) STEADY 1215
4180 FORMAT (5X,4HFV3S,10X,64HT**3 COEFFICIENT FOR FUEL HEAT CAPACITY BELU STEADY 1216
      +W MELTING (J/G-K**4),16X,1H=,1PE10.4) STEADY 1217
4200 FORMAT (5X,3HFCL,11X,58HCONSTANT TERM FOR FUEL HEAT CAPACITY ABOVE STEADY 1218
      + MELTING (J/G-K),22X,1H=,1PE10.3) STEADY 1219
4220 FORMAT (5X,3HFVL,11X,54HT TERM FOR FUEL HEAT CAPACITY ABOVE MELTIN STEADY 1220
      +G (J/G-K**2),26X,1H=,1PE10.3) STEADY 1221
4240 FORMAT (1H0,4X,3HECS,11X,58HCONSTANT TERM FOR CLAD HEAT CAPACITY B STEADY 1222
      +ELOW MELTING (J/G-K),22X,1H=,1PE10.3) STEADY 1223
4260 FORMAT (5X,3HEVS,11X,61HT COEFFICIENT FOR CLAD HEAT CAPACITY BELOW STEADY 1224
      + MELTING (J/G-K**2),19X,1H=,1PE10.3) STEADY 1225
4280 FORMAT (5X,3HECL,11X,58HCONSTANT TERM FOR CLAD HEAT CAPACITY ABOVE STEADY 1226

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+ MELTING (J/G-K),22X,1H=,1PE10.3)	STEADY	1227
4300 FORMAT (5X,3HEVL,11X,53HT TERM FOR CLAD HEAT CAPACITY ABOVE MELTIN	STEADY	1228
+G(J/G-K**2),27X,1H=,1PE10.3)	STEADY	1229
4320 FORMAT (5X,4HEVL2,10X,57HT**2 TERM FOR CLAD HEAT CAPACITY ABOVE ME	STEADY	1230
+LTING (J/G-K**3),23X,1H=,1PE10.3)	STEADY	1231
4340 FORMAT (1H0,4X,3HCLC,11X,57HCONSTANT TERM FOR HEAT CAPACITY OF LIQ	STEADY	1232
+UID COOLANT (J/G-K),23X,1H=,1PE10.3)	STEADY	1233
4360 FORMAT (5X,3HCLV,11X,57HT COEFFICIENT FOR LIQUID COOLANT HEAT CAPA	STEADY	1234
+CITY (J/G-K**2),23X,1H=,1PE10.3)	STEADY	1235
4380 FORMAT (5X,4HCLV2,10X,53HT**2 TERM FOR LIQUID COOLANT HEAT CAPACIT	STEADY	1236
+V (J/G-K**3),27X,1H=,1PE10.3)	STEADY	1237
4400 FORMAT (5X,3HCVV,11X,53HCONSTANT TERM FOR COOLANT VAPOR HEAT CAPAC	STEADY	1238
+ITY (J/G-K),27X,1H=,1PE10.3)	STEADY	1239
4420 FORMAT (5X,3HCVV,11X,49HT TERM FOR COOLANT VAPOR HEAT CAPACITY (J/	STEADY	1240
+G-K**2),31X,1H=,1PE10.3)	STEADY	1241
4440 FORMAT (5X,4HCVV2,10X,52HT**2 TERM FOR COOLANT VAPOR HEAT CAPACITY	STEADY	1242
+ (J/G-K**3),28X,1H=,1PE10.3)	STEADY	1243
4460 FORMAT (1H0,4X,8HDENSE(1),6X,33HDENSITY OF FABRICATED FUEL (G/CC),	STEADY	1244
+47X,1H=,1PE9.3)	STEADY	1245
4480 FORMAT (5X,8HDENSE(2),6X,31HDENSITY OF SINTERED FUEL (G/CC),49X,1H	STEADY	1246
+,,1PE9.3)	STEADY	1247
4500 FORMAT (5X,6HDENSEE,8X,22HDENSITY OF CLAD (G/CC),58X,1H=,1PE9.3)	STEADY	1248
4520 FORMAT (1H0,4X,4HRLIQ,10X,42HDENSITY OF SATURATED LIQUID COOLANT (	STEADY	1249
+G/CC),38X,1H=,1PE9.3)	STEADY	1250
4540 FORMAT (5X,4HRVAP,10X,41HDENSITY OF SATURATED VAPOR COOLANT (G/CC)	STEADY	1251
+,,39X,1H=,1PE9.3)	STEADY	1252
4560 FORMAT (1H0,4X,6HTMELTL,8X,17HFUEL SOLIDOUS (K),63X,1H=,1PE9.3)	STEADY	1253
4580 FORMAT (5X,6HTMELTL,8X,18HFUEL LIQUIDOUS (K),62X,1H=,1PE9.3)	STEADY	1254
4600 FORMAT (5X,5HTSINT,9X,30HFUEL SINTERING TEMPERATURE (K),50X,1H=,1P	STEADY	1255
+L9.3)	STEADY	1256
4620 FORMAT (5X,6HTMELTE,8X,28HCLAD MELTING TEMPERATURE (K),52X,1H=,1PE	STEADY	1257
+9.3)	STEADY	1258
4640 FORMAT (1H0,4X,6HHFUSEF,8X,25HHEAT OF FUSION FUEL (J/G),55X,1H=,1P	STEADY	1259
+E9.3)	STEADY	1260
4660 FORMAT (5X,6HHFUSEE,8X,25HHEAT OF FUSION CLAD (J/G),55X,1H=,1PE9.3	STEADY	1261
+,	STEADY	1262
4680 FORMAT (5X,5HHVAPC,9X,37HHEAT OF VAPORIZATION OF COOLANT (J/G),43X	STEADY	1263
+,,1H=,1PE9.3)	STEADY	1264
4700 FORMAT (1H0,4X,5HCLADK,9X,56HCONSTANT TERM FOR CLAD THERMAL CONDUCT	STEADY	1265
+TIVITY (J/CM-SEC-K),24X,1H=,1PE9.3)	STEADY	1266
4720 FORMAT (5X,6HCLADKT,8X,59HT COEFFICIENT FOR CLAD THERMAL CONDUCTIV	STEADY	1267
+ITY (J/CM-SEC-K**2),21X,1H=,1PE10.3)	STEADY	1268
4740 FORMAT (5X,6HCONLIQ,8X,66HCONSTANT TERM FOR LIQUID COOLANT THERMAL	STEADY	1269
+ CONDUCTIVITY (J/CM-SEC-K),14X,1H=,1PE10.3)	STEADY	1270

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4760 FORMAT (5X,6HCONLI1,8X,69HT COEFFICIENT FOR LIQUID COOLANT THERMAL STEADY 1271
+ CONDUCTIVITY (J/CM-SEC-K**2),11X,1H=,1PE10.3) STEADY 1272
4780 FORMAT (5X,6HCONLI2,8X,72HT**2 COEFFICIENT FOR LIQUID COOLANT THER STEADY 1273
+ MAL CONDUCTIVITY (J/CM-SEC-K**3),8X,1H=,1PE10.3) STEADY 1274
4800 FORMAT (5X,6HCONVAP,8X,50HTHERMAL CONDUCTIVITY OF VAPOR COOLANT (J STEADY 1275
+ /CM-SEC-K),30X,1H=,1PE9.3) STEADY 1276
4820 FORMAT (5X,6HCONFUL,8X,67HTHERMAL CONDUCTIVITY OF LIQUID FUEL IN C STEADY 1277
+ OOLANT CHANNEL (J/CM-SEC-K),13X,1H=,1PE9.3) STEADY 1278
4840 FORMAT (1H0,4X,3HRLC,11X,40HCONSTANT TERM FOR COOLANT DENSITY (G/G STEADY 1279
+ C),40X,1H=,1PE10.3) STEADY 1280
4860 FORMAT (5X,3HRLV,11X,35HT TERM FOR COOLANT DENSITY (G/CC-K),45X,1H STEADY 1281
+ =,1PE10.3) STEADY 1282
4880 FORMAT (5X,4HRLV2,10X,41HT**2 TERM FOR COOLANT DENSITY (G/CC-K**2) STEADY 1283
+ ,39X,1H=,1PE10.3) STEADY 1284
4900 FORMAT (1H0,4X,6HIPAIR1,8X,54HNUMBER OF ENTRIES IN FUEL THERMAL CO STEADY 1285
+ NDUCTIVITY LIBRARY,26X,1H=,1I3/10X,50HTYPE 1 IS UNSINTERED FUEL, TY STEADY 1286
+ PE 2 IS SINTERED FUEL/5X,9HBASICT(K),5X,58HTEMPERATURE CORRESPONDI STEADY 1287
+ NG TO FUEL THERMAL CONDUCTIVITY (K)/5X,53HCONDUCT(K,TYPE) FUEL THER STEADY 1288
+ MAL CONDUCTIVITY (J/CM-SEC-K)//) STEADY 1289
4920 FORMAT (5X,6HBASICT,8X,16F7.0) STEADY 1290
4940 FORMAT (5X,11HCONDUCT( ,1),3X,16F7.4) STEADY 1291
4960 FORMAT (5X,11HCONDUCT( ,2),3X,16F7.4) STEADY 1292
4980 FORMAT (1H ) STEADY 1293
5000 FORMAT (5X,80HCON(RADIAL,ZONE) THERMAL CONDUCTIVITY OF NON CORE-NO STEADY 1294
+ N COOLANT NODES (J/CM-SEC-K)/1H0,18X,9HZONE NO.) STEADY 1295
5020 FORMAT (23X,I2,1P+e10.3) STEADY 1296
5040 FORMAT (1H0,4X,67HCAP(RADIAL,ZONE) HEAT CAPACITY OF NON CORE-NON C STEADY 1297
+ OOLANT NODES (J/CC)/1H0,18X,6HZONE NO.) STEADY 1298
5060 FORMAT (47H0* * * HEAT TRANSFER SPECIFICATIONS FOR CHANNEL,I3) STEADY 1299
5080 FORMAT (5X,6HHTCLIQ,8X,56HLIQUID COOLANT HEAT TRANSFER COEFFICIENT STEADY 1300
+ (J/CM**2-SEC-K),24X,1H=,1PE9.3) STEADY 1301
5100 FORMAT (5X,6HVAFHTC,8X,55HVAPOR COOLANT HEAT TRANSFER COEFFICIENT STEADY 1302
+ (J/CM**2-SEC-K),25X,1H=,1PE9.3) STEADY 1303
5120 FORMAT (5X,5HCGAPC,9X,59HCLAD COEFFICIENT OF THERMAL EXPANSION - I STEADY 1304
+ NTERCEPT (CM/CM-K),21X,1H=,1PE9.3) STEADY 1305
5140 FORMAT (5X,6HCGAPC2,8X,58HCLAD COEFFICIENT OF THERMAL EXPANSION - STEADY 1306
+ SLOPE (CM/CM-K**2),22X,1H=,1PE9.3) STEADY 1307
5160 FORMAT (1H0/39H0* * * POWER SPECIFICATIONS FOR CHANNEL,I3) STEADY 1308
5180 FORMAT (1H0,4X,4HPOWF,10X,35HFRACTION OF POWER GENERATED IN FUEL,4 STEADY 1309
+ 5X,1H=,1PE9.3) STEADY 1310
5200 FORMAT (5X,4HPOWE,10X,35HFRACTION OF POWER GENERATED IN CLAD,45X,1 STEADY 1311
+ H=,1PE9.3) STEADY 1312
5220 FORMAT (5X,4HPOWC,10X,38HFRACTION OF POWER GENERATED IN COOLANT,42 STEADY 1313
+ X,1H=,1PE9.3) STEADY 1314

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5240	FORMAT (1H0,+X,67HRA0PF(RADIAL) RELATIVE RADIAL POWER FACTORS FOR	STEADY	1315
	+CORE FUEL PIN NODES/1H0,15X,11F6.3)	STEADY	1316
5260	FORMAT (1H0/35H0* * * STRUCTURAL NODES FOR CHANNEL,I3)	STEADY	1317
5280	FORMAT (20X,7HCOOLANT,+X,9HADIABATIC,2X,7HTHERMAL,6X,10HVOLUMETRIC	STEADY	1318
	+12X,4HZONE,5X,6HRA0DIUS,5X,6HRA0DIUS,1X,12HCONDUCTIVITY,2X,13HHEAT	STEADY	1319
	+CAPACITY)	STEADY	1320
5300	FORMAT (115,F12.3,F11.3,F10.3,F14.3)	STEADY	1321
5320	FORMAT (59H0* * * COOLANT FLOW, AND TEMPERATURE CONDITIONS FOR CHA	STEADY	1322
	+NNEL,I3)	STEADY	1323
5340	FORMAT (1H0,+X,4HFLCW,10X,33HCHANNEL FLOW RATE PER PIN (G/SEC),47X	STEADY	1324
	+1H=,1PE9.3)	STEADY	1325
5360	FORMAT (5X,6HTINLET,8X,29HCOOLANT INLET TEMPERATURE (K),51X,1H=,1P	STEADY	1326
	+E9.3)	STEADY	1327
5380	FORMAT (5X,4HPSAT,10X,33HSATURATION PRESSURE (DYNES/CM**2),47X,1H=	STEADY	1328
	+1PE9.3)	STEADY	1329
5400	FORMAT (5X,4HTSAT,10X,26HSATURATION TEMPERATURE (K),54X,1H=,1PE9.3	STEADY	1330
	+)	STEADY	1331
5420	FORMAT (5X,6HTSUPER,8X,34HTEMPERATURE INITIATING BOILING (K),46X,1	STEADY	1332
	+H=,1PE9.3)	STEADY	1333
5440	FORMAT (5X,5HPEXIT,9X,27HEXIT PRESSURE (DYNES/CM**2),53X,1H=,1PE9.	STEADY	1334
	+3)	STEADY	1335
5460	FORMAT (5X,6HIBREAK,8X,64HNODE WHERE DIVERSION FLOW CAN OCCUR (USE	STEADY	1336
	+ 0 IF NO DIVERSION FLOW),16X,1H=,I3)	STEADY	1337
5480	FORMAT (5X,5HISETP,9X,59HSWITCH FOR FRICTION FACTORS (0/1=EACH ZON	STEADY	1338
	+E/ONLY FIRST ZONE),21X,1H=,I1)	STEADY	1339
5500	FORMAT (5X,10HDELP(ZONE),+X,42HZONAL FRICTION PRESSURE LOSS (DYNES	STEADY	1340
	+2CM**2)/1H0,15X,1P10E10.3)	STEADY	1341
5520	FORMAT (45H0* * * FISSION GAS SPECIFICATIONS FOR CHANNEL,I3)	STEADY	1342
5540	FORMAT (5X,5HTGASS,9X,49HTEMPERATURE OF PLENUM CLAD INITIATING FAI	STEADY	1343
	+LURE (K),31X,1H=,1PE9.3)	STEADY	1344
5560	FORMAT (5X,5HAHOLE,9X,47HPLENUM FAILURE - HOLE AREA(CM**2) *LOEFFI	STEADY	1345
	+CIENT,33X,1H=,1PE9.3)	STEADY	1346
5580	FORMAT (5X,5HPLENA,9X,35HPLENUM CROSS SECTIONAL AREA (CM**2),45X,1	STEADY	1347
	+H=,1PE9.3)	STEADY	1348
5600	FORMAT (1H0/+5H0* * * FUEL MOTION SPECIFICATIONS FOR CHANNEL,I3)	STEADY	1349
5620	FORMAT (1H0,+X,6HIFUELS,8X,40HFUEL FIN RADIAL NODE TO TEST FOR FAI	STEADY	1350
	+LURE,40X,1H=,I2)	STEADY	1351
5640	FORMAT (5X,6HJFUELS,8X,81HIF NOT ZERO TEST ONLY THIS AXIAL POSITIO	STEADY	1352
	+N (REL TO CORE BOT), OTHERWISE TEST ALL =,I2)	STEADY	1353
5660	FORMAT (5X,6HKFUELS,8X,45HAXIAL LEVEL FOR FAILURE (REL. TO CORE BO	STEADY	1354
	+TTOM),35X,1H=,I2)	STEADY	1355
5680	FORMAT (5X,6HTFUELS,8X,42HTEMPERATURE OF NODE INITIATING FAILURE (	STEADY	1356
	+K),38X,1H=,1PE9.3)	STEADY	1357
5700	FORMAT (5X,6HORIFIC,8X,48HSQUIRTING FUEL ORIFICE COEF. (DYNES/(CC/	STEADY	1358

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+SEC)**2),32X,1H=,1PE9.3) STEADY 1359
5720 FORMAT (5X,4HGTCL,10X,78HSQUIRTING GAS VELOCITY/LIQUID FUEL VELOC STEADY 1360
+TY (NEGATIVE/POSITIVE=VOLUME RATIO IN/63X13HPIN/AS INPUT)23X1H=1PE STEADY 1361
+10.3) STEADY 1362
5740 FORMAT (5X,4HWAIT,10X,24HSECONDS DELAY BEFORE FCI,56X,1H=,1PE9.3) STEADY 1363
5760 FORMAT (81H0* * * POWER, FUEL AND COOLANT WORTHS, AND DOPPLER AXIA STEADY 1364
+L DISTRIBUTIONS IN CHANNEL,I3) STEADY 1365
5780 FORMAT (1H0,4X,9HGW(AXIAL),5X,49HCOOLANT VOID WORTH AT HEIGHT CH(A STEADY 1366
+XIAL) DELTA K/KG/5X,9HFW(AXIAL),5X,42HFUEL WORTH AT HEIGHT FH(AXIA STEADY 1367
+L), DELTA K/KG/5X,9HOC(AXIAL),5X,37HDOPPLER WEIGHTING FACTOR AT HE STEADY 1368
+IGHT DH/5X,5HDOPPW,9X,23HWET DOPPLER COEFFICIENT,37X,1H=,1PE10.3/5 STEADY 1369
+X5HDOPPD,5X,23HDRY DOPPLER COEFFICIENT,57X,1H=,1PE10.3/5X,6HBASEQ STEADY 1370
+,8X43HCOOLANT DENSITY USED FOR WET DOPPLER (G/CC),37X,1H=,1PE9.3/5 STEADY 1371
+X,11HAXPF(AXIAL),3X,44HRELATIVE AXIAL POWER AT EACH AXIAL CORE NOD STEADY 1372
+E/10X,2HCH,7X,2HGW,8X,2HFW,8X,2HGH,10X,2HOC,19X,4HNODE,3X, STEADY 1373
+4HAXFF/10X,2HCM,4X,8HDEL K/KG,5X,2HCM,5X,8HDEL K/KG,5X,2HCM) STEADY 1374
5800 FORMAT (1H ) STEADY 1375
5820 FORMAT (1H+,6X,F6.1,1PE12.3) STEADY 1376
5840 FORMAT (1H+,26X,F6.1,1PE12.3) STEADY 1377
5860 FORMAT (1H+,46X,F6.1,1PE12.3) STEADY 1378
5880 FORMAT (1H+,83X,I2,3X,F6.3) STEADY 1379
5900 FORMAT (31H1 * * * SIEX INPUT DATA CHANNEL,I3) STEADY 1380
5920 FORMAT (1H0,4X,3HPBU,11X,19HPEAK BURNUP MW/MY,61X,1H=,1PE9.3/5X, STEADY 1381
+4HEFPD,10X,40HOPERATING TIME-EFFECTIVE FULL POWER DAYS,40X,1H=,1PE STEADY 1382
+9.3/5X,5HSTEP,9X,35HNUMBER OF TIME STEPS TO PEAK BURNUP,45X,1H=,1 STEADY 1383
+PE9.3/5X,2HZ1,12X,37HFRACTION OF GAS RELEASE-COLUMNAR ZONE,43X,1H= STEADY 1384
+,1PE9.3/5X,2HZ2,12X,37HFRACTION OF GAS RELEASE-EQUIAXED ZONE,43X,1 STEADY 1385
+H=,1PE9.3/5X,2HZ3,12X,43HFRACTION OF GAS RELEASE-UNRESTRICTED ZO STEADY 1386
+N=,37X,1H=,1PE10.3) STEADY 1387
5940 FORMAT (5X,5HCCFGM,9X,33HSORBLD GAS PER GRAM OF FUEL CC/GM,47X,1H= STEADY 1388
+,1PE9.3/5X,3HPPM,11X,29HPARTS PER MILLION WATER VAPOR,51X,1H=,1PE9 STEADY 1389
+.3/5X,5HYMOD0,9X,36HYCUNGS MODULUS-INTERCEPT DYNES/CM**2,44X,1H=,1 STEADY 1390
+PE9.3/5X,5HYMODS,9X,32HYOUNGS MODULUS-SLOPE DYNES/CM**2,48X,1H=,1P STEADY 1391
+PE9.3/5X,3HPNU,11X,14HPOISSONS RATIO,66X,1H=,1PE9.3/5X,5HPFLUX,9X,2 STEADY 1392
+4HPEAK FLUX NEUT/CM**2 SEC,56X,1H=,1PE9.3/5X,5HTEMP2,9X,26HEQUIAXE STEADY 1393
+D TEMPERATURE DEG C,54X,1H=,1PE9.3/5X,5HSIEX,9X,65HSIEX PRINTOUT STEADY 1394
+OPTIONS (0=NO SIEX OUTPUT,1=COMPLETE SIEX PRINTOUT),15X,1H=,I2) STEADY 1395
5960 FORMAT (5X,6HITRGAP,8X,46HTRANSIENT GAP CONDUCTANCE OPTION (0/1=DU STEADY 1396
+NT/DU)34X,1H=,I2) STEADY 1397
5980 FORMAT (56H0TEMPERATURES EXCEED CONDUCTIVITY TABLES AT AXIAL LEVEL STEADY 1398
+,I2,12H IN CHANNEL ,I2) STEADY 1399
6000 FORMAT (1H1120XA10/1X8A10,40XA10/30X35HSTEADY STATE CONDITIONS.--- STEADY 1400
+ CHANNEL,I3/8X,10HSEG CENTER,105X,4HEXIT/9X,6HHEIGHT,14X,44HNODAL STEADY 1401
+TEMPERATURE (DEGREES K) AT RADIAL NODE,39X,17HPRESSURE VELOCITY/13 STEADY 1402

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4	ZONE SEG CM,15I6,25H COOLANT M DYNES CM/SEC)	STEADY	1403
6020	FORMAT (1X)	STEADY	1404
6040	FORMAT (1H+,2I4,F6.1,1X,15F6.0)	STEADY	1405
6060	FORMAT (1H+,1+X,A1,14(5X,A1))	STEADY	1406
6080	FORMAT (1H+,10+X,F6.0,-6PF7,3,0PF9.0)	STEADY	1407
6100	FORMAT (24H1COLD LEG HEAD (DYNES/CM**2)=,1PE10.4/51H PUMP HEAD INC	STEADY	1408
	+LUDING FRICTION LOSSES (DYNES/CM**2)=,1PE10.4)	STEADY	1409
6120	FORMAT (12H0AXIAL LEVEL,10X,24HCOLD FUEL NODE BOUNDRIES)	STEADY	1410
6140	FORMAT (I6,12F7.5)	STEADY	1411
6160	FORMAT (12H0AXIAL LEVEL,10X,24HCOLD FUEL CENTROID RADII)	STEADY	1412
6180	FORMAT (I6,11F7.5)	STEADY	1413
6200	FORMAT (19H1J/SEC FOR THIS PIN,E20.5)	STEADY	1414
6220	FORMAT (2X,33HAVERAGE PIN POWER (KW/CM) = ,E12.5)	STEADY	1415
6240	FORMAT (2X,33HAVERAGE PIN POWER (KW/FT) = ,E12.5)	STEADY	1416
6260	FORMAT (2X,33HP-AK PIN POWER (KW/CM) = ,E12.5)	STEADY	1417
6280	FORMAT (2X,33HPEAK PIN POWER (KW/FT) = ,E12.5)	STEADY	1418
6300	FORMAT (61H0TEMPERATURES EXCEED FUEL HEAT CAPACITY TABLES AT AXIAL	STEADY	1419
	+ LEVEL,I3,11H IN CHANNEL,I3)	STEADY	1420
6320	FORMAT (61H0TEMPERATURES EXCEED CLAD HEAT CAPACITY TABLES AT AXIAL	STEADY	1421
	+ LEVEL,I3,11H IN CHANNEL,I3)	STEADY	1422
6340	FORMAT (64H0COOLANT TEMPERATURES EXCEED HEAT CAPACITY TABLES AT AX	STEADY	1423
	+IAL LEVEL,I3,11H IN CHANNEL,I3)	STEADY	1424
	END	STEADY	1425

SUBROUTINE DRAW (T1,T2,NC,NB,NT,NTOP,ICHAN,TITLE,BINGO,WORK,NCHAN)	DRAW	1
*)	DRAW	3
DIMENSION T1(15,2),T2(2),NTOP(2),TITLE(2),BINGO(2),X(18),Y(22),	DRAW	4
PARM(18)	DRAW	5
J=NTOP(NB)	DRAW	6
JP2=J+2	DRAW	7
DO 120 I=1,JP2	DRAW	8
120 X(I)=BINGO(I)*100.	DRAW	9
NC1=NC+1	DRAW	10
M=NB	DRAW	11
L=1	DRAW	12
DO 160 I=1,NC	DRAW	13
Y(I)=I	DRAW	14
DO 140 K=1,J	DRAW	15
BINGO(L)=T1(K,I)*.01	DRAW	16
140 L=L+1	DRAW	17
BINGO(L)=T2(M)*.01	DRAW	18
L=L+1	DRAW	19
BINGO(L)=.01*T2(NB)	DRAW	20
L=L+1	DRAW	21
160 M=M+1	DRAW	22
Y(NC1)=Y(NC)+.001	DRAW	23
DO 180 I=1,JP2	DRAW	24
BINGO(L)=.01*T2(NB)	DRAW	25
180 L=L+1	DRAW	26
CALL SYMBOL (1.25,8.,.112,TITLE,0,72)	DRAW	27
CALL SYMBOL (3.6,7.75,.112,30MCORE TEMPERATURES FOR CHANNEL ,0,30)	DRAW	28
FCHAN=ICHAN	DRAW	29
CALL NUMBER (999.,999.,.112,FCHAN,0,-1)	DRAW	30
PARM(1)=100.	DRAW	31
PARM(2)=75.	DRAW	32
PARM(3)=15.	DRAW	33
PARM(4)=10.	DRAW	34
PARM(5)=JP2	DRAW	35
PARM(6)=NC	DRAW	36
PARM(7)=JP2	DRAW	37
PARM(8)=1000.	DRAW	38
PARM(9)=1.5	DRAW	39
PARM(10)=1.5	DRAW	40
PARM(11)=8.	DRAW	41
PARM(12)=0.	DRAW	42
PARM(13)=X(1)	DRAW	43
PARM(14)=X(JP2)	DRAW	44
PARM(15)=Y(1)	DRAW	45

PARM(16)=Y(NC)	DRAW	46
TMIN=.01*(T2(NB)-10.)	DRAW	47
TMAX=TMIN	DRAW	48
DO 220 I=1,NC	DRAW	49
DO 200 K=1,J	DRAW	50
IF (.01*T1(K,I).LT.TMAX) GO TO 200	DRAW	51
TMAX=.01*T1(K,I)	DRAW	52
200 CONTINUE	DRAW	53
220 CONTINUE	DRAW	54
PARM(17)=TMIN	DRAW	55
PARM(18)=TMAX	DRAW	56
CALL PLOT3D (X,Y,BINGO,PARM,WORK)	DRAW	57
CALL PLOT (13.,G,-3)	DRAW	58
L1=2*NC	DRAW	59
L2=3*NC	DRAW	60
N1=J-4	DRAW	61
N2=J-2	DRAW	62
N3=J	DRAW	63
M=1	DRAW	64
DO 240 L=1,NC	DRAW	65
BINGO(L)=100.*BINGO(M)	DRAW	66
BINGO(L+NC)=100.*BINGO(M+N1)	DRAW	67
BINGO(L+L1)=100.*BINGO(M+N2)	DRAW	68
BINGO(L+L2)=100.*BINGO(M+N3)	DRAW	69
Y(L)=Y(L)+NB-1	DRAW	70
240 M=M+JP2	DRAW	71
CALL SYMBOL (.25,10.,.112,TITLE,0,72)	DRAW	72
CALL SYMBOL (2.35,9.79,.112,30HCORE TEMPERATURES FOR CHANNEL ,0,30	DRAW	73
*)	DRAW	74
CALL NUMBER (999.,999.,.112,FCHAN,0,-1)	DRAW	75
CALL SYMBOL (1.67,9.62,.112,0,0,-1)	DRAW	76
CALL SYMBOL (1.67,9.56,.112,11H CENTERLINE,0,11)	DRAW	77
CALL SYMBOL (3.,9.62,.112,3,0,-1)	DRAW	78
CALL SYMBOL (3.,9.56,.112,14H FUEL SURFACE ,0,14)	DRAW	79
CALL SYMBOL (4.6,9.62,.112,4,0,-1)	DRAW	80
CALL SYMBOL (4.6,9.56,.112,6H CLAD ,0,6)	DRAW	81
CALL SYMBOL (5.3,9.62,.112,11,0,-1)	DRAW	82
CALL SYMBOL (5.3,9.56,.112,8H COOLANT,0,8)	DRAW	83
CALL CSCALE (Y,6.,NC,1,FIRSTX,DELTAX)	DRAW	84
CALL CSCALE (BINGO,8.,4*NC,1,FIRSTY,DELTAY)	DRAW	85
CALL PLOT (1.5,1.5,-3)	DRAW	86
CALL AXIS (0,0,9HDEGREES K,9,8.,90.,FIRSTY,DELTAY)	DRAW	87
CALL AXIS (0,0,10HAXIAL NODE,-10,6.,0,FIRSTX,DELTAX)	DRAW	88
CALL LINE (Y,BINGO,NC,1,1,0,FIRSTX,DELTAX,FIRSTY,DELTAY)	DRAW	89

CALL LINE (Y,BINGO(NC+1),NC,1,1,3,FIRSTX,DELTAX,FIRSTY,DELTAY)	DRAW	90
CALL LINE (Y,BINGO(2*NC+1),NC,1,1,4,FIRSTX,DELTAX,FIRSTY,DELTAY)	DRAW	91
CALL LINE (Y,BINGO(3*NC+1),NC,1,1,11,FIRSTX,DELTAX,FIRSTY,DELTAY)	DRAW	92
CALL PLOT (9.,-1.5,-3)	DRAW	93
RETURN	DRAW	94
END	DRAW	95

SUBROUTINE TPUT (NPRINT)	TPUT	2
COMMON CORE(9230),ITUC,IOUT(206)	TPUT	3
DIMENSION ITS(400),ITF(400),ITC(75),NTOP(2)	TPUT	4
EQUIVALENCE (CORE(5655),NAXIAL),(CORE(5656),NBCORE),(CORE(5657),	TPUT	5
+NTCORE),(CORE(5658),NTOP)	TPUT	6
NAMELIST/SPECIF/ITS,ITF,ITC	TPUT	7
READ (5,SPECIF)	TPUT	8
WRITE (NPRINT,840)	TPUT	9
WRITE (NPRINT,860) ITS(1)	TPUT	10
WRITE (NPRINT,880) ITF(1)	TPUT	11
WRITE (NPRINT,900) ITC(1)	TPUT	12
WRITE (NPRINT,920)	TPUT	13
WRITE (NPRINT,940)	TPUT	14
ITUC=NAXIAL	TPUT	15
IKE=0	TPUT	16
JAKE=0	TPUT	17
IF (ITF(1).NE.400) GO TO 180	TPUT	18
IKE=1	TPUT	19
L=1	TPUT	20
DO 120 I=NBCORE,NTCORE	TPUT	21
ITF(2*L-1)=1	TPUT	22
ITF(2*L)=I-1	TPUT	23
120 L=L+1	TPUT	24
ITF(2*L-1)=0	TPUT	25
ITF(2*L)=0	TPUT	26
I=L+1	TPUT	27
K=NTOP(NBCORE)-3	TPUT	28
DO 140 I=NBCORE,NTCORE	TPUT	29
ITF(2*L-1)=K	TPUT	30
ITF(2*L)=I-1	TPUT	31
140 L=L+1	TPUT	32
ITF(2*L-1)=0	TPUT	33
ITF(2*L)=0	TPUT	34
L=L+1	TPUT	35
K=NTOP(NBCORE)-1	TPUT	36
DO 160 I=NBCORE,NTCORE	TPUT	37
ITF(2*L-1)=K	TPUT	38
ITF(2*L)=I-1	TPUT	39
160 L=L+1	TPUT	40
ITF(2*L-1)=-10	TPUT	41
180 IF (ITC(1).NE.400) GO TO 220	TPUT	42
L=1	TPUT	43
JAKE=1	TPUT	44
DO 200 I=NBCORE,NTCORE	TPUT	45

200	ITC(I)=I-1	TPUT	46
	ITC(NTCORE)=-10	TPUT	47
220	CONTINUE	TPUT	48
	J1=0	TPUT	49
	J2=0	TPUT	50
	J3=0	TPUT	51
	IF (ITS(1)-100) 320,240,240	TPUT	52
240	ISUM=0	TPUT	53
	DO 300 I=2,NAXIAL	TPUT	54
	IF (I-NBCORE) 280,300,260	TPUT	55
260	IF (I-NTCORE) 300,300,280	TPUT	56
280	ISUM=ISUM+NTOP(I)	TPUT	57
300	CONTINUE	TPUT	58
	IOUT(1)=ISUM	TPUT	59
	IOUT(4)=1000	TPUT	60
	N1=6	TPUT	61
	GO TO 460	TPUT	62
320	DO 420 I=1,200	TPUT	63
	IF (ITS(2*I-1)) 440,340,340	TPUT	64
340	IF (ITS(2*I)-NBCORE-1) 360,360,400	TPUT	65
360	IOUT(I+6)=4*ITS(2*I)+ITS(2*I-1)	TPUT	66
	GO TO 420	TPUT	67
380	IF (I.EQ.1) GO TO 440	TPUT	68
	IOUT(I+6)=0	TPUT	69
	J1=J1+1	TPUT	70
	GO TO 420	TPUT	71
400	IOUT(I+6)=4*(ITS(2*I)-(NTCORE-NBCORE+1))+ITS(2*I-1)	TPUT	72
420	CONTINUE	TPUT	73
	I=201	TPUT	74
440	IOUT(1)=I-1	TPUT	75
	IOUT(4)=IOUT(1)	TPUT	76
	N1=I+5	TPUT	77
460	IF (ITF(1)-100) 520,480,480	TPUT	78
480	ISUM=0	TPUT	79
	DO 500 I=NBCORE,NTCORE	TPUT	80
500	ISUM=ISUM+NTOP(I)	TPUT	81
	IOUT(2)=ISUM	TPUT	82
	IOUT(5)=1000	TPUT	83
	N2=N1	TPUT	84
	GO TO 600	TPUT	85
520	DO 560 I=1,200	TPUT	86
	IF (ITF(2*I-1)) 580,540,560	TPUT	87
540	IF (I.EQ.1) GO TO 580	TPUT	88
	ITF(2*I)=NBCORE-1	TPUT	89

J2=J2+1	TPUT	90
560 IOUT(I+N1)=ITF(2*I-1)+15*(ITF(2*I)-NBCORE+1)	TPUT	91
I=201	TPUT	92
580 IOUT(2)=I-1	TPUT	93
IOUT(5)=IOUT(2)	TPUT	94
N2=N1+I-1	TPUT	95
600 IF (ITC(1)-100) 640,620,620	TPUT	96
620 IOUT(3)=NAXIAL-1	TPUT	97
IOUT(6)=1000	TPUT	98
GO TO 740	TPUT	99
640 DO 700 I=1,75	TPUT	100
IF (ITC(I)) 720,660,680	TPUT	101
660 IF (I.EQ.1) GO TO 720	TPUT	102
IOUT(I+N2)=80	TPUT	103
J3=J3+1	TPUT	104
GO TO 700	TPUT	105
680 IOUT(I+N2)=ITC(I)+1	TPUT	106
700 CONTINUE	TPUT	107
I=76	TPUT	108
720 IOUT(3)=I-1	TPUT	109
IOUT(6)=IOUT(3)	TPUT	110
740 CONTINUE	TPUT	111
DO 760 I=1,3	TPUT	112
IF (IOUT(I).NE.0) IOUT(I)=IOUT(I)+1	TPUT	113
760 CONTINUE	TPUT	114
IF (IOUT(1).EQ.0.OR.IOUT(4).EQ.1000) GO TO 780	TPUT	115
M=IOUT(4)	TPUT	116
WRITE (NPRINT,960)	TPUT	117
WRITE (NPRINT,980) (ITS(I),I=1,M)	TPUT	118
780 IF (IOUT(2).EQ.0.OR.IOUT(5).EQ.1000.OR.IKE.EQ.1) GO TO 800	TPUT	119
M=IOUT(5)	TPUT	120
WRITE (NPRINT,1000)	TPUT	121
WRITE (NPRINT,980) (ITF(I),I=1,M)	TPUT	122
800 IF (IOUT(3).EQ.0.OR.IOUT(6).EQ.1000.OR.JAKE.EQ.1) GO TO 820	TPUT	123
WRITE (NPRINT,1020)	TPUT	124
M=IOUT(6)	TPUT	125
WRITE (NPRINT,980) (ITC(I),I=1,M)	TPUT	126
820 CONTINUE	TPUT	127
RETURN	TPUT	128
C	TPUT	129
840 FORMAT (34H1OUTPUT TEMPERATURE SPECIFICATIONS)	TPUT	130
860 FORMAT (7H0ITS(1),2X,89HSINK NODES (1000/NEGATIVE/OTHER = ALL/NONE	TPUT	131
+ /SPECIFIED AS (RADIAL INDEX,AXIAL INDEX) LIST)7X,1H=,I4)	TPUT	132
880 FORMAT (7H0ITF(1),2X,46HFUEL AND CLAD NODES (400/1000/NEGATIVE/OTH	TPUT	133

*ER =/9X79HCENTERLINE,SURFACE,AND CLAD CENTROID/ALL/NONE/SPECIFIED	TPUT	134
*AS (RADIAL,AXIAL) LIST)17X1H=I4)	TPUT	135
900 FORMAT (7H0ITC(1),2X81HCOOLANT NODES (400/1000/NEGATIVE/OTHER = C0	TPUT	136
*RE/ALL/NONE/SPECIFIED AS (AXIAL) LIST)15X1H=I4)	TPUT	137
920 FORMAT (63H0NOTE - A ZERO INDEX INDICATES A LIST PER PAGE BREAK FO	TPUT	138
*R OUTPUT)	TPUT	139
940 FORMAT (8X26HA NEGATIVE INDEX ENDS LIST)	TPUT	140
960 FORMAT (4H0ITS)	TPUT	141
980 FORMAT (1H 42(I2,1H,))	TPUT	142
1000 FORMAT (4H0ITF)	TPUT	143
1020 FORMAT (4H0ITC)	TPUT	144
END	TPUT	145

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      SUBROUTINE CURVE (YOUT,XIN,X,Y,NO,IERROR)
C
C  LINEAR INTERPOLATION
C  X IS INDEPENDENT VARIABLE ARRAY
C  Y IS DEPENDENT VARIABLE ARRAY
C  NO IS NUMBER OF POINTS IN X OR Y
C  XIN IS INDEPENDENT VALUE
C  YOUT IS DEPENDENT VALUE
C  IERROR SET TO 0/1 = OK/OUTSIDE DATA LIMITS
C
      DIMENSION X(2),Y(2)
      IERROR=0
      IF (XIN.LT.X(1).OR.XIN.GT.X(NO)) GO TO 200
      DO 120 I=1,NO
      IF (XIN-X(I)) 180,140,120
120  CONTINUE
140  YOUT=Y(I)
160  RETURN
180  YOUT=Y(I-1)+(Y(I)-Y(I-1))/(X(I)-X(I-1))*(XIN-X(I-1))
      GO TO 160
200  IERROR=1
      GO TO 160
      END

```

```

CURVE      2
CURVE      3
CURVE      4
CURVE      5
CURVE      6
CURVE      7
CURVE      8
CURVE      9
CURVE     10
CURVE     11
CURVE     12
CURVE     13
CURVE     14
CURVE     15
CURVE     16
CURVE     17
CURVE     18
CURVE     19
CURVE     20
CURVE     21
CURVE     22
CURVE     23
CURVE     24

```

SUBROUTINE LINE (XARRAY,YARRAY,NPTS,INC,LINTYP,INTEQ,FIRSTX,DELTAX	LINE	2
*,FIRSTY,DELTAY)	LINE	3
DIMENSION XARRAY(1),YARRAY(1)	LINE	4
LMIN=NPTS*INC+1	LINE	5
LDX=LMIN+INC	LINE	6
NL=LMIN+INC	LINE	7
CALL WHERE (XN,YN,DF)	LINE	8
XN=XN*DELTAX+FIRSTX	LINE	9
YN=YN*DELTAY+FIRSTY	LINE	10
DF=AMAX1 (ABS(XARRAY(1)-XN),ABS(YARRAY(1)-YN))	LINE	11
DL=AMAX1 (ABS(XARRAY(NL)-XN),ABS(YARRAY(NL)-YN))	LINE	12
IPEN=3	LINE	13
ICODE=-1	LINE	14
NT=IABS(LINTYP)	LINE	15
IF (LINTYP) 140,120,140	LINE	16
120 NT=1	LINE	17
140 IF (DF-DL) 180,180,160	LINE	18
160 NF=NL	LINE	19
NA=((NPTS-1)/NT)*NT+NT-(NPTS-1)	LINE	20
KK=-INC	LINE	21
GO TO 200	LINE	22
180 NF=1	LINE	23
NA=NT	LINE	24
KK=INC	LINE	25
200 IF (LINTYP) 220,240,260	LINE	26
220 IFCNA=3	LINE	27
ICODEA=-1	LINE	28
LSW=1	LINE	29
GO TO 280	LINE	30
240 NA=LDX	LINE	31
260 IPENA=2	LINE	32
ICODEA=-2	LINE	33
LSW=0	LINE	34
280 DO 400 I=1,NPTS	LINE	35
XN=(XARRAY(NF)-FIRSTX)/DELTAX	LINE	36
YN=(YARRAY(NF)-FIRSTY)/DELTAY	LINE	37
IF (NA-NT) 300,320,340	LINE	38
300 IF (LSW) 360,340,360	LINE	39
320 CALL SYMBOL (XN,YN,.08,INTEQ,0.0,ICODE)	LINE	40
NA=1	LINE	41
GO TO 380	LINE	42
340 CALL PLOT (XN,YN,IPEN)	LINE	43
360 NA=NA+1	LINE	44
380 NF=NF+KK	LINE	45


```
      ICODE=ICODEA  
400 IPEN=IPENA  
      RETURN  
      END
```

```
LINE 46  
LINE 47  
LINE 48  
LINE 49
```

```

SUBROUTINE CSCALE (ARRAY,AXLEN,NPTS,INC,FIRSTV,DELTA)
DIMENSION ARRAY(1),SAVE(7)
SAVE(1)=1.
SAVE(2)=2.
SAVE(3)=4.
SAVE(4)=5.
SAVE(5)=8.
SAVE(6)=10.
SAVE(7)=20.
FAD=.01
IF (FIRSTV.NE.-307.42) GO TO 220
J=DELTA+.1
J=J-NPTS
YO=ARRAY(1)
YN=YO
I=0
DO 200 L=1,INC
  DO 180 K=1,NPTS
    I=I+1
    IF (YO-ARRAY(I)) 140,140,120
120  YO=ARRAY(I)
    GO TO 180
140  IF (ARRAY(I)-YN) 180,180,160
160  YN=ARRAY(I)
180  CONTINUE
200  I=I+J
    GO TO 320
220  CONTINUE
    K=IABS(INC)
    N=NPTS*K
    YO=ARRAY(1)
    YN=YO
    DO 300 I=1,N,K
      YS=ARRAY(I)
      IF (YO-YS) 260,260,240
240  YO=YS
      GO TO 300
260  IF (YS-YN) 300,300,280
280  YN=YS
300  CONTINUE
320  CONTINUE
    FIRSTV=YO
    IF (YO) 340,360,360
340  FAD=FAD-1.

```

CSCALE	2
CSCALE	3
CSCALE	4
CSCALE	5
CSCALE	6
CSCALE	7
CSCALE	8
CSCALE	9
CSCALE	10
CSCALE	11
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CSCALE	15
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CSCALE	19
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CSCALE	29
CSCALE	30
CSCALE	31
CSCALE	32
CSCALE	33
CSCALE	34
CSCALE	35
CSCALE	36
CSCALE	37
CSCALE	38
CSCALE	39
CSCALE	40
CSCALE	41
CSCALE	42
CSCALE	43
CSCALE	44
CSCALE	45

```

360 DELTAV=(YN-FIRSTV)/AXLEN
    IF (DELTAV) 560,560,380
380 I=ALOG10(DELTAV)+1000.
    P=10.** (I-1000)
    DELTAV=DELTAV/P-.01
    DO 400 I=1,6
    IS=1
    IF (SAVE(I)-DELTAV) 400,420,420
400 CONTINUE
420 DELTAV=SAVE(IS)*P
    FIRSTV=DELTAV*AIN(T/YO/DELTAV+FAD)
    T=FIRSTV+(AXLEN+.01)*DELTAV
    IF (T-YN) 440,460,460
440 IS=IS+1
    GO TO 420
460 FIRSTV=FIRSTV-AINT((AXLEN+(FIRSTV-YN)/DELTAV)/2.)*DELTAV
    IF (YO*FIRSTV) 480,480,500
480 FIRSTV=0.0
500 IF (INC) 520,520,540
520 FIRSTV=FIRSTV+AXLEN*DELTAV
    DELTAV=-DELTAV
540 RETURN
560 DELTAV=1.
    FIRSTV=FIRSTV-.5
    GO TO 540
END

```

```

CSCALE 46
CSCALE 47
CSCALE 48
CSCALE 49
CSCALE 50
CSCALE 51
CSCALE 52
CSCALE 53
CSCALE 54
CSCALE 55
CSCALE 56
CSCALE 57
CSCALE 58
CSCALE 59
CSCALE 60
CSCALE 61
CSCALE 62
CSCALE 63
CSCALE 64
CSCALE 65
CSCALE 66
CSCALE 67
CSCALE 68
CSCALE 69
CSCALE 70
CSCALE 71

```

C-2. TRANSIENT

PROGRAM MELT (INPUT,TAPE5=INPUT,OUTPUT,TAPE6=OUTPUT,DUMP,TAPE4=DUM	MELT	2
+P,START,TAPE2=START,TAPE1=13,TAPE99=0)	MELT	3
COMMON/DUMDUM4/SIZZLE(155)	MELT	4
COMMON/FIT/FIT(385)	MELT	5
COMMON/ZPLOTZ/I(801)	MELT	6
COMMON/NTABZZ/NTA3(49)	MELT	7
COMMON/IPRESR/IP(20)	MELT	8
COMMON/GOLLY/IUNIT,GELWIZ(20)	MELT	9
COMMON SPACL(14334)	MELT	10
DIMENSION BUFFER(1006)	MELT	11
DATA GELWIZ/20*-10./,SIZZLE/105*0./	MELT	12
C****	MELT	13
C**** SET UP DISK INFORMATION TABLES "FIT" AND OPEN DISK FILES	MELT	14
CALL FILEWA (FIT,3LLFN,6LTAPE12,2LRT,1LU,3LMRL,10550,3LFWB,BUFFER,	MELT	15
+3LBFS,1050,3LSJS,3LYES)	MELT	16
CALL OPENM (FIT,3LI-0,1LR)	MELT	17
CALL FILEWA (FIT(36),3LLFN,6LTAPE13,2LRT,1LU,3LMRL,10550,3LFWB,BUF	MELT	18
+FER,3LBFS,1050,3LSJS,3LYES)	MELT	19
CALL OPENM (FIT(36),3LI-0,1LR)	MELT	20
CALL FILEWA (FIT(71),3LLFN,6LTAPE14,2LRT,1LU,3LMRL,10550,3LFWB,BUF	MELT	21
+FER,3LBFS,1050,3LSJS,3LYES)	MELT	22
CALL OPENM (FIT(71),3LI-0,1LR)	MELT	23
CALL FILEWA (FIT(106),3LLFN,6LTAPE15,2LRT,1LU,3LMRL,10550,3LFWB,BU	MELT	24
+FFER,3LBFS,1050,3LSJS,3LYES)	MELT	25
CALL OPENM (FIT(106),3LI-0,1LR)	MELT	26
CALL FILEWA (FIT(141),3LLFN,6LTAPE16,2LRT,1LU,3LMRL,10550,3LFWB,BU	MELT	27
+FFER,3LBFS,1050,3LSJS,3LYES)	MELT	28
CALL OPENM (FIT(141),3LI-0,1LR)	MELT	29
CALL FILEWA (FIT(176),3LLFN,6LTAPE17,2LRT,1LU,3LMRL,10550,3LFWB,BU	MELT	30
+FFER,3LBFS,1050,3LSJS,3LYES)	MELT	31
CALL OPENM (FIT(176),3LI-0,1LR)	MELT	32
CALL FILEWA (FIT(211),3LLFN,6LTAPE18,2LRT,1LU,3LMRL,10550,3LFWB,BU	MELT	33
+FFER,3LBFS,1050,3LSJS,3LYES)	MELT	34
CALL OPENM (FIT(211),3LI-0,1LR)	MELT	35
CALL FILEWA (FIT(246),3LLFN,6LTAPE19,2LRT,1LU,3LMRL,10550,3LFWB,BU	MELT	36
+FFER,3LBFS,1050,3LSJS,3LYES)	MELT	37
CALL OPENM (FIT(246),3LI-0,1LR)	MELT	38
CALL FILEWA (FIT(281),3LLFN,6LTAPE20,2LRT,1LU,3LMRL,10550,3LFWB,BU	MELT	39
+FFER,3LBFS,1050,3LSJS,3LYES)	MELT	40
CALL OPENM (FIT(281),3LI-0,1LR)	MELT	41
CALL FILEWA (FIT(316),3LLFN,6LTAPE21,2LRT,1LU,3LMRL,10550,3LFWB,BU	MELT	42
+FFER,3LBFS,1050,3LSJS,3LYES)	MELT	43
CALL OPENM (FIT(316),3LI-0,1LR)	MELT	44
CALL FILEWA (FIT(351),3LLFN,6LTAPE22,2LRT,1LU,3LMRL,10550,3LFWB,BU	MELT	45
+FFER,3LBFS,1050,3LSJS,3LYES)	MELT	46
CALL OPENM (FIT(351),3LI-0,1LR)	MELT	47
C****	MELT	48
C**** GO TO EXECUTE TRANSIENT MELT-III	MELT	49
CALL READ, RETURNS (120)	MELT	50
CALL RUN	MELT	51
CALL WRAPUP	MELT	52
CALL XPLOTX	MELT	53
120 STOP	MELT	54
END	MELT	55

```

SUBROUTINE PRESS, RETURNS (IERROR)
C****
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS
DIMENSION SLO3(1)
REAL KINSRT,KWTHDR
LOGICAL PRINT,DONE,SCRAM
COMMON
      DONE,ISTAT      ,IIN      ,SLO3(3)      ,
+IBLOCK      ,H(2)      ,T(2)      ,HREDO      ,ICHAN      ,VOIDUK(2)      ,
+DOPPK(2)      ,COL4PK(2)      ,NEW      ,IOLD      ,NOUT      ,TERROR      ,
+GERROR      ,FEXIT(3)      ,PERKOR      ,PRINT      ,DELTIM      ,PN(2)      ,
+PBQTT(3,2)      ,IACTIV(20)      ,FLOW(3,2)      ,TOPT(3,2)      ,TOPEN(3)      ,WOLF(3)      ,
+LOOP(20)      ,IOUTL      ,NTR=AT      ,IKINET      ,TOUT      ,HMAX      ,
+TIMEIN(50)      ,DKIN(50)      ,TIMOUT(50)      ,DKOUT(50)      ,IPAIR2      ,AN(2)      ,
+IPAIR3      ,KOUNT      ,RH(2)      ,BBO100      ,RHOSWZ      ,NGROUP      ,
+C(6,2)      ,ALIFE      ,ALPH(6)      ,GAM(6)      ,B(6)      ,AL(6)      ,
+BB      ,SCRAM      ,TSCRAM(2)      ,PERIOD      ,RSLOPE      ,ERROR      ,
+KINSRT(2)      ,KWTHDR(2)      ,REDUCE      ,PRINT1      ,PRINT2      ,RYIN      ,
COMMON
+ANLOW      ,TQUIT      ,LSTEP      ,JSTEP      ,ANIC      ,TKGS      ,
+IFLOT      ,ERRUR1      ,TERM(13)      ,TITLE(8)      ,HOTPIH      ,SPCB      ,
+SPCC      ,SPCU      ,LINESL      ,KSTEP      ,NCHAN      ,MSTEP      ,
+IIRINT      ,MPRINT      ,IDUMP      ,QGEN(2)      ,ANI      ,ANSCKY      ,
+TDELAY      ,NLOJPS      ,RHOCCE(3)      ,VOLTOP(3)      ,HEAD(3)      ,FRESTM(50)      ,
+PRESUR(50,3)      ,IPAIR4      ,FD(3)      ,RUNITIM      ,VER      ,ETAD(4)      ,
+KBLOCK      ,JBLOCK      ,MBLOCK      ,N12      ,N13      ,EXTRA      ,
+GJACK(3)      ,VJACK(2)      ,ITRGAP      ,
+HMIN      ,N22      ,NIN      ,INPUT      ,N2      ,N+      ,
+N7      ,N8      ,KPRINT      ,PCWSS      ,HMAX3      ,HMAXF      ,
+TRIPFW(3)      ,TRIPFP(3)      ,TRIPPF(3)      ,TRIPOT(3)      ,DELAYF      ,
EQUIVALENCE (QMOL,TERM(4)),(T4OL,TERM(5)),(GMOL,TERM(6)),(PERMUL,T
+ERM(7)),(SLO3,DJNL)
C****
C****
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA
DIMENSION S(1),CORE(1),IS(1),_PYTH(15,20),OIL(8),XLIQ(11,20,2)
INTLG=K SMELP
COMMON
      TCGOL(7,2),RLOG(22,20),UU(3)      ,ULIQ(7,2)      ,
+      UVAP(7,2)      ,
+AFLOW(7,2)      ,US(4,20)      ,HCWPS(4,20)      ,DSAVE1(4,55,2),DSAVE2(7,2)      ,
+DSAVE3(15,20,2),DSAVE4(75,2),POW(16,20),VOLUME(15,20),HCAPF(15,20)
+TEMPER(15,20,2),TSINK(4,55,2),VOIDUV(20)      ,VPLEN      ,PPLN(2)      ,
+RFLEN(2)      ,G(75,2)      ,
+VOLF(2)      ,GT0      ,GT1      ,GT2      ,GT3      ,GASBU(2,2)      ,
+GASBU(2,2)      ,FUELB0(2)      ,FUELB1(2)      ,FANN(75)      ,P(7,2)      ,KHJG(75,2)      ,
+RHOF(7,2)      ,WF(7,2)      ,WC(7,2)      ,NOPINS      ,NAXIAL      ,NJCORE      ,
+NTCORE      ,NTOP(75),NTYPE(15,20)      ,IGAS(2)      ,NDFLEN      ,
+IFUEL(2)      ,IBOIL(2)      ,IGASU(2,2),IGASU(2,2),IFUEL0(2)      ,IFUEL1(2)      ,
+IBOILD(2,2),IBOILU(2,2),NBOIL(2)      ,NGAS(2)      ,RLC      ,RLV      ,
COMMON
+ULLC      ,CLV      ,CVU      ,CVV      ,BASILT(50),CONUUC(50)      ,
+2)      ,IPAIR1      ,CGAPA      ,CGAPB      ,CGAPL      ,CGAPJ      ,SLEMP(60)      ,
+ST1(6,2)      ,TTEMP(30)      ,ST2(30)      ,DENSEE      ,DENSEL(2)      ,TMAG1C      ,
+TSAT      ,AHOLE      ,HAXF      ,HAXL      ,HAXV      ,PSAT      ,
+RLIQ      ,RLQF      ,PTRY      ,PVOID      ,IFUELS      ,JFUELS      ,
+TGASS      ,TSUP=K      ,TFUELS      ,TMELTH      ,TMELTL      ,GAMMA      ,
+PINT=K(20,2),GAPR(20)      ,GAPRL      ,CLVC      ,DOPODE(20,2)      ,
+BASENA      ,DOPPW      ,WBASEL      ,SPC2(2)      ,HFUSEE      ,UKNA(20,2)      ,
+WALTAR(7,2)      ,PARTAN(20),LGAP
COMMON
+KFULS      ,SPC3(13)      ,HI(7,2)      ,CLAUKT      ,
+RLV2      ,CLV2      ,CVV2      ,HAXL1      ,HAXL2      ,CGAPB2      ,
+CLACK      ,CAPL(7,2)      ,TSTRUK(7,2),USTL(75),USTV(75),DSAVE0(7,2)
+CLIQ(15)      ,CLIQT(15)      ,CVAP(13)      ,CVAPT(16)      ,HLLP(75)      ,SMELP(75)      ,
+RHODNA(75,2),TW(11)      ,UOLD(7,2)      ,IBILL      ,JBILL      ,BOX(2,4)      ,
+CCPERC(3,20),PO=0(3,20),YCHYEH(11,20),SPC4      ,IOUT(2,6)

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COMMON	IBAX,ITAX,LUP,LOWN,LUP0,LOWN0,DUP,DOWN,DUP0,DOWN0,	CHNDAT	34
+	ALFA(20,2),RHOH(20,2),V(20,2),AREAH(20,2),AREAX(20,2),OHJP(20,2),	CHNDAT	35
+	PIN(20,2),AAA(20,2),ENTPY(20,2),QMASS(20),QHEAT(20),DLIQIN(20),	CHNDAT	36
+	GASIN(20),TBAR(20),VMELT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2,	CHNDAT	37
+	NINPIN	CHNDAT	38
	EQUIVALENCE (ULIQ(1),VFUELS),(ULIQ(75),ORIFLG),(UVAP(1),RHOSQF),	CHNDAT	39
+	(G(75,1),FQSDHR),(G(75,2),IZOP),(HTYPE(1,1),EPTYM(1,1)),(DOPCOE(1,	CHNDAT	40
+	2),DOPPO),(DOPCOE(2,2),JOPDEL),(DOPCOE(3,2),OIL),(UVAP(75),GTOL)	CHNDAT	41
+	(USTL,IZAP),(USTV,IZUP),(CGAPA,LAXIAL),(XLIQ,DSAVE3)	CHNDAT	42
+	(S,GORE,IS,TCOUL),(SCOTT,IFUELS)	CHNDAT	43
	EQUIVALENCE (TW(1),SKEW), (TW(2),RHOKAT),(TW(3),DETAIL)	CHNDAT	44
	EQUIVALENCE (TW(4),PLEL), (TW(5),PSTART),(TW(6),TREAT)	CHNDAT	45
	EQUIVALENCE (TW(7),FRACTN),(TW(8),SPREAD),(TW(9),VORIG)	CHNDAT	46
	EQUIVALENCE (TW(10),AREA), (TW(11),FRICT)	CHNDAT	47
C****		CHNDAT	48
	IF (NTREAT.NE.0) GO TO 200	PRESS	5
	DO 160 I=1,NLOOPS	PRESS	6
	TOPT(I,NEW)=TOPT(I,IOLD)-(WOLF(1)*RHOCE(I)*TOPT(I,IOLD)-TOPEN(I))	PRESS	7
	+/((VOLTOP(1)+WOLF(1))*RHOCE(I))	PRESS	8
	IF (NCHAN.EQ.1) GO TO 140	PRESS	9
	IF (FLOW(I,IOLD)) 120,140,140	PRESS	10
120	P3OTT(I,NEW)=P3OTT(I,IOLD)+GJACK(I)*FLOW(I,IOLD)**2	PRESS	11
	GO TO 160	PRESS	12
140	CALL CURVE (ABLE,T(NEW),PRESTM,PRESUR(1,I),IPAIR4,I19)	PRESS	13
	IF (I19.GT.0) GO TO 180	PRESS	14
	GJACK(I)=(P3OTT(I,IOLD)-PEXIT(I))/FLOW(I,IOLD)**2	PRESS	15
	P3OTT(I,NEW)=ABLE-PU(I)*FLOW(I,IOLD)**2+HEAD(I)+PEXIT(I)-SLOA(I)/H	PRESS	16
	+(IOLD)*(FLOW(I,IOLD)-FLOW(I,NEW))	PRESS	17
160	CONTINUE	PRESS	18
	RETURN	PRESS	19
180	WRITE (NOUT,240) T(NEW),I	PRESS	20
	RETURN IERROR	PRESS	21
200	CONTINUE	PRESS	22
	BAKER=GJACK(NEW)*TW(1)/KHOONA(NAXIAL,NEW)	PRESS	23
	GJACK(NEW)=GJACK(IOLD)+BAKER*H(NEW)	PRESS	24
	PEXIT(1)=1.013E+6*(TW(9)/(TW(9)-GJACK(NEW)))**1.67	PRESS	25
	CALL CURVE (ABLE,BAKER,PRESTM,PRESUR,IPAIR4,I19)	PRESS	26
	I=412	PRESS	27
	IF (I19.GT.0) GO TO 140	PRESS	28
	P3OTT(1,NEW)=PEXIT(1)+ABLE+EXTRA	PRESS	29
	IF (TOPEN(1).EQ.0.0) GO TO 220	PRESS	30
	TOPT(1,NEW)=TOPT(1,IOLD)-(WOLF(1)*RHOCE(1)*TOPT(1,IOLD)-TOPEN(1))	PRESS	31
	+/((VOLTOP(1)+WOLF(1))*RHOCE(1))	PRESS	32
220	RETURN	PRESS	33
C		PRESS	34
240	FORMAT (9H0AT TIME ,1PE10.4,OH LOOP ,I1,17H HAS NO HEAD DATA)	PRESS	35
	END	PRESS	36

SUBROUTINE WRAPUP	WRAPUP	2
EXTERNAL JOLLY	WRAPUP	3
COMMON/FIT/FIT(385)	WRAPUP	4
COMMON/GOLLY/IUNIT,GEENWIZ(20)	WRAPUP	5
DIMENSION NTOP(75)	WRAPUP	6
C****	CASPAR	2
C**** COMMON DECK"CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLOA(1)	CASPAR	4
REAL <INSTR,KWTHDR	CASPAR	5
LOGICAL PRINT,DONE,SCRAM	CASPAR	6
COMMON	CASPAR	7
DONE,ISTAT	CASPAR	7
,IIN	CASPAR	7
,SLOA(3)	CASPAR	7
*IBLOCK	CASPAR	8
,H(2)	CASPAR	8
,T(2)	CASPAR	8
,HREAD	CASPAR	8
,ICHAN	CASPAR	8
,VJLCK(2)	CASPAR	8
*DPPK(2)	CASPAR	9
,COLAPK(2)	CASPAR	9
,NEW	CASPAR	9
,IOLD	CASPAR	9
,NOUT	CASPAR	9
,TEKOR	CASPAR	9
*GERROR	CASPAR	10
,PEXIT(3)	CASPAR	10
,FERROR	CASPAR	10
,FRINT	CASPAR	10
,DELTIM	CASPAR	10
*PJGTT(3,2)	CASPAR	11
,IACIV(20)	CASPAR	11
,FLOW(3,2)	CASPAR	11
,TOPT(3,2)	CASPAR	11
,TGFEN(3)	CASPAR	11
,WOLF(3)	CASPAR	11
*LOOP(20)	CASPAR	12
,IOUTL	CASPAR	12
,NTREAT	CASPAR	12
,IKINET	CASPAR	12
,TOUT	CASPAR	12
,HMAX	CASPAR	12
*TIMEIN(50)	CASPAR	13
,DKIN(50)	CASPAR	13
,TIMOUT(50)	CASPAR	13
,UKOUT(50)	CASPAR	13
,IPAIR2	CASPAR	13
,AN(2)	CASPAR	13
*IPAIR3	CASPAR	14
,KUUNT	CASPAR	14
,KH(2)	CASPAR	14
,BB0100	CASPAR	14
,RHOSWZ	CASPAR	14
,NRGROUP	CASPAR	14
*C(6,2)	CASPAR	15
,ALIFE	CASPAR	15
,ALPH(6)	CASPAR	15
,GAM(6)	CASPAR	15
,B(6)	CASPAR	15
,AL(6)	CASPAR	15
*JBJ	CASPAR	16
,SCRAM	CASPAR	16
,ISCRAM(2)	CASPAR	16
,PERIOD	CASPAR	16
,RSLOPE	CASPAR	16
*KINSRT(2)	CASPAR	17
,KWTHDR(2)	CASPAR	17
,REDUCE	CASPAR	17
,FRINT1	CASPAR	17
,PRINT2	CASPAR	17
,RMIN	CASPAR	17
COMMON	CASPAR	18
ANLOW	CASPAR	19
,TQJIT	CASPAR	19
,LSTEP	CASPAR	19
,JSTEP	CASPAR	19
,ANIC	CASPAR	19
,TKGS	CASPAR	19
*IFLOT	CASPAR	20
,ERROR1	CASPAR	20
,TERM(13)	CASPAR	20
,TITLE(8)	CASPAR	20
,HOTPIH	CASPAR	20
,SPCB	CASPAR	20
*SPCC	CASPAR	21
,SPCU	CASPAR	21
,LINCSL	CASPAR	21
,KSTEP	CASPAR	21
,NCHAN	CASPAR	21
,MSTEP	CASPAR	21
*IPRINT	CASPAR	22
,IPRINT	CASPAR	22
,IOUMP	CASPAR	22
,QGEN(2)	CASPAR	22
,ANI	CASPAR	22
,ANSCRM	CASPAR	22
*TDELAY	CASPAR	23
,NLOJPS	CASPAR	23
,RHUCCL(3)	CASPAR	23
,VOLTOP(3)	CASPAR	23
,HEAD(3)	CASPAR	23
,PRESTM(50)	CASPAR	23
*PRESUR(50,3)	CASPAR	24
,IPAIR4	CASPAR	24
,PD(3)	CASPAR	24
,KUNTIM	CASPAR	24
,VER	CASPAR	24
,ETAD(4)	CASPAR	24
*KBLOCK	CASPAR	25
,JBLOCK	CASPAR	25
,MBLOCK	CASPAR	25
,N12	CASPAR	25
,N13	CASPAR	25
,EXTRA	CASPAR	25
*GJACK(3)	CASPAR	26
,VJACK(2)	CASPAR	26
,ITRGAP	CASPAR	26
*H4IN	CASPAR	27
,N22	CASPAR	27
,NIN	CASPAR	27
,INPUT	CASPAR	27
,N2	CASPAR	27
,N4	CASPAR	27
*N7	CASPAR	28
,N8	CASPAR	28
,KPRINT	CASPAR	28
,POWSS	CASPAR	28
,HMAX3	CASPAR	28
,HMAXF	CASPAR	28
*TRIPFW(3)	CASPAR	29
,TRIPPP(3)	CASPAR	29
,TRIPPF(3)	CASPAR	29
,TRIPOT(3)	CASPAR	29
,DELAYF	CASPAR	29
EQUIVALENCE (QMOL,TERM(4)),(TMOL,TERM(5)),(UMOL,TERM(6)),(PERMOL,T	CASPAR	30
ERM(7)),(SLOB,DONE)	CASPAR	31
C****	CASPAR	32
COMMON BLOCK(8234),LBLOCK(203),NS(78),NT(100),NBLOCK(500),TIME(100)	WRAPUP	8
*J)	WRAPUP	9
COMMON/NTABZZ/NTAB(49)	WRAPUP	10
C	WRAPUP	11
C	WRAPUP	12
C	WRAPUP	13
C	WRAPUP	14
C	WRAPUP	15
TRANSFER NAXIAL,NBCORE,NTCORE,NTOP INTO ARRAY NS FROM DISC	WRAPUP	16
EQUIVALENCE(NS,NAXIAL),(NS(2),NBCORE),(NS(3),NTCORE),	WRAPUP	17
*(NS(4),NTOP)	WRAPUP	18
EQUIVALENCE (ITRGAP,N20)	WRAPUP	19
COMMON/IPRESR/IPRESR(20)	WRAPUP	20
NBUFF=IBLOCK	WRAPUP	21
IBLOCK=ISTAT	WRAPUP	22
IF (IPRINT.LT.2) GO TO 4060	WRAPUP	23
NTGAP=72	WRAPUP	24
C * * * * *	WRAPUP	25
C EXTRACT TIME, POWER, HEAT GENERATED, AND MOLTEN FUEL STUFF	WRAPUP	26
IF (GEENWIZ(9).GT.0.0) GO TO 340	WRAPUP	27
IUNIT=9	WRAPUP	28
IWA=1	WRAPUP	29
C HOW MUCH WILL FIT INTO CORE	WRAPUP	30
NUM=(IBLOCK/13)*13	WRAPUP	31
C HOW MANY COMPLETE FILLINGS	WRAPUP	32
K=(13*IPRINT)/NUM	WRAPUP	33
C HOW MANY LEFT OVER	WRAPUP	34
LEFT=13*IPRINT-K*NUM	WRAPUP	35
INDEX=1	WRAPUP	36
LINESL=0	WRAPUP	37
IF (LEFT) 120,120,140	WRAPUP	37

120	N1=NUM	WRAPUP	38
	GO TO 160	WRAPUP	39
140	K=K+1	WRAPUP	40
	N1=LEFT	WRAPUP	41
160	DO 240 L=1,K	WRAPUP	42
	CALL GET (FIT(141),BLOCK,IWA,0,0,10*N1,JOLLY)	WRAPUP	43
	IF (GEHWIZ(9).GT.0.0) GO TO 340	WRAPUP	44
	IWA=IWA+N1	WRAPUP	45
	N2=N1/13	WRAPUP	46
	DO 220 I=1,N2	WRAPUP	47
	TIME(INDEX)=BLOCK(13*I-12)	WRAPUP	48
	IF (LINESL-1) 180,200,200	WRAPUP	49
180	CALL HADD (6)	WRAPUP	50
	WRITE (NOUT,4083)	WRAPUP	51
	LINESL=57	WRAPUP	52
200	WRITE (NOUT,4100) BLOCK(13*I-12),BLOCK(13*I-11),BLOCK(13*I-10),BLOCK(13*I-9),BLOCK(13*I-8),BLOCK(13*I-7),BLOCK(13*I-6)	WRAPUP	53
	INDEX=INDEX+1	WRAPUP	54
220	LINESL=LINESL-1	WRAPUP	55
240	N1=NUM	WRAPUP	56
C	*****	WRAPUP	57
C	PHYSICS INFO	WRAPUP	58
	CALL REWIND (FIT(141))	WRAPUP	59
	IF (NTR=AT.NE.0) GO TO 340	WRAPUP	60
	IWA=1	WRAPUP	61
	IF (LEFT.GT.0) N1=LEFT	WRAPUP	62
	LINESL=0	WRAPUP	63
	DO 320 L=1,K	WRAPUP	64
	CALL GET (FIT(141),BLOCK,IWA,0,0,10*N1,JOLLY)	WRAPUP	65
	IF (GEHWIZ(9).GT.0.0) GO TO 340	WRAPUP	66
	IWA=IWA+N1	WRAPUP	67
	N2=N1/13	WRAPUP	68
	DO 300 I=1,N2	WRAPUP	69
	IF (LINESL-1) 260,280,280	WRAPUP	70
260	CALL HADD (7)	WRAPUP	71
	WRITE (NOUT,4123)	WRAPUP	72
	LINESL=57	WRAPUP	73
280	WRITE (NOUT,4140) BLOCK(13*I-12),BLOCK(13*I-5),BLOCK(13*I-4),BLOCK(13*I-3),BLOCK(13*I-2),BLOCK(13*I-1),BLOCK(13*I)	WRAPUP	74
300	LINESL=LINESL-1	WRAPUP	75
320	N1=NUM	WRAPUP	76
C	*****	WRAPUP	77
C	INLET AND OUTLET VELOCITIES	WRAPUP	78
	CALL REWIND (FIT(141))	WRAPUP	79
340	IUNIT=5	WRAPUP	80
	IF (GEHWIZ(5).GT.0.0) GO TO 500	WRAPUP	81
	MACCUM=0	WRAPUP	82
	DO 480 ICHAN=1,NCHAN	WRAPUP	83
	CALL REWIND (FIT(176))	WRAPUP	84
	IWA=1+MACCUM	WRAPUP	85
	IFIZZ=20*(NLW-1)+ICHAN	WRAPUP	86
	IFIZZ=NTAB(IFIZZ)	WRAPUP	87
	N1=3*IFIZZ	WRAPUP	88
	LINESL=0	WRAPUP	89
	J31=(IBLOCK/51)*51	WRAPUP	90
	J32=N1/J31	WRAPUP	91
	IF (N1.GT.J32*J31) GO TO 360	WRAPUP	92
	J33=J31	WRAPUP	93
	GO TO 380	WRAPUP	94
360	J33=N1-J32*J31	WRAPUP	95
	J32=J32+1	WRAPUP	96
380	DO 460 I=1,J32	WRAPUP	97
	CALL GET (FIT(176),BLOCK,IWA,0,0,10*J33,JOLLY)	WRAPUP	98
	IF (GEHWIZ(5).GT.0.0) GO TO 500	WRAPUP	99
	IWA=IWA+J33	WRAPUP	100
	J=1	WRAPUP	101
		WRAPUP	102
		WRAPUP	103

N=51	WRAPUP	104
IF (N.GT.N1) N=N1	WRAPUP	105
J34=J33/51	WRAPUP	106
IF (J34*51.LT.J33) J34=J34+1	WRAPUP	107
DO 440 MM=1,J34	WRAPUP	108
IF (LINE SL-3) 400,420,420	WRAPUP	109
+C0 CALL M=00 (8)	WRAPUP	110
WRITE (NOUT,4160) ICHAN	WRAPUP	111
LINE SL=57	WRAPUP	112
+20 CONTINUE	WRAPUP	113
WRITE (NOUT,4180) (BLOCK(M),M=J,N,3)	WRAPUP	114
J=J+1	WRAPUP	115
WRITE (NOUT,4200) (BLOCK(M),M=J,N,3)	WRAPUP	116
J=J+1	WRAPUP	117
WRITE (NOUT,4220) (BLOCK(M),M=J,N,3)	WRAPUP	118
J=J+9	WRAPUP	119
N=N+51	WRAPUP	120
IF (N.GT.N1) N=N1	WRAPUP	121
440 LINE SL=LINE SL-3	WRAPUP	122
+00 J33=J31	WRAPUP	123
480 MACCUM=MACCUM+3*MFRINT	WRAPUP	124
* * * * *	WRAPUP	125
C PRESSURES	WRAPUP	126
CALL REWIND (FIT(176))	WRAPUP	127
+00 CONTINUE	WRAPUP	128
IF (GEOMIZ(4).GT.0.0) GO TO 1020	WRAPUP	129
MACCUM=0	WRAPUP	130
DO 1000 ICHAN=1,NCHAN	WRAPUP	131
IF (IPRERR(ICHAN).EQ.0) GO TO 980	WRAPUP	132
C READ NAXIAL,H3CORE,NTCORE	WRAPUP	133
CALL REWIND (FIT(211))	WRAPUP	134
IUNIT=10	WRAPUP	135
IWA=5005+NBUFF*(ICHAN-1)	WRAPUP	136
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP	WRAPUP	137
CALL GET (FIT,NS,IWA,0,0,30,JOLLY)	WRAPUP	138
CALL REWIND (FIT(1))	WRAPUP	139
IWA=1+MACCUM	WRAPUP	140
NA=NBDCORE-2	WRAPUP	141
NB=(NA+20)/20	WRAPUP	142
C CUR=SPACE	WRAPUP	143
NUM=(BLOCK/NAXIAL)*NAXIAL	WRAPUP	144
C FILLINGS	WRAPUP	145
KK=20*(NCH-1)+ICHAN	WRAPUP	146
KK=NTAB(KK)	WRAPUP	147
K=NAXIAL*KK/NUM	WRAPUP	148
C LEFT OVER	WRAPUP	149
LEFT=KK*NAXIAL-K*NUM	WRAPUP	150
IP=1	WRAPUP	151
INDEX=1	WRAPUP	152
LINE SL=0	WRAPUP	153
IF (LEFT) 520,520,540	WRAPUP	154
520 N1=NUM	WRAPUP	155
GO TO 550	WRAPUP	156
540 N1=LEFT	WRAPUP	157
K=K+1	WRAPUP	158
560 DO 720 L=1,K	WRAPUP	159
IUNIT=4	WRAPUP	160
CALL GET (FIT(211),BLOCK,IWA,0,0,10*N1,JOLLY)	WRAPUP	161
IF (GEOMIZ(4).GT.0.0) GO TO 1020	WRAPUP	162
IWA=IWA+N1	WRAPUP	163
N2=N1/NAXIAL	WRAPUP	164
DO 700 I=1,N2	WRAPUP	165
IF (LINE SL-NB) 580,580,590	WRAPUP	166
580 CALL M=00 (9)	WRAPUP	167
WRITE (NOUT,4240) ICHAN	WRAPUP	168
GO TO (600,620,640), NB	WRAPUP	169

600	WRITE (NOUT,4260) (M,M=1,NA)	WRAPUP	170
	GO TO 600	WRAPUP	171
620	WRITE (NOUT,4280) (M,M=1,NA)	WRAPUP	172
	GO TO 600	WRAPUP	173
640	WRITE (NOUT,4300) (M,M=1,NA)	WRAPUP	174
660	LINESL=57	WRAPUP	175
680	J=(INDEX-1P)*NAXIAL+1	WRAPUP	176
	M=J+NA	WRAPUP	177
	WRITE (NOUT,4320) (BLOCK(N),N=J,M)	WRAPUP	178
	LINESL=LINESL-NB	WRAPUP	179
	TIME (INDEX)=BLOCK(J)	WRAPUP	180
700	INDEX=INDEX+1	WRAPUP	181
	IF=INDEX	WRAPUP	182
720	N1=NUM	WRAPUP	183
	NA=NA+1	WRAPUP	184
	NB=NTCORE-1	WRAPUP	185
	IF (LEFT.GT.0) N1=LEFT	WRAPUP	186
	LINESL=0	WRAPUP	187
	INDEX=1	WRAPUP	188
	IP=1	WRAPUP	189
	CALL REWIND (FIT(211))	WRAPUP	190
	IWA=1+MACCUM	WRAPUP	191
	DO 800 L=1,K	WRAPUP	192
	IUNIT=4	WRAPUP	193
	CALL GET (FIT(211),BLOCK,IWA,J,0,10*N1,JOLLY)	WRAPUP	194
	IF (GEOWIZ(4).GT.0.0) GO TO 1320	WRAPUP	195
	IWA=IWA+N1	WRAPUP	196
	N2=N1/NAXIAL	WRAPUP	197
	DO 780 I=1,N2	WRAPUP	198
	IF (LINESL-1) 740,760,760	WRAPUP	199
740	CALL HEDD (10)	WRAPUP	200
	WRITE (NOUT,4340) ICHAN	WRAPUP	201
	WRITE (NOUT,4360) (M,M=NA,NB)	WRAPUP	202
	LINESL=57	WRAPUP	203
760	J=(INDEX-IP)*NAXIAL+NA+1	WRAPUP	204
	M=J+NTCORE-NBCORE	WRAPUP	205
	WRITE (NOUT,4380) TIME (INDEX), (BLOCK(N),N=J,M)	WRAPUP	206
	LINESL=LINESL-1	WRAPUP	207
780	INDEX=INDEX+1	WRAPUP	208
	IF=INDEX	WRAPUP	209
800	N1=NUM	WRAPUP	210
	NA=NB+1	WRAPUP	211
	NC=NAXIAL-1	WRAPUP	212
	NB=(NC-NA+20)/20	WRAPUP	213
	IF (LEFT.GT.0) N1=LEFT	WRAPUP	214
	INDEX=1	WRAPUP	215
	IP=1	WRAPUP	216
	LINESL=0	WRAPUP	217
	CALL REWIND (FIT(211))	WRAPUP	218
	IWA=1+MACCUM	WRAPUP	219
	DO 960 L=1,K	WRAPUP	220
	IUNIT=4	WRAPUP	221
	CALL GET (FIT(211),BLOCK,IWA,J,0,10*N1,JOLLY)	WRAPUP	222
	IF (GEOWIZ(4).GT.0.0) GO TO 1020	WRAPUP	223
	IWA=IWA+N1	WRAPUP	224
	N2=N1/NAXIAL	WRAPUP	225
	DO 940 I=1,N2	WRAPUP	226
	IF (LINESL-N3) 820,920,920	WRAPUP	227
820	CALL HEDD (11)	WRAPUP	228
	WRITE (NOUT,4360) ICHAN	WRAPUP	229
	GO TO (840,860,880), NB	WRAPUP	230
840	WRITE (NOUT,4260) (M,M=NA,NC)	WRAPUP	231
	GO TO 900	WRAPUP	232
860	WRITE (NOUT,4280) (M,M=NA,NC)	WRAPUP	233
	GO TO 900	WRAPUP	234
880	WRITE (NOUT,4300) (M,M=NA,NC)	WRAPUP	235

900	LINE SL=57	WRAPUP	236
920	J=(INDEX-IP)*NAXIAL+NTCORE+1	WRAPUP	237
	M=J+NAXIAL-NTCORE-1	WRAPUP	238
	WRITE (NOUT,432) TIME (INDEX), (BLOCK(N),N=J,M)	WRAPUP	239
	LINE SL=LINE SL-NB	WRAPUP	240
940	INDEX=INDEX+1	WRAPUP	241
	IF=INDEX	WRAPUP	242
960	N1=NUM	WRAPUP	243
980	MACCUM=MACCUM+MPRINT*NAXIAL	WRAPUP	244
1000	CONTINUE	WRAPUP	245
C	*****	WRAPUP	246
C	SLUG INTERFACES	WRAPUP	247
	CALL REWIND (FIT(211))	WRAPUP	248
1020	CONTINUE	WRAPUP	249
	IF (GEZWIZ(6).GT.0.0) GO TO 1260	WRAPUP	250
	IUNIT=6	WRAPUP	251
	DO 1240 ICHAN=1,NCHAN	WRAPUP	252
C	NUMBER OF POINTS THAT CAN BE STORED	WRAPUP	253
	NUM=(IBLOCK/10)*10	WRAPUP	254
C	NUMBER OF COMPLETE MEAS	WRAPUP	255
	KK=20*(NCHW-1)+ICHAN	WRAPUP	256
	KK=NTAD(KK)	WRAPUP	257
	K=(10*KK)/NUM	WRAPUP	258
C	NUMBER EXTRA	WRAPUP	259
	LEFT=10*KK-K*NUM	WRAPUP	260
	IF (LEFT) 1040,1040,1060	WRAPUP	261
1040	N1=NUM	WRAPUP	262
	GO TO 1080	WRAPUP	263
1060	N1=LEFT	WRAPUP	264
	K=K+1	WRAPUP	265
1080	CONTINUE	WRAPUP	266
	INDEX=1	WRAPUP	267
	IF=1	WRAPUP	268
	LINE SL=3	WRAPUP	269
	CALL REWIND (FIT(351))	WRAPUP	270
	IWA=1+10*MPRINT*(ICHAN-1)	WRAPUP	271
	IZZY=3	WRAPUP	272
	IF (LEFT.GT.0) N1=LEFT	WRAPUP	273
	DO 1220 L=1,K	WRAPUP	274
	CALL GET (FIT(351),BLOCK,IWA,0,0,10*N1,JOLLY)	WRAPUP	275
	IF (GEZWIZ(6).GT.0.0) GO TO 1260	WRAPUP	276
	IWA=IWA+N1	WRAPUP	277
	N2=N1/10	WRAPUP	278
	DO 1200 I=1,N2	WRAPUP	279
	IF (IZZY) 1100,1100,1140	WRAPUP	280
1100	IF (BLOCK(10*I-9)) 1200,1200,1120	WRAPUP	281
1120	IZZY=1	WRAPUP	282
1140	IF (LINE SL-1) 1160,1160,1180	WRAPUP	283
1160	CALL HEAD (12)	WRAPUP	284
	WRITE (NOUT,430) ICHAN	WRAPUP	285
	LINE SL=57	WRAPUP	286
1180	J=(INDEX-IP)*10+1	WRAPUP	287
	M=J+4	WRAPUP	288
	WRITE (NOUT,440) (BLOCK(N),N=J,M),BLOCK(M+4),BLOCK(M+5)	WRAPUP	289
	LINE SL=LINE SL-1	WRAPUP	290
1200	INDEX=INDEX+1	WRAPUP	291
	IF=INDEX	WRAPUP	292
1220	N1=NUM	WRAPUP	293
1240	CONTINUE	WRAPUP	294
C	*****	WRAPUP	295
C	COOLANT NODE TEMPERATURES	WRAPUP	296
	CALL REWIND (FIT(351))	WRAPUP	297
1260	CONTINUE	WRAPUP	298
	IF (GEZWIZ(3).GT.0.0) GO TO 2100	WRAPUP	299
	MACCUM=0	WRAPUP	300
	DO 2000 ICHAN=1,NCHAN	WRAPUP	301

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C READ THE TEMPERATURE SPECIFICATIONS
IWA=NBUFF*(ICHAN-1)+JBLOCK+5
IUNIT=10
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP
CALL GET (FIT,LBLOCK,IWA,0,0,10*(KBLOCK-4),JOLLY)
CALL REWIND (FIT(1))
IF (LBLOCK(3)) 2080,2180,1280
1280 CONTINUE
C READ MAXIAL,NBCORE, AND NTCORE
IWA=NBUFF*(ICHAN-1)+5655
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP
CALL GET (FIT,NS,IWA,0,0,30,JOLLY)
CALL REWIND (FIT(1))
IF (LBLOCK(3)-1000) 1780,1300,1300
C WANT ALL
1300 MAXM1=MAXIAL
C HOW MANY FIT INTO CORE
NUM=(IBLOCK/MAXM1)*MAXM1
C HOW MANY COMPLETE FILLS
KK=20*(NEW-1)+ICHAN
KK=NTAB(KK)
K=(MAXM1*KK)/NUM
C HOW MANY LEFT OVER
LEFT=MAXM1*KK-K*NUM
IF (LEFT) 1320,1320,1340
1320 N1=NUM
GO TO 1360
1340 N1=LEFT
K=K+1
1360 INDEX=1
IF=1
LINESL=0
NA=NBCORE-2
NB=(NA+19)/20
CALL REWIND (FIT(316))
IWA=1+MACCUM
IUNIT=3
DO 1520 L=1,K
CALL GET (FIT(316),BLOCK,IWA,0,0,10*N1,JOLLY)
IF (GELWIZ(3).GT.0.0) GO TO 2100
IWA=IWA+N1
N2=N1/MAXM1
DO 1500 I=1,N2
IF (LINESL-NB) 1380,1480,1480
1380 CALL HEDD (13)
WRITE (NOUT,4420) ICHAN
GO TO (1400,1420,1440), NB
1400 WRITE (NOUT,4440) (M,M=1,NA)
GO TO 1460
1420 WRITE (NOUT,4460) (M,M=1,NA)
GO TO 1460
1440 WRITE (NOUT,4480) (M,M=1,NA)
1460 LINESL=57
1480 J=(INDEX-IP)*MAXM1+1
M=J+NA
WRITE (NOUT,4500) (BLOCK(N),N=J,M)
TIME(INDEX)=BLOCK(J)
INDEX=INDEX+1
1500 LINESL=LINESL-N3
IF=INDEX
1520 N1=NUM
CALL REWIND (FIT(316))
IWA=1+MACCUM
NA=NA+1
NB=NA+NTCORE-NBCORE
TIME=Y=1

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WRAPUP 302
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IF=1	WRAPUP	368
LINESL=0	WRAPUP	369
IF (LEFT.GT.0) N1=LEFT	WRAPUP	370
DO 1630 L=1,K	WRAPUP	371
CALL GET (FIT(316),BLOCK,IWA,0,0,10*N1,JOLLY)	WRAPUP	372
IF (GE=HIZ(3).GT.0.0) GO TO 2100	WRAPUP	373
IWA=IWA+N1	WRAPUP	374
N2=N1/NAXM1	WRAPUP	375
DO 1580 I=1,N2	WRAPUP	376
IF (LINESL-1) 1540,1560,1580	WRAPUP	377
1540 CALL HEDD (14)	WRAPUP	378
WRITE (NOUT,4520) ICHAN	WRAPUP	379
WRITE (NOUT,4440) (M,M=NA,NB)	WRAPUP	380
LINESL=57	WRAPUP	381
1560 J=(INDEX-IP)*NAXM1+NA+1	WRAPUP	382
M=J+N3-NA	WRAPUP	383
WRITE (NOUT,4500) TIME(INDEX),(BLOCK(N),N=J,M)	WRAPUP	384
INDEX=INDEX+1	WRAPUP	385
1580 LINESL=LINESL-1	WRAPUP	386
IF=INDEX	WRAPUP	387
1600 N1=NUM	WRAPUP	388
NA=NB+1	WRAPUP	389
NC=NA+NAXIAL-NTCORE-1	WRAPUP	390
NO=(NAXIAL-NTCORE+19)/20	WRAPUP	391
INDEX=1	WRAPUP	392
IP=1	WRAPUP	393
CALL REWIND (FIT(316))	WRAPUP	394
IWA=1+MACCUM	WRAPUP	395
LINESL=0	WRAPUP	396
IF (LEFT.GT.0) N1=LEFT	WRAPUP	397
DO 1750 L=1,K	WRAPUP	398
CALL GET (FIT(316),BLOCK,IWA,0,0,10*N1,JOLLY)	WRAPUP	399
IF (GE=HIZ(3).GT.0.0) GO TO 2100	WRAPUP	400
IWA=IWA+N1	WRAPUP	401
N2=N1/NAXM1	WRAPUP	402
DO 1740 I=1,N2	WRAPUP	403
IF (LINESL-NB) 1620,1720,1720	WRAPUP	404
1620 CALL HEDD (15)	WRAPUP	405
WRITE (NOUT,4540) ICHAN	WRAPUP	406
GO TO (1640,1660,1680), NB	WRAPUP	407
1640 WRITE (NOUT,4440) (M,M=NA,NC)	WRAPUP	408
GO TO 1700	WRAPUP	409
1660 WRITE (NOUT,4460) (M,M=NA,NC)	WRAPUP	410
GO TO 1700	WRAPUP	411
1680 WRITE (NOUT,4480) (M,M=NA,NC)	WRAPUP	412
1700 LINESL=57	WRAPUP	413
1720 J=(INDEX-IP)*NAXM1+NA+1	WRAPUP	414
M=J+NC-NA	WRAPUP	415
WRITE (NOUT,4500) TIME(INDEX),(BLOCK(N),N=J,M)	WRAPUP	416
INDEX=INDEX+1	WRAPUP	417
1740 LINESL=LINESL-NB	WRAPUP	418
IF=INDEX	WRAPUP	419
1760 N1=NUM	WRAPUP	420
MACCUM=MACCUM+MPRINT*NAXM1	WRAPUP	421
GO TO 2080	WRAPUP	422
1780 NAXM1=LBLOCK(3)	WRAPUP	423
C FIND PAGE BREAKS	WRAPUP	424
ISTART=MOD(LBLOCK(1)+LBLOCK(2),1000)+4	WRAPUP	425
JNDX=ISTART	WRAPUP	426
INDEX=1	WRAPUP	427
J=0	WRAPUP	428
DO 1840 I=1,NAXM1	WRAPUP	429
IF (LBLOCK(ISTART)-50) 1820,1800,1800	WRAPUP	430
1800 NT(INDEX)=I-INDEX	WRAPUP	431
J=J+NT(INDEX)	WRAPUP	432

INDEX=INDEX+1	WRAPUP	433
1820 LBLOCK(ISTART)=LBLOCK(ISTART)-1	WRAPUP	434
1840 ISTART=ISTART+1	WRAPUP	435
NAXM1=NAXM1+1	WRAPUP	436
NT(INDEX)=NAXM1-INDEX-J	WRAPUP	437
C HOWMUCH DATA CAN BE STUFFED INTO CORE	WRAPUP	438
NUM=(LBLOCK/NAXM1)*NAXM1	WRAPUP	439
N1=NUM	WRAPUP	440
C HOW MANY COMPLETE STUFFINGS	WRAPUP	441
KK=20*(INEX-1)+ICHAN	WRAPUP	442
KK=NTA3(KK)	WRAPUP	443
K=(NAXM1*KK)/NUM	WRAPUP	444
C HOW MANY LEFT OVER	WRAPUP	445
LEFT=KK*NAXM1-K*NUM	WRAPUP	446
IF (LEFT.GT.0) K=K+1	WRAPUP	447
NACCU=1	WRAPUP	448
NDEX=INDEX	WRAPUP	449
IUNIT=3	WRAPUP	450
DO 2050 I16=1,NDEX	WRAPUP	451
INDEX=1	WRAPUP	452
IP=1	WRAPUP	453
LINESL=0	WRAPUP	454
NB=(NT(I16)+19)/20	WRAPUP	455
KNDEX=JNDEX+NT(I16)-1	WRAPUP	456
IF (LEFT.GT.0) N1=LEFT	WRAPUP	457
CALL REWIND (FIT(316))	WRAPUP	458
IWA=1+NACCU	WRAPUP	459
DO 2040 L=1,K	WRAPUP	460
CALL GET (FIT(316),BLOCK,IWA,0,5,10*N1,JOLLY)	WRAPUP	461
IF (GEZWIZ(3).GT.0.0) GO TO 2100	WRAPUP	462
IWA=IWA+N1	WRAPUP	463
N2=N1/NAXM1	WRAPUP	464
DO 2020 I=1,N2	WRAPUP	465
IF (LINESL-NB) 1800,1960,1960	WRAPUP	466
1800 CALL HADD (16)	WRAPUP	467
WRITE (NOUT,4560) ICHAN	WRAPUP	468
GO TO (1800,1900,1920), NB	WRAPUP	469
1880 WRITE (NOUT,4440) (LBLOCK(N),N=JNDEX,KNDEX)	WRAPUP	470
GO TO 1940	WRAPUP	471
1900 WRITE (NOUT,4460) (LBLOCK(N),N=JNDEX,KNDEX)	WRAPUP	472
GO TO 1940	WRAPUP	473
1920 WRITE (NOUT,4480) (LBLOCK(N),N=JNDEX,KNDEX)	WRAPUP	474
1940 LINESL=27	WRAPUP	475
1960 J=(INDEX-IP)*NAXM1+NACCU	WRAPUP	476
M=J+NT(I16)	WRAPUP	477
IF (I16.NE.1) GO TO 1980	WRAPUP	478
WRITE (NOUT,4500) (BLOCK(N),N=J,M)	WRAPUP	479
TIME(INDEX)=BLOCK(J)	WRAPUP	480
GO TO 2000	WRAPUP	481
1980 M=M-1	WRAPUP	482
WRITE (NOUT,4500) TIME(INDEX), (BLOCK(N),N=J,M)	WRAPUP	483
2000 INDEX=INDEX+1	WRAPUP	484
2020 LINESL=LINESL-NB	WRAPUP	485
IP=INDEX	WRAPUP	486
2040 N1=NUM	WRAPUP	487
NACCU=NACCU+NT(I16)+1	WRAPUP	488
IF (I16.EQ.1) NACCU=NACCU+1	WRAPUP	489
2060 JNDEX=KNDEX+2	WRAPUP	490
NACCU=NACCU+MPRINT*NAXM1	WRAPUP	491
2080 CONTINUE	WRAPUP	492
C * * * * *	WRAPUP	493
C CORE TEMPERATURES	WRAPUP	494
CALL REWIND (FIT(316))	WRAPUP	495
2100 CONTINUE	WRAPUP	496
IF (GEZWIZ(2).GT.0.0) GO TO 2620	WRAPUP	497
NACCU=0	WRAPUP	498
DO 2600 ICHAN=1,NCHAN	WRAPUP	499

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C READ TEMPERATURE SPECIFICATIONS
  IUNIT=10
  IWA=NBUFF*(ICHAN-1)+JBLOCK+5
  IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP
  CALL GET (FIT,LBLOCK,IWA,0,0,10*(KBLOCK-4),JOLLY)
  CALL REWIND (FIT(1))
  IF (LBLOCK(2)) 2600,2500,2120
2120 CONTINUE
C READ MAXIAL,NBCORE,NTCORE,NTOP
  IWA=NBUFF*(ICHAN-1)+5055
  IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP
  CALL GET (FIT,N3,IWA,,0,780,JOLLY)
  CALL REWIND (FIT(1))
  IF (LBLOCK(2)-1000) 2280,2140,2140
C WANT ALL HOW MANY ARE THERE
2140 ISUM=1
  DO 2160 I=NBCORE,NTCORE
2160 ISUM=ISUM+NTOP(I)
C ONE PAGE FOR EACH AXIAL LEVEL - RADIAL TEMPS ACROSS PAGE
C HOW MANY FIT INTO CORE
  NUM=(IBLOCK/ISUM)*ISUM
  N1=NUM
C HOW MANY COMPLETE FILLINGS
  KK=20*(N1-1)+ICHAN
  KK=NTAB(KK)
  K=(KK*ISUM)/NUM
C HOW MANY LEFT OVER
  LEFT=KK*ISUM-K*NUM
  JSUM=2
  IF (LEFT.GT.0) K=K+1
  IUNIT=2
  DO 2260 IAXIAL=NBCORE,NTCORE
  CALL REWIND (FIT(281))
  IWA=1+MACCUM
  LINESL=0
  IF (LEFT.GT.0) N1=LEFT
  DO 2240 L=1,K
  IND=X=1
C READ TEMPS
  CALL GET (FIT(281),BLOCK,IWA,0,0,10*N1,JOLLY)
  IF (GETWIZ(2).GT.0.0) GO TO 2620
  IWA=IWA+N1
  N2=N1/ISUM
  JAKE=IAXIAL-1
  IKE=NTOP(IAXIAL)
  DO 2220 I=1,N2
  IF (LINESL-1) 2180,2200,2200
2180 CALL HEAD (17)
  WRITE (NOUT,4580) ICHAN,JAKE,(M,M=1,IKE)
  LINESL=57
2200 J=(I-1)*ISUM+JSUM
  M=J+NTOP(IAXIAL)-1
  WRITE (NOUT,4580) BLOCK(INDX),(BLOCK(N),N=J,M)
  INDX=INDX+ISUM
2220 LINESL=LINESL-1
2240 N1=NUM
2260 JSUM=JSUM+NTOP(IAXIAL)
  GO TO 2580
C USE SPECIFIED FORMAT
C CREATE NOVAL LABELS (RADIAL,AXIAL)
C DETERMINE HOW MANY PAGES
2280 INDX=1
  J=0
  ISTART=MOD(LBLOCK(1),1000)+3
  ISUM=LBLOCK(2)
  DO 2340 I=1,ISUM

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2300	IF (LBLOCK(I+ISTART)) 2300,2300,2320	WRAPUP	566
	NT(INDEX)=I-INDEX-J	WRAPUP	567
	J=J+NT(INDEX)	WRAPUP	568
	INDEX=INDEX+1	WRAPUP	569
2320	NBLOCK(2*I)=(LBLOCK(I+ISTART)-1)/15	WRAPUP	570
	NBLOCK(2*I-1)=LBLOCK(I+ISTART)-15*NBLOCK(2*I)	WRAPUP	571
2340	NBLOCK(2*I)=NBLOCK(2*I)+NBLOCK(2*I)	WRAPUP	572
	ISUM=ISUM+1	WRAPUP	573
	NT(INDEX)=ISUM-INDEX-J	WRAPUP	574
C HOW	MANY FIT IN COR:	WRAPUP	575
	NUM=(LBLOCK/ISUM)*ISUM	WRAPUP	576
	N1=NUM	WRAPUP	577
C HOW	MANY COMPLETE FILLS	WRAPUP	578
	KK=20*(NEW-1)+ICHAN	WRAPUP	579
	KK=NTAB(KK)	WRAPUP	580
	K=(KK*ISUM)/NUM	WRAPUP	581
C HOW	MANY LEFT OVER	WRAPUP	582
	LEFT=KK*ISUM-K*NUM	WRAPUP	583
	IF (LEFT.GT.0) K=K+1	WRAPUP	584
	IKE=1	WRAPUP	585
	JSUM=1	WRAPUP	586
	NDEX=INDEX	WRAPUP	587
	IUNIT=2	WRAPUP	588
	DO 2500 I10=1,NDEX	WRAPUP	589
	INDEX=1	WRAPUP	590
	IF (LEFT.GT.0) N1=LEFT	WRAPUP	591
	IF=1	WRAPUP	592
	LINE=0	WRAPUP	593
	JAK=IKE+NT(I10)-1	WRAPUP	594
	N3=(NT(I10)+1)/20	WRAPUP	595
	CALL XCHNG (FIT(281))	WRAPUP	596
	IWA=1+MACCUM	WRAPUP	597
	DO 2540 L=1,K	WRAPUP	598
C READ DATA		WRAPUP	599
	CALL GET (FIT(281),BLOCK,IWA,0,0,10*N1,JOLLY)	WRAPUP	600
	IF (GET=WIZ(2).GT.0.0) GO TO 2520	WRAPUP	601
	IWA=IWA+N1	WRAPUP	602
	N2=N1/ISUM	WRAPUP	603
	DO 2520 I=1,N2	WRAPUP	604
	IF (LINE=JL-N3) 2300,2400,2460	WRAPUP	605
2300	CALL HEND (18)	WRAPUP	606
	WRITE (NOUT,4600) ICHAN	WRAPUP	607
	GO TO (2300,2400,2420), N3	WRAPUP	608
2380	WRITE (NOUT,4620) (NBLOCK(2*N-1),NBLOCK(2*N),N=IKE,JAK)	WRAPUP	609
	GO TO 2440	WRAPUP	610
2400	WRITE (NOUT,4640) (NBLOCK(2*N-1),NBLOCK(2*N),N=IKE,JAK)	WRAPUP	611
	GO TO 2440	WRAPUP	612
2420	WRITE (NOUT,4660) (NBLOCK(2*N-1),NBLOCK(2*N),N=IKE,JAK)	WRAPUP	613
2440	LINE=SL+7	WRAPUP	614
2460	J=(INDEX-IP)*ISUM+JSUM	WRAPUP	615
	M=J+NT(I10)	WRAPUP	616
	IF (I10.NE.1) GO TO 2480	WRAPUP	617
	WRITE (NOUT,4500) (BLOCK(N),N=J,M)	WRAPUP	618
	TIME(INDEX)=BLOCK(J)	WRAPUP	619
	GO TO 2500	WRAPUP	620
2480	M=M-1	WRAPUP	621
	WRITE (NOUT,4500) TIME(INDEX), (BLOCK(N),N=J,M)	WRAPUP	622
2500	INDEX=INDEX+1	WRAPUP	623
2520	LINE=SL+LINE-N3	WRAPUP	624
	IP=INDEX	WRAPUP	625
2540	N1=NUM	WRAPUP	626
	IKE=JAK+2	WRAPUP	627
	JSUM=JSUM+NT(I10)+1	WRAPUP	628
	IF (I10.EQ.1) JSUM=JSUM+1	WRAPUP	629
2560	CONTINUE	WRAPUP	630
2580	MACCUM=MACCUM+MPRINT*ISUM	WRAPUP	631

2600	CONTINUE	WRAPUP	632
C	*****	WRAPUP	633
C	NON CORE - NON COOLANT TEMPERATURES	WRAPUP	634
	CALL REWIND (FIT(281))	WRAPUP	635
2620	CONTINUE	WRAPUP	636
	IF (GSEWIZ(1).GT.0.0) GO TO 3620	WRAPUP	637
	MACQUY=0	WRAPUP	638
	DO 3600 ICHAN=1,NCHAN	WRAPUP	639
C	FIND OUT WHATS WANTED	WRAPUP	640
	IUNIT=10	WRAPUP	641
	IWA=NBUFF*(ICHAN-1)+JBLOCK+5	WRAPUP	642
	IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP	WRAPUP	643
	CALL GET (FIT,LBLOCK,IWA,0,0,10*(KBLOCK-4),JOLLY)	WRAPUP	644
	CALL REWIND (FIT(1))	WRAPUP	645
	IF (LBLOCK(1)) 3600,3600,2640	WRAPUP	646
2640	CONTINUE	WRAPUP	647
C	READ MAXIAL,NBCORE,NTCORE	WRAPUP	648
	IWA=NBUFF*(ICHAN-1)+5555	WRAPUP	649
	IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP	WRAPUP	650
	CALL GET (FIT,N3,IWA,0,0,780,JOLLY)	WRAPUP	651
	CALL REWIND (FIT(1))	WRAPUP	652
	IF (LBLOCK(1)-1500) 3260,2660,2660	WRAPUP	653
C	WANT ALL THE OAK THINGS	WRAPUP	654
C	HOW MANY BELOW CORE	WRAPUP	655
2660	ISUM=1	WRAPUP	656
	J=NBCORE-1	WRAPUP	657
	DO 2680 I=2,J	WRAPUP	658
2680	ISUM=ISUM+NTOP(I)	WRAPUP	659
C	HOW MANY ABOVE CORE	WRAPUP	660
	KSUM=0	WRAPUP	661
	J=NTCORE+1	WRAPUP	662
	DO 2700 I=J,NAXIAL	WRAPUP	663
2700	KSUM=KSUM+NTOP(I)	WRAPUP	664
	NSUM=ISUM+KSUM	WRAPUP	665
	ISUMM1=ISUM-1	WRAPUP	666
	NSUMM1=NSUM-1	WRAPUP	667
C	DO BELOW CORE ON ONE PAGE - ABOVE ON ANOTHER	WRAPUP	668
C	HOW MANY FIT INTO CORE	WRAPUP	669
	NUM=(IBLOCK/NSUM)*NSUM	WRAPUP	670
C	HOW MANY COMPLETE FILLS	WRAPUP	671
	KK=20*(NCH-1)+ICHAN	WRAPUP	672
	KK=NTAB(KK)	WRAPUP	673
	K=(KK*NSUM)/NUM	WRAPUP	674
C	HOW MANY LEFT OVER	WRAPUP	675
	LEFT=KK*NSUM-K*NUM	WRAPUP	676
	IF (LEFT) 2720,2720,2740	WRAPUP	677
2720	N1=NUM	WRAPUP	678
	GO TO 2760	WRAPUP	679
2740	N1=LEFT	WRAPUP	680
	K=K+1	WRAPUP	681
2760	INDEX=1	WRAPUP	682
	IP=1	WRAPUP	683
	LINESL=0	WRAPUP	684
C	CREATE (MAXIAL,AXIAL) INDICES	WRAPUP	685
	KNDLX=1	WRAPUP	686
	DO 2840 I=2,NAXIAL	WRAPUP	687
	IF (I-NBCORE) 2800,2840,2780	WRAPUP	688
2780	IF (I-NTCORE) 2840,2840,2800	WRAPUP	689
2800	J=NTOP(I)	WRAPUP	690
	DO 2820 L=1,J	WRAPUP	691
	NBLOCK(2*KNDLX-1)=L	WRAPUP	692
	NBLOCK(2*KNDLX)=I-1	WRAPUP	693
2820	KNDLX=KNDLX+1	WRAPUP	694
2840	CONTINUE	WRAPUP	695
C	LINES PER TIME STEP	WRAPUP	696
	NB=(ISUM+19)/20	WRAPUP	697

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C TSINK DRUM POINTER START
  CALL REWND (FIT(246))
  IWA=1+MACCUM
  IUNIT=1
  DO 3040 L=1,K
C READ DATA
  CALL GET (FIT(246),BLOCK,IWA,0,0,10*N1,JOLLY)
  IF (GE=HIZ(1).GT.0.0) GO TO 3620
  IWA=IWA+N1
  N2=N1/NSUM
  DO 3020 I=1,N2
  IF (LINE=SL-N3) 2800,3000,3000
2800 CALL READ (19)
  WRITE (NOUT,4680) ICHAN
  IF (N3-2) 2880,2900,2920
2880 WRITE (NOUT,4620) (NBLOCK(2*N-1),NBLOCK(2*N),N=1,ISUMM1)
  LINE=SL=58
  GO TO 3000
2900 WRITE (NOUT,4640) (NBLOCK(2*N-1),NBLOCK(2*N),N=1,ISUMM1)
  LINE=SL=57
  GO TO 3000
2920 IK=NB-3
  LINE=SL=59
  I10=1
  I17=20
  IF (IK_) 2980,2980,2940
2940 DO 2960 JAK=1,IK_
  WRITE (NOUT,4700) (NBLOCK(2*N-1),NBLOCK(2*N),N=I10,I17)
  LINE=SL=LINE=SL-1
  I10=I17+1
2960 I17=I17+20
2980 WRITE (NOUT,4660) (NBLOCK(2*N-1),NBLOCK(2*N),N=I10,ISUMM1)
  LINE=SL=LINE=SL-3
3000 J=(INDEX-IP)*NSJM+1
  M=J+10J-1
  WRITE (NOUT,4500) (BLOCK(N),N=J,M)
  TIME(INDEX)=BLOCK(J)
  INDEX=INDEX+1
3020 LINE=SL=LINE=SL-NB
  IF=INDEX
3040 N1=NUM
  INDEX=1
  IP=1
  LINE=SL=0
  ISUM=ISUM+1
  ISUMM1=ISUMM1+1
  IF (LEFT.GT.0) N1=LEFT
  N3=(KSUM+19)/20
  CALL REWND (FIT(246))
  IWA=1+MACCUM
  DO 3240 L=1,K
  CALL GET (FIT(246),BLOCK,IWA,0,0,10*N1,JOLLY)
  IF (GE=HIZ(1).GT.0.0) GO TO 3620
  IWA=IWA+N1
  N2=N1/NSUM
  DO 3220 I=1,N2
  IF (LINE=SL-NB) 3060,3200,3200
3060 CALL READ (20)
  WRITE (NOUT,4680) ICHAN
  IF (N3-2) 3080,3100,3120
3080 WRITE (NOUT,4620) (NBLOCK(2*N-1),NBLOCK(2*N),N=1,ISUMM1,NSUMM1)
  LINE=SL=58
  GO TO 3200
3100 WRITE (NOUT,4640) (NBLOCK(2*N-1),NBLOCK(2*N),N=1,ISUMM1,NSUMM1)
  LINE=SL=57
  GO TO 3200

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3120	IKL=NB-3	WRAPUP	704
	LINE SL=59	WRAPUP	765
	I16=ISUMM1	WRAPUP	766
	I17=I16+19	WRAPUP	767
	IF (IKL) 3180,3180,3140	WRAPUP	768
3140	DO 3160 JAKL=1,IKL	WRAPUP	769
	WRITE (NOUT,400) (NBLOCK(2*N-1),NBLOCK(2*N),N=I16,I17)	WRAPUP	770
	LINE SL=LINE SL-1	WRAPUP	771
	I16=I17+1	WRAPUP	772
	I17=I17+20	WRAPUP	773
3160	CONTINUE	WRAPUP	774
3180	WRITE (NOUT,400) (NBLOCK(2*N-1),NBLOCK(2*N),N=I16,NSUMM1)	WRAPUP	775
	LINE SL=LINE SL-3	WRAPUP	776
3200	J=(INDEX-IP)*NSUM+ISUM	WRAPUP	777
	M=J-1+KSUM	WRAPUP	778
	WRITE (NOUT,400) TIME(INDEX),(BLOCK(N),N=J,M)	WRAPUP	779
	INDEX=INDEX+1	WRAPUP	780
3220	LINE SL=LINE SL-NJ	WRAPUP	781
	IP=INDEX	WRAPUP	782
3240	N1=NUM	WRAPUP	783
	MACCUM=MACCUM+MPRINT*NSUM	WRAPUP	784
	GO TO 3600	WRAPUP	785
C WANT SPECIFIED ONES		WRAPUP	786
3260	NSUM=LBLOCK(1)	WRAPUP	787
	KUTOFF=NB CORE-1	WRAPUP	788
	NADD=NT CORE-NB CORE	WRAPUP	789
	INDEX=1	WRAPUP	790
	J=0	WRAPUP	791
	DO 3320 I=1,NSUM	WRAPUP	792
	IF (LBLOCK(I+3)) 3240,3280,3300	WRAPUP	793
3280	NT(INDEX)=I-INDEX-J	WRAPUP	794
	J=J+NT(INDEX)	WRAPUP	795
	INDEX=INDEX+1	WRAPUP	796
3300	K=(LBLOCK(I+3)-1)/4	WRAPUP	797
	L=LBLOCK(I+3)-4*K	WRAPUP	798
	IF (K.GT.KUTOFF) K=K+NADD	WRAPUP	799
	NBLOCK(2*I-1)=L	WRAPUP	800
3320	NBLOCK(2*I)=K+1	WRAPUP	801
	NSUM=NSUM+1	WRAPUP	802
	NT(INDEX)=NSUM-INDEX-J	WRAPUP	803
C HOW MANY FIT IN CORE		WRAPUP	804
	NUM=(LBLOCK/NSUM)*NSUM	WRAPUP	805
C HOW MANY FILLINGS		WRAPUP	806
	KK=20*(NEW-1)+ICHAN	WRAPUP	807
	KK=NTAB(KK)	WRAPUP	808
	K=(KK*NSUM)/NUM	WRAPUP	809
C HOW MANY LEFT OVER		WRAPUP	810
	LEFT=KK*NSUM-K*NUM	WRAPUP	811
	IF (LEFT.GT.0) K=K+1	WRAPUP	812
	N1=NUM	WRAPUP	813
	IKL=1	WRAPUP	814
	JSUM=1	WRAPUP	815
	NDEX=INDEX	WRAPUP	816
	IUNIT=2	WRAPUP	817
	DO 3580 I16=1,NDEX	WRAPUP	818
	INDEX=1	WRAPUP	819
	IP=1	WRAPUP	820
	LINE SL=0	WRAPUP	821
	JAKL=IKL-1+NT(I16)	WRAPUP	822
	NB=(NT(I16)+19)/20	WRAPUP	823
	CALL REWIND (FIT(240))	WRAPUP	824
	IWA=1+MACCUM	WRAPUP	825
	IF (LEFT.GT.0) N1=LEFT	WRAPUP	826
	DO 3500 L=1,K	WRAPUP	827
	CALL GET (FIT(246),BLOCK,IWA,J,C,10*N1,JOLLY)	WRAPUP	828
	IF (GETW(1).GT.0.) GO TO 3620	WRAPUP	829

IWA=IWA+N1	WRAPUP	830
N2=N1/NSUM	WRAPUP	831
DO 3340 I=1,N2	WRAPUP	832
IF (LINESL-NB) 3340,3480,3480	WRAPUP	833
3340 CALL HEDD (21)	WRAPUP	834
WRITE (NOUT,4080) ICHAN	WRAPUP	835
IF (N3-2) 3360,3380,3400	WRAPUP	836
3360 WRITE (NOUT,4620) (NBLOCK(2*N-1),NBLOCK(2*N),N=IKE,JAKE)	WRAPUP	837
LINESL=58	WRAPUP	838
GO TO 3480	WRAPUP	839
3380 WRITE (NOUT,4640) (NBLOCK(2*N-1),NBLOCK(2*N),N=IKE,JAKE)	WRAPUP	840
LINESL=57	WRAPUP	841
GO TO 3480	WRAPUP	842
3400 IZZY=N3-3	WRAPUP	843
LINESL=59	WRAPUP	844
NA=IKE	WRAPUP	845
I17=NA+19	WRAPUP	846
IF (IZZY) 3400,3400,3420	WRAPUP	847
3420 DO 3440 M=1,IZZY	WRAPUP	848
WRITE (NOUT,4700) (NBLOCK(2*N-1),NBLOCK(2*N),N=NA,I17)	WRAPUP	849
NA=I17	WRAPUP	850
LINESL=LINESL-1	WRAPUP	851
3440 I17=I17+20	WRAPUP	852
3460 WRITE (NOUT,4660) (NBLOCK(2*N-1),NBLOCK(2*N),N=NA,JAKE)	WRAPUP	853
LINESL=LINESL-3	WRAPUP	854
3480 J=(INDEX-IP)*NSUM+JSUM	WRAPUP	855
I=J+NT(I16)	WRAPUP	856
IF (I16.NE.1) GO TO 3500	WRAPUP	857
WRITE (NOUT,4500) (BLOCK(N),N=J,M)	WRAPUP	858
TIME(INDEX)=BLOCK(J)	WRAPUP	859
GO TO 3520	WRAPUP	860
3500 M=M-1	WRAPUP	861
WRITE (NOUT,4500) TIME(INDEX),(BLOCK(N),N=J,M)	WRAPUP	862
3520 INDEX=INDEX+1	WRAPUP	863
3540 LINESL=LINESL-NB	WRAPUP	864
IP=INDEX	WRAPUP	865
3560 N1=NUM	WRAPUP	866
JSUM=JSUM+NT(I16)+1	WRAPUP	867
IF (I16.EQ.1) JSUM=JSUM+1	WRAPUP	868
3580 IKE=JAKE+2	WRAPUP	869
MAGCU1=MAGCU1+MFRINI*NSUM	WRAPUP	870
3600 CONTINUE	WRAPUP	871
CALL XEND (FIT(240))	WRAPUP	872
3620 CONTINUE	WRAPUP	873
IF (GEWIZ(7).GT.0.0) GO TO 3640	WRAPUP	874
C	WRAPUP	875
C GAS AND VAPOR VOLUMES IN CHANNEL	WRAPUP	876
C	WRAPUP	877
IUNIT=7	WRAPUP	878
DO 3630 ICHAN=1,NCHAN	WRAPUP	879
IWA=1+4*MPRINT*(ICHAN-1)	WRAPUP	880
K=NTM3(20*(N-1)+ICHAN)	WRAPUP	881
CALL XEND (FIT(71))	WRAPUP	882
LINESL=0	WRAPUP	883
J33=0	WRAPUP	884
J31=(BLOCK/4)*4	WRAPUP	885
J32=(4*K)/J31	WRAPUP	886
IF (4*K.GT.J31*J32) GO TO 3640	WRAPUP	887
J33=J31	WRAPUP	888
GO TO 3600	WRAPUP	889
3640 J33=4*K-J31*J32	WRAPUP	890
J32=J32+1	WRAPUP	891
3660 DO 3780 J34=1,J32	WRAPUP	892
CALL GET (FIT(71),BLOCK,IWA,0,0,10*J33,JOLLY)	WRAPUP	893
IWA=IWA+J33	WRAPUP	894
IF (GEWIZ(7).GT.0.0) GO TO 3620	WRAPUP	895

IF (J3>.GT.0) GO TO 3700	WRAPUP	896
I=1	WRAPUP	897
J30=J33/4	WRAPUP	898
DO 3680 L14=1,J36	WRAPUP	899
IF (BLOCK(4*I-2).NE.0.0.OR.BLOCK(4*I-1).NE.0.0.OR.BLOCK(4*I).NE.0.0)	WRAPUP	900
+J) GO TO 3700	WRAPUP	901
3680 I=I+1	WRAPUP	902
GO TO 3780	WRAPUP	903
3700 J35=10	WRAPUP	904
N=J33/4	WRAPUP	905
DO 3760 M=1,N	WRAPUP	906
IF (LINE\$) 3720,3720,3740	WRAPUP	907
3720 CONTINUE	WRAPUP	908
CALL MEND (22)	WRAPUP	909
WRITE (NOUT,4720) ICHAN	WRAPUP	910
LINE\$=55	WRAPUP	911
3740 LINE\$=LINE\$-1	WRAPUP	912
WRITE (NOUT,4740) BLOCK(4*I-3),BLOCK(4*I-2),BLOCK(4*I-1),BLOCK(4*I	WRAPUP	913
*)	WRAPUP	914
I=I+1	WRAPUP	915
IF (I.GT.K) GO TO 3800	WRAPUP	916
3760 CONTINUE	WRAPUP	917
3780 J33=J31	WRAPUP	918
3800 CONTINUE	WRAPUP	919
3820 CONTINUE	WRAPUP	920
3840 CONTINUE	WRAPUP	921
C	WRAPUP	922
C CHANNEL VOID AND FUEL REACTIVITIES	WRAPUP	923
C	WRAPUP	924
IF (NTREAT.NE.0) GO TO 4060	WRAPUP	925
IF (GEZWIZ(8).GT.0.0) GO TO 4060	WRAPUP	926
IUNIT=8	WRAPUP	927
DO 4020 ICHAN=1,NCHAN	WRAPUP	928
IWA=1+3*MPRINT*(ICHAN-1)	WRAPUP	929
K=NTAB(20*(NEW-1)+ICHAN)	WRAPUP	930
K=IPRINT	WRAPUP	931
CALL REWNI (FIT(1.0))	WRAPUP	932
LINE\$=0	WRAPUP	933
J35=0	WRAPUP	934
J31=(18BLOCK/3)*3	WRAPUP	935
J32=(3*K)/J31	WRAPUP	936
IF (3*K.GT.J31*J32) GO TO 3860	WRAPUP	937
J33=J31	WRAPUP	938
GO TO 3880	WRAPUP	939
3860 J33=3*K-J31*J32	WRAPUP	940
J32=J32+1	WRAPUP	941
3880 DO 4000 J34=1,J32	WRAPUP	942
CALL GLT (FIT(100),BLOCK,IWA,J,0,10*J33,JOLLY)	WRAPUP	943
IWA=IWA+J33	WRAPUP	944
IF (GEZWIZ(8).GT.0.0) GO TO 4040	WRAPUP	945
IF (J35.GT.0) GO TO 3920	WRAPUP	946
I=1	WRAPUP	947
J30=J33/3	WRAPUP	948
DO 3900 L14=1,J36	WRAPUP	949
IF (BLOCK(3*I-1).NE.0.0.OR.BLOCK(3*I).NE.0.0) GO TO 3920	WRAPUP	950
3900 I=I+1	WRAPUP	951
GO TO 4000	WRAPUP	952
3920 J35=10	WRAPUP	953
N=J33/3	WRAPUP	954
DO 3980 M=1,N	WRAPUP	955
IF (LINE\$) 3940,3940,3960	WRAPUP	956
3940 CONTINUE	WRAPUP	957
CALL MEND (23)	WRAPUP	958
WRITE (NOUT,4760) ICHAN	WRAPUP	959
LINE\$=55	WRAPUP	960
3960 LINE\$=LINE\$-1	WRAPUP	961

WRITE (NOUT,478J) BLOCK(3*I-2),BLOCK(3*I-1),BLOCK(3*I)	WRAPUP	962
I=I+1	WRAPUP	963
IF (I.GT.IPRINT) GO TO 4020	WRAPUP	964
3960 CONTINUE	WRAPUP	965
4000 J33=J31	WRAPUP	966
4020 CONTINUE	WRAPUP	967
4040 CONTINUE	WRAPUP	968
4060 CONTINUE	WRAPUP	969
IBLOCK=VBUFF	WRAPUP	970
RETURN	WRAPUP	971
C	WRAPUP	972
4080 FORMAT ('O TIME"5X"POWER"3X"GENERATED"3X"MOLTEN"4X"MOLTEN"4X"MOLT	WRAPUP	973
+EN"3X"MOLTEN"/4X"SEC"7X"MW"6X"MW SEC"4X"MW SEC"4X"DEG. K"6X"KGS."3	WRAPUP	974
+X"PERCENT")	WRAPUP	975
4100 FORMAT (F9.4,5E10.4,F8.3)	WRAPUP	976
4120 FORMAT ('O TIME"22X"REACTIVITIES IN CENTS"/4X"SEC"9X"NET"4X"PROGR	WRAPUP	977
+AMED"3X"SGRA1"2X"UOPPLER"5X"FUEL"5X"SODIUM")	WRAPUP	978
4140 FORMAT (F9.4,6F10.3)	WRAPUP	979
4160 FORMAT (39X,48HINLET AND OUTLET VELOCITIES (M/SEC) FOR CHANNEL ,I2	WRAPUP	980
+)	WRAPUP	981
4180 FORMAT (" TIME ",17F7.4)	WRAPUP	982
4200 FORMAT (8H INLET , -2P17F7.2)	WRAPUP	983
4220 FORMAT (8H OUTLET , -2P17F7.2)	WRAPUP	984
4240 FORMAT (39X"BELOW CORE PRESSURE - BARS"5X"CHANNEL"13)	WRAPUP	985
4260 FORMAT (3X"TIME"47X"NODE"/4X"SEC"20I6)	WRAPUP	986
4280 FORMAT (54X"NODE"/3X"TIME"20I6/4X"SEC"20I6)	WRAPUP	987
4300 FORMAT (7X20I6/3X"TIME"20I6/4X"SEC"20I6)	WRAPUP	988
4320 FORMAT (F9.4, -6P20F6.1/(9X, -6P20F6.1))	WRAPUP	989
4340 FORMAT (4X"CORE PRESSURES - BARS"5X"CHANNEL"13)	WRAPUP	990
4360 FORMAT (39X"ABOVE CORE PRESSURES - BARS"5X"CHANNEL"13)	WRAPUP	991
4380 FORMAT (49X,32HFUEL SQUIRTING INFO FOR CHANNEL ,I2/113H TIME FU	WRAPUP	992
+EL SQUIRTED PRESSURE IN FUEL PRESSURE IN CHANNEL MOLTEN FUEL IN PI	WRAPUP	993
+NS LOWER INTERFACE UPPER INTERFACE/2X,3HSEC,7X,5HGRAMS,9X,7HM DY	WRAPUP	994
NES,11X,7HM DYNES,14X,5HGRAMS,15X,2HCM,16X,2HCM)	WRAPUP	995
4400 FORMAT (F9.4,F8.1, -6PF15.1,F15.1,6PF20.6,2F18.1)	WRAPUP	996
4420 FORMAT (39X"COOLANT NODE TEMPERATURES BELOW CORE - DEGREES K"5X"CH	WRAPUP	997
+ANNEL"13)	WRAPUP	998
4440 FORMAT (3X"TIME"36X"NODE"/4X"SEC"20I6)	WRAPUP	999
4460 FORMAT (3X"TIME"9I6,I3,10I6/4X"SEC"17,19I6)	WRAPUP	1000
4480 FORMAT (113,3I6,I6,10I6/3X"TIME"17,10I6/4X"SEC"17,10I6)	WRAPUP	1001
4500 FORMAT (F9.4,20F6.0/(F15.3,19F6.0))	WRAPUP	1002
4520 FORMAT (36X"CORE COOLANT NODE TEMPERATURES - DEGREES K"5X"CHANNEL"	WRAPUP	1003
+I3)	WRAPUP	1004
4540 FORMAT (36X"COOLANT NODE TEMPERATURES ABOVE CORE - DEGREES K"5X"CH	WRAPUP	1005
+ANNEL"13)	WRAPUP	1006
4560 FORMAT (20X"COOLANT NODE TEMPERATURES - DEGREES K"5X"CHANNEL"13)	WRAPUP	1007
4580 FORMAT (16X"RADIAL CORE TEMPERATURES - DEGREES K FOR CHANNEL"13,"	WRAPUP	1008
+AXIAL LEVEL"13/3X"TIME"36X"RADIAL NODE"/4X"SEC"9I6,17,5I6)	WRAPUP	1009
4600 FORMAT (10X"CORE TEMPERATURES - DEGREES K"5X"CHANNEL"13)	WRAPUP	1010
4620 FORMAT (3X"TIME"30X"NODES"/4X"SEC"2X20(I3,""I2))	WRAPUP	1011
4640 FORMAT (3X"TIME"2X20(I3,""I2)/4X"SEC"2X20(I3,""I2))	WRAPUP	1012
4660 FORMAT (4X20(I3,""I2)/3X"TIME"2X20(I3,""I2)/4X"SEC"2X20(I3,""I2	WRAPUP	1013
+))	WRAPUP	1014
4680 FORMAT (10X"NON CORE - NON COOLANT TEMPERATURES - DEGREES K"5X"CHA	WRAPUP	1015
+NNEL"13)	WRAPUP	1016
4700 FORMAT (4X20(I3,""I2))	WRAPUP	1017
4720 FORMAT (10X,"FISSION GAS FROM PIN",2X"SODIUM VAPOR"2X"FISSION GAS	WRAPUP	1018
+FROM PLENUM"/3X"TIME"10X"CC"17X"CC"18X"CC"14X"CHANNEL"13)	WRAPUP	1019
4740 FORMAT (F9.4,1P15.3,2E20.3)	WRAPUP	1020
4760 FORMAT (12X,"VOID REACTIVITY",3X,"FUEL REACTIVITY"/3X"TIME"8X"CENT	WRAPUP	1021
+S"12X"CENTS"13X"CHANNEL"13)	WRAPUP	1022
4780 FORMAT (F9.4,1P15.3,E17.3)	WRAPUP	1023
END	WRAPUP	1024

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SUBROUTINE CENTER (X,M)
  DIMENSION X(2)
  DATA BLANK/10H /
  DO 120 I=1,M
    IF (BLANK.NE.X(I)) GO TO 140
  120 CONTINUE
  GO TO 240
  140 I1=I
  DO 160 I=1,M
    J=M+1-I
    IF (BLANK.NE.X(J)) GO TO 180
  160 CONTINUE
  GO TO 240
  180 I2=J
  I3=I2-I1+1
  IEMPTY=M-I3
  IF (IEMPTY.EQ.0) GO TO 240
  JEMPTY=IEMPTY/2
  IEMPTY=IEMPTY-JEMPTY
  DO 200 I=1,I3
    J=M+1-JEMPTY-I
    K=I2+1-I
  200 X(J)=X(K)
  DO 220 I=1,IEEMPTY
  220 X(I)=BLANK
  240 RETURN
  END

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CENTER	2
CENTER	3
CENTER	4
CENTER	5
CENTER	6
CENTER	7
CENTER	8
CENTER	9
CENTER	10
CENTER	11
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CENTER	13
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CENTER	26
CENTER	27
CENTER	28

SUBROUTINE XPL0TX	XPL0TX	2
EXTERNAL JOLLY	XPL0TX	3
COMMON/GOLLY/IUNIT,GEEMIZ(20)	XPL0TX	4
COMMON/FIT/FIT(385)	XPL0TX	5
DIMENSION BUFFER(1024)	XPL0TX	6
DIMENSION TIME(1000)	XPL0TX	7
DIMENSION Y(400)	XPL0TX	8
DIMENSION IX(20),IY(20)	XPL0TX	9
DIMENSION NS(78),NTOP(75),IB(3),IT(3),KCOLB(8213)	XPL0TX	10
C****	CASPAR	2
C**** COMMON DECK"CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLOB(1)	CASPAR	4
REAL KINSRT,KWTHDR	CASPAR	5
LOGICAL PRINT,DONE,SCRAM	CASPAR	6
COMMON	CASPAR	7
COMMON DUNE,ISTAT,IIIN,SLOA(3),	CASPAR	8
+IBLOCK,H(2),T(2),HKEDO,ICHAN,VJIOK(2),	CASPAR	9
+DUPPK(2),GOLAPK(2),NEW,IOLD,NOUT,TERROR,	CASPAR	10
+GERROR,PEXIT(3),PERROR,PINT,DELTIM,PV(2),	CASPAR	11
+PBIT(3,2),IACTIV(20),FLOW(3,2),TOFT(3,2),TOPEN(3),WOLF(3),	CASPAR	12
+LOOP(20),LOUTL,NTRCAT,IKINET,TOUT,HMAX,	CASPAR	13
+TIMLIN(50),TIMOUT(50),DKOUT(50),IPAIR2,AV(2),	CASPAR	14
+IPAIR3,KOUNT,KH(2),BB0100,RHOSWZ,NRGROUP,	CASPAR	15
+C(6,2),ALIFE,ALFH(6),GAM(6),B(6),AL(6),	CASPAR	16
+JB,SCRAM,TSCRAM(2),PCKIOU,RSLOPE,ERROR,	CASPAR	17
+KINSRT(2),KWTHDR(2),REDUCE,PRINT1,PRINT2,RMIN	CASPAR	18
COMMON	CASPAR	19
+ANLOW,TQUIT,LSTEP,JSTEP,ANIC,TKGS,	CASPAR	20
+IPL0T,ERROR1,TERM(13),TITLE(8),HOTPIH,SFCB,	CASPAR	21
+SFCO,SFCO,LINESL,KSTEP,NCHAN,MSTEP,	CASPAR	22
+IPRINT,MPRINT,ISUMP,QGEN(2),ANI,ANSGRM,	CASPAR	23
+TDELAY,NLOOPS,RHOCEE(3),VULTOP(3),HEAD(3),PRESTM(50),	CASPAR	24
+PRESUR(50,3),IPAIR4,P0(3),RUNTIM,VER,ETAU(4),	CASPAR	25
+KBLOCK,JBLOCK,MBLOCK,N12,N13,EXTRA,	CASPAR	26
+GJACK(3),VJACK(2),ITRGAP,	CASPAR	27
+MYIN,V22,NIN,INPUT,N2,N4,	CASPAR	28
+N7,N8,KPRINT,POWSS,HMAX3,HMAXF,	CASPAR	29
+TRIPFW(3),TRIPPP(3),TRIPPF(3),TRIPOT(3),DELAYF	CASPAR	30
EQUIVALENCE (QMOL,TERM(4)),(TMOL,TERM(5)),(GMOL,TERM(6)),(PERMOL,T	CASPAR	31
TERM(7)),(SLOB,DUNE)	CASPAR	32
C****	XPL0TX	12
EQUIVALENCE (IPL0T,IWRAP),(Y,IY,TIME)	XPL0TX	13
COMMON BLOCK(6500),BLOC(6500)	XPL0TX	14
C	XPL0TX	15
C	XPL0TX	16
C TRANSFER NAXIAL,NBCORE,NTCORE,NTOP INTO ARRAY NS FROM DISC	XPL0TX	17
C	XPL0TX	18
C	XPL0TX	19
EQUIVALENCE (NS(1),NAXIAL),(NS(2),NBCORE),(NS(3),NTCORE),	XPL0TX	20
+ (NS(4),NTOP),(BLOCK,KCOLB)	XPL0TX	21
EQUIVALENCE (IB(1),TMELTH),(IB(2),TMELTL)	XPL0TX	22
COMMON/1PRESR/1PRESR(20)	XPL0TX	23
COMMON/NTABZZ/NTAB(49)	XPL0TX	24
COMMON/ZPLOTZ/JCHAN(20),JPLOTS(20),LISTJ(20,20),KPLOTS(20),LISTK(2	XPL0TX	25
+J,20),ITAB	XPL0TX	26
DATA ON/1.,OFF/C.0/	XPL0TX	27
NTGAP=72	XPL0TX	28
NBUFF=1BLOCK	XPL0TX	29
IBLOCK=1STAT	XPL0TX	30
IF (1PRINT.LT.2.OR.1PLOT.EQ.0) GO TO 1000	XPL0TX	31
CALL PLOTS (BUFFER,1024,8)	XPL0TX	32
CALL PLOT (2.,0,-3)	XPL0TX	33
C RETURN PHYSICS INFO DRUM	XPL0TX	34
IF (GEEMIZ(9).GT.0.) GO TO +20	XPL0TX	35
IUNIT=9	XPL0TX	36
IWA=1		

C	HOW MUCH WILL FIT INTO CORE	XPLOTX	37
	NUM=(IBLOCK/13)*13	XPLOTX	38
C	HOW MANY COMPLETE FILLINGS	XPLOTX	39
	K=(13*IPRINT)/NUM	XPLOTX	40
C	HOW MANY LEFT OVER	XPLOTX	41
	LEFT=13*IPRINT-K*NUM	XPLOTX	42
	IF (LEFT) 120,120,140	XPLOTX	43
120	N1=NUM	XPLOTX	44
	GO TO 100	XPLOTX	45
140	K=K+1	XPLOTX	46
	N1=LEFT	XPLOTX	47
100	INDEX=0	XPLOTX	48
	DO 200 I=1,K	XPLOTX	49
	CALL GET (FIT(141),BLOCK,IWA,J,0,10*N1,JOLLY)	XPLOTX	50
	IF (GLEWIZ(9).GT.0.0) GO TO 420	XPLOTX	51
	IWA=IWA+N1	XPLOTX	52
	NN=N1/13	XPLOTX	53
	DO 180 I=1,NN	XPLOTX	54
	I1=I+INDEX	XPLOTX	55
	JND_X=13*(I-1)	XPLOTX	56
	TIME(I1)=BLOCK(JND_X+1)	XPLOTX	57
	DO 180 J=8,13	XPLOTX	58
	BLOC(I1)=BLOC(J+JND_X)	XPLOTX	59
180	I1=I1+IPRINT	XPLOTX	60
	N1=NUM	XPLOTX	61
200	INDEX=INDEX+1	XPLOTX	62
	J=1	XPLOTX	63
	I=MAX0(2,IPRINT/10)	XPLOTX	64
	IF (INTRCAT.NE.0) GO TO 280	XPLOTX	65
	CALL OSCALC (TIME,6.,IPRINT,1,FIRSTX,DELTAX)	XPLOTX	66
	CALL OSCALC (BLOC,8.,0*IPRINT,1,FIRSTY,DELTAY)	XPLOTX	67
220	CALL SYMBOL (2.27,10.,.112,TITLE,0,72)	XPLOTX	68
	CALL SYMBOL (3.28,9.78,.112,12HREACTIVITIES,0,12)	XPLOTX	69
	CALL SYMBOL (1.0,9.02,.112,0,0,-1)	XPLOTX	70
	CALL SYMBOL (1.0,9.02,.112,4H NET,0,4)	XPLOTX	71
	CALL SYMBOL (2.27,9.02,.112,3,0,-1)	XPLOTX	72
	CALL SYMBOL (2.27,9.02,.112,7H INSERT,0,7)	XPLOTX	73
	CALL SYMBOL (3.28,9.02,.112,4,0,0,-1)	XPLOTX	74
	CALL SYMBOL (3.28,9.02,.112,6H SCRAM,0,6)	XPLOTX	75
	CALL SYMBOL (4.26,9.02,.112,11,0,-1)	XPLOTX	76
	CALL SYMBOL (4.26,9.02,.112,9H JUFPLER,0,9)	XPLOTX	77
	CALL SYMBOL (5.36,9.02,.112,2,0,-1)	XPLOTX	78
	CALL SYMBOL (5.36,9.02,.112,5H FULL,0,5)	XPLOTX	79
	CALL SYMBOL (6.63,9.02,.112,14,0,-1)	XPLOTX	80
	CALL SYMBOL (6.63,9.02,.112,7H SODIUM,0,7)	XPLOTX	81
	CALL PLOT (1.0,1.0,-3)	XPLOTX	82
	CALL AXIS (0,0,8H TIME SEC,-8,0,0,FIRSTX,DELTAX)	XPLOTX	83
	CALL AXIS (0,0,8H CENTS,5,0,0,FIRSTY,DELTAY)	XPLOTX	84
	CALL LINE (TIME(J),BLOC(J),IPRINT-J+1,1,1,0,FIRSTX,DELTAX,FIRSTY,J	XPLOTX	85
	+DELTAY)	XPLOTX	86
	CALL LINE (TIME(J),BLOC(IPRINT+J),IPRINT-J+1,1,1,3,FIRSTX,DELTAX,F	XPLOTX	87
	+IRSTY,DELTAY)	XPLOTX	88
	CALL LINE (TIME(J),BLOC(2*IPRINT+J),IPRINT-J+1,1,1,4,FIRSTX,DELTAX	XPLOTX	89
	+FIRSTY,DELTAY)	XPLOTX	90
	CALL LINE (TIME(J),BLOC(3*IPRINT+J),IPRINT-J+1,1,1,11,FIRSTX,DELTAX	XPLOTX	91
	+X,FIRSTY,DELTAY)	XPLOTX	92
	CALL LINE (TIME(J),BLOC(4*IPRINT+J),IPRINT-J+1,1,1,2,FIRSTX,DELTAX	XPLOTX	93
	+FIRSTY,DELTAY)	XPLOTX	94
	CALL LINE (TIME(J),BLOC(5*IPRINT+J),IPRINT-J+1,1,1,14,FIRSTX,DELTAX	XPLOTX	95
	+X,FIRSTY,DELTAY)	XPLOTX	96
	CALL PLOT (9.,-1.0,-3)	XPLOTX	97
	IF (J.NE.1) GO TO 280	XPLOTX	98
	IZACK=4*IPRINT+1	XPLOTX	99
	M=IZACK+IPRINT-1	XPLOTX	100
	DO 240 J=IZACK,M	XPLOTX	101
	IF (BLOC(J).NE.0) GO TO 260	XPLOTX	102
240	CONTINUE	XPLOTX	103

GO TO 280	XPL0TX	104
260 IF (J.EQ.IZACK.OR.J.EQ.IZACK+1.OR.J.EQ.M) GO TO 280	XPL0TX	105
J=J-IZACK+1	XPL0TX	106
CALL CSCALE (TIME(J),0.,IPRINT-J+1,1,FIRSTX,DELTAX)	XPL0TX	107
I=MAX(2,(IPRINT-J+1)/10)	XPL0TX	108
GO TO 220	XPL0TX	109
280 CONTINUE	XPL0TX	110
CALL REWNO (FIT(1+1))	XPL0TX	111
C	XPL0TX	112
IWA=1	XPL0TX	113
C POWER	XPL0TX	114
C	XPL0TX	115
IF (LEFT.GT.3) N1=LEFT	XPL0TX	116
INDEX=0	XPL0TX	117
DO 340 L=1,K	XPL0TX	118
IF (K.LQ.1) GO TO 300	XPL0TX	119
CALL GET (FIT(1+1),BLOCK,IWA,3,C,10*N1,JOLLY)	XPL0TX	120
IF (G=EWIZ(3).GT.0.0) GO TO 420	XPL0TX	121
IWA=IWA+N1	XPL0TX	122
300 N1=N1/13	XPL0TX	123
DO 320 I=1,N1	XPL0TX	124
I1=I+INDEX	XPL0TX	125
JNDEX=13*(I-1)	XPL0TX	126
DO 320 J=2,7	XPL0TX	127
BLOC(I1)=BLOCK(J+JNDEX)	XPL0TX	128
320 I1=I1+IPRINT	XPL0TX	129
N1=NUM	XPL0TX	130
340 INDEX=N1	XPL0TX	131
CALL SYMBOL (.25,10.,.112,TITLE,C,72)	XPL0TX	132
CALL SYMBOL (2.5,9.02,.112,0,0,-1)	XPL0TX	133
CALL SYMBOL (2.5,9.00,.112,CH POWER,0,0)	XPL0TX	134
CALL SYMBOL (3.0,9.02,.112,3,0,-1)	XPL0TX	135
CALL SYMBOL (3.0,9.00,.112,19H ACCUMULATED ENERGY,0,19)	XPL0TX	136
CALL CSCALE (TIME,6.,IPRINT,1,FIRSTX,DELTAX)	XPL0TX	137
CALL CSCALE (BLOC,8.,IPRINT,1,FY1,DY1)	XPL0TX	138
CALL PLOT (1.,1.0,-3)	XPL0TX	139
CALL AXIS (0,0,3HPOWER MW,8,8,.90.,FY1,DY1)	XPL0TX	140
CALL PLOT (.75,0,-3)	XPL0TX	141
CALL CSCALE (BLOC(IPRINT+1),8.,IPRINT,1,FIRSTY,DELTAY)	XPL0TX	142
CALL AXIS (0,0,25HACCUMULATED ENERGY MW SEC,25,8,.90.,FIRSTY,DELTA	XPL0TX	143
+Y)	XPL0TX	144
CALL AXIS (0,0,4HTIME SEC,-8,0,0,FIRSTX,DELTAX)	XPL0TX	145
I=MAX(2,IPRINT/10)	XPL0TX	146
CALL LINE (TIME,BLOC,IPRINT,1,I,0,FIRSTX,DELTAX,FY1,DY1)	XPL0TX	147
CALL LINE (TIME,BLOC(IPRINT+1),IPRINT,1,I,3,FIRSTX,DELTAX,FIRSTY,0	XPL0TX	148
+DELTAY)	XPL0TX	149
CALL PLOT (.75,-1.0,-3)	XPL0TX	150
C WHERE DOES MOLTEN STUFF BECOME NON ZERO	XPL0TX	151
INDEX=2*IPRINT	XPL0TX	152
DO 360 I=1,IPRINT	XPL0TX	153
IF (BLOC(I+INDEX)) 360,360,360	XPL0TX	154
360 CONTINUE	XPL0TX	155
C NOTHING THERE	XPL0TX	156
GO TO 430	XPL0TX	157
C STARTING PLACE FOR TIME	XPL0TX	158
380 I10=1	XPL0TX	159
C HOW MANY	XPL0TX	160
I9=IPRINT-I+1	XPL0TX	161
IF (I9.LT.2) GO TO 400	XPL0TX	162
C STARTING PLACE FOR MOLTEN STUFF	XPL0TX	163
I11=I10+2*IPRINT	XPL0TX	164
CALL SYMBOL (.25,10.,.112,TITLE,C,72)	XPL0TX	165
CALL SYMBOL (3.0,9.02,.112,0,0,-1)	XPL0TX	166
CALL SYMBOL (3.0,9.00,.112,7H MW-SEC,0,7)	XPL0TX	167
CALL SYMBOL (3.0,9.02,.112,3,0,-1)	XPL0TX	168
CALL SYMBOL (3.0,9.00,.112,10H DEGREES K,0,10)	XPL0TX	169

CALL SYMBOL (5.73,9.62,.112,4,0,-1)	XPLOTX	170
CALL SYMBOL (5.73,9.62,.112,4H KGS,0,4)	XPLOTX	171
CALL SYMBOL (6.3,9.62,.112,11,0,-1)	XPLOTX	172
CALL SYMBOL (6.3,9.62,.112,8H PERCENT,0,8)	XPLOTX	173
CALL CSCALE (TIME(I10),5.,19,1,FIRSTX,DELTAX)	XPLOTX	174
CALL CSCALE (BLOC(I11),8.,19,1,FY1,OY1)	XPLOTX	175
CALL CSCALE (BLOC(I11+IPRINT),8.,19,1,FY2,OY2)	XPLOTX	176
CALL CSCALE (BLOC(2*IPRINT+I11),8.,19,1,FY3,OY3)	XPLOTX	177
CALL CSCALE (BLOC(3*IPRINT+I11),8.,19,1,FIRSTY,DELTAY)	XPLOTX	178
CALL AXIS (1.75,1.5,21MMW-SEC IN MOLTEN FUEL,21,8.,90.,FY1,OY1)	XPLOTX	179
CALL AXIS (1.5,1.5,22HMOLTEN TEMP. DEGREES K,22,8.,90.,FY2,OY2)	XPLOTX	180
CALL AXIS (2.25,1.5,13HMOLTEN KGS,10,8.,90.,FY3,OY3)	XPLOTX	181
CALL AXIS (3.,1.5,7HPERCENT,7,8.,90.,FIRSTY,DELTAY)	XPLOTX	182
CALL PLOT (3.,1.5,-3)	XPLOTX	183
CALL AXIS (3,0,8HTIME SEC,-8,5.,0,FIRSTX,DELTAX)	XPLOTX	184
I=MAX(2,I9/10)	XPLOTX	185
CALL LINE (TIME(I10),BLOC(I11),19,1,I,0,FIRSTX,DELTAX,FY1,OY1)	XPLOTX	186
I11=I11+IPRINT	XPLOTX	187
CALL LINE (TIME(I10),BLOC(I11),19,1,I,3,FIRSTX,DELTAX,FY2,OY2)	XPLOTX	188
I11=I11+IPRINT	XPLOTX	189
CALL LINE (TIME(I10),BLOC(I11),19,1,I,4,FIRSTX,DELTAX,FY3,OY3)	XPLOTX	190
I11=I11+IPRINT	XPLOTX	191
CALL LINE (TIME(I10),BLOC(I11),19,1,I,11,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	192
CALL PLOT (7.5,-1.5,-3)	XPLOTX	193
400 CONTINUE	XPLOTX	194
CALL REWIND (FIT(1+1))	XPLOTX	195
+20 CONTINUE	XPLOTX	196
C FUEL SQUIRTING JAZZ	XPLOTX	197
C	XPLOTX	198
IF (GEHWIZ(6).GT.0.0) GO TO 6+0	XPLOTX	199
DO 620 ICHAN=1,NCHAN	XPLOTX	200
IUNIT=6	XPLOTX	201
IY(ICHAN)=0	XPLOTX	202
IFIZZ=20*(NCHAN-1)+ICHAN	XPLOTX	203
IFIZZ=NTAB(IFIZZ)	XPLOTX	204
CALL REWIND (FIT(3+1))	XPLOTX	205
IWA=1+10*MPRINT*(ICHAN-1)	XPLOTX	206
CALL IN (3+1,BLOCK,IWA,10*IFIZZ,IBLOCK)	XPLOTX	207
IF (GEHWIZ(6).GT.0.0) GO TO 6+0	XPLOTX	208
L=1	XPLOTX	209
L31=0	XPLOTX	210
C HOW MUCH FUEL IN CHANNEL DID WE START WITH	XPLOTX	211
CALL REWIND (FIT)	XPLOTX	212
IUNIT=10	XPLOTX	213
IWA=6069+NBUFF*(ICHAN-1)	XPLOTX	214
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP	XPLOTX	215
CALL GET (FIT,ACCUM,IWA,0,0,10,JOLLY)	XPLOTX	216
SWITCH=OFF	XPLOTX	217
N=1	XPLOTX	218
DO 520 I=1,IFIZZ	XPLOTX	219
INDEX=10*I-10	XPLOTX	220
IF (BLOCK(INDEX+1).EQ.0.0) GO TO 520	XPLOTX	221
DO 440 M=1,5	XPLOTX	222
JNDX=(M-1)*IFIZZ	XPLOTX	223
440 BLOC(JNDX+L)=BLOCK(M+INDEX)	XPLOTX	224
JNDX=JNDX+IFIZZ	XPLOTX	225
ACCUM=ACCUM+BLOC(IFIZZ+L)	XPLOTX	226
BLOC(JNDX+L)=ACCUM	XPLOTX	227
IF (BLOCK(INDEX+10).EQ.0.0) GO TO 480	XPLOTX	228
IF (SWITCH.EQ.ON) GO TO 460	XPLOTX	229
L31=L31+1	XPLOTX	230
IX(L31)=N	XPLOTX	231
SWITCH=ON	XPLOTX	232
460 JNDX=JNDX+IFIZZ	XPLOTX	233
	XPLOTX	234
	XPLOTX	235

TIME(N)=BLOCK(INDEX+1)	XPLOTX	236
BLOC(JNDEX+N)=BLOCK(INDEX+8)	XPLOTX	237
JNDEX=JNDEX+IFIZZ	XPLOTX	238
BLOC(JNDEX+N)=BLOCK(INDEX+9)	XPLOTX	239
JNDEX=JNDEX+IFIZZ	XPLOTX	240
BLOC(JNDEX+N)=BLOCK(INDEX+10)	XPLOTX	241
N=N+1	XPLOTX	242
GO TO 500	XPLOTX	243
*50 IF (SWITCH.EQ.OFF) GO TO 500	XPLOTX	244
L31=L31+1	XPLOTX	245
IX(L31)=N-1	XPLOTX	246
500 L=L+1	XPLOTX	247
520 CONTINUE	XPLOTX	248
L=L-1	XPLOTX	249
IF (SWITCH.EQ.OFF) GO TO 540	XPLOTX	250
L31=L31+1	XPLOTX	251
IX(L31)=N-1	XPLOTX	252
540 IF (N.LT.2) GO TO 580	XPLOTX	253
CALL SYMBOL (.25,10.,.112,TITLE,0,72)	XPLOTX	254
CALL SYMBOL (2.1,9.5,.112,24HFUEL BUBBLE FOR CHANNEL ,0,24)	XPLOTX	255
FCHAN=ICHAN	XPLOTX	256
CALL NUMBER (999.,999.,.112,FCHAN,0,-1)	XPLOTX	257
CALL DSCALE (TIME,0.,N-1,1,FIRSTX,DELTAX)	XPLOTX	258
FIRSTY=-3.742	XPLOTX	259
DELTAY=IFIZZ	XPLOTX	260
CALL DSCALE (BLOC(0*IFIZZ+1),0.,N-1,3,FIRSTY,DELTAY)	XPLOTX	261
CALL PLOT (1.5,1.5,-3)	XPLOTX	262
CALL AXIS (0,0,HEIGHT CM,9,0.,90.,FIRSTY,DELTAY)	XPLOTX	263
CALL AXIS (0,0,HTIME SEC,-8,0.,0,FIRSTX,DELTAX)	XPLOTX	264
L31=L31/2	XPLOTX	265
DO 550 I=1,L31	XPLOTX	266
N=IX(2*I-1)	XPLOTX	267
M=IX(2*I)-N+1	XPLOTX	268
I1=0*IFIZZ+N	XPLOTX	269
I2=1+IFIZZ	XPLOTX	270
CALL LINE (TIME(N),BLOC(I1),M,1,0,0,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	271
CALL LINE (TIME(N),BLOC(I1+IFIZZ),M,1,0,0,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	272
+TAY)	XPLOTX	273
CALL LINE (TIME(N),BLOC(I2+IFIZZ),M,1,0,0,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	274
+TAY)	XPLOTX	275
550 CONTINUE	XPLOTX	276
CALL PLOT (9.,-1.5,-3)	XPLOTX	277
580 IF (L.LT.2) GO TO 620	XPLOTX	278
CALL SYMBOL (.25,10.,.112,TITLE,0,72)	XPLOTX	279
CALL SYMBOL (2.14,9.75,.112,30HFUEL DRIVING PRESSURES FOR CHANNEL ,0,30)	XPLOTX	280
FCHAN=ICHAN	XPLOTX	281
CALL NUMBER (999.,999.,.112,FCHAN,0,-1)	XPLOTX	282
CALL DSCALE (BLOC(0.,L,1,FIRSTX,DELTAX)	XPLOTX	283
FIRSTY=-3.742	XPLOTX	284
DELTAY=IFIZZ	XPLOTX	285
CALL DSCALE (BLOC(2*IFIZZ+1),0.,L,2,FIRSTY,DELTAY)	XPLOTX	286
CALL SYMBOL (2.14,9.62,.112,0,0,-1)	XPLOTX	287
CALL SYMBOL (2.14,9.55,.112,10M PRESSURE IN PIN,0,10)	XPLOTX	288
CALL SYMBOL (4.34,9.62,.112,3,0,-1)	XPLOTX	289
CALL SYMBOL (4.34,9.55,.112,20M PRESSURE IN CHANNEL,0,20)	XPLOTX	290
I=MAXJ(2,L/10)	XPLOTX	291
CALL PLOT (1.5,1.5,-3)	XPLOTX	292
CALL AXIS (0,0,HUYNES,0,0.,90.,FIRSTY,DELTAY)	XPLOTX	293
CALL AXIS (0,0,HTIME SEC,-8,0.,0,FIRSTX,DELTAX)	XPLOTX	294
CALL LINE (BLOC,BLOC(2*IFIZZ+1),L,1,I,0,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	295
	XPLOTX	296

+Y)	CALL LINE (BLOC,BLOC(3*IFIZZ+1),L,1,I,3,FIRSTX,DELTAX,FIRSTY,DELTA	XPLOTX	297
		XPLOTX	298
+Y)		XPLOTX	299
CALL PLOT (9.,-1.5,-3)		XPLGTX	300
DO 600 I=1,L		XPLOTX	301
600 BLOC(3*IFIZZ+I)=BLOC(I+IFIZZ)		XPLOTX	302
CALL SYMBOL (1.2,10.,.112,TITLE,0,72)		XPLOTX	303
CALL SYMBOL (3.1,9./8.,.112,23MOLTEN FUEL IN CHANNEL ,0,23)		XPLOTX	304
FCHAN=ICHAN		XPLOTX	305
CALL NUMBER (999.,999.,.112,FCHAN,0,-1)		XPLOTX	306
CALL SYMBOL (1.9,9.02,.112,0,0,-1)		XPLOTX	307
CALL SYMBOL (1.9,9.02,.112,16H GRAMS SQUIRTED ,0,16)		XPLOTX	308
CALL SYMBOL (999.,9.02,.112,3,0,-1)		XPLOTX	309
CALL SYMBOL (999.,9.02,.112,14H GRAMS IN PIN ,0,14)		XPLOTX	310
CALL SYMBOL (999.,9.02,.112,11,0,-1)		XPLOTX	311
CALL SYMBOL (999.,9.02,.112,11H GRAMS GONE,0,11)		XPLOTX	312
FIRSTY=-307.42		XPLOTX	313
DELTAY=IFIZZ		XPLOTX	314
CALL GSCALE (BLJC(3*IFIZZ+1),9.,L,3,FIRSTY,DELTAY)		XPLOTX	315
CALL PLOT (1.5,1.5,-3)		XPLOTX	316
I=MAX(2,L/10)		XPLOTX	317
CALL AXIS (0,0.,HGRAMS,5,8.,90.,FIRSTY,DELTAY)		XPLOTX	318
CALL AXIS (0,0,3HTIME SEC,-8,0.,0,FIRSTX,DELTAX)		XPLOTX	319
CALL LINE (BLOC,BLOC(3*IFIZZ+1),L,1,-1,0,FIRSTX,DELTAX,FIRSTY,DELT		XPLOTX	320
+AY)		XPLOTX	321
CALL LINE (BLOC,BLOC(4*IFIZZ+1),L,1,I,3,FIRSTX,DELTAX,FIRSTY,DELTA		XPLOTX	322
+Y)		XPLOTX	323
CALL LINE (BLOC,BLOC(5*IFIZZ+1),L,1,I,11,FIRSTX,DELTAX,FIRSTY,DELT		XPLOTX	324
+AY)		XPLOTX	325
CALL PLOT (9.,-1.5,-3)		XPLOTX	326
IY(ICHAN)=1		XPLOTX	327
620 CONTINUE		XPLOTX	328
CALL XLWNO (FIT(351))		XPLOTX	329
640 CONTINUE		XPLOTX	330
		XPLOTX	331
C CORE TEMPERATURES		XPLOTX	332
		XPLOTX	333
IF (GEWIZ(2).GT.0.0) GO TO 1780		XPLOTX	334
LCHAN=1		XPLOTX	335
KCHAN=1		XPLOTX	336
MCHAN=1		XPLOTX	337
NACCUM=0		XPLOTX	338
NACCUM=0		XPLOTX	339
DO 1700 ICHAN=1,NCHAN		XPLOTX	340
C READ HOW MANY TEMPS SAVED PER STEP		XPLOTX	341
CALL XLWNO (FIT)		XPLOTX	342
IUNIT=10		XPLOTX	343
IWA=JBLUCK+0+NBJFF*(ICHAN-1)		XPLOTX	344
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP		XPLOTX	345
CALL GET (FIT,NS,IWA,0,0,20,JOLLY)		XPLOTX	346
IFLIST=NS(1)		XPLOTX	347
ICLIST=NS(2)		XPLOTX	348
IF (JCHAN(LCHAN),NE,ICHAN) GO TO 1740		XPLOTX	349
LCHAN=LCHAN+1		XPLOTX	350
C READ AXIAL,NBCORE,NTCORE,NTOP		XPLOTX	351
CALL XLWNO (FIT)		XPLOTX	352
IWA=JBLUCK+NBUFF*(ICHAN-1)		XPLOTX	353
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP		XPLOTX	354
CALL GET (FIT,NS,IWA,0,0,780,JOLLY)		XPLOTX	355
C MAX NO. OF TIME STEPS TO BE PLOTTED		XPLOTX	356
NU=IBLUCK/5		XPLOTX	357
C NO. OF TIME STEPS AVAILABLE		XPLOTX	358
IFIZZ=20*(NEW-1)+ICHAN		XPLOTX	359
IFIZZ=NTAJ(IFIZZ)		XPLOTX	360
JFIZZ=MIN0(IFLIST+1,NTOP(NBCORE)*(NTCORE-NBCORE+1)+1)		XPLOTX	361

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      KFIZZ=MIN0 (ICLIST+1,NAXIAL)
      IKE=(IFIZZ+NO-1)/NO
C FUEL
C HOW MANY TIME POINTS FIT IN CORE
      NUM=(IBLOCK/JFIZZ)*JFIZZ
C HOE MANY COMPLETE FILLINGS
      N1=(JFIZZ*IFIZZ)/NUM
C HOW MANY LEFT
      LEFT=IFIZZ*JFIZZ-N1*NUM
      IF (LEFT.NE.0) N1=N1+1
      JNUM=IFIZZ/IKI
      NOUT=NTCORE-NBCORE+1
C COOLANT
C HOW MANY TIME PERIODS FIT IN CORE
      NUM1=(IBLOCK/KFIZZ)*KFIZZ
C HOW MANY COMPLETE FILLINGS
      N11=(IFIZZ*KFIZZ)/NUM1
C HOW MANY LEFT
      LEFT1=IFIZZ*KFIZZ-N11*NUM1
      IF (LEFT1.NE.0) N11=N11+1
      NP=JPLOTS(MCHAN)
      MCHAN=MCHAN+1
      IF (NP.EQ.0) GO TO 900
      IF (IFLIST.EQ.0) GO TO 900
      IF (ICLIST.EQ.0) GO TO 900
      NCORE=NTCORE-NBCORE+1
      DO 380 NN=1,NP
      IF (LISTJ(NN,ICHAN).EQ.0) GO TO 900
      I203=LISTJ(NN,ICHAN)-NBCORE+2
      JJ=NTOP(NBCORE)
      I302=JJ+(LISTJ(NN,ICHAN)-NBCORE+1)+1
      IF (LEFT.EQ.0) GO TO 660
      N3=LEFT
      GO TO 660
660  N3=NUM
680  CALL REND0 (FIT(281))
      IWA=1+MACCUM
      JUNIT=2
      L=1
      DO 780 I=1,N1
      CALL GET (FIT(251),BLOCK,IWA,J,C,10*N3,JOLLY)
      IF (C=LWI/(2).GT.0.0) GO TO 1780
      IWA=IWA+N3
      NN4=N3/JFIZZ
      DO 760 J=1,NN4,IKI
      K=(J-1)*JFIZZ+1
      BLOCK(I)=BLOCK(K)
      IF (IFLIST.LT.1900) GO TO 700
      I/4=L+JNUM
      I47=K+I302
      BLOCK(I/4)=BLOCK(I47)
      I74=I74+JNUM
      I47=JJ-4+I302+K
      BLOCK(I74)=BLOCK(I47)
      I74=I74+JNUM
      I47=JJ-2+I302+K
      BLOCK(I74)=BLOCK(I47)
      GO TO 740
700  DO 720 JJ=1,3
      I74=L+JJ*JNUM
      I47=I203+K+NCORE-N*(JJ-1)
      BLOCK(I74)=BLOCK(I47)
720  BLOCK(I74)=BLOCK(I47)
740  L=L+1
760  CONTINUE
780  N3=NUM

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L=4*JNUM+1	XPLOTX	427
IF (L=FT1.EQ.0) GO TO 800	XPLOTX	428
N3=L=FT1	XPLOTX	429
GO TO 820	XPLOTX	430
800 N3=NUM1	XPLOTX	431
820 CALL REWNO (FIT(316))	XPLOTX	432
IWA=1+NACCUH	XPLOTX	433
IUNIT=3	XPLOTX	434
DO 860 I=1,N11	XPLOTX	435
CALL GET (FIT(316),BLOCK,IWA,0,0,10*N3,JOLLY)	XPLOTX	436
IF (G=HIZ(3).GT.0.0) GO TO 920	XPLOTX	437
IWA=IWA+N3	XPLOTX	438
NN4=N3/KFIZZ	XPLOTX	439
I203=1+LISTJ(NN,ICHAN)	XPLOTX	440
IF (ICLIST.EQ.NUMT) I203=I203-NBCORE+2	XPLOTX	441
DO 840 J=1,NN4,1KE	XPLOTX	442
K=(J-1)*KFIZZ+I203	XPLOTX	443
BLOC(L)=BLOCK(K)	XPLOTX	444
840 L=L+1	XPLOTX	445
860 N3=NUM1	XPLOTX	446
L=JNUM	XPLOTX	447
CALL SYMBOL (.20,10.,.112,TITLE,0,72)	XPLOTX	448
CALL SYMBOL (1.70,9.70,.112,30HORE TEMPERATURES FOR CHANNEL ,0,3,	XPLOTX	449
*)	XPLOTX	450
FCHAN=ICHAN	XPLOTX	451
CALL NUMBER (999.,999.,.112,FCHAN,0,-1)	XPLOTX	452
CALL SYMBOL (999.,999.,.112,13H AXIAL LEVEL ,0,13)	XPLOTX	453
FAX=LISTJ(NN,ICHAN)	XPLOTX	454
CALL NUMBER (999.,999.,.112,FAX,0,-1)	XPLOTX	455
CALL SYMBOL (1.75,9.62,.112,0,0,-1)	XPLOTX	456
CALL SYMBOL (1.75,9.50,.112,11H CENTERLINE,0,11)	XPLOTX	457
CALL SYMBOL (3.1,9.02,.112,3,0,-1)	XPLOTX	458
CALL SYMBOL (3.1,9.00,.112,13H FUEL SURFACE,0,13)	XPLOTX	459
CALL SYMBOL (4.07,9.62,.112,4,0,-1)	XPLOTX	460
CALL SYMBOL (4.07,9.50,.112,5H CLAD,0,5)	XPLOTX	461
CALL SYMBOL (5.35,9.62,.112,11,0,-1)	XPLOTX	462
CALL SYMBOL (5.35,9.50,.112,8H COOLANT,0,8)	XPLOTX	463
CALL CSCALE (BLOC,0.,L,1,FIRSTX,DELTAX)	XPLOTX	464
CALL CSCALE (BLOC(L+1),0.,+*L,1,FIRSTY,DELTAY)	XPLOTX	465
CALL PLOT (1.5,1.0,-3)	XPLOTX	466
CALL AXIS (0,0,9HUEGRLES K,9,8.,90.,FIRSTY,DELTAY)	XPLOTX	467
CALL AXIS (0,0,9HTIME SEC,-8,0.,0,FIRSTX,DELTAX)	XPLOTX	468
I=MAX(2,L/10)	XPLOTX	469
CALL LINE (BLOC,BLOC(L+1),L,1,I,0,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	470
CALL LINE (BLOC,BLOC(2*L+1),L,1,I,3,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	471
CALL LINE (BLOC,BLOC(3*L+1),L,1,I,4,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	472
CALL LINE (BLOC,BLOC(+*L+1),L,1,I,11,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	473
CALL PLOT (9.,-1.0,-3)	XPLOTX	474
880 CONTINUE	XPLOTX	475
900 CONTINUE	XPLOTX	476
920 CONTINUE	XPLOTX	477
NP=KPLOTS(KCHAN)	XPLOTX	478
KCHAN=KCHAN+1	XPLOTX	479
IF (ICLIST.NE.1000) GO TO 1440	XPLOTX	480
C FIND VOLUME OF JINTERED,LOUI-AXED, AND UNRESTRICTED FUEL	XPLOTX	481
JJ=15*(NTCORE-NBCORE+1)	XPLOTX	482
CALL REWNO (FIT)	XPLOTX	483
IUNIT=10	XPLOTX	484
IWA=2394+NBUFF*(ICHAN-1)	XPLOTX	485
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP	XPLOTX	486
CALL GET (FIT,BLOCK,IWA,0,0,10*JJ,JOLLY)	XPLOTX	487
C READ MTYPE	XPLOTX	488
CALL REWNO (FIT)	XPLOTX	489
IWA=2733+NBUFF*(ICHAN-1)	XPLOTX	490
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP	XPLOTX	491
CALL GET (FIT,BLOCK(JJ+1).IWA,0,0,10*JJ,JOLLY)	XPLOTX	492


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      ST=0.0
      ET=0.0
      UT=0.0
      J1=NTCORE-NBCORE+1
      J2=NTOP(NBCORE)-4
      DO 1000 I=1,J1
        INDEX=15*(I-1)
        JNDEX=INDEX+JJ
        DO 1000 J=1,J2
          IF (KCOLB(J+JNDEX)-2) 940,960,980
940    UT=UT+BLOCK(J+INDEX)
        GO TO 1000
960    ST=ST+BLOCK(J+INDEX)
        GO TO 1000
980    ET=ET+BLOCK(J+INDEX)
1000  CONTINUE
C CONVERT VOLUMES TO FRACTIONS
      DO 1030 I=1,J1
        INDEX=15*(I-1)
        JNDEX=INDEX+JJ
        DO 1040 J=1,J2
          IF (KCOLB(J+JNDEX)-2) 1020,1040,1060
1020  BLOCK(J+INDEX)=BLOCK(J+INDEX)/UT
        GO TO 1080
1040  BLOCK(J+INDEX)=BLOCK(J+INDEX)/ST
        GO TO 1080
1060  BLOCK(J+INDEX)=BLOCK(J+INDEX)/ET
1080  CONTINUE
C READ IN TIME AND TEMPERATURES
      CALL REWIND (FIT(281))
      N3=NUM
      IF (LEFT.GT.0) N3=LEFT
      L=2*JJ+1
      J16=L+IFIZZ
      J17=L+4*IFIZZ
      DO 1100 I=J16,J17
1100  BLOCK(I)=0.0
C READ TMELTH AND TMELTL
      CALL REWIND (FIT)
      IUNIT=10
      IWA=6494+NBUFF*(ICHAN-1)
      IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP
      CALL GET (FIT,IB,IWA,0,0,20,JOLLY)
      IWA=1+MACCUM
      DO 1320 I=1,N1
        IUNIT=2
        CALL GET (FIT(281),BLOC,IWA,0,0,13*N3,JOLLY)
        IF (IG=ZWIZ(2).GT.0.0) GO TO 1780
        IWA=IWA+N3
        NN4=N3/JFIZZ
        DO 1300 I1=1,NN4
          KNDX=(I1-1)*JFIZZ
          BLOCK(L)=BLOC(KNDX+1)
          DO 1240 I2=1,J1
            INDEX=15*(I2-1)
            JNDEX=INDEX+JJ
            LNDEX=KNDX+(I2-1)*NTOP(NBCORE)+1
            DO 1260 I3=1,J2
              IF (BLOC(I3+LNDEX)-TMELTL) 1280,1280,1120
1120  IF (BLOC(I3+LNDEX)-TMELTH) 1140,1160,1160
1140  F=(BLOC(I3+LNDEX)-TMELTL)/(TMELTH-TMELTL)
              GO TO 1180
1160  F=1.
1180  IF (KCOLB(I3+JNDEX)-2) 1200,1220,1240
1200  BLOCK(L+IFIZZ)=BLOCK(L+IFIZZ)+F*BLOCK(I3+INDEX)
              GO TO 1260

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XPL0TX 493
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XPL0TX 558

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1220	I4=L+2*IFIZZ	XPLOTX	009
	BLOCK(I4)=BLOCK(I4)+F*BLOCK(I3+INDEX)	XPLOTX	010
	GO TO 1260	XPLOTX	011
1240	I4=L+3*IFIZZ	XPLOTX	012
	BLOCK(I4)=BLOCK(I4)+F*BLOCK(I3+INDEX)	XPLOTX	013
1260	CONTINUE	XPLOTX	014
1280	CONTINUE	XPLOTX	015
	L=L+1	XPLOTX	016
1300	CONTINUE	XPLOTX	017
1320	N3=NUM	XPLOTX	018
C DET	TERMINE WHERE NON ZERO VALUES ARE	XPLOTX	019
	K=0	XPLOTX	020
	DO 1340 I=1,3	XPLOTX	021
	INDEX=2*JJ+I*IFIZZ	XPLOTX	022
	DO 1340 J=1,IFIZZ	XPLOTX	023
	IF (BLOCK(J+INDEX).NE.0) GO TO 1360	XPLOTX	024
1340	CONTINUE	XPLOTX	025
	IB(I)=IFIZZ+1	XPLOTX	026
	IT(I)=0	XPLOTX	027
	GO TO 1380	XPLOTX	028
1360	IB(I)=J-1	XPLOTX	029
	IF (IB(I).EQ.0) IB(I)=1	XPLOTX	030
	IT(I)=IFIZZ-IB(I)+1	XPLOTX	031
	K=1	XPLOTX	032
1380	CONTINUE	XPLOTX	033
	IF (K.EQ.0) GO TO 1440	XPLOTX	034
	CALL SYMBOL (2.5,10.,.112,TITLE,0,72)	XPLOTX	035
	CALL SYMBOL (2.5,9.78,.112,28+FACTION MOLTEN FOR CHANNEL ,0,28)	XPLOTX	036
	FCHAN=ICHAN	XPLOTX	037
	CALL NUMBER (999.,999.,.112,FCHAN,0,-1)	XPLOTX	038
	CALL SYMBOL (2.6,9.02,.112,4,J,-1)	XPLOTX	039
	CALL SYMBOL (2.6,9.56,.112,9H SINTERED,0,9)	XPLOTX	040
	CALL SYMBOL (3.72,9.02,.112,5,0,-1)	XPLOTX	041
	CALL SYMBOL (3.72,9.56,.112,1JH EQUI-AXED,0,10)	XPLOTX	042
	CALL SYMBOL (5.05,9.62,.112,3,0,-1)	XPLOTX	043
	CALL SYMBOL (5.05,9.56,.112,15H UNRESTRUCTURED,0,15)	XPLOTX	044
	FIRSTY=0.0	XPLOTX	045
	DELTAY=.125	XPLOTX	046
	MIN=10000	XPLOTX	047
	DO 1400 I=1,3	XPLOTX	048
	IF (IT(I).EQ.0) GO TO 1400	XPLOTX	049
	IF (IB(I).GT.MIN) GO TO 1400	XPLOTX	050
	K=I	XPLOTX	051
	MIN=IB(I)	XPLOTX	052
1400	CONTINUE	XPLOTX	053
	L=IT(K)	XPLOTX	054
	M=2*JJ+IB(K)	XPLOTX	055
	CALL CSCALE (BLOCK(M),0.,L,1,FIRSTX,DELTAY)	XPLOTX	056
	CALL PLOT (1.,1.,-3)	XPLOTX	057
	CALL AXIS (0,0,8HFACTION,8,8.,90.,FIRSTY,DELTAY)	XPLOTX	058
	CALL AXIS (0,0,8HTIME SEC,-8,5.,0,FIRSTX,DELTAY)	XPLOTX	059
	DO 1420 I=1,3	XPLOTX	060
	M=2*JJ+I*IFIZZ+IB(I)	XPLOTX	061
	N=2*JJ+IB(I)	XPLOTX	062
	L=IT(I)	XPLOTX	063
	IF (L.EQ.0) GO TO 1420	XPLOTX	064
	J=MAXJ(2,L/10)	XPLOTX	065
	CALL LINE (BLOCK(N),BLOCK(M),L,1,J,I+2,FIRSTX,DELTAY,FIRSTY,DELTAY	XPLOTX	066
	)	XPLOTX	067
1420	CONTINUE	XPLOTX	068
	CALL PLOT (9.,-1.5,-3)	XPLOTX	069
C ARE	TEMPERATURE VERSUS RADIUS PLOTS WANTED	XPLOTX	070
1440	IF (NP.EQ.0) GO TO 1740	XPLOTX	071
	DO 1720 IP=1,NP	XPLOTX	072
	IF (LISTK(IP,ICHAN).EQ.0) GO TO 1740	XPLOTX	073

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C DEVELOP RADII
  CALL REWNO (FIT)
  IUNIT=10
  IWA=1+NBUFF*(ICHAN-1)
  IF (ITRGAP.LQ.1) IWA=IWA+(ICHAN-1)*NTGAP
  CALL IN (1,BLOC,IWA,4700,IBLOCK)
  J1=LISTK(IP,ICHAN)-NBSCORE+2
  J2=NTOP(NBSCORE)
  J3=J2-4
  INDEX=(J1-1)*J2+2493
  BLOCK(1)=0.0
  IF (BLOC(J1+4633).GT.0.0) BLOCK(1)=SQRT(BLOC(J1+4633)/3.14159)
  DO 1480 I=1,J3
    BLOCK(I+1)=SQRT(BLOC(1+INDEX)/3.14159+BLOCK(I)**2)
1480  BLOCK(I)=SQRT(.5*(BLOCK(I+1)**2+BLOCK(I)**2))
    BLOCK(J3+1)=BLOCK(J3+1)
    BLOCK(J3+2)=BLOCK(J3+1)+.002
    BLOCK(J3+2)=BLOCK(J3+2)
    I=J3+3+INDEX
    BLOCK(J3+3)=SQRT(BLOC(I)/3.14159+BLOCK(J3+2)**2)
    BLOCK(J3+3)=SQRT(.5*(BLOCK(J3+2)**2+BLOCK(J3+3)**2))
    BLOCK(J3+4)=BLOCK(J3+3)
C NOW HALVE TO OUTER RADIUS
  DO 1490 I=1,J2
1490  BLOCK(I)=BLOC(I)/BLOC(J2)
C READ TEMPERATURES AND SAVE FIRST, LAST, AND HALFWAY TIME PERIODS
  KACCUM=0
  N3=NUM
  IF (LEFT.GT.0) N3=LEFT
  CALL REWNO (FIT(281))
  IWA=1+MACCUM
  DO 1640 I=1,N1
    IUNIT=2
    CALL GET (FIT(281),BLOC,IWA,0,0,10*N3,JOLLY)
    IF (JOLWIZ(2).GT.0.0) GO TO 1780
    IWA=IWA+N3
    IF (LINE.1) GO TO 1560
    TIM(1)=BLOC(1)
    IB(1)=1
    INDEX=NTOP(NBSCORE)*(LISTK(IP,ICHAN)-NBSCORE+1)+1
    J=NTOP(NBSCORE)
    DO 1500 L=1,J
1500  BLOCK(L+J)=BLOC(L+INDEX)
    IF (N3/JFIZZ.LT.JFIZZ/2) GO TO 1660
    L=JFIZZ/2
    LB(1)=2
    LL=(L-1)*JFIZZ+1
    TIME(2)=BLOC(LL)
    JJ=J+J
    INDEX=INDEX+LL-1
    DO 1520 LLL=1,J
1520  BLOCK(LL+JJ)=BLOC(LL+INDEX)
    INDEX=INDEX+LL+1
    IF (N1.NE.1) GO TO 1600
    LL=(JFIZZ-1)*JFIZZ+1
    TIME(3)=BLOC(LL)
    JJ=JJ+J
    INDEX=INDEX+LL-1
    DO 1540 LLL=1,J
1540  BLOCK(LL+JJ)=BLOC(LL+INDEX)
    GO TO 1700
1560  LLL=LB(1)
    GO TO (1580,1620), LLL
1580  L=(JFIZZ/2-KACCUM-1)*JFIZZ+1
    IF (LINE.13) GO TO 1600

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XPL0TX 088

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TIME(2)=BLOC(L)	XPLOTX	689
IS(1)=2	XPLOTX	690
J=NTOP(NBCORE)	XPLOTX	691
INDEX=J*(LISTK(IP,ICHAN)-NBCORE+1)+L	XPLOTX	692
JJ=2*J	XPLOTX	693
DO 1600 LLL=1,J	XPLOTX	694
1600 BLOCK(LLL+JJ)=BLOC(LLL+INDEX)	XPLOTX	695
1620 IF (I.NE.N1) GO TO 1600	XPLOTX	696
L=(IFIZZ-KACCU4-1)*JFIZZ+1	XPLOTX	697
TIME(3)=BLOC(L)	XPLOTX	698
J=NTOP(NBCORE)	XPLOTX	699
JJ=3*J	XPLOTX	700
INDEX=L+J*(LISTK(IP,ICHAN)-NBCORE+1)	XPLOTX	701
DO 1640 LLL=1,J	XPLOTX	702
1640 BLOCK(LLL+JJ)=BLOC(LLL+INDEX)	XPLOTX	703
GO TO 1750	XPLOTX	704
1660 KACCU4=KACCU4+N3/JFIZZ	XPLOTX	705
1680 N3=NUM	XPLOTX	706
1700 CONTINUE	XPLOTX	707
CALL SYMBOL (.25,13.,.112,TITLE,0,72)	XPLOTX	708
CALL SYMBOL (1.75,9.76,.112,3JHCORE TEMPERATURES FOR CHANNEL ,0,3J	XPLOTX	709
*)	XPLOTX	710
FCHAN=ICHAN	XPLOTX	711
CALL NUMBER (999.,999.,.112,FCHAN,0,-1)	XPLOTX	712
CALL SYMBOL (999.,999.,.112,13H AXIAL LEVEL ,0,13)	XPLOTX	713
FAX=LISTK(IP,ICHAN)	XPLOTX	714
CALL NUMBER (999.,999.,.112,FAX,0,-1)	XPLOTX	715
CALL SYMBOL (1.75,9.62,.112,0,0,-1)	XPLOTX	716
CALL SYMBOL (1.75,9.56,.112,6H TIME=,0,6)	XPLOTX	717
FAX=TIME(1)	XPLOTX	718
CALL NUMBER (999.,999.,.112,FAX,0,3)	XPLOTX	719
CALL SYMBOL (3.65,9.62,.112,3,0,-1)	XPLOTX	720
CALL SYMBOL (3.65,9.56,.112,6H TIME=,0,6)	XPLOTX	721
FAX=TIME(2)	XPLOTX	722
CALL NUMBER (999.,999.,.112,FAX,0,3)	XPLOTX	723
CALL SYMBOL (5.55,9.62,.112,4,0,-1)	XPLOTX	724
CALL SYMBOL (5.55,9.56,.112,6H TIME=,0,6)	XPLOTX	725
FAX=TIME(3)	XPLOTX	726
CALL NUMBER (999.,999.,.112,FAX,0,3)	XPLOTX	727
FIRSTX=0.0	XPLOTX	728
DELTAX=1./6.	XPLOTX	729
CALL OSCALE (BLOCK(J+1),8.,3*J,1,FIRSTX,DELTAX)	XPLOTX	730
CALL PLOT (1.5,1.5,-3)	XPLOTX	731
CALL AXIS (0,0,3HUEGREES K,9,3.,90.,FIRSTX,DELTAX)	XPLOTX	732
CALL AXIS (0,0,24HFRACTION OF OUTER RADIUS,-24,0.,0,FIRSTX,DELTAX)	XPLOTX	733
CALL LINE (BLOCK,BLOCK(J+1),J,1,1,0,FIRSTX,DELTAX,FIRSTX,DELTAX)	XPLOTX	734
CALL LINE (BLOCK,BLOCK(2*J+1),J,1,1,3,FIRSTX,DELTAX,FIRSTX,DELTAX)	XPLOTX	735
CALL LINE (BLOCK,BLOCK(3*J+1),J,1,1,4,FIRSTX,DELTAX,FIRSTX,DELTAX)	XPLOTX	736
CALL PLOT (9.,-1.5,-3)	XPLOTX	737
1720 CONTINUE	XPLOTX	738
1740 IF (IFLIST.NE.0) IFLIST=JFIZZ	XPLOTX	739
IF (ICLIST.NE.0) ICLIST=KFIZZ	XPLOTX	740
MACCU4=MACCU4+IFLIST*MPRINT	XPLOTX	741
NACCU4=NACCU4+ICLIST*MPRINT	XPLOTX	742
1760 CONTINUE	XPLOTX	743
1780 CONTINUE	XPLOTX	744
C	XPLOTX	745
C CHANNEL REACTIVITIES (VOID+FUEL)	XPLOTX	746
C	XPLOTX	747
IF (NTREAT.NE.0) GO TO 1880	XPLOTX	748
IF (GEZWIZ(8).GT.0.5) GO TO 1880	XPLOTX	749
IUNIT=3	XPLOTX	750
DO 1800 ICHAN=1,NCHAN	XPLOTX	751
IFIZZ=IPRINT	XPLOTX	752
IFIZZ1=IFIZZ-1	XPLOTX	753
CALL REWNU (FIT(100))	XPLOTX	754

IWA=1+3*MPRINT*(ICAN-1)	XPLOTX	759
CALL GET (FIT(136),BLOCK,IWA,0,0,30*IFIZZ,JOLLY)	XPLOTX	760
IF (GELWIZ(8).GT.0.0) GO TO 1880	XPLOTX	767
C WHERE DOES THE ACTION START	XPLOTX	768
DO 1800 J=1,IFIZZ1	XPLOTX	769
IF (BLOCK(3*J+1)-BLOCK(3*J-2).LT.PRINT2) GO TO 1820	XPLOTX	760
1800 CONTINUE	XPLOTX	761
GO TO 1860	XPLOTX	762
1820 L=1	XPLOTX	763
JFIZZ=IFIZZ-J+1	XPLOTX	764
DO 1840 I=J,IFIZZ	XPLOTX	765
BLOC(L)=BLOCK(3*I-2)	XPLOTX	766
BLOC(L+JFIZZ)=BLOCK(3*I-1)	XPLOTX	767
BLOC(L+2*JFIZZ)=BLOCK(3*I)	XPLOTX	768
1840 L=L+1	XPLOTX	769
CALL DSCALE (BLOC,0.,JFIZZ,1,FIRSTX,DELTAX)	XPLOTX	770
CALL DSCALE (BLOC(JFIZZ+1),3.,2*JFIZZ,1,FIRSTY,DELTAY)	XPLOTX	771
CALL SYMBOL (.25,10.,.112,TITLE,0,72)	XPLOTX	772
CALL SYMBOL (2.7,9.78,.112,25HREACTIVITIES FOR CHANNEL ,0,25)	XPLOTX	773
FCHAN=ICAN	XPLOTX	774
CALL JUMBER (999.,999.,.112,FCHAN,0,-1)	XPLOTX	775
CALL SYMBOL (3.7,9.52,.112,0,0,-1)	XPLOTX	776
CALL SYMBOL (3.32,9.53,.112,4HVOID,0,4)	XPLOTX	777
CALL SYMBOL (4.58,9.62,.112,3,0,-1)	XPLOTX	778
CALL SYMBOL (4.74,9.53,.112,4HFULL,0,4)	XPLOTX	779
I=MAX(2,JFIZZ/5)	XPLOTX	780
CALL PLOT (1.5,1.5,-3)	XPLOTX	781
CALL AXIS (0,0,5HCENTS,5,8.,90.,FIRSTY,DELTAY)	XPLOTX	782
CALL AXIS (1,0,3HTIME SEC,-8,5.,0,FIRSTX,DELTAX)	XPLOTX	783
CALL LINE (BLOC,BLOC(JFIZZ+1),JFIZZ,1,I,0,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	784
CALL LINE (BLOC,BLOC(2*JFIZZ+1),JFIZZ,1,I,3,FIRSTX,DELTAX,FIRSTY,DELTAY)	XPLOTX	785
CALL PLOT (9.,-1.5,-3)	XPLOTX	786
1860 CONTINUE	XPLOTX	787
1880 CONTINUE	XPLOTX	788
CALL PLOT (0,0,999)	XPLOTX	789
1900 CONTINUE	XPLOTX	790
C RESTORE IBLOCK	XPLOTX	791
IBLOCK=NBUFF	XPLOTX	792
RETURN	XPLOTX	793
END	XPLOTX	794

SUBROUTINE FIRST	FIRST	2
COMMON/FIT/FIT(385)	FIRST	3
COMMON/IPRESR/IPRESR(20)	FIRST	4
COMMON/ZPLOTZ/JCHAN(20),JPLOTS(20),LISTJ(20,20),KPLOTS(20),	FIRST	5
*LISTK(20,20),ITAB	FIRST	6
C****	CASPAR	2
C**** COMMON DECK"CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLOB(1)	CASPAR	4
REAL KINSRT,KWTHOR	CASPAR	5
LOGICAL PRINT,DONE,SCRAM	CASPAR	6
COMMON	CASPAR	7
DONE,ISTAT	CASPAR	8
IIN	CASPAR	9
SLOA(3)	CASPAR	10
*IBLOCK	CASPAR	11
H(2)	CASPAR	12
T(2)	CASPAR	13
HRED	CASPAR	14
ICHAN	CASPAR	15
VJIDK(2)	CASPAR	16
*JOPFK(2)	CASPAR	17
COLAPK(2)	CASPAR	18
NEW	CASPAR	19
IOLO	CASPAR	20
NOUT	CASPAR	21
TE RROR	CASPAR	22
*GERROR	CASPAR	23
PEXIT(3)	CASPAR	24
PERROR	CASPAR	25
PRINT	CASPAR	26
DELTIM	CASPAR	27
PN(2)	CASPAR	28
*P3OTT(3,2)	CASPAR	29
IACIIV(20)	CASPAR	30
FLOW(3,2)	CASPAR	31
TOPT(3,2)	CASPAR	32
TOPEV(3)	CASPAR	33
WOLF(3)	CASPAR	34
*LOOP(20)	CASPAR	35
IOUFL	CASPAR	36
NTRAT	CASPAR	37
IKINET	CASPAR	38
TOUT	CASPAR	39
HMAX	CASPAR	40
*TIMEIN(50)	CASPAR	41
UKIN(50)	CASPAR	42
TIMOUT(50)	CASPAR	43
UKOUT(50)	CASPAR	44
IPAIR2	CASPAR	45
AN(2)	CASPAR	46
*IPAIR3	CASPAR	47
KOUNT	CASPAR	48
RH(2)	CASPAR	49
BB0100	CASPAR	50
RHUSMZ	CASPAR	51
NROUP	CASPAR	52
*C(6,2)	CASPAR	53
ALIFE	CASPAR	54
ALPH(6)	CASPAR	55
GAM(6)	CASPAR	56
B(6)	CASPAR	57
AL(6)	CASPAR	58
*33	CASPAR	59
SCRAM	CASPAR	60
TSCRAM(2)	CASPAR	61
PERIOD	CASPAR	62
RSLUPE	CASPAR	63
ERROR	CASPAR	64
*KINSRT(2)	CASPAR	65
KWTHOR(2)	CASPAR	66
KEUUC	CASPAR	67
PRINT1	CASPAR	68
PRINT2	CASPAR	69
RMIN	CASPAR	70
COMMON	CASPAR	71
*ANLOW	CASPAR	72
TQUIT	CASPAR	73
LSTEP	CASPAR	74
JSTEP	CASPAR	75
ANLC	CASPAR	76
TKGS	CASPAR	77
*IPLOT	CASPAR	78
ERRR1	CASPAR	79
TERM(13)	CASPAR	80
TITLE(8)	CASPAR	81
HOTPIH	CASPAR	82
SPCB	CASPAR	83
*SPCC	CASPAR	84
SPCU	CASPAR	85
LINESL	CASPAR	86
KSTEP	CASPAR	87
NCHAN	CASPAR	88
*STEP	CASPAR	89
*IFRINT	CASPAR	90
MPRINT	CASPAR	91
IJUMP	CASPAR	92
QGEN(2)	CASPAR	93
ANI	CASPAR	94
ANSCRY	CASPAR	95
*TDELAY	CASPAR	96
NLOOPS	CASPAR	97
KHUCE(3)	CASPAR	98
VOLTOP(3)	CASPAR	99
HCAJ(3)	CASPAR	100
PR-STM(50)	CASPAR	101
*PRESUR(50,3)	CASPAR	102
IPAIR4	CASPAR	103
PJ(3)	CASPAR	104
VER	CASPAR	105
ETAJ(4)	CASPAR	106
*KBLOCK	CASPAR	107
JBLOCK	CASPAR	108
MBLOCK	CASPAR	109
N12	CASPAR	110
N13	CASPAR	111
*GJACK(3)	CASPAR	112
VJACK(2)	CASPAR	113
ITRGAP	CASPAR	114
*HMIN	CASPAR	115
N22	CASPAR	116
NIN	CASPAR	117
INPUT	CASPAR	118
N2	CASPAR	119
N+	CASPAR	120
*N7	CASPAR	121
N6	CASPAR	122
KPRINT	CASPAR	123
FGWS	CASPAR	124
HMAX3	CASPAR	125
HMAXF	CASPAR	126
*TRIPFW(3)	CASPAR	127
TRIPPP(3)	CASPAR	128
TRIPFF(3)	CASPAR	129
TRIPOT(3)	CASPAR	130
DELAYF	CASPAR	131
EQUIVALENCE (QMOL,TERM(4)),(TMOL,TERM(5)),(GMOL,TERM(6)),(PERMOL,T	CASPAR	132
ERM(7)),(SLOB,DONE)	CASPAR	133
C****	CASPAR	134
DIMENSION BUM(665)	FIRST	8
EQUIVALENCE (DONE,BUM)	FIRST	9
NAMLIST/STACK/NCHAN,IPRESR,JCHAN,JPLOTS,LISTJ,KPLOTS,LISTK	FIRST	10
DO 120 I=1,665	FIRST	11
BUM(I)=0.0	FIRST	12
DONE=.FALSE.	FIRST	13
C SIZE OF WORD ADDRESSIBLE FILES BUFFER DECLARED IN MELT	FIRST	14
ISTAT=1055	FIRST	15
C SIZE OF CHANNEL DATA	FIRST	16
JBLOCK=3230	FIRST	17
C SIZE OF TEMPERATURE OUTPUT SPECIFICATIONS	FIRST	18
KBLOCK=267	FIRST	19
IBLOCK=JBLOCK+KBLOCK	FIRST	20
C*****	FIRST	21
C*****	FIRST	22
C*****	FIRST	23
DO NO NO	FIRST	24
ISTAT=IBLOCK	FIRST	25
C***** FOR BLRKELEY 7600 *****	FIRST	26
C*****	FIRST	27
C*****	FIRST	28
C SIZE OF BLANK COMMON BEFORE CHANNEL DATA	FIRST	29
MBLOCK=665	FIRST	30
C CARD READER ASSIGNMENT	FIRST	31
NIN=5	FIRST	32
C PRINTER ASSIGNMENT	FIRST	33
NOUT=5	FIRST	34
C RUN DATA JKUM UNIT	FIRST	35
N12=12	FIRST	36
C RUN DATA JKUM UNIT	FIRST	37
N13=13	FIRST	38

C TAPL UNIT FOR PREVIOUS JUMP OR STEADY STATE (START)	FIRST	38
N2=2	FIRST	39
C TAPL UNIT FOR DUMP OUTPUT (DUMP)	FIRST	40
N4=4	FIRST	41
C TAPL UNIT FOR PLOT (PLOT)	FIRST	42
N7=8	FIRST	43
READ CASE TITLE	FIRST	44
READ (NIN,240) (TITLE(I),I=1,8)	FIRST	45
READ (NIN,STACK)	FIRST	46
C PRINTOUT INFORMATION INPUT BY NAMELIST "STACK"	FIRST	47
CALL HEAD (0)	FIRST	48
WRITE (NOUT,260) NCHAN	FIRST	49
WRITE (NOUT,280)	FIRST	50
WRITE (NOUT,300) (IPRESR(J),J=1,NCHAN)	FIRST	51
WRITE (NOUT,320) (JCHAN(J),J=1,NCHAN)	FIRST	52
WRITE (NOUT,340) (JPLOTS(J),J=1,NCHAN)	FIRST	53
DO 140 I=1,NCHAN	FIRST	54
WRITE (NOUT,360) I, (LISTJ(J,I),J=1,20)	FIRST	55
140 CONTINUE	FIRST	56
WRITE (NOUT,380) (KPLOTS(K),K=1,NCHAN)	FIRST	57
DO 160 I=1,NCHAN	FIRST	58
WRITE (NOUT,400) I, (LISTK(K,I),K=1,20)	FIRST	59
160 CONTINUE	FIRST	60
C TIME ESTIMATE FOR TEMPERATURE PLOTS/STEP	FIRST	61
ITAB=1	FIRST	62
I19=1	FIRST	63
I20=1	FIRST	64
DO 200 I=1,NCHAN	FIRST	65
IF (JCHAN(I).EQ.0) GO TO 220	FIRST	66
IF (JPLOTS(I19).EQ.0) GO TO 180	FIRST	67
ITAB=ITAB+JPLOTS(I19)	FIRST	68
I19=I19+1	FIRST	69
180 IF (KPLOTS(I20).EQ.0) GO TO 200	FIRST	70
ITAB=ITAB+KPLOTS(I20)	FIRST	71
I20=I20+1	FIRST	72
200 CONTINUE	FIRST	73
220 IF (ITAB.GT.0) ITAB=20*ITAB+19	FIRST	74
RETURN	FIRST	75
C	FIRST	76
240 FORMAT (8410)	FIRST	77
260 FORMAT (10H NCHAN,9X,27HNUMBER OF CHANNELS (20 MAX),53X,1H=,13	FIRST	78
*)	FIRST	79
280 FORMAT (5X,5HIPRESR,8X,40HLIST BY CHANNEL (0/1=JCN"'/00 PRINT PRES	FIRST	80
+URES)/5X,5HJCHAN,9X,50HLIST OF CHANNELS FOR WHICH TEMPERATURE PLO	FIRST	81
+TS ARE DESIRED/5X,6HJPLOTS,8X,77HLIST BY CHANNEL OF AXIAL LEVELS T	FIRST	82
+O PLOT FULL INNER NOBLE,FUEL SURFACE,AND CLAD/19X,33HCENTRIOD TEMPL	FIRST	83
+RATURES VERSUS TIME/5X,5HLISTJ,9X,47HLIST (ORDER,CHANNEL) OF AXIAL	FIRST	84
+LEVELS FOR JPLOTS/5X,6HKPLOTS,8X,75HLIST BY CHANNEL OF AXIAL LEVE	FIRST	85
+LS TO PLOT FUEL TEMPERATURES VERSUS RADIUS FOR/19X,55HFIRST TIME S	FIRST	86
+T,P, LAST TIME STEP, AND HALFWAY BETWEEN/5X,5HLISTK,9X,47HLIST (ORDE	FIRST	87
+R,CHANNEL) OF AXIAL LEVELS FOR KPLOTS)	FIRST	88
300 FORMAT (/13H IPRESR(1) =,20I4)	FIRST	89
320 FORMAT (13H JCHAN(1) =,20I4)	FIRST	90
340 FORMAT (/13H JPLOTS(1) =,20I4)	FIRST	91
360 FORMAT (9H LISTJ(1,,I2,2H)=,20I4)	FIRST	92
380 FORMAT (/13H KPLOTS(1) =,20I4)	FIRST	93
400 FORMAT (9H LISTK(1,,I2,2H)=,20I4)	FIRST	94
END	FIRST	95

SUBROUTINE ONDISK (IFIZZ)	ONDISK	2
COMMON/ADD/IX(11),VGAS,VVOID,VLIQ,TOTMEL	ONDISK	3
* ,IXX(6),A92	ONDISK	4
DIMENSION JCORE(213)	ONDISK	5
COMMON/FIT/FIT(385)	ONDISK	6
COMMON/GOLLY/IUNIT,GELWIZ(20)	ONDISK	7
DIMENSION BLOCK(301)	ONDISK	8
EQUIVALENCE (BLOCK,TERM(60))	ONDISK	9
COMMON/NTABZZ/NTAB(49)	ONDISK	10
COMMON/IPRESR/IPRESR(20)	ONDISK	11
EXTERNAL JOLLY	ONDISK	12
C****	CASPAR	2
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLOB(1)	CASPAR	4
REAL KINSRT,KWTHOR	CASPAR	5
LOGICAL PRINT,DONE,SCRAM	CASPAR	6
COMMON	CASPAR	7
JONE,ISTAT ,IIN ,SLOA(3)	CASPAR	8
*IBLOCK ,H(2) ,T(2) ,HREDO ,ICHAN ,VJOCK(2)	CASPAR	9
*DOPPK(2) ,COLAPK(2) ,NEW ,IOLU ,NOUT ,TEROR	CASPAR	10
*GERROR ,PEXIT(3) ,FERROR ,PRINT ,DELTIM ,FN(2)	CASPAR	11
*P3OUT(3,2) ,IACILV(20) ,FLOW(3,2) ,TOPT(3,2) ,TOPLV(3) ,HJLF(3)	CASPAR	12
*LOOP(20) ,IOUTL ,NTRAT ,IKINET ,TOUT ,HMAX	CASPAR	13
*TIMEIN(50) ,JKIN(50) ,TIMOUT(50) ,DKOUT(50) ,IPAIR2 ,AV(2)	CASPAR	14
*IPAIR3 ,KOUNT ,RH(2) ,BBOLU ,RHOSWZ ,NROUOP	CASPAR	15
*C(6,2) ,ALIFE ,ALPH(6) ,GAM(6) ,B(6) ,AL(6)	CASPAR	16
*J3 ,SCRAM ,TSCRAM(2) ,PERIOD ,RSLOP ,EROR	CASPAR	17
*KINSRT(2) ,KWTHOR(2) ,KCJUGE ,PPINT1 ,PRINT2 ,RMIN	CASPAR	18
COMMON	CASPAR	19
*ANLOW ,TQUIT ,LSTLP ,JSTEP ,ANIC ,TXGS	CASPAR	20
*IPLUT ,ERROR1 ,TERM(13) ,TITLE(8) ,HOTPIH ,SPGD	CASPAR	21
*SPCC ,SPCU ,LINESL ,KSTEP ,NCHAN ,MSTLP	CASPAR	22
*IPRINT ,MPRINT ,IJUMP ,QGEN(2) ,ANI ,AYSURM	CASPAR	23
*TDELAY ,NLOOPS ,RHOCCE(3) ,VOLTOP(3) ,HEAD(3) ,PRESTM(50)	CASPAR	24
*PRESUR(50,3) ,IPAIR4 ,PD(3) ,RUNTIM ,VER ,ETAU(4)	CASPAR	25
*KBLOCK ,JBLOCK ,M3LOCK ,N12 ,N13 ,EXTRA	CASPAR	26
*GJACK(3) ,VJACK(2)	CASPAR	27
*HMIN ,N22 ,NIN ,INPUT ,N2 ,N+	CASPAR	28
*N7 ,N8 ,KPRINT ,PCWSS ,HMAX3 ,HMAXF	CASPAR	29
*TRIPFW(3) ,TRIPFP(3) ,TRIPPF(3) ,TRIPOT(3) ,DELAYF	CASPAR	30
EQUIVALENCE (QMOL,TERM(4)),(TMOL,TERM(5)),(GMOL,TERM(6)),(PERMOL,T	CASPAR	31
*ERM(7)),(SLOB,JONE)	CASPAR	32
C****	CHNDAT	2
C****	CHNDAT	3
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA	CHNDAT	4
DIMENSION S(1),JORE(1),LS(1),LPYTM(15,20),GIL(8),XLIQ(11,20,2)	CHNDAT	5
INTEGER SMELP	CHNDAT	6
COMMON	CHNDAT	7
TCOOL(7,2),RLOG(22,20),UU(3) ,UJLIQ(7)	CHNDAT	8
* UVAP(7)	CHNDAT	9
*AFLOW(7)	CHNDAT	10
*US(4,55) ,HCAPS(4,55) ,USAVE1(4,55,2) ,DSAVL2(7,2)	CHNDAT	11
*USAVE3(15,20,2) ,DSAVL4(75,2) ,POW(16,20) ,VOLUME(13,20) ,HCAPF(15,20)	CHNDAT	12
*TEMPER(15,20,2) ,TSINK(4,55,2) ,VOLUV(20) ,VPLEN ,PPLCN(2)	CHNDAT	13
*RPLEN(2) ,G(7,2) ,GT1 ,GT2 ,GT3 ,GASBU(2,2)	CHNDAT	14
*VOLF(2) ,GTO ,FUELB(2) ,FUELB(2) ,FANN(75) ,P(7,2) ,RHUG(7,2)	CHNDAT	15
*GASBU(2,2) ,W(75) ,WC(7) ,NOPINS ,NAXIAL ,NBUCRE	CHNDAT	16
*NTCORE ,NTOP(7),MYPE(15,20) ,IGAS(2) ,NBPLEN	CHNDAT	17
*IFUEL(2) ,I3OIL(2) ,IGASU(2,2) ,IGASU(2,2) ,IFUEL(2) ,IFULLU(2)	CHNDAT	18
*I3OIL(2,2) ,I3OILU(2,2) ,N3OIL(2) ,NGAS(2) ,RLC ,RLV	CHNDAT	19
COMMON	CHNDAT	20
*GLC ,CLV ,CVC ,CVV ,BASLST(50) ,CONDU(50)	CHNDAT	21
*J1,IPAIR1 ,CGAPA ,CGAPB ,CGAPC ,CGAPD ,STEMP(50)	CHNDAT	22
*J11(50,2) ,TSEMP(30) ,ST2(30) ,DENSEE ,DENSE(2)	CHNDAT	23
*TSAT ,AHOLE ,HAXF ,HAXL ,HAXV ,PJAT	CHNDAT	24
*RLU ,RLQF ,PRY ,PVOID ,IFUELS ,JFUELS	CHNDAT	25
*TGAS ,TSUPK ,TFUELS ,TMELTH ,TMLTL ,GAMMA	CHNDAT	26

+PINTEN(20,2),GAPR(20),GAPR	,CLVC	,DOPCOE(20,2),	CHNDAT	25				
+BASENA	,DOFPW	,RBASEC	,SPC2(2)	,HFUSEE	,DKNA(20,2),	CHNDAT	26	
+WALTAR(75)	,PARIAN(20),IGAP					CHNDAT	27	
COMMON	KFUELS	,SPC3(13)	,HI(75)	,CLAJKT		CHNDAT	28	
+RLV2	,CLV2	,GVV2	,HAXL1	,HAXL2	,CGAPB2		CHNDAT	29
+GLADK	,CAP3(75)	,TSTRUK(75,2)	,USTL(75)	,USTV(75)	,OSAVE0(75,2)		CHNDAT	30
+CLIQ(15)	,CLIJT(15)	,GVAP(10)	,GVAPT(10)	,HELP(75)	,SMELP(75)		CHNDAT	31
+RHOGNA(75,2),TW(11)	,UGLD(75)	,IBILL	,JBILL	,BOJX(25,4)		CHNDAT	32	
+COPERC(3,20),PURCS(3,20),YELHYLH(11,20),SPC4	,IOUT(200)					CHNDAT	33	
COMMON	ITAX,ITAX,LUP,LOWN,LUPJ,LOWNC,DUP,DOWN,DUPD,DOWND,					CHNDAT	34	
+ALFA(20,2),RHOG(20,2),V(20,2),AREAH(20,2),AREAX(20,2),UHUP(20,2),						CHNDAT	35	
+PIN(20,2),AAA(20,2),ENTPY(20,2),QMASS(20),QHEAT(20),JLIQH(20),						CHNDAT	36	
+GASIN(20),TBAR(20),VMELT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2,						CHNDAT	37	
+NINFIN						CHNDAT	38	
EQUIVALENCE (ULIQ(1),VFUELS),(ULIQ(75),GRIFIC),(UVAP(1),RHOSQF),						CHNDAT	39	
+G(75,1),FQSDHR),(G(75,2),IZGP),(MTYPE(1,1),EPTYM(1,1)),(DOPCOE(1,						CHNDAT	40	
2),DOPPJ),(DOPCOE(2,2),DOPDEL),(DOPCOE(3,2),OIL),(UVAP(75),GTUL)						CHNDAT	41	
),(USTL,IZAP),(USTV,IZUP),(CGAPA,LAXIAL),(XLIQ,USAVE3)						CHNDAT	42	
),(S,CORE,IS,TCOUL),(SCUTT,IFUELS)						CHNDAT	43	
EQUIVALENCE (TW(1),SKLW), (TW(2),RHOFAT),(TW(3),DETAIL)						CHNDAT	44	
EQUIVALENCE (TW(4),PEEL), (TW(5),PSTART),(TW(6),TREAT)						CHNDAT	45	
EQUIVALENCE (TW(7),FRAGTN),(TW(8),SPREAD),(TW(9),VORIG)						CHNDAT	46	
EQUIVALENCE (TW(10),AREA), (TW(11),FRICT)						CHNDAT	47	
C****						CHNDAT	48	
C****						BCOM	2	
C**** BLANK COMMON SCRATCH PAD						BCOM	3	
INTEGER STATE						BCOM	4	
COMMON STATE(75)						BCOM	5	
+LIST(75),TERM1(75),TERM2(75),TERM3(75),TERM4(75),TERM5(75),						BCOM	6	
+TERM6(75),TERM7(75),TERM8(75),A1(15,75),D1(15,75),A2(75),						BCOM	7	
+J2(75),DRUT(75),VMELT(20),VMUSH(20),GAP(20),VNUH(75),						BCOM	8	
+MUEL(75),SUB(2),FOHR(75),U(15,20),A3(75),D3(75),						BCOM	9	
+TERM10(75),TERM11(75),Q(75),BLOPER(75),DEL(2,75),BUMBUM(155)						BCOM	10	
+,BLOJ(665)						BCOM	11	
C****						BCOM	12	
EQUIVALENCE (JCORE,IOUT(4))						ONDISK	16	
C						ONDISK	17	
N1=3						ONDISK	18	
N2=3						ONDISK	19	
IF (G=HIZ(1).GT.0.0) GO TO 300						ONDISK	20	
IUNIT=1						ONDISK	21	
C TSINK * * * * *						ONDISK	22	
IF (JCORE(1)-1000) 240,120,120						ONDISK	23	
C ALL						ONDISK	24	
120 L=1						ONDISK	25	
BLOCK(1)=T(NEW)						ONDISK	26	
K=2						ONDISK	27	
DO 200 I=2,NAXIAL						ONDISK	28	
IF (I-NBCORE) 100,200,140						ONDISK	29	
140 IF (I-NTCORE) 200,200,160						ONDISK	30	
160 M=NTOP(I)						ONDISK	31	
L=L+1						ONDISK	32	
DO 180 J=1,M						ONDISK	33	
BLOCK(K)=TSINK(J,L,NEW)						ONDISK	34	
180 K=K+1						ONDISK	35	
200 CONTINUE						ONDISK	36	
N1=3						ONDISK	37	
220 K=K-1						ONDISK	38	
IWA=K*NTAB(IF IZZ)+NTAB(41)+1						ONDISK	39	
CALL PUT (FIT(246),BLOCK,10*K,IWA,0,0,JULLY)						ONDISK	40	
CALL RETURN (FIT(246))						ONDISK	41	
GO TO 300						ONDISK	42	
240 IF (JCORE(1)) 300,300,200						ONDISK	43	
C SCATTERED						ONDISK	44	
200 BLOCK(1)=T(NEW)						ONDISK	45	

K=2	ONDISK	46
N1=3+JCORE(1)	ONDISK	47
DO 280 I=4,N1	ONDISK	48
INDEX=JCORE(I)	ONDISK	49
BLOCK(K)=TSINK(INDEX,1,NEW)	ONDISK	50
280 K=K+1	ONDISK	51
GO TO 220	ONDISK	52
C TEMPER * * * * *	ONDISK	53
300 CONTINUE	ONDISK	54
IF (GEEWIZ(2).GT.0.0) GO TO 460	ONDISK	55
IUNIT=2	ONDISK	56
IF (JCORE(2)-1000) 400,320,320	ONDISK	57
C ALL	ONDISK	58
320 L=0	ONDISK	59
BLOCK(1)=T(NEW)	ONDISK	60
K=2	ONDISK	61
DO 360 I=N3CORE,NTCORE	ONDISK	62
M=NTOP(I)	ONDISK	63
L=L+1	ONDISK	64
DO 340 J=1,M	ONDISK	65
BLOCK(K)=TEMPER(J,L,NEW)	ONDISK	66
340 K=K+1	ONDISK	67
360 CONTINUE	ONDISK	68
M2=N1	ONDISK	69
380 K=K-1	ONDISK	70
IWA=K*NTAB(IFIZZ)+NTA3(42)+1	ONDISK	71
CALL PJT (FIT(281),BLOCK,10*K,IWA,0,0,JOLLY)	ONDISK	72
CALL REWNO (FIT(281))	ONDISK	73
GO TO 460	ONDISK	74
400 IF (JCORE(2)) 460,400,420	ONDISK	75
C SCATTERED	ONDISK	76
420 BLOCK(1)=T(NEW)	ONDISK	77
K=2	ONDISK	78
M2=N1+JCORE(2)	ONDISK	79
N1=N1+1	ONDISK	80
DO 440 I=N1,M2	ONDISK	81
INDEX=JCORE(I)	ONDISK	82
BLOCK(K)=TEMPER(INDEX,1,NEW)	ONDISK	83
440 K=K+1	ONDISK	84
GO TO 380	ONDISK	85
C TCOOL * * * * *	ONDISK	86
460 CONTINUE	ONDISK	87
IF (GEEWIZ(3).GT.0.0) GO TO 600	ONDISK	88
IUNIT=3	ONDISK	89
IF (JCORE(3)-1000) 540,480,480	ONDISK	90
C ALL	ONDISK	91
480 K=NAXIAL+1	ONDISK	92
BLOCK(1)=T(NEW)	ONDISK	93
DO 500 I=2,NAXIAL	ONDISK	94
BLOCK(I)=TCOOL(I,NEW)	ONDISK	95
500 K=K-1	ONDISK	96
IWA=K*NTAB(IFIZZ)+NTA3(43)+1	ONDISK	97
CALL PJT (FIT(316),BLOCK,10*K,IWA,0,0,JOLLY)	ONDISK	98
CALL REWNO (FIT(316))	ONDISK	99
GO TO 600	ONDISK	100
540 IF (JCORE(3)) 600,600,560	ONDISK	101
C SCATTERED	ONDISK	102
560 K=2	ONDISK	103
BLOCK(1)=T(NEW)	ONDISK	104
N3=M2+JCORE(3)	ONDISK	105
M2=M2+1	ONDISK	106
DO 580 I=M2,N3	ONDISK	107
INDEX=JCORE(I)	ONDISK	108
BLOCK(K)=TCOOL(INDEX,NEW)	ONDISK	109
580 K=K+1	ONDISK	110

GO TO 520	UNDISK	111
C PRESSURE * * * * *	UNDISK	112
600 IF (IPRESR(ICHAN).EQ.0) GO TO 640	UNDISK	113
IF (GUEWIZ(4).GT.0.0) GO TO 640	UNDISK	114
IUNIT=4	UNDISK	115
BLOCK(1)=T(NEW)	UNDISK	116
DO 620 I=2,NAXIAL	UNDISK	117
620 BLOCK(I)=P(I,NEW)	UNDISK	118
IWA=NAXIAL*NTAB(IFIZZ)+NTAB(4)+1	UNDISK	119
CALL PUT (FIT(211),BLOCK,1J*NAXIAL,IWA,0,0,JOLLY)	UNDISK	120
CALL REWNO (FIT(211))	UNDISK	121
C VELOCITY * * * * *	UNDISK	122
640 CONTINUE	UNDISK	123
IF (GUEWIZ(5).GT.0.0) GO TO 650	UNDISK	124
IUNIT=5	UNDISK	125
BLOCK(1)=T(NEW)	UNDISK	126
BLOCK(2)=G(1,NEW)/RHOO(1,NEW)	UNDISK	127
BLOCK(3)=G(NAXIAL,NEW)/RHOO(NAXIAL,NEW)	UNDISK	128
IWA=1+3*NTAB(IFIZZ)+NTAB(45)	UNDISK	129
CALL PUT (FIT(176),BLOCK,30,IWA,0,0,JOLLY)	UNDISK	130
CALL REWNO (FIT(176))	UNDISK	131
C INTERFACE * * * * *	UNDISK	132
650 DO 680 I=1,10	UNDISK	133
680 BLOCK(I)=0.0	UNDISK	134
IF (GUEWIZ(6).GT.0.0) GO TO 780	UNDISK	135
IUNIT=6	UNDISK	136
IF (VOLF(NEW).EQ.0.0.AND.VOLG(NEW).EQ.0.0) GO TO 760	UNDISK	137
BLOCK(1)=T(NEW)	UNDISK	138
BLOCK(2)=VFULLS*RHOJGF*NOPIINS	UNDISK	139
BLOCK(3)=BOX(14,4)	UNDISK	140
I=KFUELJ+NBLOCK-1	UNDISK	141
BLOCK(4)=P(I+1,NEW)	UNDISK	142
BLOCK(5)=NOPIINS*AP2	UNDISK	143
IF (BLOCK(5).LT.0.0) BLOCK(5)=0.0	UNDISK	144
IF (IFULLD(NEW)-NAXIAL) 760,730,760	UNDISK	145
760 IF (IFUEL(NEW)-1) 760,760,720	UNDISK	146
720 J=IFULLD(NEW)-1	UNDISK	147
BLOCK(9)=HI(J)+FUELBD(NEW)*DELX(J)	UNDISK	148
J=IFUEL(NEW)-1	UNDISK	149
IF (J.LT.NAXIAL) GO TO 740	UNDISK	150
BLOCK(10)=HI(NAXIAL)	UNDISK	151
J=BOX(13,3)	UNDISK	152
BLOCK(8)=AMIN1(BLOCK(10),HI(J))	UNDISK	153
GO TO 760	UNDISK	154
740 CONTINUE	UNDISK	155
BLOCK(10)=HI(J)+FUELBD(NEW)*DELX(J)	UNDISK	156
J=BOX(13,3)	UNDISK	157
BLOCK(8)=AMIN1(BLOCK(10),HI(J))	UNDISK	158
760 IWA=10*NTAB(IFIZZ)+NTAB(46)+1	UNDISK	159
CALL PUT (FIT(351),BLOCK,100,IWA,0,0,JOLLY)	UNDISK	160
CALL REWNO (FIT(351))	UNDISK	161
780 IF (GUEWIZ(7).GT.0.0) GO TO 830	UNDISK	162
IUNIT=7	UNDISK	163
BLOCK(1)=T(NEW)	UNDISK	164
J=IFULL(NEW)	UNDISK	165
BLOCK(2)=OIL(NEW)*DELX(J)	UNDISK	166
BLOCK(3)=CIL(NEW+2)	UNDISK	167
BLOCK(4)=BOX(NEW+8,+)	UNDISK	168
IWA=4*NTAB(IFIZZ)+NTAB(47)+1	UNDISK	169
CALL PUT (FIT(71),BLOCK,40,IWA,0,0,JOLLY)	UNDISK	170
CALL REWNO (FIT(71))	UNDISK	171
830 NTAB(IFIZZ)=NTAB(IFIZZ)+1	UNDISK	172
RETURN	UNDISK	173
END	UNDISK	174

SUBROUTINE CURVE (YOUT,XIN,X,Y,NO,IERROR)	CURVE	2
C	CURVE	3
C LINEAR INTERPOLATION	CURVE	4
C X IS INDEPENDENT VARIABLE ARRAY	CURVE	5
C Y IS DEPENDENT VARIABLE ARRAY	CURVE	6
C NO IS NUMBER OF POINTS IN X OR Y	CURVE	7
C XIN IS INDEPENDENT VALUE	CURVE	8
C YOUT IS DEPENDENT VALUE	CURVE	9
C IERROR SET TO 0/1 = OK/OUTSIDE DATA LIMITS	CURVE	10
C	CURVE	11
DIMENSION X(2),Y(2)	CURVE	12
IERROR=0	CURVE	13
IF (XIN.LT.X(1)) GO TO 200	CURVE	14
IF (XIN.GT.X(NO)) GO TO 220	CURVE	15
DO 120 I=1,NO	CURVE	16
IF (XIN-X(I)) 180,140,120	CURVE	17
120 CONTINUE	CURVE	18
140 YOUT=Y(I)	CURVE	19
160 RETURN	CURVE	20
180 YOUT=Y(I-1)+(Y(I)-Y(I-1))/(X(I)-X(I-1))*(XIN-X(I-1))	CURVE	21
GO TO 160	CURVE	22
200 IERROR=1	CURVE	23
GO TO 160	CURVE	24
220 IERROR=2	CURVE	25
GO TO 160	CURVE	26
END	CURVE	27

SUBROUTINE LINE (XARRAY,YARRAY,NPTS,INC,LINTYP,INTEQ,FIRSTX,DELTA	LINE	2
*,FIRSTY,DELTAY)	LINE	3
DIMENSION XARRAY(1),YARRAY(1)	LINE	4
LMIN=NPTS*INC+1	LINE	5
LDX=LMIN+INC	LINE	6
NL=LMIN+INC	LINE	7
CALL WHERE (XN,YN,DF)	LINE	8
XN=XN*DELTA+FIRSTX	LINE	9
YN=YN*DELTAY+FIRSTY	LINE	10
UF=AMAX1(ABS(XARRAY(1)-XN),ABS(YARRAY(1)-YN))	LINE	11
UL=AMAX1(ABS(XARRAY(NL)-XN),ABS(YARRAY(NL)-YN))	LINE	12
IPEN=3	LINE	13
ICODE=-1	LINE	14
NT=IABS(LINTYP)	LINE	15
IF (LINTYP) 140,120,140	LINE	16
120 NT=1	LINE	17
140 IF (UF-UL) 180,180,160	LINE	18
160 NF=NL	LINE	19
NA=((NPTS-1)/NT)*NT+NT-(NPTS-1)	LINE	20
KK=-INC	LINE	21
GO TO 200	LINE	22
18 NF=1	LINE	23
NA=NT	LINE	24
KK=INC	LINE	25
220 IF (LINTYP) 220,240,200	LINE	26
240 IF (NA-3)	LINE	27
ICODEA=-1	LINE	28
LSW=1	LINE	29
GO TO 280	LINE	30
240 NA=LDX	LINE	31
260 IPEN=2	LINE	32
ICODEA=-2	LINE	33
LSW=1	LINE	34
280 DO 400 I=1,NPTS	LINE	35
XI=(XARRAY(NF)-FIRSTX)/DELTA	LINE	36
YI=(YARRAY(NF)-FIRSTY)/DELTAY	LINE	37
IF (NA-NT) 300,320,340	LINE	38
300 IF (LSW) 300,340,300	LINE	39
320 CALL SYMBOL (XN,YN,IC3,INTEQ,JUL,ICODE)	LINE	40
NA=1	LINE	41
GO TO 380	LINE	42
340 CALL PLOT (XN,YN,IPEN)	LINE	43
360 NA=NA+1	LINE	44
380 NF=NF+KK	LINE	45
ICODE=ICODEA	LINE	46
400 IF (EN=IPEN)	LINE	47
RETURN	LINE	48
END	LINE	49

SUBROUTINE CSCALE (ARRAY,AXLEN,NPTS,INC,FIRSTV,DELTAV)	CSCALE	2
DIMENSION ARRAY(1),SAVE(7)	CSCALE	3
SAVE(1)=1.	CSCALE	4
SAVE(2)=2.	CSCALE	5
SAVE(3)=4.	CSCALE	6
SAVE(4)=5.	CSCALE	7
SAVE(5)=8.	CSCALE	8
SAVE(6)=10.	CSCALE	9
SAVE(7)=20.	CSCALE	10
FAD=.01	CSCALE	11
IF (FIRSTV.NE.-307.42) GO TO 220	CSCALE	12
J=DELTAV+.1	CSCALE	13
J=J-NPTS	CSCALE	14
YO=ARRAY(1)	CSCALE	15
YN=YO	CSCALE	16
I=0	CSCALE	17
DO 200 L=1,INC	CSCALE	18
DO 160 K=1,NPTS	CSCALE	19
I=I+1	CSCALE	20
IF (YO-ARRAY(I)) 140,140,120	CSCALE	21
120 YO=ARRAY(I)	CSCALE	22
GO TO 180	CSCALE	23
140 IF (ARRAY(I)-YN) 180,180,160	CSCALE	24
160 YN=ARRAY(I)	CSCALE	25
180 CONTINUE	CSCALE	26
200 I=I+J	CSCALE	27
GO TO 320	CSCALE	28
220 CONTINUE	CSCALE	29
K=IABS(INC)	CSCALE	30
N=NPTS*K	CSCALE	31
YO=ARRAY(1)	CSCALE	32
YN=YO	CSCALE	33
DO 300 I=1,N,K	CSCALE	34
YS=ARRAY(I)	CSCALE	35
IF (YO-YS) 260,260,240	CSCALE	36
240 YO=YS	CSCALE	37
GO TO 300	CSCALE	38
260 IF (YS-YN) 300,300,280	CSCALE	39
280 YN=YS	CSCALE	40
300 CONTINUE	CSCALE	41
320 CONTINUE	CSCALE	42
FIRSTV=YO	CSCALE	43
IF (YO) 340,360,380	CSCALE	44
340 FAD=FAD-1.	CSCALE	45
360 DELTAV=(YN-FIRSTV)/AXLEN	CSCALE	46
IF (DELTAV) 560,560,380	CSCALE	47
380 I=ALOG10(DELTAV)+1000.	CSCALE	48
P=10.**(-I-1000)	CSCALE	49
DELTAV=DELTAV/P+.01	CSCALE	50
DO 400 I=1,6	CSCALE	51
IS=I	CSCALE	52
IF (SAVE(I)-DELTAV) 400,420,420	CSCALE	53
400 CONTINUE	CSCALE	54
420 DELTAV=SAVE(IS)*P	CSCALE	55
FIRSTV=DELTAV*ALNT(YO/DELTAV+FAD)	CSCALE	56
T=FIRSTV+(AXLEN+.01)*DELTAV	CSCALE	57
IF (T-YN) 440,460,460	CSCALE	58
440 IS=IS+1	CSCALE	59
GO TO 420	CSCALE	60
460 FIRSTV=FIRSTV-ALNT((AXLEN+(FIRSTV-YN)/DELTAV)/2.)*DELTAV	CSCALE	61
IF (YO*FIRSTV) 480,480,500	CSCALE	62

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460 FIRSTV=0.0
500 IF (INC) 520,523,540
520 FIRSTV=FIRSTV+AXLEN*DELTA
DELTA=-DELTA
540 RETURN
560 DELTA=1.
FIRSTV=FIRSTV+.5
GO TO 540
END

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USCALE 03
USCALE 04
USCALE 05
USCALE 06
USCALE 07
USCALE 08
USCALE 09
USCALE 70
USCALE 71

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SUBROUTINE JOLLY	JOLLY	2
COMMON/GOLLY/IUNIT,GEWIZ(20)	JOLLY	3
C****	CASPAR	2
C**** COMMON DECK"CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLO3(1)	CASPAR	4
REAL KINSRT,KWTHDR	CASPAR	5
LOGICAL PRINT,DONE,SGRAM	CASPAR	6
COMMON	CASPAR	7
DONE,ISTAT	CASPAR	8
,IIN	CASPAR	9
,SLOA(3)	CASPAR	10
+I3LOGK	CASPAR	11
,H(2)	CASPAR	12
,T(2)	CASPAR	13
,HKEDD	CASPAR	14
,ICHAN	CASPAR	15
,VJIOK(2)	CASPAR	16
+JOPPK(2)	CASPAR	17
,COLAPK(2)	CASPAR	18
,NEW	CASPAR	19
,IOLD	CASPAR	20
,NOUT	CASPAR	21
,TERKOR	CASPAR	22
+GERROR	CASPAR	23
,PEXIT(3)	CASPAR	24
,PERROR	CASPAR	25
,PRINT	CASPAR	26
,DELTIM	CASPAR	27
,PV(2)	CASPAR	28
+PBOTT(3,2)	CASPAR	29
,IACIV(20)	CASPAR	30
,FLOW(3,2)	CASPAR	31
,TOPT(3,2)	CASPAR	32
,TOPEV(3)	CASPAR	33
,WOLF(3)	CASPAR	34
+LOOP(20)	CASPAR	35
,IOUTL	CASPAR	36
,NT-EAT	CASPAR	37
,IKINET	CASPAR	38
,TOUT	CASPAR	39
,HMAX	CASPAR	40
+TIMEIN(50)	CASPAR	41
,DKIN(50)	CASPAR	42
,TIMOUT(50)	CASPAR	43
,DKOUT(50)	CASPAR	44
,IPAIR2	CASPAR	45
,AN(2)	CASPAR	46
+IPAIR3	CASPAR	47
,KOUNT	CASPAR	48
,RH(2)	CASPAR	49
,BB0100	CASPAR	50
,RHOSWZ	CASPAR	51
,NGROUP	CASPAR	52
+C(6,2)	CASPAR	53
,ALIFE	CASPAR	54
,ALPH(6)	CASPAR	55
,GAM(6)	CASPAR	56
,B(6)	CASPAR	57
,AL(6)	CASPAR	58
+JB	CASPAR	59
,SGRAM	CASPAR	60
,TSGRAM(2)	CASPAR	61
,PERIOD	CASPAR	62
,KSLOPE	CASPAR	63
,ERROR	CASPAR	64
+KINSRT(2)	CASPAR	65
,KWTHDR(2)	CASPAR	66
,REDUCE	CASPAR	67
,PRINT1	CASPAR	68
,PRINT2	CASPAR	69
,RMIN	CASPAR	70
COMMON	CASPAR	71
+ANLOW	CASPAR	72
,TQUIT	CASPAR	73
,LSTEP	CASPAR	74
,JSTEP	CASPAR	75
,ANIC	CASPAR	76
,TKGS	CASPAR	77
+IPL0T	CASPAR	78
,ERROR1	CASPAR	79
,TERM(13)	CASPAR	80
,TITLE(8)	CASPAR	81
,HOTPLM	CASPAR	82
,SPCB	CASPAR	83
+SPGC	CASPAR	84
,SPCD	CASPAR	85
,LINESL	CASPAR	86
,KSTEP	CASPAR	87
,NCHAN	CASPAR	88
,MSTEP	CASPAR	89
+IFRINT	CASPAR	90
,MPRINT	CASPAR	91
,IDUMP	CASPAR	92
,QGEN(2)	CASPAR	93
,ANI	CASPAR	94
,ANSURM	CASPAR	95
+TDELAY	CASPAR	96
,NLODPS	CASPAR	97
,RHUCCL(3)	CASPAR	98
,VOLTOP(3)	CASPAR	99
,HEAD(3)	CASPAR	100
,PRISTM(50)	CASPAR	101
+PRESUR(50,3)	CASPAR	102
,IPAIR+	CASPAR	103
,PU(3)	CASPAR	104
,RUNTIM	CASPAR	105
,VCR	CASPAR	106
,ETAU(4)	CASPAR	107
+KBLOCK	CASPAR	108
,JBLOCK	CASPAR	109
,MBLOCK	CASPAR	110
,N12	CASPAR	111
,N13	CASPAR	112
,EXTRA	CASPAR	113
+GJACK(3)	CASPAR	114
,VJACK(2)	CASPAR	115
,ITRGAP	CASPAR	116
+HMIN	CASPAR	117
,N22	CASPAR	118
,NIN	CASPAR	119
,INPUT	CASPAR	120
,N2	CASPAR	121
,N+	CASPAR	122
+N7	CASPAR	123
,N8	CASPAR	124
,KPRINT	CASPAR	125
,POWSS	CASPAR	126
,HMAX3	CASPAR	127
,HMAXF	CASPAR	128
+TRIPFW(3)	CASPAR	129
,TRIPPP(3)	CASPAR	130
,TRIPPF(3)	CASPAR	131
,TRIPOT(3)	CASPAR	132
,DELAYF	CASPAR	133
EQUIVALENCE (QMOL,TERM(4)),(TMOL,TERM(5)),(GMOL,TERM(6)),(PERMOL,T	CASPAR	134
ERM(7)),(SLO3,DONE)	CASPAR	135
C****	CASPAR	136
COMMON /FIT/ FIT(385)	JOLLY	137
DIMENSION IFIT(11)	JOLLY	138
DATA IFIT/240,281,316,211,170,301,71,106,141,1,361/	JOLLY	139
I=IFIT(IUNIT)	JOLLY	140
M=IFETCH(FIT(1),3LINKS)	JOLLY	141
WRITE (NOUT,120) IUNIT,M	JOLLY	142
GEWIZ(IUNIT)=1J.	JOLLY	143
RETURN	JOLLY	144
C	JOLLY	145
120 FORMAT (" ERROR OCCURRED ON DISC UNIT "I3," FIT TABLE IKS FIELD IS	JOLLY	146
"022)	JOLLY	147
END	JOLLY	148

SUBROUTINE REWNO (FIT)
CALL CLOSEM (FIT)
CALL OPENM (FIT,3LI-0,1LR)
RETURN
END

REWNO 2
REWNO 3
REWNO 4
REWNO 5
REWNO 6

SUBROUTINE IWASH (K,MODE,M), RETURNS (IERROR,IBACK)	IWASH	2
DIMENSION E1(8), L3(8,6),E4(8,6),CT(6),RT(8),PT(8),PPT(8),	IWASH	3
*ARG(8),ARG2(8),UCT(8,6)	IWASH	4
C****	CASPAR	2
C**** COMMON DECK"CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLOB(1)	CASPAR	4
REAL KINSRT,KWTHDR	CASPAR	5
LOGICAL PRINT,DONE,SCRAM	CASPAR	6
COMMON DON_,ISTAT ,IIN ,SLUA(3) ,	CASPAR	7
*IBLOCK ,H(2) ,T(2) ,HREDO ,ICHAN ,VOIDK(2) ,	CASPAR	8
*DOPPK(2) ,COLAPK(2) ,NEW ,IOLD ,NOUT ,TERROR ,	CASPAR	9
*GERROR ,PEXIT(3) ,PERROR ,PRINT ,DELTIM ,PN(2) ,	CASPAR	10
*PHOTT(3,2) ,IACTIV(20) ,FLOW(3,2) ,TGPT(3,2) ,TOPEV(3) ,WOLF(3) ,	CASPAR	11
*LOOP(20) ,IGUTL ,NTREAT ,IKINET ,TOUT ,HMAX ,	CASPAR	12
*TIMEIN(50) ,OKIN(50) ,TIMOUT(50) ,OKOUT(50) ,IPAIR2 ,AV(2) ,	CASPAR	13
*IPAIR3 ,KUJNT ,RH(2) ,BBG100 ,RHOSWZ ,NGROUP ,	CASPAR	14
*C(6,2) ,ALIFE ,ALPH(6) ,GAM(6) ,B(6) ,AL(6) ,	CASPAR	15
*BB ,SCRAM ,TSCRAM(2) ,PERIOD ,RSLOPE ,ERROR ,	CASPAR	16
*KINSRT(2) ,KWTHUR(2) ,REDUCE ,PRINT1 ,PRINT2 ,RMIN ,	CASPAR	17
COMMON	CASPAR	18
*ANLOW ,TQJIT ,LSTEP ,JSTEP ,ANIG ,TKGS ,	CASPAR	19
*IPLDT ,ERRORI ,TERM(13) ,TITLE(8) ,HOTPIH ,SPGD ,	CASPAR	20
*SPCC ,SPCU ,LINESL ,KSTEP ,NCHAN ,MSTEP ,	CASPAR	21
*IPRINT ,MPRINT ,IDUMP ,QGEN(2) ,ANI ,ANSCRM ,	CASPAR	22
*TDELAY ,NLOJPS ,RHOCCE(3) ,VULTOP(3) ,HEAD(3) ,PRESTM(50) ,	CASPAR	23
*PRESUR(50,3) ,IPAIR4 ,PD(3) ,KUNTIM ,VER ,ETAU(4) ,	CASPAR	24
*KJLOCK ,JBLOCK ,MBLOCK ,N12 ,N13 ,EXTRA ,	CASPAR	25
*GJACK(3) ,VJACK(2) ,	CASPAR	26
*HMIN ,N22 ,NIN ,INPUT ,N2 ,N+ ,	CASPAR	27
*N7 ,N8 ,KPCINT ,POHSS ,HMAX3 ,HMAXF ,	CASPAR	28
*TRIPFH(3) ,TRIPFP(3) ,TRIPPF(3) ,TRIPOT(3) ,DELAYF ,	CASPAR	29
EQUIVALENCE (QMUL,TERM(4)) , (T4OL,TERM(5)) , (GMOL,TERM(6)) , (PERMOL,T	CASPAR	30
TERM(7)) , (SLOB,DONE)	CASPAR	31
C****	CASPAR	32
EQUIVALENCE (DELT,H+1)	IWASH	6
DATA IGLOM/0/	IWASH	7
C****	IWASH	8
C****	IWASH	9
C**** BEGIN SUBROUTINE IWASH	IWASH	10
IF (IGLOM.NE.0) GO TO 100	IWASH	11
C****	IWASH	12
C**** SET UP EXPONENTIAL ON FIRST TIME THROUGH ONLY	IWASH	13
IGLOM=10	IWASH	14
OH=DELT/7.	IWASH	15
MH=0.3	IWASH	16
DO 140 I=1,8	IWASH	17
DO 120 J=1,NGROUP	IWASH	18
L3(I,J)=EXP(AL(J)*MH)	IWASH	19
E4(I,J)=1./E3(I,J)	IWASH	20
120 E3(I,J)=E3(I,J)*OH	IWASH	21
140 MH=MH+OH	IWASH	22
100 GO TO (223,190) , MODE	IWASH	23
C****	IWASH	24
C**** ESTIMATE PRECURSOR DENSITIES BY FINITE LIFE MODEL	IWASH	25
130 DO 200 I=1,NGROUP	IWASH	26
200 CT(I)=C(I,IOLD)/ALIFE	IWASH	27
GO TO 200	IWASH	28
C****	IWASH	29
C**** ESTIMATE PRECURSOR DENSITIES BY ZERO LIFE MODEL	IWASH	30
220 DO 240 I=1,NGROUP	IWASH	31
240 CT(I)=C(I,IOLD)	IWASH	32
C****	IWASH	33
C**** GET ESTIMATE OF REACTIVITY INSERTION	IWASH	34
C**** GET ESTIMATE OF SCRAM REACTIVITY	IWASH	35
C**** CALCULATE ESTIMATE OF REACTIVITY SLOPE WITH RESPECT TO TIME	IWASH	36

260	CALL CURVE (OKU,T(IOLD)+DELT,TIMEIN,OKIN,IPAIR2,I19)	1WASH	37
	IF (I19.GT.0) GO TO 640	1WASH	38
	RS=RSLOPE+(OKU-KINSTR(IOLD))/DELT	1WASH	39
	JKD=0.0	1WASH	40
	IF (.NOT.SCFAM) GO TO 280	1WASH	41
	TI=TSRAM(IOLD)+DELT	1WASH	42
	IF (TI.LE.0.0) GO TO 280	1WASH	43
	CALL CURVE (OKU,TT,TIMOUT,JKOUT,IPAIR3,I19)	1WASH	44
	IF (I19.GT.0) GO TO 660	1WASH	45
	RS=RS-(OKJ-KWTHDR(IOLD))/DELT	1WASH	46
C****		1WASH	47
C****	GET INITIAL ESTIMATES FOR CALCULATION OF INPUTS TO FINI NUMERICAL	1WASH	48
C****	INTEGRATION SUBROUTINE	1WASH	49
230	HH=0.0	1WASH	50
	ABLE=AN(IOLD)	1WASH	51
	CHARLY=EXP(W*DH)	1WASH	52
	BAKER=1.	1WASH	53
	DO 300 I=1,4	1WASH	54
	RT(I)=RH(IOLD)+HH*RS	1WASH	55
	E1(I)=(RT(I)-BB)/ALIFE	1WASH	56
	IF (K.EQ.2) GO TO 300	1WASH	57
	PT(I)=ABLE*BAKER	1WASH	58
	ABLE=PT(I)	1WASH	59
	BAKER=CHARLY	1WASH	60
300	HH=HH+UH	1WASH	61
	MLOOP=0	1WASH	62
	IF (K.EQ.1) GO TO 320	1WASH	63
	IF (R4(NEW).EQ.RT(8)) GO TO 620	1WASH	64
C****		1WASH	65
C****	INTEGRATE KINETIC EQUATIONS	1WASH	66
C****	AND ITERATE IN A PREDICTOR/CORRECTOR STYLE	1WASH	67
320	MLOOP=MLOOP+1	1WASH	68
	IF (MLOOP.GT.31) GO TO 680	1WASH	69
	DO 330 J=1,NGROUP	1WASH	70
	DO 340 I=1,8	1WASH	71
340	ARG(1)=B(J)*PT(1)/ALIFE*E3(I,J)	1WASH	72
	CALL FINI (ARG2,ARG)	1WASH	73
	DO 360 I=1,8	1WASH	74
360	CUT(I,J)=C+(I,J)*(C(J)+ARG2(1))	1WASH	75
380	CONTINUE	1WASH	76
	DO 420 I=1,8	1WASH	77
	SUM=0.0	1WASH	78
	DO 400 J=1,NGROUP	1WASH	79
400	SUM=SUM+AL(J)*CUT(I,J)	1WASH	80
420	ARG(1)=(E1(I)+SUM/PT(1))*UH	1WASH	81
	CALL FINI (ARG2,ARG)	1WASH	82
	DO 440 I=1,8	1WASH	83
440	PPT(1)=AN(IOLD)*EXP(ARG2(I))	1WASH	84
	IF (ABS(PPT(8)-T(8))/PT(8).LE.LRACK) GO TO 480	1WASH	85
	DO 460 I=1,8	1WASH	86
460	PT(I)=PPT(I)	1WASH	87
	GO TO 320	1WASH	88
C****		1WASH	89
C****	COMPUTE NEW ESTIMATES OF PRECURSOR DENSITIES	1WASH	90
480	GO TO (500,700), K	1WASH	91
500	GO TO (500,520), 1000	1WASH	92
520	DO 540 I=1,NGROUP	1WASH	93
540	G(I,NEW)=CUT(8,I)*ALIFE	1WASH	94
	GO TO 600	1WASH	95
560	DO 580 I=1,NGROUP	1WASH	96
580	G(I,NEW)=CUT(8,I)	1WASH	97
C****		1WASH	98
C****	PERFORM CLEAN UP OPERATIONS AND RETURN	1WASH	99
600	AN(NEW)=PPT(8)	1WASH	100
	H(NEW)=DELT	1WASH	101
	T(NEW)=T(IOLD)+DELT	1WASH	102
	IF (SCRAM) TSCRAM(NEW)=TSCRAM(IOLD)+DELT	1WASH	103

KINSRT(NEW)=DKU	IWASH	104
KWITHDR(NEW)=-UKJ	IWASH	105
620 RETURN	IWASH	106
C****	IWASH	107
C**** ERROR PRINTOUT AND ERROR RETURN	IWASH	108
640 PRINT 740	IWASH	109
GO TO 700	IWASH	110
660 PRINT 760	IWASH	111
GO TO 700	IWASH	112
680 PRINT 780	IWASH	113
700 RETURN IERROR	IWASH	114
720 IF (ABS(PPT(8)-4N(N_W))/AN(NEW).GT.ERROR1) RETURN IBACK	IWASH	115
GO TO 620	IWASH	116
C	IWASH	117
740 FORMAT (" REACTIVITY INSERTION TABLE EXCEEDED")	IWASH	118
760 FORMAT (" REACTIVITY WITHDRAWAL TABLE EXCEEDED")	IWASH	119
780 FORMAT (" MLOOP MAXIMUM EXCEEDED AT IWASH.69")	IWASH	120
END	IWASH	121

SUBROUTINE FINT (J,A)	FINT	2
DIMENSION A(8),B(8)	FINT	3
B(1)=0.0	FINT	4
B(2)=(36799.*A(1)+139349.*A(2)-121797.*A(3)+123133.*A(4)-88547.*A(	FINT	5
+5)+41499.*A(6)-11351.*A(7)+1375.*A(8))/120900.	FINT	6
B(3)=(1107.*A(1)+5804.*A(2)-639.*A(3)+2448.*A(4)-1927.*A(5)+936.*A	FINT	7
+(6)-201.*A(7)+32.*A(8))/3780.	FINT	8
B(4)=(1325.*A(1)+0795.*A(2)+1377.*A(3)+5927.*A(4)-3033.*A(5)+1377.	FINT	9
+*A(6)-373.*A(7)+45.*A(8))/4480.	FINT	10
B(5)=(139.*A(1)+724.*A(2)+108.*A(3)+892.*A(4)-53.*A(5)+108.*A(6)-3	FINT	11
+2.*A(7)+4.*A(8))/472.5	FINT	12
B(6)=(1431.*A(1)+7345.*A(2)+1395.*A(3)+8325.*A(4)+2725.*A(5)+3411.	FINT	13
+*A(6)-495.*A(7)+55.*A(8))/4838.4	FINT	14
B(7)=(41.*A(1)+A(7))+216.*A(2)+A(6))+27.*A(3)+A(5))+272.*A(4))/	FINT	15
+100.	FINT	16
B(8)=7.*(751.*A(1)+A(8))+3577.*A(2)+A(7))+1323.*A(3)+A(6))+2989	FINT	17
+.*A(4)+A(5))/17280.	FINT	18
RETURN	FINT	19
END	FINT	20

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SUBROUTINE INTERF                                INTERF    2
COMMON/ADD/LOUPE,MORE(21)                        INTERF    3
DIMENSION FINTER(2,2),IFINTR(2,2)               INTERF    4
EQUIVALENCE (FUELD,FINTER),(IFUELD,IFINTR),(30X(14,4),PFUEL),(BU INTERF    5
+X(15,4),ADDER)                                INTERF    6
C****                                           CASPAR    2
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS    CASPAR    3
DIMENSION SLOB(1)                                CASPAR    4
REAL KINSRT,KWTHDR                                CASPAR    5
LOGICAL PRINT,DONE,SCRAM                           CASPAR    6
COMMON                                           CASPAR    7
      DONE,ISTAT      ,IIN      ,SLUA(3)      , CASPAR    8
+IBLOCK      ,H(2)      ,T(2)      ,HREDO      ,ICHAN      ,VOIDK(2)      , CASPAR    9
+DOPPK(2)      ,COLAPK(2)      ,NEW      ,ICLD      ,NOUT      ,TEKRROR      , CASPAR   10
+GERROR      ,PEXIT(3)      ,PERROR      ,PRINT      ,DELTIM      ,PN(2)      , CASPAR   11
+P3OTT(3,2)      ,IACTIV(20)      ,FLUM(3,2)      ,TCPT(3,2)      ,TOPEN(3)      ,WOLF(3)      , CASPAR   12
+LOOP(20)      ,IOUIL      ,NTRAT      ,IKINET      ,TOUT      ,HMAX      , CASPAR   13
+TIMEIN(50)      ,OKIN(50)      ,TIMOUT(50)      ,OKOUT(50)      ,IPAIR2      ,AN(2)      , CASPAR   14
+IPAIR3      ,KOUNT      ,RH(2)      ,BBOIGG      ,RHOSWZ      ,NGROUP      , CASPAR   15
+C(6,2)      ,ALIFE      ,ALPH(6)      ,GAM(6)      ,B(6)      ,AL(6)      , CASPAR   16
+33      ,SCRAM      ,TSCRAM(2)      ,PERIOD      ,RSLJPE      ,ERROR      , CASPAR   17
+KINSRT(2)      ,KWTHDR(2)      ,REDUCE      ,PRINT1      ,PRINT2      ,RMIN      , CASPAR   18
COMMON                                           CASPAR   19
+ANLCH      ,TQUIT      ,LSTEP      ,JSTEP      ,ANIC      ,TKGS      , CASPAR   20
+IFLOT      ,ERRK1      ,TERM(13)      ,TITLE(8)      ,HOTPIM      ,SPUD      , CASPAR   21
+SFCC      ,SPCO      ,LINESL      ,KSTEP      ,NCHAN      ,MSTEP      , CASPAR   22
+IFPRINT      ,MPRINT      ,IDUMP      ,QGEN(2)      ,ANI      ,ANSCRM      , CASPAR   23
+TDLAY      ,NLOOPS      ,RHJCEL(3)      ,VOLTOF(3)      ,HEAD(3)      ,PRESTM(50)      , CASPAR   24
+PRESUR(50,3)      ,IPAIR4      ,PD(3)      ,RUNTIM      ,VER      ,ETAD(4)      , CASPAR   25
+KJLOCK      ,JBLCK      ,MBLOCK      ,N12      ,N13      ,EXTRA      , CASPAR   26
+GJACK(3)      ,VJACK(2)      ,N22      ,NIN      ,INPUT      ,N2      ,N+      , CASPAR   27
+N7      ,N8      ,KPRINT      ,POWS      ,HMAX3      ,HMAXF      , CASPAR   28
+TRIPFH(3)      ,TRIPPF(3)      ,TRIPPF(3)      ,TRIPOT(3)      ,DELAYF      , CASPAR   29
EQUIVALENCE (QMOL,TERM(4)),(TMOL,TERM(5)),(GMOL,TERM(6)),(PERMOL,T CASPAR   30
+ERM(7)),(SLOB,DONE)                            CASPAR   31
C****                                           CASPAR   32
C****                                           CHNDAT    2
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA    CHNDAT    3
DIMENSION S(1),CORE(1),IS(1),EPTM(15,20),OIL(3),XLIQ(11,20,2) CHNDAT    4
INTEGER SMELP                                     CHNDAT    5
COMMON                                           CHNDAT    6
      TCOOL(75,2),RLOG(22,20),UU(3)      ,ULIQ(75)      , CHNDAT    7
+UVAP(75)      , DELX(75)      , CHNDAT    8
+AFLOW(75)      ,US(4,55)      ,HCAPS(4,55),DSAVE1(4,55,2),DSAVE2(75,2)      , CHNDAT    9
+DSAVE3(15,20,2),DSAVE4(75,2),POW(16,20),VOLUME(15,20),HCAFF(15,20) CHNDAT   10
+,TEMPER(15,20,2),TSINK(4,55,2),VOIDV(20)      ,VPLEN      ,PPLEN(2)      , CHNDAT   11
+RPLEN(2)      ,G(75,2)      , RHOO(75,2),VOLG(2)      , CHNDAT   12
+VOLF(2)      ,GT0      ,GT1      ,GT2      ,GT3      ,GASBO(2,2)      , CHNDAT   13
+GASBO(2,2)      ,FUELBO(2)      ,FULLBU(2)      ,FANN(75)      ,P(75,2)      ,RHUG(75,2)      , CHNDAT   14
+RHUF(75,2)      ,WF(75)      ,WC(75)      ,NUPINS      ,NAXIAL      ,NBOUR      , CHNDAT   15
+NTCORE      ,NTOP(75),NTYPE(15,20)      , IGAS(2)      ,N3PLEN      , CHNDAT   16
+IFUEL(2)      ,IBOIL(2)      ,IGASO(2,2),ICASU(2,2),IFUEL(2)      ,IFUELU(2)      , CHNDAT   17
+IBOIL(2,2),IBOILU(2,2),NBOIL(2)      ,NGAS(2)      ,RLC      ,RLV      , CHNDAT   18
COMMON                                           CHNDAT   19
+CLC      ,CLV      ,CVC      ,CVV      ,BASICT(50),CONDU(50)      , CHNDAT   20
+2),IPAIR1      ,CGAPA      ,CGAPB      ,CGAPC      ,CGAPD      ,SLMP(60)      , CHNDAT   21
+ST1(60,2)      ,TSEMP(30)      ,ST2(30)      ,DENSEE      ,DENSE(2)      ,TMAGIC      , CHNDAT   22
+TSAT      ,AHOLE      ,HAXF      ,HAXL      ,HAXV      ,FSAT      , CHNDAT   23
+RLIQ      ,RLQF      ,FTKY      ,PVOID      ,IFUELS      ,JFUELS      , CHNDAT   24
+TGASS      ,TSUPER      ,TFUELS      ,TMELTH      ,TMELTL      ,GAMMA      , CHNDAT   25
+PINTEN(20,2),GAPR(2)      ,GAPRE      ,CLVC      ,DOFDOE(20,2)      , CHNDAT   26
+BASENA      ,DOFFH      ,RBASCL      ,SFC2(2)      ,HFUSEE      ,OKNA(20,2)      , CHNDAT   27
+WALTAX(75)      ,PARTAN(20),IGAP      , CHNDAT   28
COMMON                                           CHNDAT   29
      KFUELS      ,SFC3(13)      ,H1(75)      ,CLAUKT      , CHNDAT   30
+RLV2      ,CLV2      ,CVV2      ,HAXL1      ,HAXL2      ,CGAPB2      , CHNDAT   31
+CLACK      ,CAPS(75)      ,TSIRUK(75,2),USTL(75),USTV(75),DSAVE(75,2) CHNDAT   32

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IFINTR(NEW,2)=NAXIAL+1	INTERF	46
GO TO 640	INTERF	47
180 IFINTR(NEW,2)=IFINTR(NEW,2)+1	INTERF	48
FINTER(NEW,2)=SUM/DROT(I)	INTERF	49
IF (IFINTR(NEW,2).GE. IFINTR(IOLD,2)) GO TO 220	INTERF	50
I3=IFINTR(IOLD,2)	INTERF	51
I4=IFINTR(NEW,2)	INTERF	52
DO 200 I921X=I4,I3	INTERF	53
I5=I3+I4-I921X	INTERF	54
SMELP(I13)=I5	INTERF	55
I13=I13+1	INTERF	56
200 SMELP(I13)=1	INTERF	57
220 CONTINUE	INTERF	58
IF (IFINTR(NEW,2).GE. IX) GO TO 640	INTERF	59
IX=IX-1	INTERF	60
DO 240 I921X=I,IX	INTERF	61
J=IX+I-I921X	INTERF	62
240 G(J,NEW)=G(IX+1,NEW)*AFLOW(IX+1)/AFLOW(J)	INTERF	63
GO TO 640	INTERF	64
260 CONTINUE	INTERF	65
IK2=2	INTERF	66
IF (OIL(14).LT..5) OIL(15)=0.0	INTERF	67
OIL(17)=0.0	INTERF	68
DO 620 I=1,2	INTERF	69
IX=IFINTR(NEW,I)	INTERF	70
IF (IX.GT.NAXIAL) GO TO 620	INTERF	71
LL=IFINTR(IOLD,I)	INTERF	72
ABLE=H(NEW)	INTERF	73
NOUE=IX	INTERF	74
IF (I-2) 280,300,300	INTERF	75
280 DISTAN=G(NOUE-1,NEW)*ABLE/RHO0(NOUE-1,NEW)*AFLOW(NOUE-1)/AFLOW(NOUE)	INTERF	76
GO TO 320	INTERF	77
300 DISTAN=G(NOUE,NEW)*ABLE/RHO0(NOUE,NEW)	INTERF	78
320 FINTER(NEW,I)=FINTER(IOLD,I)	INTERF	79
IFINTR(NEW,I)=IFINTR(IOLD,I)	INTERF	80
UN=DISTAN/ABLE	INTERF	81
NOUE=LL	INTERF	82
DISTAN=DISTAN*AFLOW(IX)/AFLOW(NOUE)	INTERF	83
IF (DISTAN) 340,340,440	INTERF	84
340 DOLO=DCLX(NOUE)*(1.-FINTER(IOLD,I))	INTERF	85
NOUE=NOUE	INTERF	86
DO 420 I921X=2,NOUE	INTERF	87
L=NOUE+2-I921X	INTERF	88
IF (-DISTAN+DOLO-DCLX(L)) 360,380,380	INTERF	89
360 FINTER(NEW,I)=FINTER(NEW,I)+DISTAN/DCLX(L)	INTERF	90
GO TO 340	INTERF	91
380 IFINTR(NEW,I)=IFINTR(NEW,I)-1	INTERF	92
ABLE=ABLE*(1.+(DCLX(L)-DOLO)/DISTAN)	INTERF	93
NOUE=NOUE-1	INTERF	94
DISTAN=UN*ABLE*AFLOW(IX)/AFLOW(NOUE)	INTERF	95
DOLO=0.0	INTERF	96
FINTER(NEW,I)=.99999	INTERF	97
IF (I.NE.1) GO TO 400	INTERF	98
RHO0(L-1,IOLD)=RHO0(LL,IOLD)	INTERF	99
GO TO 420	INTERF	100
400 CONTINUE	INTERF	101
RHO0NA(L-1,IOLD)=RHO0NA(LL,IOLD)	INTERF	102
TCOOL(L-1,IOLD)=TCOOL(LL,IOLD)	INTERF	103
SMELP(I13)=L	INTERF	104
I13=I13+1	INTERF	105
SMELP(I13)=1	INTERF	106
420 CONTINUE	INTERF	107
GO TO 640	INTERF	108
440 DOLO=DCLX(NOUE)*FINTER(IOLD,I)	INTERF	109
	INTERF	110

MODE=MODE	INTERF	111
DO 520 L=MODE,NAXIAL	INTERF	112
IF (DISTAN+DOLD-DELX(L)) 460,+80,+80	INTERF	113
460 FINTER(NEW,I)=FINTER(NEW,I)+DISTAN/DELX(L)	INTERF	114
GO TO 540	INTERF	115
480 IFINTK(NEW,I)=IFINTK(NEW,I)+1	INTERF	116
ABLE=ABLE*(1.-(DELX(L)-DOLD)/DISTAN)	INTERF	117
NOUE=NOUE+1	INTERF	118
DISTAN=UN*ABLE*AFLOW(IX)/AFLOW(NODE)	INTERF	119
DOLD=D.J	INTERF	120
FINTER(NEW,I)=.001	INTERF	121
IF (I.NE.2) GO TO 500	INTERF	122
FINTER(NEW,I)=.00001	INTERF	123
GO TO 520	INTERF	124
500 CONTINUE	INTERF	125
RHOONA(L+1,IOLD)=RHOONA(LL,IOLD)	INTERF	126
TCOOL(L+1,IOLD)=TCOOL(LL,IOLD)	INTERF	127
SMCLP(I12)=L	INTERF	128
I12=I12-1	INTERF	129
SMCLP(I12)=1	INTERF	130
520 CONTINUE	INTERF	131
540 IF (I.EQ.2) GO TO 580	INTERF	132
IY=IFINTK(NEW,I)-1	INTERF	133
IF (IX.GT.IY) GO TO 620	INTERF	134
DO 560 L=IX,IY	INTERF	135
RHO(L,NEW)=RHOJ(IX-1,NEW)	INTERF	136
560 G(L,NEW)=G(IX-1,NEW)*AFLOW(IX-1)/AFLOW(L)	INTERF	137
GO TO 620	INTERF	138
580 IY=IFINTK(NEW,I)	INTERF	139
IX=IX-1	INTERF	140
IF (IX.LT.IY) GO TO 620	INTERF	141
DO 600 I921X=IY,IX	INTERF	142
L=IX+IY-I921X	INTERF	143
RHO(L,NEW)=RHOJ(IX+1,NEW)	INTERF	144
600 G(L,NEW)=G(IX+1,NEW)*AFLOW(IX+1)/AFLOW(L)	INTERF	145
620 CONTINUE	INTERF	146
NBOIL(NEW)=0	INTERF	147
640 IBOIL(NEW)=NBOIL(NEW)	INTERF	148
IFUEL(NEW)=IFUEL(IOLD)	INTERF	149
IF (IFUEL(IOLD)) 720,720,660	INTERF	150
660 IF (IFINTK(NEW,2)-1) 680,680,700	INTERF	151
680 IFUEL(NEW)=0	INTERF	152
GO TO 720	INTERF	153
700 IF (IFINTK(NEW,1)-NAXIAL) 720,720,680	INTERF	154
720 NGAS(NEW)=NGAS(IOLD)	INTERF	155
IGAS(NEW)=IGAS(IOLD)	INTERF	156
RETURN	INTERF	157
END	INTERF	158

SUBROUTINE REACT (G1,G2)	REACT	2
DIMENSION WHEYT(75)	REACT	3
DIMENSION T(15,20)	REACT	4
COMMON/DUMDUM/TRIGGER,ZU1,ZU2,ZU3,VRC1,VRC2,VRC3,FNODES,ALPHA,	REACT	5
+T(3,20,2),PERDEG,LPAD,ACCU2,TEA(20),ACCU1,AMAX,AMIN	REACT	6
COMMON/ADD/LOOPP,YRTP,JZAP,IBITTY,IBATTY,KUP,KDOWN,PGOOD,	REACT	7
+LOOP4,LOGIC,MOOP	REACT	8
+VGAS,VVOID,VLIQ,TOTML,LOOP5,LOOPF,NGOREN	REACT	9
+CAP3,A93,A92	REACT	10
EQUIVALENCE(TERM1,WHEYT)	REACT	11
+,(A1,T0)	REACT	12
C****	CASPAR	2
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLJ3(1)	CASPAR	4
REAL KINSKT,KWTHDR	CASPAR	5
LOGICAL PRINT,DONE,GRAM	CASPAR	6
COMMON	CASPAR	7
DONE,ISTAT,IIN,SLJ3(3),	CASPAR	8
+ISLOCK,H(2),T(2),HKEO,ICHAN,VJICK(2),	CASPAR	9
+JOFFK(2),COLAPK(2),NLW,IGLO,NOUT,TERKUR,	CASPAR	10
+GERROR,PEXIT(3),PLROR,PRINT,DELTIM,PV(2),	CASPAR	11
+P9OTT(3,2),IACTIV(20),FLOW(3,2),TOPT(3,2),TOPEN(3),	CASPAR	12
+LOOP(20),IOUTL,NTRAT,IKINET,TOUT,HMAX,	CASPAR	13
+TIMEIN(50),OKIN(50),TIMOUT(50),OKOUT(50),IPAIR2,	CASPAR	14
+IPAIR3,KOUNT,KH(2),BBUOC,RHUSAZ,NGROUP,	CASPAR	15
+C(6,2),ALIFE,ALPH(6),GAM(6),B(6),AL(6),	CASPAR	16
+B3,GRAM,TSCRAM(2),PERIOD,RSLPCE,ERROR,	CASPAR	17
+KINSKT(2),KWTHDR(2),REDUCE,PRINT1,PRINT2,RAIN	CASPAR	18
COMMON	CASPAR	19
+ANLOW,TOUT,LESTEP,JSTEP,ANIC,TXGS,	CASPAR	20
+IPLT,ERROR1,TERM(13),TITLE(8),HUTPIM,SPGB,	CASPAR	21
+SPCC,SPCU,LINESL,KSTEP,NCHAN,MSTEP,	CASPAR	22
+IPRINT,IPRINT,IJUMP,QLEN(2),ANI,ANSORM,	CASPAR	23
+TOELAY,NLOOPS,RHOCCL(3),VULTOP(3),HLAD(3),PRSTM(50),	CASPAR	24
+PRESUR(50,3),IPAIR4,PD(3),KUNTIM,VLC,ETAU(4),	CASPAR	25
+KJLOCK,JJLOCK,MJLOCK,N12,N13,EXTKA,	CASPAR	26
+GJACK(3),VJACK(2),	CASPAR	27
+HMIN,N22,NIN,INPUT,N2,N4,	CASPAR	28
+N7,N8,KPRINT,POWSS,HMAX3,HMAXF,	CASPAR	29
+TRIPFW(3),TRIPPP(3),TRIPPF(3),TRIPOT(3),DELAYF	CASPAR	30
EQUIVALENCE(QMOL,TERM(4)),(TMOL,TERM(5)),(GMOL,TERM(6)),(PERMOL,T	CASPAR	31
ERM(7)),(SLJ3,DONE)	CASPAR	32
C****	CHNDAT	2
C****	CHNDAT	3
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA	CHNDAT	4
DIMENSION S(1),JORE(1),IS(1),EPTYM(15,20),OIL(8),XLIQ(11,20,2)	CHNDAT	5
INTEGER SMLP	CHNDAT	6
COMMON	CHNDAT	7
TCCOL(75,2),RLOG(22,20),UU(3),ULIQ(75),	CHNDAT	8
UVAP(75),DLX(75),	CHNDAT	9
+AFLW(75),US(4,55),HCAPS(4,55),USAVE1(4,55,2),DSAVE2(75,2),	CHNDAT	10
+USAVE3(15,23,2),USAVE4(75,2),POW(10,20),VOLUME(15,20),HCAPF(15,20)	CHNDAT	11
+TEMPER(15,20,2),TSINK(4,55,2),VOIDV(20),VPLEN,PPLEN(2),	CHNDAT	12
+RPLEN(2),G(7,2),RHU(75,2),VULG(2),	CHNDAT	13
+VULF(2),GT0,GT1,GT2,GT3,GAS3D(2,2),	CHNDAT	14
+GAS3U(2,2),FUEL3U(2),FUEL3D(2),FANN(75),P(75,2),RHUG(75,2),	CHNDAT	15
+RHOF(75,2),WF(75),WC(75),NOPINS,NAXIAL,NBLOR,	CHNDAT	16
+NTCORE,MTOP(75),MTYPE(15,20),IGAS(2),N3PLEN,	CHNDAT	17
+IFUEL(2),IBOIL(2),IGASU(2,2),IGASU(2,2),IFUEL2(2),IFUEL3(2),	CHNDAT	18
+IBOILD(2,2),IBOILU(2,2),NBOIL(2),NGAS(2),RLC,RLV,	CHNDAT	19
COMMON	CHNDAT	20
+CLC,CLV,CVC,CVV,BASICT(50),GUNJUC(50),	CHNDAT	21
+2),IPAIR1,CGAFA,CGAPB,CGAPC,CGAPJ,STLMP(50),	CHNDAT	22
+ST1(60,2),TEMP(30),ST2(30),DENSE(2),TIAUL,	CHNDAT	23
+TSMT,AHOLE,HAXF,HAXV,PSTAT,	CHNDAT	24
+RLIQ,RLQF,PTRY,PVOID,IFUELS,JFUELS,	CHNDAT	25
+TGAS,TSUPER,TFUELS,TMLTH,TMLTL,GAMMA,	CHNDAT	26
+PINTM(20,2),GAPK(20),GAPL,CLVC,DDPCJ(20,2),	CHNDAT	27

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+JASENA      ,DOPPW      ,RBASEC      ,SPC2(2)      ,HFJ5=C      ,OKNA(2,2), CHNDAT      26
+HALTAR(75)  ,PARTAN(20),LGAP          CHNDAT      27
COMMON      KFUELS      ,SPC3(13)      ,HI(75)      ,CLADKT      , CHNDAT      28
+RLV2        ,CLV2        ,CVV2        ,HAXL1        ,HAXL2        ,CGAPB2      , CHNDAT      29
+CLADK        ,CAPS(75)    ,TSTRUK(75,2),USTL(75),USTV(75),USAVE=0(75,2) CHNDAT      30
+,CLIQ(15)    ,CLIQT(15)   ,CVAP(15)   ,CVAFT(15)   ,H=LP(75)   ,SMELP(75), CHNDAT      31
+RHODNA(75,2),TW(11)      ,UOLU(75)    ,IDILL      ,JBILL      ,BJX(25,4), CHNDAT      32
+CGPERC(3,20),POROS(3,20),YEHYCH(11,20),SPC4      ,IOUT(206) CHNDAT      33
COMMON      IBAX,ITAX,LUP,LOWN,LUPG,LOWNG,DUP,DOWN,DUPD,DOWNG, CHNDAT      34
+ ALFA(20,2),RHOH(20,2),V(20,2),AREAH(20,2),AREAX(20,2),JHUP(20,2), CHNDAT      35
+ PIN(20,2),AAA(20,2),ENTPY(20,2),QMASS(20),QHEAT(20),DLIQIN(20), CHNDAT      36
+ GASIN(20),TBAR(20),VMELT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2, CHNDAT      37
+ NINPIN      CHNDAT      38
EQUIVALENCE (ULIQ(1),VFUELS),(ULIQ(75),GRIFIC),(UVAP(1),RHOSQF), CHNDAT      39
+(G(75,1),FQSOHR),(G(75,2),IZUP),(MTYPE(1,1),EPTM(1,1)),(DOPCDE(1, CHNDAT      40
+ 2),DOPPD),(DOPCDE(2,2),DOPDLL),(DOPCDE(3,2),JIL),(UVAP(75),GTOL) CHNDAT      41
+,JSTL,IZUP),(USTV,IZUP),(CGAPA,LAXIAL),(XLIQ,DSAVE3) CHNDAT      42
+,IS,CORE,IS,TCOOL),(SCOTT,IFUELS) CHNDAT      43
EQUIVALENCE (TW( 1),SKLW), (TW( 2),KHOKAT),(TW( 3),DETAIL) CHNDAT      44
EQUIVALENCE (TW( 4),PEEL), (TW( 5),PSTART),(TW( 6),TREAT) CHNDAT      45
EQUIVALENCE (TW( 7),FRACTN),(TW( 8),SPREAD),(TW( 9),VORIG) CHNDAT      46
EQUIVALENCE (TW(10),AREA), (TW(11),FRICT) CHNDAT      47
C**** CHNDAT      48
C**** BCUM      49
C**** BLANK COMMON SCRATCH PAD BCUM      50
INTEGER STATE BCUM      51
COMMON STATE(75) BCUM      52
+ LIST(75) ,TERM1(75) ,TERM2(75) ,TERM3(75) ,TERM4(75) ,TERM5(75), BCUM      53
+TERM6(75) ,TERM7(75) ,TERM8(75) ,A1(15,75) ,D1(15,75) ,A2(75) , BCUM      54
+Q2(75) ,QMDT(75) ,VMELT(20) ,VMUSH(20) ,GAP(20) ,VNUW(75) , BCUM      55
+ACCEL(75) ,SUB(2) ,FOHR(75) ,U(15,20) ,A3(75) ,Q3(75) , BCUM      56
+TERM10(75) ,TERM11(75),Q(75) ,SLOPER(75),DLL(2,75) ,BUMBUM(15) BCUM      57
+,BLOB(665) BCUM      58
C**** BCUM      59
C**** REACT      60
C**** REACT      61
C**** BEGIN REACT SUBROUTINE REACT      62
C**** COMPUTE INITIAL VALUES FOR EXPLICIT VARIABLES IN CALL LIST REACT      63
G1=VDJX(NEW) REACT      64
G2=UGLAPK(NEW) REACT      65
RHOG(43,2)=RHOG(44,2) REACT      66
C**** REACT      67
C**** BYPASS REACT SUBROUTINE FOR TREAT RUN REACT      68
IF (NTREAT.NE.C) GO TO 1020 REACT      69
+AM-AM=12130./(10.5-1-ALOG(PTRY/1.013E+6)) REACT      70
C**** REACT      71
C**** DETERMINE IF AXIAL AND RADIAL EXPANSION CONTRIBUTIONS ARE DESIRED REACT      72
M=TRIGGR+1. REACT      73
GO TO (220,200,120,120), M REACT      74
120 CONTINUE REACT      75
C**** REACT      76
C**** DO AXIAL EXPANSION CONTRIBUTION REACT      77
C**** READ IN STEADY STATE FUEL TEMPERATURES REACT      78
IF (ICHAH.EQ.1) REWIND 1 REACT      79
READ (1) ((T0(I,J),I=1,15),J=1,20) REACT      80
EMU=0.0 REACT      81
J=NTOP(NBCORE)+1 REACT      82
DO 140 I=1,J REACT      83
N=1+MOD(MTYPE(I,1)-1,2) REACT      84
140 EMU=MO+VOLUME(I,1)*DENSE(N) REACT      85
IF (FNUES.EQ.0.) FNUES=NTOP(NBCORE)+4 REACT      86
JU=J-(FNUES-1.) REACT      87
AVLU=0.0 REACT      88
SUM=0.0 REACT      89

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DO 180 I=NB CORE,NTCORE	REACT	46
K=I+1-NBCORE	REACT	47
AVE=J.0	REACT	48
DO 160 L=JJ,J	REACT	49
160 AVE=AVE+TEMPER(L,K,NEW)-TJ(L,K)	REACT	50
AVE=AVE*ALPHA/FNOULS	REACT	51
COLAPK(NEW)=COLAPK(NEW)+EMO*WF(I)*(SUM/(1.+AVEO)-(SUM+AVE)/(1.+AVE	REACT	52
+))*NOPINS	REACT	53
AVEO=AVE	REACT	54
180 SUM=SUM+AVE	REACT	55
COLAPK(NEW)=COLAPK(NEW)+EMO*WF(NTCORE+1)*SUM/(1.+AVE)*NOPINS	REACT	56
200 CONTINUE	REACT	57
IF (M.EQ.3) GO TO 220	REACT	58
C****	REACT	59
C**** CALCULATE EFFECT ON REACTIVITY OF RADIAL BOWING	REACT	60
DENOM=VRC1/H(NEW)+ZU1	REACT	61
AZ1=ZU1/DENOM	REACT	62
DZ1=VRC1/H(NEW)*TEE(1,ICHAN,IOLU)/DENOM	REACT	63
DENOM=VRC2/H(NEW)+ZU2+ZU1*(1.-AZ1)	REACT	64
AZ2=ZU2/DENOM	REACT	65
DZ2=(VRC2/H(NEW)*TEE(2,ICHAN,IOLU)+ZU1*DZ1)/DENOM	REACT	66
DENOM=VRC3/H(NEW)+ZU3+ZU2*(1.-AZ2)	REACT	67
AZ3=ZU3/DENOM	REACT	68
DZ3=(VRC3/H(NEW)*TEE(3,ICHAN,IOLU)+ZU2*DZ2)/DENOM	REACT	69
TEE(3,ICHAN,NEW)=AZ3*TCOOL(LPAD,NEW)+DZ3	REACT	70
TEE(2,ICHAN,NEW)=AZ2*TEE(3,ICHAN,NEW)+DZ2	REACT	71
TEE(1,ICHAN,NEW)=AZ1*TEE(2,ICHAN,NEW)+DZ1	REACT	72
ABLE=(TEE(1,ICHAN,NEW)+TEE(2,ICHAN,NEW)+TEE(3,ICHAN,NEW))/3.-TEA(1	REACT	73
+CHAN)	REACT	74
ACCU1=ACCU1+ABLE*NOPINS*PERDEG/ACCU2	REACT	75
220 CONTINUE	REACT	76
C**** COMPUTE DOPPLER EFFECT ON FUEL REACTIVITY	REACT	77
J=1	REACT	78
I=0	REACT	79
SODIUM=C.0	REACT	80
DO 360 IAXIAL=NB CORE,NTCORE	REACT	81
I=I+1	REACT	82
M=NTOP(IAXIAL)-4	REACT	83
SUM=C.0	REACT	84
PINTEM(I,NEW)=0.0	REACT	85
DO 260 IRAD=1,M	REACT	86
N=1+MOD(MTYPE(IRAD,I)-1,2)	REACT	87
ABLE=VOLUME(IRAD,I)*OLNSE(N)	REACT	88
IF (Y=HYEH(IRAD,I).EQ.1.) GO TO 240	REACT	89
PINTEM(I,NEW)=PINTEM(I,NEW)+(1.-YEHYEH(IRAD,I))*ABLE*RAHKAM	REACT	90
SUM=SJM+(1.-YEHYEH(IRAD,I))*ABLE	REACT	91
ABLE=ABLE*YEHYEH(IRAD,I)	REACT	92
240 CONTINUE	REACT	93
SUM=SJM+ABLE	REACT	94
PINTEM(I,NEW)=PINTEM(I,NEW)+ABLE*TEMPER(IRAD,I,NEW)	REACT	95
260 CONTINUE	REACT	96
PINTEM(I,NEW)=PINTEM(I,NEW)/SUM	REACT	97
L=STATE(IAXIAL)	REACT	98
IF (L.EQ.4) GO TO 280	REACT	99
IF (L.EQ.5) GO TO 300	REACT	100
IF (L.EQ.14) GO TO 320	REACT	101
ABLE=RHOD(IAXIAL,NEW)	REACT	102
GO TO 340	REACT	103
280 ABLE=RHODNA(IAXIAL,NEW)*FUELBU(NEW)	REACT	104
GO TO 340	REACT	105
300 ABLE=RHOD(IAXIAL,NEW)*(1.-FUELBU(NEW))	REACT	106
GO TO 340	REACT	107
320 ABLE=C.0	REACT	108
340 CHARLY=(DOPPD+ABLE*DOPUL)*ALOG(PINTEM(I,NEW)/DKNA(I,1))*DOPCOE(I,	REACT	109
+1)	REACT	110

BAKER=(DOPPO+PARTAN(I)*DOPDEL)*ALOG(PINTEM(1,NEW)/PINTEM(1,IOLD))*	REACT	111
+DOPCO(1,1)	REACT	112
DOPPK(NEW)=DOPPK(NEW)+BAKER	REACT	113
OKNA(1,2)=OKNA(1,2)+BAKER	REACT	114
SODIUM=SODIUM+OKNA(1,2)-CHARLY	REACT	115
PARTAN(I)=ABLE	REACT	116
300 CONTINUE	REACT	117
C****	REACT	118
C**** CALCULATE EFFECT OF SODIUM VOIDING ON REACTIVITY	REACT	119
SODIUM=SODIUM/NJPINS	REACT	120
J=1	REACT	121
DO 420 IAXIAL=2,NAXIAL	REACT	122
L=STATE(IAXIAL)	REACT	123
IF (L.EQ.4) GO TO 350	REACT	124
IF (L.EQ.5) GO TO 400	REACT	125
IF (L.EQ.14) GO TO 420	REACT	126
SODIUM=SODIUM+H0(IAXIAL)*RHOG(IAXIAL,NEW)	REACT	127
GO TO 420	REACT	128
380 SODIUM=SODIUM+H0(IAXIAL)*RHOGNA(IAXIAL,NEW)*FUELB0(NEW)	REACT	129
GO TO 420	REACT	130
400 SODIUM=SODIUM+H0(IAXIAL)*RHOG(IAXIAL,NEW)*(1.-FUELB0(NEW))	REACT	131
420 CONTINUE	REACT	132
VOIDK(NEW)=VOIDK(NEW)+(BASENA-SODIUM)*NJPINS	REACT	133
G1=(VOIDK(NEW)-G1)*BBO100	REACT	134
C****	REACT	135
C**** COMPUTE EFFECT ON REACTIVITY OF FUEL MOVEMENT	REACT	136
IF (VLIQ) 1020,1020,400	REACT	137
C**** REACTIVITY EFFECT OUTSIDE PIN	REACT	138
440 NC=NBORL+NFULLS-1	REACT	139
R13ORF=RLQF*(VLIQ-VOLF(NEW))/(TOTMEL+VVOID)	REACT	140
I1=IFJLLO(NEW)	REACT	141
I2=IFJLLO(NEW)	REACT	142
IF (I1.GE.I2) GO TO 520	REACT	143
WHLYT(I1)=TW(I1)**(IABS(I1-NC))	REACT	144
SUMLR=JELX(I1)*RHOF(I1,NEW)*(1.-FUELB0(NEW))*(AFLOW(I1)-RHOG(I1,1	REACT	145
)/RLQF)	REACT	146
MMUS=SUMLR*WHLYT(I1)	REACT	147
WHLYT(I2)=TW(I2)**(IABS(I2-NC))	REACT	148
JELX(I2)*FUELB0(NEW)*RHOF(I2,NEW)*(AFLOW(I2)-RHOG(I2,1)/RLQF)	REACT	149
MMUS=-MMUS+JELX(I2)*WHLYT(I2)	REACT	150
SUMR=SUMLR+MMUS	REACT	151
IF (I1+1.EQ.I2) GO TO 480	REACT	152
I3=I1+1	REACT	153
I4=I2-1	REACT	154
DO 460 I=I3,I4	REACT	155
JELX(I)*RHOF(I,NEW)*(AFLOW(I)-RHOG(I,1)/RLQF)	REACT	156
WHLYT(I)=TW(I)**(IABS(NC-I))	REACT	157
MMUS=-MMUS+JELX(I)*WHLYT(I)	REACT	158
460 SUMR=SUMR+MMUS	REACT	159
480 MMW=SUMMR/REMMUS	REACT	160
WHLYT(I1)=WHLYT(I1)*MMW*RHOF(I1,NEW)	REACT	161
WHLYT(I2)=WHLYT(I2)*MMW*RHOF(I2,NEW)	REACT	162
IF (I1+1.EQ.I2) GO TO 520	REACT	163
DO 500 I=I3,I4	REACT	164
WHLYT(I)=WHLYT(I)*MMW*RHOF(I,NEW)	REACT	165
520 K1=100	REACT	166
K1=100	REACT	167
DO 540 K=2,NAXIAL	REACT	168
IF (-HUG(K,1).EQ.0.0) GO TO 540	REACT	169
IF (K1.EQ.100) K1=K	REACT	170
K2=K	REACT	171
540 C N1,400	REACT	172
J2=MAX0(2,I2)	REACT	173
J1=MAX0(K1,I1)	REACT	174
RTOT=0.0	REACT	175

IF (J2.LT.J1) GO TO 840	REACT	170
IF (TW(3)) 620,620,660	REACT	177
560 IF (LINESL-(J2-J1+3)) 580,580,600	REACT	178
580 WRITE (NOUT,1040) LTAO(1),(TITLE(K9),K9=1,8),LTAO(2)	REACT	179
LINESL=57	REACT	180
600 LINESL=LINESL-(J2-J1+3)	REACT	181
WRITE (NOUT,1060) ICHAN	REACT	182
620 CONTINUE	REACT	183
DO 820 I921X=J1,J2	REACT	184
I=J2+J1-I921X	REACT	185
IF (I.LT.K1.OR.I.GT.K2) GO TO 640	REACT	186
BAKER=RHO(I,1)*NOPINS*WF(I)	REACT	187
CHARLY=RHO(I,1)*DELX(I)	REACT	188
GO TO 600	REACT	189
640 BAKER=0.0	REACT	190
CHARLY=0.0	REACT	191
660 IF (I.LT.I1.OR.I.GT.I2) GO TO 760	REACT	192
IF (STATE(I)-5) 680,700,720	REACT	193
680 ABLE=WHEYT(I)*(1.-FUELB0(NEW))	REACT	194
GO TO 740	REACT	195
700 ABLE=WHEYT(I)*FUELB0(NEW)	REACT	196
GO TO 740	REACT	197
720 ABLE=WHEYT(I)	REACT	198
740 EASY=ABLE*NOPINS*WF(I)*(AFLOW(I)-RHOG(I,1)/RLQF)	REACT	199
FOX=WHEYT(I)	REACT	200
GORGE=AMIN1(TW(7)*H(NEW),1.)	REACT	201
DELPT=GORGE*ABLE*(AFLOW(I)-RHOG(I,1)/RLQF)	REACT	202
DOG=AFLOW(I)-RHOG(I,1)/RLQF	REACT	203
IF (DOG-DELPT/RLQF.LE.0.0) DELPT=RLQF*(DOG-.01)	REACT	204
FANN(I)=FANN(I)*(DOG/(DOG-DELPT/RLQF))**2	REACT	205
RHOG(I,1)=RHOG(I,1)+DELPT	REACT	206
GO TO 780	REACT	207
760 EASY=0.0	REACT	208
FOX=0.0	REACT	209
780 COLAPK(NEW)=COLAPK(NEW)+EASY+BAKER	REACT	210
ABLE=EASY+BAKER	REACT	211
RTOT=RTOT+ABLE	REACT	212
IF (TW(3)) 820,820,800	REACT	213
800 ABLE=ABLE*83010	REACT	214
II=I-1	REACT	215
WRITE (NOUT,1080) II,FOX,ABLE,CHARLY	REACT	216
820 CONTINUE	REACT	217
RTOT=RTOT*83010	REACT	218
IF (TW(3).GT.0.0) WRITE (NOUT,1100) RTOT	REACT	219
3*** REACTIVITY EFFECT OF FUEL MOVEMENT INSIDE FIN	REACT	220
840 CONTINUE	REACT	221
I1=0	REACT	222
DO 860 I=1,NCOREN	REACT	223
IF (V4USH(I).EQ.0.0) GO TO 860	REACT	224
IF (I1.EQ.0) I1=I	REACT	225
I2=1	REACT	226
860 CONTINUE	REACT	227
IF (OIL(0).GT.0.0) I2=I2+1	REACT	228
IF (IBAX.NE.0) I1=IBAX	REACT	229
IF (ITAX.NE.0) I2=ITAX	REACT	230
DO 900 I=I1,I2	REACT	231
IF (VOLP(NEW).EQ.0.0) GO TO 880	REACT	232
IF (HJTP14.NE.1.0) GO TO 880	REACT	233
WHEYT(I)=RHOH(I,N=H)	REACT	234
GO TO 900	REACT	235
880 WHEYT(I)=FQSOH	REACT	236
900 CONTINUE	REACT	237
I=NCOREN+I2-1	REACT	238
IF (TW(3).EQ.0.0) GO TO 900	REACT	239
IF (LINESL-(I2-I1+3)) 920,920,940	REACT	240

920	WRITE (NOUT,1040) L1AD(1),(TITLE(K9),K9=1,8),ETA0(2)	REACT	241
	LINE5L=57	REACT	242
940	LINE5L=LINE5L-(I2-11+5)	REACT	243
	WRITE (NOUT,1120) ICHAN	REACT	244
960	TOTK=0.0	REACT	245
	DO 1000 I921X=I1,I2	REACT	246
	J=I2+I1-I921X	REACT	247
	ABLE=-WF(I)*NOPINS*(VMELT(J)-VMUSH(J)*WHEYT(J))	REACT	248
	IF (OIL(6).EQ.0.0.OR.J.NE.I2) GO TO 980	REACT	249
	ABLE=OIL(6)*WF(I)*NOPINS*WHEYT(J)/DELX(I)	REACT	250
980	CONTINUE	REACT	251
	TOTK=TOTK+ABLE	REACT	252
	IF (IFUEL(NEW).EQ.0) ABLE=0.	REACT	253
	CULAPK(NEW)=CULAPK(NEW)+ABLE	REACT	254
	IF (TW(3).EQ.0.0) GO TO 1000	REACT	255
	ABLE=ABLE*.830100	REACT	256
	WRITE (NOUT,1080) J,WHEYT(J),ABLE	REACT	257
1000	I=I-1	REACT	258
	IF (TW(3).EQ.0.0) GO TO 1020	REACT	259
	TOTK=TOTK*.830100	REACT	260
	RTOT=RTOT+TOTK	REACT	261
	WRITE (NOUT,1100) TOTK,RTOT	REACT	262
1020	CONTINUE	REACT	263
	G2=(CULAPK(NEW)-G2)*.830100	REACT	264
	RETURN	REACT	265
0		REACT	266
1040	FORMAT (1H1120XA10/2X8A10,40XA10)	REACT	267
1060	FORMAT (" OUTSIDE OF PIN IN CHANNEL"13,4X"NODE"2X"FUEL DENSITY (G/	REACT	268
	+CC)"3X"REACTIVITY (CENTS)"3X"GRAMS PLATED PER PIN")	REACT	269
1080	FORMAT (33X13,1PE14.3,13XUPF7.3,E21.4)	REACT	270
1100	FORMAT (57X"TOTAL"55.3)	REACT	271
1120	FORMAT (" INSIDE OF PIN IN CHANNEL"13,4X"NODE"2X"FUEL DENSITY (G/	REACT	272
	+CC)"3X"REACTIVITY (CENTS)")	REACT	273
	END	REACT	274

SUBROUTINE RUN	RUN	2
EXTERNAL JOLLY	RUN	3
COMMON /FRUG/IJCHAN,IJTYPE,LOOP9,LOOPS,LOOPJ,KOOP	RUN	4
COMMON/DUMDUM/SIZE(155)	RUN	5
COMMON/FIT/FIT(385)	RUN	6
COMMON/ZPLUTZ/A(860),ITAB	RUN	7
COMMON/IPRES</IPRES(20)	RUN	8
COMMON/NTABZZ/NTAB(49)	RUN	9
COMMON/TRGAP/DJUMP(20),RFO1(20),FMOL(5),ACON(5,3),CLAJOR,CLAJR,	RUN	10
*POISSN,ALFAF1,ALFAF2,ALFAC1,ALFAC2,YMODF1,YMODF2,YMODG1,YMODG2	RUN	11
*,NTGAP	RUN	12
DIMENSION TGAP(72)	RUN	13
EQUIVALENCE (TGAP,DJUMP)	RUN	14
COMMON/GOLLY/IUNIT,GELWIZ(20)	RUN	15
COMMON/ADD/CRUD,DPRINT,LMORE(20)	RUN	16
C****	CASPAR	2
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLOB(1)	CASPAR	4
REAL KINSRT,KWTHOR	CASPAR	5
LOGICAL PRINT,DONE,SCRAM	CASPAR	6
COMMON	CASPAR	7
*,IBLOCK ,H(2) ,T(2) ,HREAD ,ICHAN ,VOLUK(2) ,	CASPAR	8
*JUPPK(2) ,COLUPK(2) ,NEW ,ICLD ,NOUT ,TERKOR ,	CASPAR	9
*GERROR ,PEXIT(3) ,FERROR ,FRINT ,DELTIM ,PN(2) ,	CASPAR	10
*PBOIT(3,2) ,IACIV(20) ,FLOW(3,2) ,TOPT(3,2) ,TOPEN(3) ,WOLF(3) ,	CASPAR	11
*LOOP(20) ,IOUTL ,NTREAT ,IKINET ,TOUT ,HMAX ,	CASPAR	12
*TIMEIN(50) ,DKIN(50) ,TIMEOUT(50) ,IFAIR2 ,AV(2) ,	CASPAR	13
*IFAIR3 ,KOUNT ,KH(2) ,BBOIOL ,RHOSHZ ,NGROUP ,	CASPAR	14
*C(6,2) ,ALIFE ,ALPH(6) ,GAM(6) ,B(6) ,AL(6) ,	CASPAR	15
*AB ,SCRAM ,TSCRAM(2) ,PERIOD ,RSLUPE ,ERROR ,	CASPAR	16
*KINSRT(2) ,KWTHOR(2) ,REJUCE ,PRINT1 ,PRINT2 ,RMIN	CASPAR	17
COMMON	CASPAR	18
*ANLOW ,IQUIT ,LSTEP ,JSTEP ,ANIC ,TKGS ,	CASPAR	19
*IPLUT ,ERROR1 ,TERM(13) ,TITLE(8) ,HUTPLM ,SPCB ,	CASPAR	20
*SPCL ,SPCL ,LINECL ,KSTEP ,NCHAN ,MSTEP ,	CASPAR	21
*IPRINT ,MPRINT ,IDUMP ,QGLN(2) ,ANI ,ANSGRM ,	CASPAR	22
*DELAY ,NLOOPS ,RHOCCE(3) ,VOLTOP(3) ,HEAD(3) ,PRLSIM(50) ,	CASPAR	23
*PRESUR(50,3) ,IPAIR ,PU(3) ,RUNTIM ,VER ,ETAU(4) ,	CASPAR	24
*KBLOCK ,JBLOCK ,MBLOCK ,N12 ,N13 ,EXTRA ,	CASPAR	25
*GJACK(3) ,VJACK(2)	CASPAR	26
*HMIN ,N22 ,NIN ,INPUT ,N2 ,N+ ,	CASPAR	27
*N7 ,N8 ,KPRINT ,PCWSS ,HMAX3 ,HMAXF ,	CASPAR	28
*TRIPFW(3) ,TRIPFP(3) ,TRIPPF(3) ,TRIPOT(3) ,DELAYF	CASPAR	29
EQUIVALENCE (QMOL,TERM(4)) , (TMOL,TERM(5)) , (GMOL,TERM(6)) , (PERMOL,T	CASPAR	30
*CR4(7)) , (SLOB,DONE)	CASPAR	31
C****	CASPAR	32
C****	CHNDAT	2
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA	CHNDAT	3
DIMENSION S(1),CORE(1),IS(1),EFTYM(15,20),CIL(8),XLIQ(11,20,2)	CHNDAT	4
INTEGER SMELF	CHNDAT	5
COMMON	CHNDAT	6
*,TGOUL(75,2),RLOG(22,20),UU(3) ,ULIQ(75) ,	CHNDAT	7
*,UVAP(75) ,	CHNDAT	8
*,AFLUW(75) ,US(4,55) ,HCAPS(4,55),OSAVE1(4,55,2),OSAVE2(75,2)	CHNDAT	9
*,OSAVE3(15,20,2),OSAVE4(75,2),POW(16,20),VOLUME(15,20),HCAPF(15,20)	CHNDAT	10
*,TEMPER(15,20,2),TSINK(4,55,2),VOIDV(20) ,VFLEN ,PPLEN(2) ,	CHNDAT	11
*,RPLEN(2) ,GT(7,2) ,	CHNDAT	12
*,VOLF(2) ,GT0 ,GT1 ,GT2 ,GT3 ,GASBU(2,2) ,	CHNDAT	13
*,GASBU(2,2) ,FUELBO(2) ,FUELBUI(2) ,FANN(75) ,P(75,2) ,RHOG(75,2) ,	CHNDAT	14
*,RHOF(75,2) ,WF(75) ,WG(75) ,NUPINS ,NAXIAL ,NBORC ,	CHNDAT	15
*,NTCOR ,NTOP(75) ,NTYPE(15,20) ,	CHNDAT	16
*,IFUEL(2) ,IBOIL(2) ,IGASU(2,2) ,IGASU(2,2) ,IFUEL(2) ,IFUEL(2) ,	CHNDAT	17
*,IBOIL(2,2) ,IBOILU(2,2) ,NBOIL(2) ,NGAS(2) ,RLC ,RLV	CHNDAT	18
COMMON	CHNDAT	19
*,CLC ,CLV ,CVC ,CVV ,BASIS(55),CONDU(55) ,	CHNDAT	20
*,IPAIR1 ,CGAP ,CGAPB ,CGAPC ,CGAPJ ,STEMP(60) ,	CHNDAT	21
*,ST1(60,2) ,TSEMP(30) ,ST2(30) ,DENSEL ,DENSE(2) ,TMAGIC	CHNDAT	22


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+TSAT      ,AHOLE      ,HAXF      ,HAXL      ,HAXV      ,PSAT      ,CHNJAT      22
+RLIQ      ,RLQF      ,PTRY      ,PVOID      ,IFULLS      ,JFULLS      ,CHNJAT      23
+TGASS      ,TSUPER      ,TFUELS      ,TMELTH      ,TMELFL      ,GAMMA      ,CHNJAT      24
+PINT=4(20,2),GAPR(20) ,GAPRE      ,CLVC      ,DUPCODE(20,2), ,CHNJAT      25
+BASENA      ,JUPPW      ,KBASLC      ,SFC2(2)      ,HFUSEL      ,JKVA(2,2), ,CHNJAT      26
+WALTAR(75) ,PARTAN(20),IGAP      ,CHNJAT      27
COMMON      ,KFUELS      ,SPC3(13) ,HI(75) ,CLADKT      ,CHNJAT      28
+RLV2      ,CLV2      ,GVV2      ,HAXL1      ,HAXL2      ,GGAPB2      ,CHNJAT      29
+CLADK      ,CAPS(75) ,TSTRUK(7,2),USTL(75),USTV(75),USAVL6(7,2),CHNJAT      30
+,CLIQ(15) ,CLUT(15) ,CVAP(15) ,CVAPT(10) ,HELP(75) ,SMELP(75), ,CHNJAT      31
+RHUONA(75,2),TW(11) ,UOLO(75) ,IBILL      ,JBILL      ,BOX(25,+) ,CHNJAT      32
+CCPERC(3,20),PORDS(3,20),YCHYEH(11,20),SPC4 ,IOUT(200) ,CHNJAT      33
COMMON 1,AX,ITAX,LUP,LOWN,LUP0,LOWNC,DUP,DOWN,JUPC,DOWN0, ,CHNJAT      34
+ALFA(20,2),RHOH(20,2),V(20,2),AREAH(20,2),AREAX(20,2),UHJP(20,2), ,CHNJAT      35
+PIN(20,2),AAA(20,2),INTPY(2,2),UMASS(20),QHEAT(20),DLIQIN(20), ,CHNJAT      36
+GASIN(20),TBAR(20),VMELT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2, ,CHNJAT      37
+,INFIN      ,CHNJAT      38
EQUIVALENCE (ULIQ(1),VFUELS), (ULIQ(75),ORIFIG), (UVAP(1),RHOSQF), ,CHNJAT      39
+(G(75,1),FQSOHR), (G(7,2),IZOP), (MTYPE(1,1),EPTYM(1,1)), (JOPCOE(1, ,CHNJAT      40
+2),JUPPD), (JOPCOE(2,2),DOPDEL), (DOPCOE(3,2),OIL), (UVAP(75),GFLC) ,CHNJAT      41
+, (USTL,IZAF), (USTV,IZUF), (GGAPA,LAXIAL), (XLIQ,OSAVE3) ,CHNJAT      42
+, (S,CORE,IS,TCOOL), (SCOTT,IFUELS) ,CHNJAT      43
EQUIVALENCE (TW(1),SKELW), (TW(2),RHOAT), (TW(3),DETAIL) ,CHNJAT      44
EQUIVALENCE (TW(4),PEEL), (TW(5),PSTART), (TW(5),TREAT) ,CHNJAT      45
EQUIVALENCE (TW(7),FPACTN), (TW(8),SPREAD), (TW(9),JORIG) ,CHNJAT      46
EQUIVALENCE (TW(10),AREA), (TW(11),FRIGT) ,CHNJAT      47
C**** ,CHNJAT      48
C**** ,CHNJAT      49
C**** BLANK COMMON SCRATCH PAD ,CHNJAT      50
INTEGER STATE ,CHNJAT      51
COMMON STATE(75) ,CHNJAT      52
+LIST(75) ,TERM1(75) ,TERM2(75) ,TERM3(75) ,TERM4(75) ,TERM5(75) ,CHNJAT      53
+TERM6(75) ,TERM7(75) ,TERM8(75) ,A1(15,75) ,D1(15,75) ,A2(75) ,CHNJAT      54
+D2(75) ,OXDI(75) ,VMELT(20) ,VMUSH(20) ,GAP(20) ,VNOW(75) ,CHNJAT      55
+ACCEL(75) ,SUB(2) ,FOHR(75) ,U(15,20) ,A3(75) ,D3(75) ,CHNJAT      56
+TERM9(75) ,TERM11(75),Q(75) ,BLOPER(75),DEL(2,75) ,BUMBUM(15) ,CHNJAT      57
+,BLOS(600) ,CHNJAT      58
C**** ,CHNJAT      59
DIMENSION JIMMY(300),EXPO(6),CG(6),JP(20) ,CHNJAT      60
LOGICAL STOP ,CHNJAT      61
EQUIVALENCE (NPHYS,IJUMP), (JIMMY,STATE(13)), (EXPO,STATE) ,CHNJAT      62
DATA IJCHAN/0/,IJTYPE/0/ ,CHNJAT      63
C**** ,CHNJAT      64
C**** ,CHNJAT      65
C**** BEGIN RUN SUBROUTINE ,CHNJAT      66
CALL SECOND (USL0) ,CHNJAT      67
HMIN=0.0005 ,CHNJAT      68
TOUT=AINTE((T(NEW)+.0001)/PRINT1)*PRINT1+PRINT1 ,CHNJAT      69
KFRINT=2000 ,CHNJAT      70
NTGAP=72 ,CHNJAT      71
C**** SET WRAFOR WRITL COUNTERS FOR EACH CHANNEL ,CHNJAT      72
DO 120 I=1,NCHAN ,CHNJAT      73
JP(I)=0 ,CHNJAT      74
IF (.NOT.IV(I).NE.0) TOUT=AINTE((T(NEW)+.0001)/PRINT2)*PRINT2+PRINT2 ,CHNJAT      75
NTAB(I)=1 ,CHNJAT      76
NTAB(I+20)=1 ,CHNJAT      77
120 CONTINUE ,CHNJAT      78
SAVL=HMAX ,CHNJAT      79
C**** ,CHNJAT      80
C**** ,CHNJAT      81
C**** BEGIN MAIN LOOP FOR NEXT TIME STEP ,CHNJAT      82
C**** INTERCHANGE ROLLS OF DRUM UNITS IN TO OUT ,CHNJAT      83
I=IIN ,CHNJAT      84
IIN=IOUTL ,CHNJAT      85
IOUTL=I ,CHNJAT      86
INFI=1 ,CHNJAT      87

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IF (IIN.EQ.13) INFIT=36	RUN	48
IOUTFT=1	RUN	49
IF (IOUTL.EQ.13) IOUTFT=36	RUN	50
C**** GET ELAPSED TIME	RUN	51
CALL SECOND (TSEC)	RUN	52
SLOC=TSEC-OSLOC	RUN	53
OSLOC=TSEC	RUN	54
C**** SAVE // COMMON AND /DUMDUM/ COMMON IN CASE OF TROUBLE	RUN	55
DO 160 I=1,MBLOCK	RUN	56
160 BLOB(I)=SLOC(I)	RUN	57
DO 180 I=1,155	RUN	58
180 BUMBUM(I)=SIZZLE(I)	RUN	59
DELTIM=PRINT2	RUN	60
C**** SAVE DRUM POINTERS FOR WRAPUP IN CASE OF TROUBLE	RUN	61
DO 200 I=41,49	RUN	62
NTAB(I)=0	RUN	63
200 CONTINUE	RUN	64
IFIZZ1=20*(NEW-1)	RUN	65
IFIZZ2=20*(IOLD-1)	RUN	66
DO 220 I=1,NCHAN	RUN	67
NTAB(I+IFIZZ2)=NTAB(I+IFIZZ1)	RUN	68
220 CONTINUE	RUN	69
C****	RUN	70
C**** DETERMINE MODE OF POWER CALCULATION	RUN	71
IF (IKINET-3) 400,240,240	RUN	72
C**** COMPUTE POWER FROM POWER VERSUS TIME INPUT TABLE	RUN	73
240 I=NEW	RUN	74
NEW=IOLD	RUN	75
IOLD=I	RUN	76
MODE=3	RUN	77
260 ABLE=TOUT-T(IOLD)	RUN	78
IF (ABLE.GT.HMAX) ABLE=HMAX	RUN	79
IF (ABLE.LT.HMIN) ABLE=AIMT(ABLE/HMIN+1.E-6)*HMIN	RUN	80
IF (ABLE.LT.HMIN) ABLE=HMIN	RUN	81
T(NEW)=T(IOLD)+ABLE	RUN	82
H(NEW)=ABLE	RUN	83
TT=T(NEW)	RUN	84
TIT=T(NEW)	RUN	85
CALL CURVE (ABLE,T(NEW),TIMLIN,UKIN,IPAIR2,I19)	RUN	86
IF (I19.GT.0) GO TO 280	RUN	87
AN(NEW)=ANI*ABLE	RUN	88
GO TO 1320	RUN	89
C****	RUN	90
C****	RUN	91
C**** WRITE OUT ERROR MESSAGE	RUN	92
280 WRITE (NOUT,232) IT,TIMEIN(IPAIR2)	RUN	93
C****	RUN	94
C**** TROUBLE HAS OCCURRED, DUMP COMMON, DRUM FILES, ETC.	RUN	95
300 IF (NPHYS.EQ.0) RETURN	RUN	96
REWIND 44	RUN	97
DO 320 I=1,MBLOCK	RUN	98
320 SLOB(I)=BLOB(I)	RUN	99
DO 340 I=1,155	RUN	100
340 SIZZLE(I)=BUMBUM(I)	RUN	101
CALL REWIND (FIT(INFIT))	RUN	102
CALL REWIND (FIT(IOUTFT))	RUN	103
WRITE (N4) (BLOB(I),I=1,MBLOCK)	RUN	104
IF (ETAU(4).EQ.0) GO TO 380	RUN	105
WRITE (N4) SIZZLE	RUN	106
IF (ETAU(4).EQ.1.) GO TO 380	RUN	107
REWIND 1	RUN	108
DO 360 I=1,NCHAN	RUN	109
READ (1) (JIMMY(J),J=1,300)	RUN	110
WRITE (N4) (JIMMY(J),J=1,300)	RUN	111
360 CONTINUE	RUN	112

380	CONTINUE	RUN	113
	CALL REWIND (FIT)	RUN	114
	IWA=1	RUN	115
	DO 420 ICHAN=1,NCHAN	RUN	116
	IUNIT=10	RUN	117
	IF (INFIT.NE.1) IUNIT=11	RUN	118
	CALL IN (INFIT,3,IWA,18BLOCK,ISTAT)	RUN	119
	IF (ITRGAP.EQ.1) CALL IN (INFIT,TGAP,IWA,NTGAP,1STAT)	RUN	120
	CVV=VOLF(NEW)*DLX(NBCORE)*RLIF*NDPINS	RUN	121
	WRITE (N4) (S(I),I=1,18BLOCK)	RUN	122
	IF (ITRGAP.EQ.1) WRITE (N4) TGAP	RUN	123
	DO 400 I=1,17	RUN	124
400	BLOB(I)=0.0	RUN	125
	WRITE (N4) (BLOB(I),I=1,17)	RUN	126
420	CONTINUE	RUN	127
	ENDFILE N4	RUN	128
	REWIND N4	RUN	129
	CALL REWIND (FIT(INFIT))	RUN	130
	WRITE (NOUT,2340)	RUN	131
	RETURN	RUN	132
C***	WRITE ERROR MESSAGES	RUN	133
440	WRITE (NOUT,2360) TIT,TIMOUT(IPAIR3)	RUN	134
	GO TO 300	RUN	135
C***		RUN	136
C***	SET METHOD TO CALCULATE PRECURSOR DENSITIES	RUN	137
460	IF (IKINLT-1) 480,500,520	RUN	138
480	MODE=1	RUN	139
	KOUNT KOUNT+1	RUN	140
	GO TO 650	RUN	141
500	MODE=2	RUN	142
	KOUNT=0	RUN	143
	GO TO 780	RUN	144
520	IF (KOUNT) 540,540,600	RUN	145
540	IF (RH(NEW)*300100-RHDSWZ) 560,560,560	RUN	146
C***	REACTIVITY REQUIRES SWITCH FROM ZERO TO FINITE LIFE	RUN	147
560	DO 580 I=1,NGROUP	RUN	148
	G(I,NEW)=G(I,NEW)/ALIFE	RUN	149
	ALPH(I)=W-GAM(I)	RUN	150
580	G(I,IOLD)=G(I,IOLD)/ALIFE	RUN	151
	I=JSTEP+1	RUN	152
	WRITE (NOUT,2380) I	RUN	153
	LINCOL=LINCOL+1	RUN	154
	GO TO 480	RUN	155
600	IF (KOUNT-5) 480,480,520	RUN	156
620	IF (RH(NEW)*300100-RHDSWZ) 640,640,480	RUN	157
C***	CAN SWITCH FROM FINITE TO ZERO LIFE	RUN	158
640	DO 660 I=1,NGROUP	RUN	159
	G(I,NEW)=G(I,NEW)*ALIFE	RUN	160
660	G(I,IOLD)=G(I,IOLD)*ALIFE	RUN	161
	I=JSTEP+1	RUN	162
	WRITE (NOUT,2400) I	RUN	163
	LINCOL=LINCOL+1	RUN	164
	GO TO 560	RUN	165
C***	UPDATE PRECURSOR DENSITIES BY FINITE LIFE MODEL	RUN	166
680	SUM=0.0	RUN	167
	DO 740 I=1,NGROUP	RUN	168
	IF (IUNL) GO TO 740	RUN	169
	ABLE=ALPH(I)*H(NEW)	RUN	170
	IF (ABS(ABLE)-.4) 720,700,700	RUN	171
700	G(I,NEW)=EXP(GAM(I)*H(NEW))*(G(I,IOLD)+AN(NEW)*B(I)*((EXP(ABLE)-1.	RUN	172
	+)/ALPH(I)-H(NEW))/ALIFE)	RUN	173
	GO TO 740	RUN	174
720	G(I,NEW)=EXP(GAM(I)*H(NEW))*(G(I,IOLD)+AN(NEW)*B(I)*H(NEW)*ABLE*(1	RUN	175
	+ABLE*(1./3.+ABLE*(1./12.+ABLE/60.)))/(2.*ALIFE))	RUN	176
740	SUM=SUM+AL(I)*G(I,NEW)	RUN	177
C***	CALCULATE REACTOR PERIOD	RUN	178
	WD=H	RUN	179

W=(RH(NEW)-33)/ALIFE+SUM/AN(NEW)	RUN	180
DO 700 I=1,NGROUP	RUN	181
GAM(I)=3(I)*AN(NEW)/(ALIFE*C(I,NEW))-AL(I)	RUN	182
700 ALPH(I)=W-GAM(I)	RUN	183
GO TO 820	RUN	184
C**** CALCULATE PRECURSOR DENSITIES BY ZERO LIFE MODEL	RUN	185
780 DO 800 I=1,NGROUP	RUN	186
800 GAM(I)=3(I)*AN(NEW)/C(I,NEW)-AL(I)	RUN	187
C**** CALCULATE REACTOR PERIOD	RUN	188
W0=W	RUN	189
W=ALOG(AN(NEW)/AN(IOLD))/H(NEW)	RUN	190
C****	RUN	191
C**** CHECK FOR SCRAM CONDITIONS	RUN	192
820 IF (SCRAM) GO TO 980	RUN	193
DELL=1000.	RUN	194
IF (AN(NEW).LT.ANSCRM) GO TO 840	RUN	195
DELL=ALOG(ANSCRM/AN(NEW))/W	RUN	196
WRITE (NOUT,2420) AN(NEW),ANSCRM	RUN	197
840 IF (W.LT.PERIOD) GO TO 860	RUN	198
DELL=AMIN1(DELL,H(NEW)*(PERIOD-W0)/(W-W0))	RUN	199
WRITE (NOUT,2440) W,PERIOD	RUN	200
860 DO 940 I=1,NLOOPS	RUN	201
IF (FLOW(I,NEW).GT.TRIPFW(I)) GO TO 880	RUN	202
DELL=AMIN1(DELL,H(NEW)*(TRIPFW(I)-FLOW(I,IOLD))/(FLOW(I,NEW)-FLOW(I,IOLD)))	RUN	203
WRITE (NOUT,2460) FLOW(I,NEW),TRIPFW(I),I	RUN	204
880 IF (AN(NEW)/PBOTT(I,NEW).LT.TRIPFP(I)) GO TO 900	RUN	205
RN=AN(NEW)/PBOTT(I,NEW)	RUN	206
RO=AN(IOLD)/PBOTT(I,IOLD)	RUN	207
DELL=AMIN1(DELL,H(NEW)*(TRIPFP(I)-RO)/(RN-RO))	RUN	208
WRITE (NOUT,2480) AN(NEW),PBOTT(I,NEW),TRIPFP(I),I	RUN	209
900 IF (AN(NEW)/FLOW(I,NEW).LT.TRIPFF(I)) GO TO 920	RUN	210
RN=AN(NEW)/FLOW(I,NEW)	RUN	211
RO=AN(IOLD)/FLOW(I,IOLD)	RUN	212
DELL=AMIN1(DELL,H(NEW)*(TRIPFF(I)-RO)/(RN-RO))	RUN	213
WRITE (NOUT,2500) AN(NEW),FLOW(I,NEW),TRIPFF(I),I	RUN	214
920 IF (TOPT(I,NEW).LT.TRIPOT(I)) GO TO 940	RUN	215
DELL=AMIN1(DELL,H(NEW)*(TRIPOT(I)-TOPT(I,IOLD))/(TOPT(I,NEW)-TOPT(I,IOLD)))	RUN	216
WRITE (NOUT,2520) TOPT(I,NEW),TRIPOT(I),I	RUN	217
940 CONTINUE	RUN	218
IF (DELL.GT.900.) GO TO 980	RUN	219
SCRAM=.TRUE.	RUN	220
TSCRAM(NEW)=H(NEW)-DELL-TOELAY	RUN	221
ABLE=T(IOLD)+DELL*DELAYF	RUN	222
PRESTM(2)=ABLE	RUN	223
DO 960 I=3,IPAIR4	RUN	224
960 PRESTM(I)=PRESTM(1)+ABLE	RUN	225
C****	RUN	226
C**** START THE NEXT TIME STEP	RUN	227
C**** SWITCH ROLLS OF ARRAYS FROM OLD TO NEW	RUN	228
980 I=NEW	RUN	229
NEW=IOLD	RUN	230
IOLD=I	RUN	231
DONE=.FALSE.	RUN	232
ILK=0	RUN	233
H(NEW)=H(IOLD)	RUN	234
C**** DETERMINE DURATION OF STEP	RUN	235
1000 JINGO=1	RUN	236
DKD=0.0	RUN	237
BAKER=TOUT-T(IOLD)	RUN	238
HMAX=AMIN1(HMAX,BAKER,H(NEW))	RUN	239
ILK=ILK+1	RUN	240
IF (ILK.LT.10) GO TO 1020	RUN	241
WRITE (NOUT,2540)	RUN	242
GO TO 300	RUN	243

1020	IF (HH.GT.HMIN) HH=AINI(HH/HMIN+1.E-6)*HMIN	RUN	246
	TT=T(IOLD)+HH	RUN	247
0****		RUN	248
0****	DETERMINE TIME STEP FROM ERROR CRITERIA USING ZERO OR FINITE	RUN	249
0****	LIFE NEUTRON MODEL	RUN	250
	CALL CURVE (OKU,TT,TIMLIN,JKIN,IPAIR2,I19)	RUN	251
	IF (I19.GT.0) GO TO 250	RUN	252
	IF (.NOT.SCRAM) GO TO 1040	RUN	253
	TTT=TSORAM(IOLD)+HH	RUN	254
	IF (TTT.LT.0.0) GO TO 1040	RUN	255
	CALL CURVE (OKU,TTT,TIMOUT,OKJUI,IPAIR3,I19)	RUN	256
	IF (I19.GT.0) GO TO 440	RUN	257
1040	RHO=DOPEK(IOLD)+VOIEK(IOLD)+GJLAFK(IOLD)+OKU-OKU+RSLOPE*HH	RUN	258
	IF (MODE-1) 1060,1060,1140	RUN	259
0****	FINITE LIFE MODEL TIME STEP EVALUATION	RUN	260
1100	SUM=0.0	RUN	261
	DO 1120 I=1,NGROUP	RUN	262
	ABLE=HH*ALPH(I)	RUN	263
	IF (ABS(ABLE)-.01) 1060,1100,1100	RUN	264
1140	SUM=SUM+AL(I)*C(I,IOLD)*.5*HH*ABLE*(-1.+ABLE*(1./3.-ABLE/12.))	RUN	265
	GO TO 1120	RUN	266
1100	SUM=SUM+AL(I)*C(I,IOLD)*((1.-EXP(-ABLE))/ALPH(I)-HH)	RUN	267
1120	CONTINUE	RUN	268
	ANZ=EXP(W*HH)*(AN(IOLD)*(1+.5*HH*(RHO-RH(IOLD))/ALIFE)+SUM)	RUN	269
	IF (ABS(AN(IOLD)*EXP(W*HH)-ANZ)/ANZ.LT.ERROR) GO TO 1220	RUN	270
	GO TO 1240	RUN	271
****	ZERO LIFE MODEL TIME STEP EVALUATION	RUN	272
1140	SUM=0.0	RUN	273
	DO 1160 I=1,NGROUP	RUN	274
	EXPO(I)=EXP(GAM(I)*HH)	RUN	275
1160	SUM=SUM+AL(I)*C(I,IOLD)*EXPO(I)	RUN	276
	SIM=SUM/(BB-RHO)	RUN	277
	SIM1=0.0	RUN	278
	DO 1180 I=1,NGROUP	RUN	279
	CH=C(I,IOLD)*EXPO(I)	RUN	280
	CH(I)=CH+HH*8(I)*.5*(SUM-EXPO(I)*AN(IOLD))	RUN	281
	IF (ABS(CH-CH(I))/CH.GT.ERROR) GO TO 1240	RUN	282
1180	SIM1=SIM1+CH(I)*AL(I)	RUN	283
	ANZ=SIM1/(BB-RHO)	RUN	284
	IF (ABS(ANZ-SUM)/ANZ.GT.ERROR) GO TO 1240	RUN	285
	GO 1200 I=1,NGROUP	RUN	286
1200	C(I,NEW)=C(I)	RUN	287
1220	R(NEW)=RHO	RUN	288
	H(NEW)=HH	RUN	289
	AN(NEW)=ANZ	RUN	290
	KINEXI(NEW)=OKU	RUN	291
	KATHOX(NEW)=OKU	RUN	292
	TSORAM(NEW)=TTT	RUN	293
	T(NEW)=TT	RUN	294
	IF (ABS(H(NEW)-JAKER).LT.1.E-6.OR.ABS(H(NEW)-HMAX).LT.1.E-6) GO TO	RUN	295
1240		RUN	296
	JINGO=2	RUN	297
	HH=MIN1(HMAX,BACKL,AMAX1(HH/REDUCE,HH+HMIN))	RUN	298
	GO TO 1020	RUN	299
1260	GO TO (1260,1280), JINGO	RUN	300
1280	HH=HH*REDUCE	RUN	301
	GO TO 1020	RUN	302
1280	CONTINUE	RUN	303
0****	ENDING LITAT(H) UP TO AT LEAST ZERO POINT FIVE MSEC FOR FINITE	RUN	304
0****	LIFE AND ZERO LIFE NEUTRON MODELS	RUN	305
	IF (H(NEW).GE.HMIN) GO TO 1320	RUN	306
	UNLE=IRJUL	RUN	307
1300	CALL INASH (1,MODE,W), RETURNS (300,1320)	RUN	308
1320	CONTINUE	RUN	309
0****	CALCULATE INLET PLENUM PRESSURE	RUN	310
	CALL PRESS, RETURNS (300)	RUN	311

C****	DETERMINE IF THIS TIME STEP IS TO BE SAVED FOR PRINTOUT	RUN	312
	PRINT=.FALSE.	RUN	313
	IF (T(NEW)-TOUT+.0001) 1400,1340,1340	RUN	314
1340	PRINT=.TRUE.	RUN	315
	DO 1360 I=1,NCHAN	RUN	316
	IF (IACTIV(I).NE.0) GO TO 1380	RUN	317
1360	CONTINUE	RUN	318
	DPRINT=PRINT1+AINT((TOUT+.0001)/PRINT1)*PRINT1-TOUT	RUN	319
	HMAX=SAVE	RUN	320
	GO TO 1400	RUN	321
1380	DPRINT=PRINT2+AINT((TOUT+.0001)/PRINT2)*PRINT2-TOUT	RUN	322
1400	CONTINUE	RUN	323
C****		RUN	324
C****		RUN	325
C****	COMPUTE TIME (IQUIT) REQUIRED TO DO PLOTS, WRAPUP, PLUS TIME TO	RUN	326
C****	DO THE NEXT STEP AND STOP IF NOT ENOUGH TIME LEFT	RUN	327
	IQUIT=2.*JEC+2*NCHAN*LABS(NPHYS)	RUN	328
	J=ITAB*IPLOT	RUN	329
	DO 1420 I=1,NCHAN	RUN	330
	IF (IACTIV(I).GT.0) JP(I)=1	RUN	331
	IA00=NTAB(I+IFIZZ1)	RUN	332
	IQUIT=IQUIT+2+IA00/4	RUN	333
	IF (IPLOT.EQ.0) GO TO 1420	RUN	334
	IF (J.GT.0) J=J+IA00	RUN	335
	IF (JP(I).EQ.0) GO TO 1420	RUN	336
	IQUIT=IQUIT+(79+IA00)/20	RUN	337
	IF (IPRESR(I).EQ.0) GO TO 1420	RUN	338
	IQUIT=IQUIT+IA00	RUN	339
1420	CONTINUE	RUN	340
	IQUIT=IQUIT+(IPRINT+9)/5+(IPRINT+5)/3+J/20	RUN	341
	CALL SECOND (ABLE)	RUN	342
	I41=1	RUN	343
	IF (ABLE+IQUIT.GE.RUNTIM) GO TO 1480	RUN	344
C****		RUN	345
C****	CHECK ON OTHER REASONS FOR STOPPING	RUN	346
	STOP=.FALSE.	RUN	347
	I41=2	RUN	348
	IF (RM(NEW).LT.RMIN) GO TO 1480	RUN	349
	I41=3	RUN	350
	IF (RM(NEW).LT.RNLOW) GO TO 1480	RUN	351
	I41=4	RUN	352
	IF (T(NEW).GE.TOUTT) GO TO 1480	RUN	353
	I41=5	RUN	354
	IF (JSTEP+1.GE.LSTEP) GO TO 1480	RUN	355
	ABLE=2.*H(RNEW)/HMAXF	RUN	356
	I41=6	RUN	357
	DO 1460 I=1,NCHAN	RUN	358
	IF (IACTIV(I).LE.0) GO TO 1440	RUN	359
	IF (NTAB(I+IFIZZ2)+ABLE.GE.MPRINT) GO TO 1480	RUN	360
	GO TO 1460	RUN	361
1440	IF (NTAB(I+IFIZZ2)+ABLE.MPRINT) GO TO 1480	RUN	362
1460	CONTINUE	RUN	363
	GO TO 1620	RUN	364
1480	PRINT=.TRUE.	RUN	365
	STOP=.TRUE.	RUN	366
	GO TO (1510,1520,1540,1560,1580,1600), I41	RUN	367
1500	WRITE (NOUT,2500)	RUN	368
	GO TO 1620	RUN	369
1520	WRITE (NOUT,2580)	RUN	370
	GO TO 1620	RUN	371
1540	WRITE (NOUT,2600)	RUN	372

GO TO 1620	RUN	373
1560 WRITE (NOUT,2620)	RUN	374
GO TO 1620	RUN	375
1580 WRITE (NOUT,2640)	RUN	376
GO TO 1620	RUN	377
1600 WRITE (NOUT,2660)	RUN	378
C****	RUN	379
C**** INITIALIZE VARIOUS ACCUMULATORS	RUN	380
1620 CONTINUE	RUN	381
DO 1640 I=1,3	RUN	382
WOLF(I)=0.0	RUN	383
FLOW(I,NEW)=0.0	RUN	384
1640 TOPEN(I)=0.0	RUN	385
PN(NEW)=AN(NEW)+ANIC	RUN	386
QOPPK(NEW)=QOPPK(IOLD)	RUN	387
VOIDX(NEW)=0.0	RUN	388
SIZZLE(153)=0.0	RUN	389
CLLAK(NEW)=0.0	RUN	390
QGEN(NEW)=QGEN(IOLD)+.5*(PN(NEW)+PN(IOLD))*H(NEW)	RUN	391
TERM(4)=0.0	RUN	392
TERM(5)=0.0	RUN	393
TERM(6)=0.0	RUN	394
TERM(7)=0.0	RUN	395
II=1	RUN	396
ICHAN=0	RUN	397
IFLCH=0	RUN	398
GRUSOM=10000.	RUN	399
C****	RUN	400
C**** GET DATA INTO "CORE" AND DO THE TRANSIENT CALCULATION	RUN	401
C**** FOR THE NEXT CHANNEL	RUN	402
1660 ICHAN=ICHAN+1	RUN	403
IWA=IBLOCK*(ICHAN-1)+1	RUN	404
IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP	RUN	405
IUNIT=10	RUN	406
IF (IFIT.NE.1) IUNIT=11	RUN	407
CALL IN (INFIT,3,IWA,IBLOCK,ISTAT)	RUN	408
IF (ITRGAP.EQ.1) CALL IN (INFIT,TGAP,IWA,NTGAP,ISTAT)	RUN	409
CALL REMND (FIT(INFIT))	RUN	410
C**** TEMPORARILY SET LIQUID FUEL DENSITY UNTIL "READ" HAS "CHNDAT"	RUN	411
RLQF=9.6	RUN	412
CALL ORBIT, RETURNS (1680)	RUN	413
C****	RUN	414
C**** IF ORBIT OR OTHER ROUTINES CUT BACK TIME STEP, ADJUST DRUM	RUN	415
C**** POINTERS, ETC.	RUN	416
C**** OTHERWISE, WHILE "CORE" TO DRUM	RUN	417
IF (HREDO) 1900,1900,1700	RUN	418
1680 IF (ICHAN.GT.0) GO TO 300	RUN	419
IF (IITYPE.EQ.0) GO TO 300	RUN	420
ICHAN=ICHAN	RUN	421
GO TO 1700	RUN	422
1700 GRUSOM=49441(GRUSOM,HREDO)	RUN	423
C**** RESET FAILURE FLAG ON THE CHANNELS WHICH FAIL THIS TIME STEP LATER	RUN	424
IF (GRUSOM.NE.HREDO) IFLCH=ICHAN	RUN	425
IF (IFLCH.EQ.0) GO TO 1720	RUN	426
IF (IACTIV(IFLCH).EQ.-10) IACTIV(IFLCH)=-5	RUN	427
IF (IACTIV(IFLCH).EQ.-5) IACTIV(IFLCH)=0	RUN	428
1720 IFLCH=ICHAN	RUN	429
IF (ICHAN.LT.NCHAN) GO TO 1900	RUN	430
1740 HREDO=GRUSOM	RUN	431
TOUT=T(IOLD)+HREDO	RUN	432
IF (NPHYS.LT.0) SEC=10000.	RUN	433
1760 CONTINUE	RUN	434
C**** BACKUP DRUM POINTERS AND COUNTERS	RUN	435
DO 1740 I=1,49	RUN	436
1740 IWA(I)=0	RUN	437
DO 1600 I=1,NCHAN	RUN	438

1800	NTAB(I+IFIZZ2)=NTAB(I+IFIZZ1)	RUN	439
	DO 1820 I=1,3	RUN	440
	TOPEN(I)=BLOB(I+70)	RUN	441
	WOLF(I)=BLOB(I+73)	RUN	442
	DO 1820 J=1,2	RUN	443
	PJOIT(I,J)=BLOB(29+I+3*J)	RUN	444
1820	FLOW(I,J)=BLOB(1+3*J+J*J)	RUN	445
	IF (IJCHAN) 1840,1860,1880	RUN	446
1840	IJCHAN=0	RUN	447
	LINESL=0	RUN	448
	GO TO 1620	RUN	449
1860	CONTINUE	RUN	450
	IF (DONE) GO TO 1300	RUN	451
	GO TO (1000,1000,200), MODE	RUN	452
1880	ICHAN=IJCHAN-1	RUN	453
	CALL PRESS, RETURNS (300)	RUN	454
	GO TO 1600	RUN	455
1900	CONTINUE	RUN	456
	IF (IJCHAN.EQ.0) GO TO 1920	RUN	457
	IJCHAN=-1	RUN	458
	IJTYPE=0	RUN	459
	GO TO 1760	RUN	460
1920	CONTINUE	RUN	461
	IF (ICHAN.EQ.NCHAN.AND.GRUSOM.LT.9999.) GO TO 1740	RUN	462
	IWA=IBLOCK*(ICHAN-1)+1	RUN	463
	IF (ITRGAP.EQ.1) IWA=IWA+(ICHAN-1)*NTGAP	RUN	464
	IF (NPHYS.GE.0.OR.IACTIV(ICHAN).NE.1.OR.STOP) GO TO 1940	RUN	465
	GRUSOM=H(NEW)	RUN	466
	GO TO 1740	RUN	467
C****	WRITE "CORE" TO DRUM	RUN	468
1940	IUNIT=10	RUN	469
	IF (IOUTFT.NE.1) IUNIT=11	RUN	470
	CALL OUT (IOUTFT,S,IWA,IBLOCK,ISTAT)	RUN	471
	IF (ITRGAP.EQ.1) CALL OUT (IOUTFT,TGAP,IWA,NTGAP,ISTAT)	RUN	472
	CALL REWIND (FIT(IOUTFT))	RUN	473
	II=MOD(II,2)+1	RUN	474
	IF (ICHAN.LT.NCHAN) GO TO 1600	RUN	475
C****		RUN	476
C****	ALL CHANNELS COMPLETED, CALCULATE NEW VALUES OF REACTIVITY AND	RUN	477
C****	ITS SLOPE WITH RESPECT TO TIME	RUN	478
	COLAPK(NEW)=COLAPK(NEW)+AMIN1(SIZZLE(154),AMAX1(SIZZLE(155),SIZZLE	RUN	479
	+(153)))	RUN	480
	RSLOPE=(DOPPK(NEW)-JOPPK(IOLD)+VOIDK(NEW)-VOIDK(IOLD)+COLAPK(NEW)-	RUN	481
	+COLAPK(IOLD))/H(NEW)	RUN	482
	RH(NEW)=DOPPK(NEW)+VOIDK(NEW)+COLAPK(NEW)+KINSRT(NEW)+KHTADR(NEW)	RUN	483
C****		RUN	484
C****	COMPUTE POWER AND CHECK ERROR CRITERIA FOR TIME STEP LIMITATION	RUN	485
	IF (.NOT.DONE) GO TO 1960	RUN	486
	CALL IWASH (2,MODE,H), RETURNS (300,1760)	RUN	487
	GO TO 2120	RUN	488
1960	CONTINUE	RUN	489
	IF (MODE=2) 1980,2000,2120	RUN	490
C****	DO BY FINITE LIFE NEUTRON MODEL	RUN	491
1980	SUM=0.0	RUN	492
	DO 2040 I=1,NGROUP	RUN	493
	ABLE=H(NEW)*ALPH(I)	RUN	494
	IF (ABS(ABLE)-.01) 2000,2020,2020	RUN	495
2000	SUM=SUM+AL(I)*C(I,IOLD)*.5*H(NEW)*ABLE*(-1.+ABLE*(1./3.+ABLE/12.))	RUN	496
	GO TO 2040	RUN	497
2020	SUM=SUM+AL(I)*C(I,IOLD)*((1.-EXP(-ABLE))/ALPH(I)-H(NEW))	RUN	498
2040	CONTINUE	RUN	499
	ABLE=EXP(H(NEW))*((AN(IOLD)*(1.+5*H(NEW)*(RH(NEW)-RH(IOLD))/ALIF	RUN	500
	+E)+SUM)	RUN	501
	IF (ABS(AN(NEW)-ABLE)/ABLE.LT.ERROR1) GO TO 2120	RUN	502
	GO TO 1760	RUN	503

C****	DO BY ZERO LIFE NEUTRON MODEL	RUN	004
2060	SUM=0.0	RUN	005
	DO 2090 I=1,NGROUP	RUN	006
	EXPO(I)=EXP(GAM(I)*H(NEW))	RUN	007
2080	SUM=SUM+AL(I)*C(I,IOLD)*EXPO(I)	RUN	008
	SUM=SUM/(38-RH(NEW))	RUN	009
	SUM1=0.0	RUN	010
	DO 2100 I=1,NGROUP	RUN	011
	CC(I)=C(I,IOLD)*EXPO(I)*H(NEW)*B(I)*.5*(SUM+EXPO(I)*AN(IOLD))	RUN	012
	IF (ABS(C(I,NEW)-CC(I))/C(I,NEW).GT.ERROR1) GO TO 1760	RUN	013
	SUM1=SUM1+CC(I)*AL(I)	RUN	014
2100	CONTINUE	RUN	015
	IF (ABS(SUM1/(38-RH(NEW))-AN(NEW))/AN(NEW).GT.ERROR1) GO TO 1760	RUN	016
C****		RUN	017
C****	DO PRINTOUT IF TIME	RUN	018
2120	JSTEP=JSTEP+1	RUN	019
	IF (JSTEP.NE.MSTEP.AND..NOT.PRINT) GO TO 140	RUN	020
	TERM(1)=T(NEW)	RUN	021
	TERM(2)=F(NEW)	RUN	022
	TERM(3)=QGEN(NEW)	RUN	023
	IF (GMOL.NE.0.) TMOL=TMOL/GMOL	RUN	024
	IF (GMOL.EQ.0.) TMOL=0.	RUN	025
	PRMOL=GMOL/TK05	RUN	026
	GMOL=1.-3*GMOL	RUN	027
	TMOL=TMOL*1.-b	RUN	028
	TERM(8)=880100*RH(NEW)	RUN	029
	TERM(9)=880100*KINS-T(NEW)	RUN	030
	TERM(10)=880100*KINTHDX(NEW)	RUN	031
	TERM(11)=880100*DOPPK(NEW)	RUN	032
	TERM(12)=880100*COLLCK(NEW)	RUN	033
	TERM(13)=880100*VOIK(NEW)	RUN	034
	IF (LINESL-2) 2140,2160,2160	RUN	035
2140	CALL HLUJ (6)	RUN	036
	KKLT (NGUT,2080)	RUN	037
	LINESL=57	RUN	038
2160	WRITE (NGUT,2700) JSTEP,TERM(I),I=1,13	RUN	039
	LINESL=LINESL-1	RUN	040
	IF (JSTEP.EQ.MSTEP) MSTEP=MSTEP+KSTEP	RUN	041
	IF (.NOT.PRINT) GO TO 140	RUN	042
C****	PUT INFORMATION FOR PRINTOUT BY WRAPUP ON DRUM	RUN	043
	IF (GELWIZ(9).GT.0.0) GO TO 2180	RUN	044
	IWA=13*IPRINT+1	RUN	045
	IUNIT=9	RUN	046
	CALL PUT (FIT(1+1),TERM,130,IWA,0,0,JOLLY)	RUN	047
	IF (GELWIZ(9).GT.0.0) GO TO 2180	RUN	048
	CALL READU (FIT(141))	RUN	049
2180	CONTINUE	RUN	050
	IPRINT=IPRINT+1	RUN	051
	IOUT=IOUT+IPRINT	RUN	052
C****		RUN	053
C****	IF TIME TO STOP AND RESTART DUMP REQUESTED SAVE FILLS ON RESTART	RUN	054
C****	UNIT (SET EQUAL TO DUMP FILE ON CYBER 74)	RUN	055
	IF (.NOT.STOP) GO TO 140	RUN	056
	IF (NPHYS.EQ.0) GO TO 2300	RUN	057
	IF (NTRAIL.GE.0) GO TO 2200	RUN	058
	TOUT=.1	RUN	059
	T(NEW)=0.0	RUN	060
	T(IOLD)=0.0	RUN	061
	TERM(1)=0.0	RUN	062
2200	CONTINUE	RUN	063
	KWIND(N)=	RUN	064
	KKLT (N+1) (SLOJ(1),I-1.43L000)	RUN	065
	IF (LTAJ(4).EQ.0) GO TO 2240	RUN	066
	WRITE (44) SIZZLE	RUN	067
	IF (LTAJ(4).EQ.1.) GO TO 2240	RUN	068

REWIND 1	RUN	009
DO 2220 I=1,NCHAN	RUN	010
READ (1) (JIMMY(J),J=1,300)	RUN	011
WRITE (N4) (JIMMY(J),J=1,300)	RUN	012
2220 CONTINUE	RUN	013
2240 CONTINUE	RUN	014
DO 2260 ICHAN=1,NCHAN	RUN	015
IWA=IBLOCK*(ICCHAN-1)+1	RUN	016
IF (ITRGAP.EQ.1) IWA=IWA+(ICCHAN-1)*NTGAP	RUN	017
IUNIT=10	RUN	018
IF (IOUFT.NE.1) IUNIT=11	RUN	019
CALL IN (IOUFT,S,IWA,IBLOCK,ISTAT)	RUN	020
IF (ITRGAP.EQ.1) CALL IN (INFT,IGAP,IWA,NTGAP,ISTAT)	RUN	021
CALL REWIND (FIT(IOUFT))	RUN	022
CVV=VOLF(NEW)*DELX(NBCORE)*RLQF*NGPINS	RUN	023
WRITE (N4) (S(I),I=1,IBLOCK)	RUN	024
J=20*(NEW-1)+ICCHAN	RUN	025
J=NTAB(J)	RUN	026
IWA=1+10*MPRINT*(ICCHAN-1)+13*(J-1)	RUN	027
IUNIT=0	RUN	028
CALL GET (FIT(351),BLOB,IWA,0,0,100,JOLLY)	RUN	029
IF (GE=WI7(6).GT.0.0) GO TO 2300	RUN	030
CALL REWIND (FIT(351))	RUN	031
IUNIT=7	RUN	032
IWA=1+4*MPRINT*(ICCHAN-1)+4*(J-1)	RUN	033
CALL GET (FIT(71),BLOB(11),IWA,0,0,40,JOLLY)	RUN	034
IF (GE=WI7(7).GT.0.0) GO TO 2300	RUN	035
CALL REWIND (FIT(71))	RUN	036
J=IPRINT	RUN	037
IUNIT=8	RUN	038
IWA=1+3*MPRINT*(ICCHAN-1)+3*(J-1)	RUN	039
CALL GET (FIT(106),BLOB(11),IWA,0,0,30,JOLLY)	RUN	040
IF (GE=WI7(8).GT.0.0) GO TO 2300	RUN	041
CALL REWIND (FIT(106))	RUN	042
IF (INTRAT.GE.0) GO TO 2260	RUN	043
BLOB(1)=0.0	RUN	044
BLOB(11)=0.0	RUN	045
BLOB(12)=0.0	RUN	046
2260 CONTINUE	RUN	047
IF (ITRGAP.EQ.1) WRITE (N4) IGAP	RUN	048
WRITE (N4) (BLOB(I),I=1,17)	RUN	049
2280 CONTINUE	RUN	050
ENDFILE N4	RUN	051
REWIND N4	RUN	052
CALL REWIND (FIT(IOUFT))	RUN	053
WRITE (NOUT,2340)	RUN	054
C****	RUN	055
C**** NORMAL EXIT	RUN	056
2300 CONTINUE	RUN	057
RETURN	RUN	058
2320 FORMAT (14H1CURRENT TIME ,1PE10.4,22H EXCEEDS MAXIMUM TIME ,E10.4,	RUN	059
+20H IN TIME- K INSERT LIBRARY)	RUN	060
2340 FORMAT (12H FILLS SAV D)	RUN	061
2360 FORMAT (14H1CURRENT TIME 1PE10.4,22H EXCEEDS MAXIMUM TIME E10.4,29	RUN	062
+H IN TIME - K WITHDRAW LIBRARY)	RUN	063
2380 FORMAT (32H SWITCHED TO FINITE LIFE AT STEP,14)	RUN	064
2400 FORMAT (30H SWITCHED TO ZERO LIFE AT STEP,14)	RUN	065
2420 FORMAT (1" SCRAM BECAUSE OF POWER LEVEL, POWER="E11.4," TRIP="E11.4	RUN	066
+)	RUN	067
2440 FORMAT (1" SCRAM BECAUSE OF FLUX, PERIOD="E11.4," TRIP="E11.4)	RUN	068
2460 FORMAT (1" SCRAM BECAUSE OF LOW FLOW, FLOW="E11.4," TRIP="E11.4,"	RUN	069
+00P"12)	RUN	070
2480 FORMAT (1" SCRAM BECAUSE OF POWER/PRESSURE, POWER="E11.4," PRESSURE	RUN	071
+="E11.4," TRIP="E11.4," LOOP"12)	RUN	072
2500 FORMAT (1" SCRAM BECAUSE OF POWER/FLOW, POWER="E11.4," FLOW="E11.4,	RUN	073

+P=11.4," LOOP"12)	RUN	035
2520 FORMAT (" SCRAM BECAUSE OF OUTLET TEMPERATURE, OUTLET=11.4," TRI	RUN	036
+P=11.4," LOOP"12)	RUN	037
2540 FORMAT (" DOES NOT CONVERGE IN RUN TIME STEP CONTROL LOOP")	RUN	038
2560 FORMAT (" STOPPING BECAUSE OF RUNTIM OR IDUMP=-1")	RUN	039
2580 FORMAT (" STOPPING BECAUSE OF RMIN")	RUN	040
2600 FORMAT (" STOPPING BECAUSE OF ANLOW")	RUN	041
2620 FORMAT (" STOPPING BECAUSE OF TQUIT")	RUN	042
2640 FORMAT (" STOPPING BECAUSE OF LSTEP")	RUN	043
2660 FORMAT (" STOPPING BECAUSE OF DISK FILES FULL")	RUN	044
2680 FORMAT (80X,21HREACTIVITIES IN CENTS/8X,4HTIME,4X,5HPOWER,3X,46HGE	RUN	045
+NEPATED MOLTEN MOLTEN MOLTEN MOLTEN/130H STEP SEC	RUN	046
+ MW 1H SEC MW SEC DEG. K KGS. PERCENT NLT P	RUN	047
+ROGRAMED SCRAM DOPPLER COLLAPSE VOID)	RUN	048
2700 FORMAT (15,F8.4,5=10.4,F8.3,6F10.3)	RUN	049
END	RUN	050

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SUBROUTINE MOMENT, RETURNS (IERROR,IBACK)
INTEGER SWITCH
LOGICAL LOGIC
COMMON /FRUG/IJCHAN,IJTYPE,LOUPE,LOOPS,LOOPJ,KOOF
COMMON/BANG/A150,A151,A152,A153,A154
+ ,KAXIAL,A155
DIMENSION XY(2)
+ ,COLL(3)
EQUIVALENCE (N14,EXTRA),(N15,VJACK),(N18,GJACK),(BOX(14,4),PFUEL)
COMMON/ADJ/LOUPE,YRTE,JZAP,IBITTY,IBATTY,KUP,KDOWN,PGOOD,
+ LOOP4,LOGIC,MUOP
+ ,VGAS,VVOID,VLIQ,TOTMEL,LOOPT,LOOP5,LOOPF,NCOREN
+ ,CAPS,A93,A92
C****
C**** COMMON BLOCK "CASPAR" CONTAINING THE CASE PARAMETERS
DIMENSION SLOB(1)
REAL KINSRT,KWTHOR
LOGICAL PRINT,DONE,SCRAM
COMMON
+ ,IBLOCK,H(2),T(2),HREDO,ICHAN,VJACK(2),CASPAR
+ ,DOPPK(2),COLAPK(2),NEW,IOLD,NOUT,TEKROK,CASPAR
+ ,GERROR,PEXIT(3),PERKOR,FRINT,DELTIM,PV(2),CASPAR
+ ,PJOTT(3,2),IACTIV(20),FLOW(3,2),TOPT(3,2),TOPEV(3),WOLF(3),CASPAR
+ ,LOOP(20),IOUTL,NTRAT,IKINET,TOUT,HMAX,CASPAR
+ ,TIMEIN(50),DKIN(50),TIMOUT(50),DKOUT(50),IPAIR2,AV(2),CASPAR
+ ,IPAIR3,KOUNT,KH(2),BBU100,KHUSWZ,NKROUP,CASPAR
+ ,C(6,2),ALIFE,ALPH(6),GAM(6),B(6),AL(5),CASPAR
+ ,J3,SCRAM,TSCRAM(2),PERIOD,KLOPE,ERROR,CASPAR
+ ,KINSRT(2),KWTHOR(2),KEJUCE,PRINT1,PRINT2,RYAN,CASPAR
COMMON
+ ,A'LOW,TQUIT,LESTEP,JSTEP,ANIC,TGGS,CASPAR
+ ,IFLOT,ERROR1,TXRM(13),TITLE(8),HOTPIM,SPCB,CASPAR
+ ,SFCU,SFCU,LINESL,KSTEP,NCHAN,MSTLP,CASPAR
+ ,IPRINT,MPRINT,LUUMF,QUEEN(2),ANI,AVSORM,CASPAR
+ ,TDELAY,NLOOPS,KHODEE(3),VOLTOP(3),HEAD(3),PRSTIM(50),CASPAR
+ ,PRELUX(50,3),IPAIR4,PU(3),KUNTIM,VER,ETAD(4),CASPAR
+ ,KBLOCK,JBLOCK,MBLOCK,N12,N13,EXTRA,CASPAR
+ ,GJACK(3),VJACK(2),ITRGAF,CASPAR
+ ,HMIN,N22,NIN,INPUT,N2,N+,CASPAR
+ ,N7,N8,KPRINT,POWSS,HMAXJ,HMAXF,CASPAR
+ ,TRIPFW(3),TRIPFP(3),TRIPPF(3),TRIPOT(3),DDELAY,CASPAR
EQUIVALENCE (QMOL,TERM(4)),(T4OL,TERM(5)),(GMOL,TERM(6)),(PERMOL,i
+ TERM(7)),(SLOB,DONE)
C****
C****
C**** COMMON BLOCK "CHNDAT" CONTAINING THE CHANNEL DATA
DIMENSION S(1),CORE(1),IS(1),PYTM(15,20),OIL(8),XLIQ(11,20,2)
INTEGER SMLP
COMMON
+ ,TGOOL(75,2),RLOG(22,20),OU(3),ULIQ(75),CHNDAT
+ ,UVAP(75),ULX(75),CHNDAT
+ ,AFLOW(75),JS(4,55),HCAPS(4,25),OSAVE1(4,55,2),OSAVE2(1,2),CHNDAT
+ ,OSAVE3(15,20,2),OSAVE4(75,2),POW(16,20),VOLUME(15,20),HCAPF(1,20),CHNDAT
+ ,TEMPER(1,20,2),TSINK(4,55,2),VOIDV(20),VPLEN,FPLEN(2),CHNDAT
+ ,RPLEN(2),G(75,2),KHOU(75,2),VJLG(2),CHNDAT
+ ,VOLF(2),GTG,GT1,GT2,GT3,GASBU(2,2),CHNDAT
+ ,GASBU(2,2),FUELB(2),FUELB(2),FANN(75),P(75,2),KHOU(75,2),CHNDAT
+ ,KHOF(75,2),WF(75),WG(75),NOPINS,NAXIAL,N3CORE,CHNDAT
+ ,VTCORE,VTOP(75),VTYPE(15,20),IGAS(2),N3PLEN,CHNDAT
+ ,IFULL(2),IBOIL(2),IGASU(2,2),IGASU(2,2),IFUELO(2),IFUELU(2),CHNDAT
+ ,IBOILD(2,2),IBOILU(2,2),HBOIL(2),NGAS(2),KLV,KLV,CHNDAT
COMMON
+ ,CLV,CLV,CLV,CLV,BASIGT(50),CONJUL(1,2),CHNDAT
+ ,2),IPAIK1,CGAPA,CGAPB,CGAPC,CGAPJ,STEMP(60),CHNDAT
+ ,J1(50,2),TSAMP(30),J2(30),UNSEEE,OLNSL(2),TMAIC,CHNDAT

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*TSAT      ,AHJEL      ,MAXF      ,HAXL      ,MAXV      ,PSAT      ,CHNUAT      22
*RLIG      ,RLQF      ,FTKY      ,FVOID      ,IFUELS      ,JFUELS      ,CHNUAT      23
*TGASS      ,TSUPER      ,TFUELS      ,TMELTH      ,TMELTL      ,GAMMA      ,CHNUAT      24
*PINTEM(20,2),GAFR(20),GAPRL      ,CLVC      ,DOFDOE(2,2),      ,CHNUAT      25
*BASENA      ,DOPPW      ,BASEC      ,SFC2(2)      ,HFUSLE      ,UKVA(20,2),      ,CHNUAT      26
*WALTAR(75),PARTAN(20),IGAP      ,CHNUAT      27
*COMMON      ,KFUELS      ,SPC3(13)      ,HI(75)      ,CLADKT      ,CHNUAT      28
*CLV2      ,CLV2      ,GVV2      ,HAXL1      ,HAXL2      ,CGAPB2      ,CHNUAT      29
*CLADK      ,CAPS(75)      ,TSTRUK(7,2),USTL(75),USTV(75),USAVL6(75,2)      ,CHNUAT      30
*CLIQ(15)      ,CLIT(15)      ,GVAP(15)      ,GVAPT(10)      ,HELP(75)      ,SMELP(75)      ,CHNUAT      31
*CHOUNA(75,2),TW(11)      ,UOLU(75)      ,IBILL      ,JBILL      ,BDX(25,4)      ,CHNUAT      32
*CLERG(3,20),PORUS(3,2),YLHYLH(11,20),SPC4      ,IOUT(200)      ,CHNUAT      33
*COMMON      ,ISAX,ITAX,LUP,LOWN,LUPG,LOWNG,DUP,DOWN,JUPC,DOWNJ,      ,CHNUAT      34
*      ,ALFA(20,4),RHUM(25,4),V(20,2),AREAH(20,2),AREAX(20,2),JHJP(20,2),      ,CHNUAT      35
*      ,IN(20,2),AAA(20,2),MTPY(20,2),QMASS(20),QHEAT(20),ULIQIN(20),      ,CHNUAT      36
*      ,AS1(20),TBAR(20),VCLT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2,      ,CHNUAT      37
*      ,CHNUAT      38
*      ,JIVALNCE(ULIQ(1),VFUELS),(ULIQ(75),ORIFLO),(UVAP(1),RHOSUF),      ,CHNUAT      39
*      ,G(75,1),FQOHR),(G(75,2),IZUP),(MTYPE(1,1),EPTYM(1,1)),(JUPCUE(1,      ,CHNUAT      40
*      ,J(7),JUPP),(JOFUOL(2,2),DUPUL),(DOPUOL(3,2),OIL),(UVAP(75),GTOL)      ,CHNUAT      41
*      ,(USTIL,IZAP),(USTV,IZUP),(CGAPA,LAXIAL),(XLLO,DJAVC3)      ,CHNUAT      42
*      ,(J,CORE,J,TCOUL),(SOFT,IFUELS)      ,CHNUAT      43
*      ,JIVALNCE(TW(1),SKW),(TW(2),RHORAT),(TW(3),DZTIL)      ,CHNUAT      44
*      ,JIVALNCE(TW(4),PELL),(TW(5),PSTART),(TW(6),TREAT)      ,CHNUAT      45
*      ,JIVALNCE(TW(7),FRACTN),(TW(8),SPREAD),(TW(9),VORIG)      ,CHNUAT      46
*      ,JIVALNCE(TW(10),ALFA),(TW(11),FRICT)      ,CHNUAT      47
C****      ,CHNUAT      48
****      ,BOUM      2
****      ,BOUM      3
****      ,BOUM      4
****      ,BOUM      5
****      ,TERM1(75),TERM2(75),TERM3(75),TERM4(75),TERM5(75),      ,BOUM      6
****      ,TERM6(75),TERM7(75),TERM8(75),A1(15,75),D1(15,75),A2(75)      ,BOUM      7
****      ,J(75),JDOT(75),VMCLT(20),VMUSH(20),GAP(20),VMOW(75)      ,BOUM      8
****      ,MOUL(75),SUB(2),FOHR(75),U(15,20),A3(75),U3(75)      ,BOUM      9
****      ,TERM11(75),Q(75),BLOPER(75),DEL(2,75),BUMBUM(15)      ,BOUM      10
****      ,J(75)      ,BOUM      11
****      ,BOUM      12
****      ,JAS CONSTANT FOR FUSION GAS X=RC/AM=8.3167E+7/120.2      ,MOMENT      18
****      ,JATA X/10000301E+0/      ,MOMENT      19
****      ,JHAX PPMMLT=RS      ,MOMENT      20
****      ,JATA PLAMM/230./,SLAMM/3794./,LPLF/.55/,CPSP/.22/,CPNM/1.3/      ,MOMENT      21
****      ,JATA SSJGK/0./      ,MOMENT      22
C      ,MOMENT      23
C****      ,MOMENT      24
C      ,MOMENT      25
C      ,MOMENT      26
C****      ,MOMENT      27
****      ,IF (IUTYPE.GT.1) WRITE (NOUT,318C)      ,MOMENT      28
****      ,LOOPS=J      ,MOMENT      29
****      ,IF (LOPP.NE.0) GO TO 140      ,MOMENT      30
****      ,DO 120 I=1,3      ,MOMENT      31
****      ,120 J=LL(1)=0.0      ,MOMENT      32
****      ,140 J=H=0      ,MOMENT      33
****      ,IF (LOPP.EQ.0) GO TO 100      ,MOMENT      34
****      ,M10=+.33*M10+.07*B104      ,MOMENT      35
****      ,J10=4104      ,MOMENT      36
****      ,100 IF (LOPP.LT.5) M10=4104      ,MOMENT      37
****      ,JLOPP=0.0      ,MOMENT      38
****      ,JATCH=1      ,MOMENT      39
****      ,JX(1,3,4)=MAXIAL      ,MOMENT      40
****      ,LOOPS=J      ,MOMENT      41
****      ,JZAP=IFUELO(VLW)      ,MOMENT      42
C****      ,MOMENT      43
****      ,TOTPLT=0.0      ,MOMENT      44

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BUBPLT=0.1	MOMENT	45
IF (VOLF(NEW).EQ.0.0) GO TO 200	MOMENT	46
DO 180 I=2,NAXIAL	MOMENT	47
IF (RHOG(I,1).EQ.0.0) GO TO 180	MOMENT	48
ABLL=RHOG(I,1)*DELX(I)	MOMENT	49
TOTPLT=TOTPLT+ABLL/DELX(NBCORE)	MOMENT	50
BUBPLT=BUBPLT+ABLL	MOMENT	51
180 CONTINUE	MOMENT	52
200 RHOG(45,2)=BUBPLT	MOMENT	53
RHOG(45,2)=TOTPLT	MOMENT	54
IF (LOGIC) GO TO 300	MOMENT	55
C**** END SECTION 1 *****	MOMENT	56
C	MOMENT	57
C**** START SECTION 2 *****	MOMENT	58
C**** FUEL INTERACTION RATE (SPREAD) UPDATED TO LAST TIME STEP	MOMENT	59
BOX(1BILL,1)=T(NEW)	MOMENT	60
BOX(1BILL,3)=0.	MOMENT	61
IF (A92.NE.0.) BOX(1BILL,3)=A93/A92	MOMENT	62
GMF=0.0	MOMENT	63
TF=0.0	MOMENT	64
I=1BILL	MOMENT	65
SPOKT=T(NEW)	MOMENT	66
JIM=I*(5)+.001	MOMENT	67
JIMM1=JIM-1	MOMENT	68
WHIP=1./JIM	MOMENT	69
DO 280 JL=1,JIMM1	MOMENT	70
SPOKT=SPOKT-.001	MOMENT	71
IF (SPOKT.GT.1(10LD)) GO TO 280	MOMENT	72
JL 280 K=1,25	MOMENT	73
IF (1.EQ.0) I=2	MOMENT	74
IF (BOX(I,1).EQ.0.0) GO TO 280	MOMENT	75
IF (SPOKT-BOX(I,1)) 280,220,240	MOMENT	76
220 A172=WHIP*BOX(I,2)	MOMENT	77
G*F=G*F+A172	MOMENT	78
TF=TF+A172*BOX(I,3)	MOMENT	79
GO TO 280	MOMENT	80
240 J=MOJ(I,25)+1	MOMENT	81
ABLL=(SPOKT-BOX(I,1))/(BOX(J,1)-BOX(I,1))	MOMENT	82
A172=WHIP*(BOX(I,2)+ABLL*(BOX(J,2)-BOX(I,2)))	MOMENT	83
G*F=G*F+A172	MOMENT	84
TF=TF+A172*(BOX(I,3)+ABLL*(BOX(J,3)-BOX(I,3)))	MOMENT	85
GO TO 280	MOMENT	86
280 I=I-1	MOMENT	87
290 CONTINUE	MOMENT	88
C**** END SECTION 2 *****	MOMENT	89
C	MOMENT	90
C**** START SECTION 3 *****	MOMENT	91
300 CONTINUE	MOMENT	92
IF (INTRAT.LE.0) GO TO 380	MOMENT	93
C**** LOOP FOR INFLOW/OUTFLOW TREAT MODEL COUPLING	MOMENT	94
LOOPJ=0	MOMENT	95
GO TO 360	MOMENT	96
C**** JUDGE THE TREAT PLENUM CALCULATION TO SPEED CONVERGENCE	MOMENT	97
3 IF (LOOPJ.GT.10) GO TO 280	MOMENT	98
IF (LOOPJ.LT.3) GO TO 340	MOMENT	99
G(1,NEW)=.33*GJACK1+.67*G(1,NEW)	MOMENT	100
G(NAXIAL,NEW)=.33*GJACK2+.67*G(NAXIAL,NEW)	MOMENT	101
340 GJACK1=G(1,NEW)	MOMENT	102
GJACK2=G(NAXIAL,NEW)	MOMENT	103
ABLL=VUPINS*(G(NAXIAL,NEW)*AFLOW(NAXIAL)-G(1,NEW)*AFLOW(1))	MOMENT	104
GJACK(NEW)=ABLL/TW(10)	MOMENT	105
CHARLY=(VJACK(10LD)+H(NEW)*ABLL/RHOONA(NAXIAL,NEW))/TW(10)	MOMENT	106
CHARLY=A1AX1(0.,CHARLY)	MOMENT	107
EXTRA=(GJACK(NEW)-GJACK(10LD))*CHARLY/H(NEW)+GJACK(NEW)*ABS(GJACK	MOMENT	108

	*NEW))*CHARLY*TW(11)/RHOONA(NAXIAL,NEW)+980.6*CHARLY*RHOONA(NAXIAL,	MOMENT	109
	*NEW)	MOMENT	110
360	LOOPI=LOOPI+1	MOMENT	111
	CALL PRESS, RETURNS (2800)	MOMENT	112
	PJACK=PBOTT(1,NEW)	MOMENT	113
	P(1,NEW)=PBOTT(1,NEW)	MOMENT	114
380	CONTINUE	MOMENT	115
C****	END SECTION 3 *****	MOMENT	116
C		MOMENT	117
C****	START SECTION 4 *****	MOMENT	118
C****	FURTHER INITIALIZATION	MOMENT	119
	LOOPI=0	MOMENT	120
	LOOPI=0	MOMENT	121
	SLOPP=0.	MOMENT	122
	SLOPP=100.	MOMENT	123
	WANT=0.0	MOMENT	124
	MOJP=0	MOMENT	125
	LOOPI=0	MOMENT	126
	LOOPY=0	MOMENT	127
	CVC=0.0	MOMENT	128
	PHIGH=2.2+Y	MOMENT	129
	PLOW=0.0	MOMENT	130
	IMAXIAL=2	MOMENT	131
	GIMIKO=0.0	MOMENT	132
	IF (LOGIC) GO TO 40.	MOMENT	133
C****	INITIALIZE FOR NODE BETWEEN CORE AND INSTRUMENT TREE	MOMENT	134
	IF (IFUELU(NEW).GE.LAXIAL) GO TO 400	MOMENT	135
	WANT=100.	MOMENT	136
	PSUCK=1.013E+6*XP(10.51-12130./TCOOL(LAXIAL,NEW))	MOMENT	137
	PSUCK=.5*(PSUCK+CGAPB)	MOMENT	138
400	CONTINUE	MOMENT	139
		MOMENT	140
C	* * * BACK TO HERE IF FUEL SQUIRTING NODE OR STARTING OVER	MOMENT	141
C		MOMENT	142
420	L=IFUELU(IOLD)	MOMENT	143
	M=LOOPI(ICHAN)	MOMENT	144
C****	PARTIAL PARALLEL CHANNEL COUPLING	MOMENT	145
	IF (NTRLEAF.EQ.0) P(1,NEW)=PBOTT(M,NEW)-SLOA(M)/H(NEW)*NOPINS*AFLOW	MOMENT	146
	+(1)*(S(1,NEW)-G(1,IOLD))+PJ(M)*(FLOW(M,IOLD)**2-(FLOW(M,IOLD)-G(1	MOMENT	147
	*,IOLD)-G(1,NEW))*AFLOW(1)*NOPINS)**2)	MOMENT	148
	TERM2(2)=P(1,NEW)	MOMENT	149
	IF (L.EQ.0) GO TO 1000	MOMENT	150
C****	END SECTION 4 *****	MOMENT	151
C		MOMENT	152
C****	START SECTION 5 *****	MOMENT	153
	IF (LOOPI.GT.0) GO TO 040	MOMENT	154
	IF (HOTFI1.EQ.1.C.AND.LOOPP.GT.2) GO TO 040	MOMENT	155
	IF (TW(5).GT.0.0.AND.PTRY.GT.TW(5)) GO TO 040	MOMENT	156
	IF (LOOPY.GT.0) GO TO 040	MOMENT	157
C****	FUEL SQUIRT MASS AND COMPOSITION	MOMENT	158
	VFUELS=0.0	MOMENT	159
	RHOSQF=0.0	MOMENT	160
	GEORGE=0.0	MOMENT	161
	IF (HOTFI1.NE.1.0) GO TO 000	MOMENT	162
	IF (LOOPI.EQ.0) GO TO 400	MOMENT	163
	IF (LOOPI.EQ.1.AND.LUPI.EQ.0) GO TO 400	MOMENT	164
	LUP=LUP0	MOMENT	165
	LOWN=LOWN0	MOMENT	166
	LUP=LUP0	MOMENT	167
	LOWN=LOWN0	MOMENT	168
	DO 440 I=1BAX,1TAX	MOMENT	169
	RHOM(I,NEW)=RHOM(I,IOLD)	MOMENT	170
	ALFA(I,NEW)=ALFA(I,IOLD)	MOMENT	171
	PIN(1,NEW)=PIN(1,IOLD)	MOMENT	172
	V(I,NEW)=V(I,IOLD)	MOMENT	173
	AAA(1,NEW)=AAA(1,IOLD)	MOMENT	174

ENTPY(I,NEW)=ENTPY(I,IOLD)	MOMENT	175
DHDP(I,NEW)=DHDP(I,IOLD)	MOMENT	176
440 CONTINUE	MOMENT	177
460 CONTINUE	MOMENT	178
CALL CHAR	MOMENT	179
LOOPY=LOOPY+1	MOMENT	180
FLQOUT=0.0	MOMENT	181
GASIN2=0.0	MOMENT	182
QGAS=0.0	MOMENT	183
DO 480 I=1,NX,ITAX	MOMENT	184
FLQOUT=FLQOUT+((1.-ALFA(I,IOLD))*AREAH(I,IOLD)-(1.-ALFA(I,NEW))*AR	MOMENT	185
*LAH(I,NEW))*RLQF+JLIQIN(1)*H(NEW)	MOMENT	186
GASIN2=GASIN2+PIN(1,NEW)*ALFA(I,NEW)*AREAH(I,NEW)/(R*TBAR(I))	MOMENT	187
QGAS=QGAS+GASIN(I)*H(NEW)	MOMENT	188
480 CONTINUE	MOMENT	189
VLOUT=FLQOUT/RLQF	MOMENT	190
GASOUT=GASIN1-GASIN2+QGAS	MOMENT	191
RHOGAS=PIN(KFUELS,NEW)/(R*TBAR(KFUELS))	MOMENT	192
VGOUT=GASOUT/RHOGAS	MOMENT	193
IF (VGOUT.LT.0.) VGOUT=0.	MOMENT	194
GEORGE=(VLOUT+VGOUT)*DELX(L)	MOMENT	195
RATIO=VGOUT*DELX(L)/GEORGE	MOMENT	196
PFUEL=PIN(KFUELS,NEW)	MOMENT	197
GO TO 620	MOMENT	198
500 CONTINUE	MOMENT	199
ABLE=(VGAS+PVOID*VVOID-VOLG(IOLD))*DELX(L)	MOMENT	200
BAKER=(VLIQ-TOTMEL-VVOID-VOLF(IOLD))*DELX(L)	MOMENT	201
IF (IFUEL(NEW).GT.IFUEL(NEW)) GO TO 540	MOMENT	202
CHARLY=UMFIC/(1+(NEW)*H(NEW))	MOMENT	203
EASY=1./CHARLY	MOMENT	204
DOG=0.0	MOMENT	205
PFULL=ABLE/BAKER	MOMENT	206
FOX=.1*(ABLE/PTXY+BAKER)	MOMENT	207
IF (FOX.LE.0.0) GO TO 540	MOMENT	208
PFULL=PTXY+CHARLY*FOX*FOX	MOMENT	209
LOOFF=0	MOMENT	210
IF (BAKER.LT.0.0) PFULL=.5*(PTXY-ABLE/BAKER)	MOMENT	211
520 FOX=ABLE/PFULL+BAKER	MOMENT	212
GEORGE=SQR((PFUEL-PTXY)*EASY)	MOMENT	213
IF (ABS(GEORGE-FOX)/GEORGE.LT.5.E-8) GO TO 560	MOMENT	214
JOFF=-ABLE/(PFUEL*PFULL)	MOMENT	215
JOEO=.5/(CHARLY*GEORGE)	MOMENT	216
JP=(GEORGE-FOX)/(JOFF-JOEO)	MOMENT	217
PFULL=PFULL+JP*.5*(1+1IN(1,LOOFF/4))	MOMENT	218
IF (PFULL.LE.0.0) GO TO 560	MOMENT	219
JOE=PFULL	MOMENT	220
LOOFF=LOOFF+1	MOMENT	221
IF (LOOFF-30) 520,520,2960	MOMENT	222
540 VOLG(NEW)=VOLG(IOLD)	MOMENT	223
VOLF(NEW)=VOLF(IOLD)	MOMENT	224
FQSCHR=RLQF*(VLIQ-VOLF(NEW))/(TOTMEL+VVOID)	MOMENT	225
PFUEL=ABLE/BAKER	MOMENT	226
GO TO 640	MOMENT	227
560 CONTINUE	MOMENT	228
IF (TW(2).LE.0.0.OR.GEORGE.LE.TW(2)*H(NEW)) GO TO 580	MOMENT	229
GEORGE=TW(2)*H(NEW)	MOMENT	230
PFUEL=ABLE/(GEORGE-BAKER)	MOMENT	231
580 CONTINUE	MOMENT	232
IF (GTOL.LT.0.0) GO TO 600	MOMENT	233
RMAX=1+1IN(1,ABLE/(PFUEL*GEORGE))	MOMENT	234
RMIN=1.-1IN(1,.(VLIQ-VOLF(IOLD))*DELX(L)/GEORGE)	MOMENT	235
RATIO=GTOL*RMAX+(1.-GTOL)*RMIN	MOMENT	236
GO TO 620	MOMENT	237
600 RATIO=1./(1.+PFUEL*DELX(L)*(VLIQ-VOLF(IOLD))/ABLE)	MOMENT	238

020	CONTINUE	MOMENT	239
	VOLG(NEW)=VOLG(IOLD)+PFUEL*RATIO*GEORGE/DELX(L)	MOMENT	240
	VOLF(NEW)=VOLF(IOLD)+(1.-RATIO)*GEORGE/DELX(L)	MOMENT	241
	VFUELS=GEORGE*(1.-RATIO+RATIO*PFUEL/PTRY)	MOMENT	242
	RHOSQF=GEORGE*(1.-RATIO)*RLQF/VFUELS	MOMENT	243
	FUSOHR=RLQF*(VLIQ-VOLF(NEW))/(TOTMEL+VWU10)	MOMENT	244
	FUELOS=VFUELS*RHOSQF/(H(NEW)*AFLOW(L))	MOMENT	245
040	I1=IFUEL(IOLD)	MOMENT	246
	I2=IFUEL(NEW)	MOMENT	247
	BOX(IBILL,2)=BOX(JBILL,2)+8.0*(VOLF(NEW)-VOLF(IOLD))*DELX(L)	MOMENT	248
	TSAT=1213.0/(10.51-ALOG(PTRY/1.013E+6))	MOMENT	249
C***	FUEL INTERACTION RATE (SPREAD) UPDATED TO CURRENT ITERATE	MOMENT	250
	I=IBILL	MOMENT	251
	SPORT=(NEW)+.001	MOMENT	252
	BOX(NEW,4)=GMF	MOMENT	253
	BOX(NEW+2,4)=TF	MOMENT	254
	DO 720 LL=1,JLM	MOMENT	255
	SPORT=SPORT+.001	MOMENT	256
	IF (SPORT.LT.1(IOLD)) GO TO 740	MOMENT	257
	DO 700 K=1,25	MOMENT	258
	IF (I.EQ.0) I=25	MOMENT	259
	IF (BOX(I,1).EQ.0.0) GO TO 740	MOMENT	260
	IF (SPORT-BOX(I,1)) 700,600,600	MOMENT	261
000	A172=WHIP*BOX(I,2)	MOMENT	262
	BOX(NEW,4)=BOX(NEW,4)+A172	MOMENT	263
	BOX(NEW+2,4)=BOX(NEW+2,4)+A172*BOX(1,3)	MOMENT	264
	GO TO 720	MOMENT	265
080	J=MOD(I,25)+1	MOMENT	266
	ABLE=(SPORT-BOX(I,1))/(BOX(J,1)-BOX(I,1))	MOMENT	267
	A172=WHIP*(BOX(1,2)+ABLE*(BOX(J,2)-BOX(1,2)))	MOMENT	268
	BOX(NEW,4)=BOX(NEW,4)+A172	MOMENT	269
	BOX(NEW+2,4)=BOX(NEW+2,4)+A172*(BOX(1,3)+ABLE*(BOX(J,3)-BOX(1,3)))	MOMENT	270
	GO TO 720	MOMENT	271
700	I=I-1	MOMENT	272
720	CONTINUE	MOMENT	273
C***	BOILING EVAPORATION OR CONDENSATION	MOMENT	274
740	BOOM=1.	MOMENT	275
	IF (BOX(NEW,4).NE.0.) BOOM=BOX(NEW+2,4)/BOX(NEW,4)	MOMENT	276
	BOX(NEW+2,4)=BOOM	MOMENT	277
	BOOM=(BOX(NEW,4)-BOX(IOLD,4))*(FLAMDA+AMAX1(0.0,CPLF*(BOX(NEW+2,4)	MOMENT	278
	+TME LTH))+CPSF*IMLIL)+BOX(IOLD,4)*CPSF*BOX(IOLD+4,4)-A150	MOMENT	279
	QT=BOOM-BOX(NEW,4)*CPSF*TSAT	MOMENT	280
	BOX(NEW+4,4)=BOX(IOLD+4,4)	MOMENT	281
	OIL(5)=0.	MOMENT	282
	IF (QT.LQ.0.0) GO TO 840	MOMENT	283
	BOX(NEW+4,4)=TSAT	MOMENT	284
	TRYNA=QT/(CPNA*(TSAT-BOX(IOLD+4,4))+SLAMDA)	MOMENT	285
	IF (TRYNA.LE.0IL(10)) GO TO 750	MOMENT	286
	OIL(5)=(QT+CPNA*OIL(10)*(BOX(IOLD+4,4)-TCOOL(I1,NEW)))/(SLAMDA+CPN	MOMENT	287
	+A*(TSAT-TCOOL(I1,NEW)))	MOMENT	288
	GO TO 750	MOMENT	289
750	OIL(5)=TRYNA	MOMENT	290
780	IF (OIL(5)) 800,820,820	MOMENT	291
800	CONDEN=OIL(5)	MOMENT	292
	GO TO 840	MOMENT	293
820	CONDEN=0.0	MOMENT	294
840	OIL(5)=OIL(1)+BOX(IOLD)+6,4)	MOMENT	295
	IF (OIL(5).LT.0.0) OIL(5)=0.0	MOMENT	296
	BOX(NEW+6,4)=OIL(5)	MOMENT	297
C***	FULL DENSITY IN CHANNEL - HOMOGENEOUS MODEL	MOMENT	298
C***	(LATER WILL BE SKELCO IN REACT)	MOMENT	299
	OIL(NEW+2)=1200.*1.013E+6*OIL(5)/PTRY	MOMENT	300
	OIL(NEW)=(VOLG(NEW)-OIL(12))/PTRY	MOMENT	301
	OIL(11)=VOLF(NEW)-OIL(13)/RLQF-TOTPLT/RLQF	MOMENT	302
	SUM=OIL(11)*DELX(L)	MOMENT	303

SUM1=OIL(NEW)*DELX(I)	MOMENT	304
PIFFLE=OIL(9)+BOX(10,+)	MOMENT	305
IF (OIL(17).EQ.0.0) GO TO 860	MOMENT	306
PIFFLE=PIFFLE+G(I1-1,NEW)*AFLJW(I1-1)*H(NEW)/RHOG(I1-1,NEW)	MOMENT	307
860 SUM1=SUM1+PIFFLE+OIL(NEW+2)	MOMENT	308
SUM1=SUM1+SUM4	MOMENT	309
A152=0.0	MOMENT	310
SUM3=VNOW(I1)-RHOG(I1,1)/RLQF*DELX(I1)	MOMENT	311
I432=I1+1	MOMENT	312
SUM2=SUM1-SUM3	MOMENT	313
DO 880 I=I432,I2	MOMENT	314
880 RHOF(I,NEW)=0.0	MOMENT	315
DO 900 J=I432,I2	MOMENT	316
I=J	MOMENT	317
ABLE=OROT(J)-RHOG(4,1)/RLQF*DELX(J)	MOMENT	318
SUM3=SUM3+ABLE	MOMENT	319
SUM2=SUM2-ABLE	MOMENT	320
IF (SUM2) 920,920,900	MOMENT	321
900 CONTINUE	MOMENT	322
920 IF (IGAS(NEW).NE.0) GO TO 940	MOMENT	323
SUM3=SUM1	MOMENT	324
I=I2	MOMENT	325
940 IF (SUM3.NE.0.) SUM=SUM/SUM3	MOMENT	326
IF (SUM3.EQ.0.) SUM=0.	MOMENT	327
SUM=RLQF*SUM	MOMENT	328
I432=I	MOMENT	329
BOX(13,+)=I432	MOMENT	330
DO 960 I=I1,I432	MOMENT	331
960 RHOF(I,NEW)=SUM	MOMENT	332
C*** PRESSURE IN FCI ZONE	MOMENT	333
DO 980 I=I1,I2	MOMENT	334
TERM2(I)=PTRY	MOMENT	335
TERM11(I)=PIRY	MOMENT	336
980 CONTINUE	MOMENT	337
C*** END SECTION 5 *****	MOMENT	338
C	MOMENT	339
C*** START SECTION 6 *****	MOMENT	340
C	MOMENT	341
C * * * BACK TO HERE IF GAS SQUIRTING NODE	MOMENT	342
C	MOMENT	343
1000 CONTINUE	MOMENT	344
C*** FISSION GAS SQUIRTING DIRECTLY FROM PLENUM INTO VOIDED REGION IN	MOMENT	345
C*** COOLANT	MOMENT	346
IF (IGAS(IOLD)) 1120,1120,1020	MOMENT	347
1020 VGASQT=0.0	MOMENT	348
GASUG=0.0	MOMENT	349
BOX(NEW+10,+)=PIRY	MOMENT	350
BOX(NEW+8,+)=BOX(IOLD+8,4)*BOX(IOLD+10,4)/PIRY	MOMENT	351
IF (IAXIAL.NE.2.OR.1FUELD(NEW).GT.IGAS(NEW).OR.1FUELD(NEW).LT.IGAS	MOMENT	352
+(NEW)) GO TO 1100	MOMENT	353
RHOSQT=0.0	MOMENT	354
DLT=H(NEW)*.05	MOMENT	355
PP=PPLEN(IOLD)	MOMENT	356
RP=RPLEN(IOLD)	MOMENT	357
IF (IBITTY.EQ.0) GO TO 1040	MOMENT	358
PL=PIRY	MOMENT	359
JP=0.0	MOMENT	360
GO TO 1060	MOMENT	361
1040 JP=(BOX(NEW+10,4)-BOX(IOLD+10,4))/20.	MOMENT	362
PC=BOX(IOLD+10,4)+DF	MOMENT	363
1060 CONTINUE	MOMENT	364
DO 1080 I=1,20	MOMENT	365
PRATIO=AMAX1(UT,PC/PP)	MOMENT	366
IF (PRATIO.GT.1.) PRATIO=1.	MOMENT	367
PRATIO2=PRATIO*PP/PIRY	MOMENT	368
VLLUG=SQRT(UT1*PP/PR*(1.-PRATIO**GT2))	MOMENT	369

BAKER=PRATIO*GT3	MOMENT	370
GASUG=GASUG+VELUC*RP*BAKER	MOMENT	371
ABLE=VELUC*AHOLE*DELTA	MOMENT	372
DELVP4=ABLE*BAKER	MOMENT	373
VGASQT=VGASQT+ABLE*PRATIO2	MOMENT	374
A3LE=VPLEN/(VPLEN+DELVPM)	MOMENT	375
RHOSQT=RHOSQT+DELVPM*RP	MOMENT	376
PC=PL+JP	MOMENT	377
PF=PP*ABLE**GAMMA	MOMENT	378
1080 RP=RP*A3LE	MOMENT	379
GASUG=GASUG*.05*AHOLE/AFLOW(L)	MOMENT	380
PFLN(NEW)=PP	MOMENT	381
RPLN(NEW)=RP	MOMENT	382
RHOSQT=RHOSQT/VGASQT	MOMENT	383
1100 CONTINUE	MOMENT	384
3UX(NEW+8,4)=3UX(NEW+8,4)+VGASQT	MOMENT	385
DEL(NEW)=DEL(NEW)+3UX(NEW+8,4)/DLEX(L)	MOMENT	386
1120 CONTINUE	MOMENT	387
**** END SECTION 6 ****	MOMENT	388
*****	MOMENT	389
***** START SECTION 7 ****	MOMENT	390
***** UPDATE DENSITIES AND GATHER TERMS FOR MASS AND MOMENTUM BALANCES	MOMENT	391
IF (LOOP).NE.0) GO TO 1380	MOMENT	392
J=1	MOMENT	393
DO 1200 IAXIAL=2,NAXIAL	MOMENT	394
L=STATE(IAXIAL)	MOMENT	395
IF (L.EQ.1.OR.L.EQ.4.OR.L.EQ.5) GO TO 1140	MOMENT	396
IF (L.EQ.14) GO TO 1100	MOMENT	397
1140 RHOONA(IAXIAL,NEW)=RHO+TCOOL(IAXIAL,NEW)*(RLV+TCOOL(IAXIAL,NEW)*RL	MOMENT	398
+V2)	MOMENT	399
TRM4(IAXIAL)=(RHOONA(IAXIAL,NEW)-RHOONA(IAXIAL,OLD))/H(NEW)	MOMENT	400
1160 CONTINUE	MOMENT	401
IF (L.EQ.1) GO TO 1180	MOMENT	402
IF (L.EQ.4) GO TO 1200	MOMENT	403
IF (L.EQ.5) GO TO 1220	MOMENT	404
IF (L.EQ.14) GO TO 1240	MOMENT	405
1180 RHO(IAXIAL,NEW)=RHOONA(IAXIAL,NEW)	MOMENT	406
TRM4(IAXIAL)=TRM4(IAXIAL)*DLEX(IAXIAL)	MOMENT	407
TRM5(IAXIAL)=DLEX(IAXIAL)*FANN(IAXIAL)/RHOONA(IAXIAL,NEW)	MOMENT	408
TRM7(IAXIAL)=980.0*DLEX(IAXIAL)*RHOONA(IAXIAL,NEW)	MOMENT	409
GO TO 1200	MOMENT	410
1200 RHO(IAXIAL,NEW)=RHOF(IAXIAL,NEW)	MOMENT	411
ABLE=FULL30(NEW)*DLEX(IAXIAL)	MOMENT	412
TRM4(IAXIAL)=TRM4(IAXIAL)*ABLE	MOMENT	413
TRM5(IAXIAL)=ABLE*FANN(IAXIAL)/RHOONA(IAXIAL,NEW)	MOMENT	414
TRM7(IAXIAL)=980.0*ABLE*RHOONA(IAXIAL,NEW)	MOMENT	415
RHO=RHOF	MOMENT	416
RHO=RHOONA(IAXIAL,NEW)	MOMENT	417
GO TO 1200	MOMENT	418
1220 RHO(IAXIAL,NEW)=RHOONA(IAXIAL,NEW)	MOMENT	419
RHO=RHOF	MOMENT	420
RHO=RHOONA(IAXIAL,NEW)	MOMENT	421
ABLE=(1-FULL30(NEW))*DLEX(IAXIAL)	MOMENT	422
TRM4(IAXIAL)=TRM4(IAXIAL)*ABLE	MOMENT	423
TRM5(IAXIAL)=ABLE*FANN(IAXIAL)/RHOONA(IAXIAL,NEW)	MOMENT	424
TRM7(IAXIAL)=980.0*ABLE*RHOONA(IAXIAL,NEW)	MOMENT	425
GO TO 1200	MOMENT	426
1240 RHO(IAXIAL,NEW)=RHOF(IAXIAL,NEW)	MOMENT	427
IF (RHO(IAXIAL,NEW).EQ.0.0) RHO(IAXIAL,NEW)=3.E-9*PTRY	MOMENT	428
TRM4(IAXIAL)=DLEX(IAXIAL)*(RHOF(IAXIAL,NEW)-RHOF(IAXIAL,OLD))/H	MOMENT	429
(NEW)	MOMENT	430
1260 CONTINUE	MOMENT	431
LOOP=1	MOMENT	432
IAXIAL=2	MOMENT	433
IF (WANT.LQ.0.0) GO TO 1300	MOMENT	434
***** MASS FLUX AT NODE BETWEEN COLL AND INSTRUMENT TREE (MIN	MOMENT	435

C****	INTERMEDIATE BOUNDARY CONDITION)	MOMENT	436
	GSUCK=G(LAXIAL,NEW)+TERM4(LAXIAL)	MOMENT	437
1280	XY(1)=GSUCK*GSUCK	MOMENT	438
	GIM=GSUCK	MOMENT	439
	YX=0.0	MOMENT	440
	DO 1300 I=LAXIAL,NAXIAL	MOMENT	441
	GIM=GIM-TERM4(I)	MOMENT	442
	XY(2)=GIM*GIM	MOMENT	443
	XY(1)=(XY(2)-XY(1))/RHOONA(I,NEW)	MOMENT	444
	YX=YX+TERM7(I)+TERM6(I)*GIM*ABS(GIM)+(GIM-UOLD(I)*RHOONA(I,IOLD))*	MOMENT	445
	+DEL(2,I)+.5*XY(1)	MOMENT	446
1300	XY(1)=XY(2)	MOMENT	447
	MAGIC=GSUCK*AFLOW(LAXIAL)/AFLOW(LAXIAL-1)	MOMENT	448
	IF (ABS(YX+PEXIT(M)-PSUCK)/PSUCK.LT..5*FERROR) GO TO 1360	MOMENT	449
	LOOP9=LOOP9+1	MOMENT	450
	IF (LOOP9.GT.2) GO TO 1360	MOMENT	451
	GSUCK0=GSUCK	MOMENT	452
	PSUCK0=YX+PEXIT(M)	MOMENT	453
	IF (YX+PEXIT(M)-PSUCK) 1320,1320,1340	MOMENT	454
1320	GSUCK=1.01*(GSUCK+.00001)	MOMENT	455
	GO TO 1280	MOMENT	456
1340	GSUCK=.99*(GSUCK+.00001)	MOMENT	457
	GO TO 1280	MOMENT	458
1360	ABL=(PEXIT(M)+YX-PSUCK0)/(GSUCK-GSUCK0)	MOMENT	459
	BAKER=PEXIT(M)+YX-ABL*GSUCK	MOMENT	460
	GSUCK0=GSUCK	MOMENT	461
	PSUCK0=YX+PEXIT(M)	MOMENT	462
	GSUCK=(PSUCK-BAKER)/ABL	MOMENT	463
	IF (LOOP9.LT.31) GO TO 1280	MOMENT	464
	GO TO 2980	MOMENT	465
1380	CONTINUE	MOMENT	466
C****	END SECTION 7 *****	MOMENT	467
C		MOMENT	468
C****	START SECTION 8 *****	MOMENT	469
C		MOMENT	470
C * * *	BACK TO HERE WITH NEW TRIAL INLET FLOW	MOMENT	471
C		MOMENT	472
C****	MASS AND MOMENTUM BALANCES	MOMENT	473
	L=STATE(IAXIAL)	MOMENT	474
	IF (L.GT.5) GO TO 1400	MOMENT	475
	GIN=G(IAXIAL-1,NEW)*AFLOW(IAXIAL-1)/AFLOW(IAXIAL)	MOMENT	476
	IF (IAXIAL.NE.LAXIAL) GO TO 1400	MOMENT	477
	GVG=0.0	MOMENT	478
	IF (WANT.EQ.0.0.OR.GIN.GT.GSUCK) GO TO 1460	MOMENT	479
	GIN=GSUCK	MOMENT	480
	GVG=-100.	MOMENT	481
1400	CONTINUE	MOMENT	482
	TERM1(IAXIAL)=GIN*GIN	MOMENT	483
	IF (L.EQ.1) GO TO 1420	MOMENT	484
	IF (L.EQ.4) GO TO 1440	MOMENT	485
	IF (L.EQ.5) GO TO 1480	MOMENT	486
	IF (L.EQ.14) GO TO 1500	MOMENT	487
1420	GIN=GIN-TERM4(IAXIAL)	MOMENT	488
	TERM1(IAXIAL)=(GIN*GIN-TERM1(IAXIAL))/RHOONA(IAXIAL,NEW)	MOMENT	489
	DP=TERM7(IAXIAL)+GIN*ABS(GIN)*TERM6(IAXIAL)+(GIN-UOLD(IAXIAL)*RHO	MOMENT	490
	+NA(IAXIAL,IOLD))*DEL(2,IAXIAL)	MOMENT	491
	GO TO 1420	MOMENT	492
1440	GIN=GIN-TERM4(IAXIAL)	MOMENT	493
	TERM1(IAXIAL)=(GIN*GIN-TERM1(IAXIAL))/RHOONA(IAXIAL,NEW)	MOMENT	494
	DP=TERM7(IAXIAL)+GIN*ABS(GIN)*TERM6(IAXIAL)+(GIN-UOLD(IAXIAL)*RHO	MOMENT	495
	+NA(IAXIAL,IOLD))*DEL(2,IAXIAL)	MOMENT	496
	GIM2=TERM2(IAXIAL)-DP-TERM1(IAXIAL)	MOMENT	497
	KK=IFUEL(NEW)	MOMENT	498
	BAKER=RHOONA(IAXIAL,NEW)	MOMENT	499
	CHARLEY=RHOONA(I2,NEW)	MOMENT	500
	IF (LOOP.LT.7) GO TO 1460	MOMENT	501
	BAKER=.5*(R00+R000)	MOMENT	502

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      CHARLY=.5*(RJD+RJD0)
1400 EASY=OIL(NEW*2)-OIL(IOLD*2)+DELX(KK)*(OIL(NEW)-OIL(IOLD)+OIL(11)-
      *IL(16))+(GUP*LT-RHOG(43,2))/RLQF
      IF (NTREAT.GT.0) EASY=.1+286*EASY
      ABLE=EASY+GIN*AFLOW(1AXIAL)*H(NEW)/BAKER
      GU=ABLE*CHARLY/(AFLOW(12)*H(NEW))
      IF (12.LE.NAXIAL) GO TO 1540
      GO TO 1500
1430 GIN=GU
      TERM1(1AXIAL)=0.0
      UP=0.0
      ABLE=GIN*GIN
      GIN=GIN-TERM1(1AXIAL)
      TERM1(1AXIAL)=TERM1(1AXIAL)+(GIN*GIN-ABLE)/RHODNA(1AXIAL,NEW)
      JP=UP+TERM1(1AXIAL)+GIN*ABS(GIN)*TERM0(1AXIAL)+(GIN-UOLD(1AXIAL)*
      *RHODNA(1AXIAL,IOLD))*UEL(2,1AXIAL)
      GO TO 1520
1450 GIN=GIN-TERM1(1AXIAL)
      TERM1(1AXIAL)=(GIN*GIN-TERM1(1AXIAL))/RHOF(1AXIAL,NEW)
      JP=TERM1(1AXIAL)+GIN*ABS(GIN)*TERM0(1AXIAL)+(GIN-UOLD(1AXIAL)*
      *F(1AXIAL,IOLD))*UEL(2,1AXIAL)
1470 CONTINUE
      JP=JP+TERM1(1AXIAL)
      TERM1(1AXIAL)=TERM2(1AXIAL)-JP
      TERM2(1AXIAL+1)=TERM1(1AXIAL)+.5*GIN*GIN/RHOD(1AXIAL,NEW)*(1.-(AF
      *LOW(1AXIAL)/AFLOW(1AXIAL+1))**2)
      G(1AXIAL,NEW)=GIN
1490 CONTINUE
      1AXIAL=1AXIAL+1
      GO TO 1080
C**** EN) SECTION 8 *****
C**** START SECTION 9 *****
1500 CONTINUE
C**** VALUED REGION HAS EXTENDED TO TOP OF CHANNEL
C**** CONSIDER CRITICAL FLOW RESTRAINTS
      IF (ABS(PTRY-GIMIK)/PTRY.LT.PERROR) GO TO 1580
      IF (LOOPS.GT.0) GO TO 1600
      LOOPS=1
      MUOP=0
      GO TO 1600
1560 CONTINUE
      SPEED=(GIN*AFLOW(1AXIAL)/RHODNA(1AXIAL,NEW)*H(NEW)+EASY-BUX(10,+)*
      *(1./PTRY-JOX(17,+)))/(2.*AFLOW(NAXIAL)*H(NEW))
      G(NAXIAL,NEW)=SPEED*RHOD(NAXIAL,NEW)
      IF (SWITCH.NE.1) GO TO 1640
      LOOFF=LOOFF+1
      IF (LOOFF.EQ.21) GO TO 2880
      IF (LOOPS.NE.0) GO TO 1600
      IF (ABS(PTRY-PEXIT(4))/PEXIT(4).LE.FERROR.AND.SPEED.LT.11000.) GO
      *TO 2000
      IF (SPEED.LT.11000..AND.SPEED.GT.9000..AND.PTRY.GT.PEXIT(4)) GO TO
      *2000
1600 CONTINUE
      SWITCH=2
      PSUNIC=FT-Y
      VSUNIC=SPEED
      PTRY=PEXIT(4)*(1.2+SIGN(.2,SPEED-10000.))
1620 1AXIAL=2
      JOAS=1
      KAS=1
      GO TO 420
1640 IF (ABS(PTRY-PEXIT(4))/PEXIT(4).LE.FERROR.AND.SPEED.LT.11000.) GO
      *TO 2700
      IF (SPEED.LT.11000..AND.SPEED.GT.9000..AND.PTRY.GT.PEXIT(4)) GO TO
      *2700

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LOOPS=LOOPS+1	MOMENT	009
IF (LOOPS.LT.31) GO TO 1600	MOMENT	010
GO TO 3000	MOMENT	011
1600 ABLE=(SPEED-VSONIC)/(PTRY-PSONIC)	MOMENT	012
VSONIC=SPEED	MOMENT	013
PSONIC=PTRY	MOMENT	014
MOOP=0	MOMENT	015
PTRY=PEXIT(M)	MOMENT	016
BAKER=VSONIC+ABLE*(PTRY-PSONIC)	MOMENT	017
IF (BAKER.LE.1100.) GO TO 1620	MOMENT	018
PTRY=(1000.-VSONIC)/ABLE+PSONIC	MOMENT	019
GO TO 1620	MOMENT	020
**** END SECTION 9 ****	MOMENT	021
*** START SECTION 10 ****	MOMENT	022
CONTINUE	MOMENT	023
ITERATION CONTROL SECTION	MOMENT	024
1 LOOP(1CHAN)	MOMENT	025
IF (SWITCH-1) 1700,1700,1720	MOMENT	026
*** CONTINUE WITH EXISTING PRESSURES	MOMENT	027
CONTINUE	MOMENT	028
JAS=KAS	MOMENT	029
IF (IAXIAL.GT.NAXIAL) GO TO 1840	MOMENT	030
STATE(IAXIAL)	MOMENT	031
IF (L.EQ.1) GO TO 1120	MOMENT	032
IF (L.EQ.4.OX.L.EQ.5.OR.L.EQ.14) GO TO 1380	MOMENT	033
1720 IF (LOG10) GO TO 1740	MOMENT	034
**** UPDATE PRESSURES	MOMENT	035
STATE(IAXIAL)	MOMENT	036
JAS=KAS	MOMENT	037
IF (IAXIAL-1-JZAP) 1700,1700,1820	MOMENT	038
1740 CONTINUE	MOMENT	039
JAS=KAS	MOMENT	040
IF (IAXIAL-NAXIAL) 1380,1380,1840	MOMENT	041
P(IAXIAL,NEW)=T-RM2(IAXIAL)	MOMENT	042
GO TO 1380	MOMENT	043
**** IF FULL SUBSILE PRESSURE NOT CONVERGED THEN CHANGE INLET FLOW	MOMENT	044
1740 IF (ABS(PTRY-GIMIK)/PTRY-1.E-3) 1760,1760,1800	MOMENT	045
1800 IF (GIMIK.EQ.GIMIKU) GO TO 1760	MOMENT	046
GO TO 2120	MOMENT	047
1760 IF (IAXIAL-NAXIAL) 1700,1700,1840	MOMENT	048
**** GO TO TOP OF CHANNEL	MOMENT	049
CONVERGENCE ON EXIT PRESSURE AS TESTED IN SECTION 12	MOMENT	050
1840 IAXIAL=2	MOMENT	051
**** END SECTION 10 ****	MOMENT	052
**** START SECTION 11 ****	MOMENT	053
**** TEST FOR CONVERGENCE ON EXIT PRESSURE	MOMENT	054
IF (JMAXN.EQ.1) GO TO 1900	MOMENT	055
LOOPS=0	MOMENT	056
IF (IUTYPE.EQ.2) WRITE (NOUT,3220) PTRY,TERM11(NAXIAL),OIL(NEW+2),	MOMENT	057
P(L(1,NEW),PLOW,PHIGH)	MOMENT	058
IF (IUTYPE.EQ.3.AND.SWITCH.EQ.1) WRITE (NOUT,3240) PTRY,TERM11(NAXIAL),	MOMENT	059
IFULL,IFULLU(NEW),FULL30(NEW),IFULL30(NEW),OIL(NEW),OILC(NEW+2)	MOMENT	060
IF (IUTYPE.EQ.3) GO TO 1800	MOMENT	061
ABLE=HOPKINS*(G(IAXIAL,NEW)*AFLOW(NAXIAL)-G(1,NEW)*AFLOW(1))	MOMENT	062
JOACK(NEW)=ABLE/TW(10)	MOMENT	063
CHARLY=(JOACK(IOLD)+H(NEW)*ABLE/RHOONA(NAXIAL,NEW))/TW(10)	MOMENT	064
CHARLY=CHARLY(1),CHARLY	MOMENT	065
CHARLY=(JOACK(NEW)-JOACK(IOLD))*CHARLY/H(NEW)+GJACK(NEW)*ABS(GJACK(IOLD)-GJACK(NEW))*CHARLY*TW(11)/RHOONA(NAXIAL,NEW)+980.0*CHARLY*RHOONA(NAXIAL,NEW)	MOMENT	066
CHARLY=CHARLY	MOMENT	067
TERM11(NAXIAL)=TERM11(NAXIAL)-EXTRA	MOMENT	068
1900 CONTINUE	MOMENT	069

IF (SWITCH.EQ.1) GO TO 1900	MOMENT	034
IF (LOGIC) GO TO 1940	MOMENT	035
GO TO 2420	MOMENT	036
1880 UDELL(1)=UDELL(2)	MOMENT	037
UDELL(2)=UDELL(3)	MOMENT	038
UDELL(3)=PTRY	MOMENT	039
C**** RETURN TO ORBIT FOR FURTHER ITERATIONS SINCE ONLY HYDRAULICS	MOMENT	040
C**** CONVERGENCE HAS BEEN ATTAINED (LOOPF LOOP, SWITCH=2)	MOMENT	041
IF (INTREAT.LE.0) RETURN IBACK	MOMENT	042
CALL PRESS, RETURNS (2800)	MOMENT	043
IF (ABS(P30TT(1,NEW)-PJACK)/P30TT(1,NEW).GT.PERROR) GO TO 320	MOMENT	044
RETURN IBACK	MOMENT	045
1900 GO 1920 IF=2,NAXIAL	MOMENT	046
P(1,NEW)=TERM2(I)	MOMENT	047
1920 CONTINUE	MOMENT	048
IF (IDARN.EQ.1) GO TO 1880	MOMENT	049
IF (LOGIC) PTRY=G(1,NEW)	MOMENT	050
GO TO 2700	MOMENT	051
1940 IF (ABS(TERM11(NAXIAL)-PEXIT(1))/PEXIT(1)-PERROR) 1900,1920,2080	MOMENT	052
C CHECK PRESSURE FOR BIG LOOP ON INLET FLOW	MOMENT	053
1960 IF (ABS(TERM11(NAXIAL)-PEXIT(1))/PEXIT(1)-PERROR) 2000,2030,1980	MOMENT	054
1980 K00P=0	MOMENT	055
FF=1.25	MOMENT	056
OMFF=0.5	MOMENT	057
F=.75	MOMENT	058
OMF=.25	MOMENT	059
SWITCH=2	MOMENT	060
LOOPF=LOOPF+1	MOMENT	061
IF (LOOPF-21) 2060,2050,2900	MOMENT	062
2000 CONTINUE	MOMENT	063
GO 2020 IF=2,NAXIAL	MOMENT	064
P(1,NEW)=TERM2(I)	MOMENT	065
2020 CONTINUE	MOMENT	066
A154=CONDEN	MOMENT	067
IF (INTREAT.LE.0) GO TO 2040	MOMENT	068
CALL PRESS, RETURNS (2800)	MOMENT	069
IF (ABS(P30TT(1,NEW)-PJACK)/P30TT(1,NEW).GT.PERROR) GO TO 320	MOMENT	070
2040 CONTINUE	MOMENT	071
C**** RETURN TO ORBIT WITH COMPLETE THERMAL-HYDRAULIC CONVERGENCE	MOMENT	072
C**** (SWITCH=1)	MOMENT	073
IF (IFUELU(NEW).GT.NAXIAL) BOX(16,4)=BOX(16,4)+PTRY*SPEED*AFLOW(NAXIAL)*H(NEW)	MOMENT	074
IF (PTRY.NE.0.0) BOX(17,4)=1./PTRY	MOMENT	075
IF (LOGIC) PTRY=1.013L+0	MOMENT	076
RETURN	MOMENT	077
C**** END SECTION 11 *****	MOMENT	078
C	MOMENT	079
C**** START SECTION 12 *****	MOMENT	080
C	MOMENT	081
C * * * GUESS NEW CHANNEL INLET FLOW OR FCI BUBBLE PRESSURE	MOMENT	082
C	MOMENT	083
C**** CHANGE INLET COOLANT FLOW FOR THE CASE PRIOR TO FCI (K00P LOOP)	MOMENT	084
2060 SAVEG=G(1,NEW)	MOMENT	085
SAVEP=TERM11(NAXIAL)	MOMENT	086
K00P=1	MOMENT	087
IF (TERM11(NAXIAL)-PEXIT(1)) 2300,2300,2300	MOMENT	088
2080 IF (K00P.LE.0) GO TO 2000	MOMENT	089
K00P=K00P+1	MOMENT	090
IF (K00P-41) 2100,2100,2340	MOMENT	091
2100 SLOPE=(TERM11(NAXIAL)-SAVEP)/(G(1,NEW)-SAVEG)	MOMENT	092
ABLC=TERM11(NAXIAL)-SLOPE*G(1,NEW)	MOMENT	093
SAVEP=TERM11(NAXIAL)	MOMENT	094
SAVEG=G(1,NEW)	MOMENT	095
G(1,NEW)=(PEXIT(1)-ABLC)/SLOPE	MOMENT	096
IF (INTREAT.NE.0) GO TO 1380	MOMENT	097
P(1,NEW)=P30TT(1,NEW)-SLOW(1)*AFLOW(1)*(G(1,NEW)-G(1,IOLD))/H(NEW)	MOMENT	098

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      *NOPINS+PD(4)*(FLOW(M,IOLD)**2-(FLOW(M,IOLD)-(G(1,IOLD)-G(1,NEW))*
      *AFLOW(1)*NOPINS)**2) MOMENT 700
      TERM2(2)=P(1,NEW) MOMENT 701
      GO TO 1380 MOMENT 702
C**** END SECTION 12 ***** MOMENT 703
C MOMENT 704
C**** START SECTION 13 ***** MOMENT 705
2120 CONTINUE MOMENT 706
C**** CHANGE INLET COOLANT FLOW FOR THE CASE OF FCI UNDERWAY (MOOP LOOP) MOMENT 707
      GIMIK=GIMIK MOMENT 708
      TSAVE=TERM2(JZAP) MOMENT 709
      TERM2(JZAP)=GIMIK MOMENT 710
      IF (IJTYPE.EQ.4) WRITE (NOUT,3200) PTRY,GIMIK,G(1,NEW),GLOW,GHIGH MOMENT 711
      IF (MOOP.NE.0) GO TO 2140 MOMENT 712
      IAXIAL=2 MOMENT 713
      JGAS=1 MOMENT 714
      KGAS=1 MOMENT 715
      MUOP=1 MOMENT 716
      GOOP=G(1,NEW) MOMENT 717
      POOP=TERM2(JZAP) MOMENT 718
      GLOW=0.0 MOMENT 719
      GHIGH=0.0 MOMENT 720
      IF (TERM2(JZAP)-PTRY) 2300,2300,2380 MOMENT 721
2140 MUOP=MUOP+1 MOMENT 722
      IF (MUOP.GT.+1) GO TO 2860 MOMENT 723
      ABLE=PTRY-TERM2(JZAP) MOMENT 724
      IF (ABLE) 2150,2150,2150 MOMENT 725
2150 IF (GLOW.EQ.0.0) GLOW=G(1,NEW) MOMENT 726
      GLOW=AMAX1(GLOW,G(1,NEW)) MOMENT 727
      GO TO 2200 MOMENT 728
2150 IF (GHIGH.EQ.0.0) GHIGH=G(1,NEW) MOMENT 729
      GHIGH=AMIN1(GHIGH,G(1,NEW)) MOMENT 730
2200 IF (GLOW*GHIGH) 2220,2240,2220 MOMENT 731
2220 GNEW=.5*(GLOW+GHIGH) MOMENT 732
      IF (PTRY.NE.POOP.AND.GNEW.NE.GOOP) SLOPE=(PTRY-POOP)/(GNEW-GOOP) MOMENT 733
      ABLE=GOOP+(PTRY-POOP)/SLOPE MOMENT 734
      IF (ABLE.G(1,NEW)) 2200,1380,2200 MOMENT 735
2240 IF (POOP.NE.TERM2(JZAP).AND.GOOP.NE.G(1,NEW)) SLOPE=(TERM2(JZAP)-
      *POOP)/(G(1,NEW)-GOOP) MOMENT 736
      POOP=TERM2(JZAP) MOMENT 737
      GOOP=G(1,NEW) MOMENT 738
      ABLE=GOOP+(PTRY-POOP)/SLOPE MOMENT 739
      IF (ABLE.NE.G(1,NEW)) GO TO 2200 MOMENT 740
      IAXIAL=2 MOMENT 741
      JGAS=1 MOMENT 742
      KGAS=1 MOMENT 743
      IF (TERM2(JZAP)-PTRY) 2300,2300,2380 MOMENT 744
2200 CONTINUE MOMENT 745
2280 G(1,NEW)=GOOP+(PTRY-POOP)/SLOPE MOMENT 746
      IAXIAL=2 MOMENT 747
      JGAS=1 MOMENT 748
      KGAS=1 MOMENT 749
      GO TO 420 MOMENT 750
C**** INLET FLOW CHANGE THE FIRST TIME MOMENT 751
2300 IF (G(1,NEW)) 2320,2340,2360 MOMENT 752
2320 G(1,NEW)=1.02*G(1,NEW) MOMENT 753
      GO TO 420 MOMENT 754
2340 G(1,NEW)=-5. MOMENT 755
      GO TO 420 MOMENT 756
2360 G(1,NEW)=-.98*G(1,NEW) MOMENT 757
      GO TO 420 MOMENT 758
2380 IF (G(1,NEW)) 2360,2400,2320 MOMENT 759
2400 G(1,NEW)=5. MOMENT 760
      GO TO 420 MOMENT 761
C**** END SECTION 13 ***** MOMENT 762
C MOMENT 763

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C****	START SECTION 14 *****	MOMENT	760
2420	CONTINUE	MOMENT	761
C****	GUESS NEW FCI BUBBLE PRESSURE	MOMENT	765
	GIMIKJ=0.0	MOMENT	769
	IF (MOOP.GT.2) MOOP=2	MOMENT	770
	LOOP4=LOOP4+1	MOMENT	771
	IF (ABS(TERM11(NAXIAL)-PEXIT(1))/PEXIT(M)-.5*PERROR) 2760,2760,244	MOMENT	772
	*J	MOMENT	773
C	CHANGE CONTROL NODE PRESSURE AND INLET FLOW	MOMENT	774
2440	IF (ABS(PHIGH-PLOW)/PHIGH.GT.1.E-7) GO TO 2460	MOMENT	775
	GO TO 2760	MOMENT	776
2460	IF (LOOP4.GT.41) GO TO 2940	MOMENT	777
	IF (LOOP4.NE.1) GO TO 2540	MOMENT	778
	ITASK=0	MOMENT	779
	PNEW=TERM11(NAXIAL)	MOMENT	780
	PTRY=PTRY	MOMENT	781
	IF (TERM11(NAXIAL)-PEXIT(M)) 2480,2480,2500	MOMENT	782
	PNEW=1.01*PTRY	MOMENT	783
	GO TO 2740	MOMENT	784
2480	PNEW=FF*PTRY+UMFF*PHIGH	MOMENT	785
	ITASK=0	MOMENT	786
	PLOW=PTRY	MOMENT	787
	FF=.5	MOMENT	788
	UMFF=.5	MOMENT	789
	GO TO 2740	MOMENT	790
2500	PNEW=F*PTRY+DMF*PLOW	MOMENT	791
	IF (SLOPF) 2740,2740,2520	MOMENT	792
2520	CONTINUE	MOMENT	793
	PHIGH=PTRY	MOMENT	794
	FF=.5	MOMENT	795
	UMFF=.5	MOMENT	796
	GO TO 2740	MOMENT	797
2540	SLOPF=(TERM11(NAXIAL)-PNEW)/(PTRY-PTRIED)	MOMENT	798
	SLOUP=SLOPE	MOMENT	799
	IF (SLOPL) 2560,2480,2620	MOMENT	800
2560	PNEW=.5*(PLOW+PTRY)	MOMENT	801
	IF (ITASK.NE.1) GO TO 2580	MOMENT	802
	PLOW=AMAX1(PLOW,PTRY)	MOMENT	803
	PNEW=.5*(PTRY+PHIGH)	MOMENT	804
	GO TO 2600	MOMENT	805
2580	ITASK=1	MOMENT	806
2600	CONTINUE	MOMENT	807
	FF=.5	MOMENT	808
	DMF=.5	MOMENT	809
	GO TO 2740	MOMENT	810
2620	CONTINUE	MOMENT	811
	ITASK=0	MOMENT	812
	PNEW=TERM11(NAXIAL)	MOMENT	813
	PTRY=PTRY	MOMENT	814
	PNEW=PTRY+(PEXIT(M)-TERM11(NAXIAL))/SLOPE	MOMENT	815
	IF (PNEW-PTRY) 2640,2760,2680	MOMENT	816
2640	PHIGH=AMIN1(PTRY,PHIGH)	MOMENT	817
	FF=.5	MOMENT	818
	UMFF=.5	MOMENT	819
	IF (PNEW-PLOW) 2660,2660,2720	MOMENT	820
2660	PNEW=.5*(PHIGH+PLOW)	MOMENT	821
	GO TO 2720	MOMENT	822
2680	PLOW=AMAX1(PTRY,PLOW)	MOMENT	823
	FF=.5	MOMENT	824
	UMFF=.5	MOMENT	825
	IF (PNEW-PHIGH) 2720,2700,2700	MOMENT	826
2700	PNEW=.5*(PHIGH+PLOW)	MOMENT	827
2720	IF (MOD(LUMP4,10).EQ.0) PNEW=.5*(PHIGH+PLOW)	MOMENT	828
2740	CONTINUE	MOMENT	829
	JAS=1	MOMENT	830
	KAS=1	MOMENT	831

	PTRY=PNEW	MOMENT	832
	GLOW=0.0	MOMENT	833
	GHIGH=0.0	MOMENT	834
	IF (SLOPE) 2280,420,2280	MOMENT	835
2760	CONTINUE	MOMENT	836
	IF (IJTYPE.EQ.3) WRITE (NOUT,3260) PTRY	MOMENT	837
	IF (ABS((PTRY-ODELL(1))/PTRY).GT..25*PERROR.OR.LOOPP.LT.3) GO TO 1	MOMENT	838
	+880	MOMENT	839
	IF (ODELL(2).GT.ODELL(1).AND.ODELL(2).GT.PTRY) GO TO 2780	MOMENT	840
	IF (ODELL(2).LT.ODELL(1).AND.ODELL(2).LT.PTRY) GO TO 2780	MOMENT	841
	GO TO 1880	MOMENT	842
2780	IDARN=1	MOMENT	843
	PNEW=.5*(PTRY+ODELL(2))	MOMENT	844
	IF (.NOT.LOGIC) GO TO 2740	MOMENT	845
	G(1,NEW)=PNEW	MOMENT	846
	IAXIAL=2	MOMENT	847
	GO TO 420	MOMENT	848
C****	END SECTION 14 *****	MOMENT	849
C		MOMENT	850
C****	MOMENT NOT SATISFIED	MOMENT	851
2800	CONTINUE	MOMENT	852
	RETURN IERROR	MOMENT	853
C		MOMENT	854
C****		MOMENT	855
C****	PRINT MESSAGES	MOMENT	856
2820	WRITE (NOUT,3020) IAXIAL,GJACK1,GJACK2,FJACK,NUPINS,ABLE,CHARLY,EX	MOMENT	857
	+IXA	MOMENT	858
	GO TO 2800	MOMENT	859
2840	WRITE (NOUT,3040) IAXIAL,SLOPE,SAVEP,SAVEG	MOMENT	860
	IJTYPE=4	MOMENT	861
	GO TO 2800	MOMENT	862
2860	WRITE (NOUT,3060) IAXIAL,GLOW,GHIGH,PTRY,JZAP,TER42(JZAP),G00P,POU	MOMENT	863
	+P,GNEW,SLOPE	MOMENT	864
	IJTYPE=4	MOMENT	865
	GO TO 2800	MOMENT	866
2880	IJTYPE=2	MOMENT	867
	GO TO 2920	MOMENT	868
2900	IJTYPE=3	MOMENT	869
2920	WRITE (NOUT,3080) IJTYPE,SWITCH,GIMIK,IAXIAL,PTRY,GIMIKO,PERKUR,JZ	MOMENT	870
	+AP,IDARN	MOMENT	871
	GO TO 2800	MOMENT	872
2940	IJTYPE=8	MOMENT	873
	WRITE (NOUT,3100) IJTYPE,PTRILU,PWAS,PNEW,FHIGH,PLOW,ITASK,IDARN,S	MOMENT	874
	+LOOF,SLOPE,PTRY,ODELL(1),ODELL(2),ODELL(3)	MOMENT	875
	GO TO 2800	MOMENT	876
2960	WRITE (NOUT,3120) FOX,GEORGE,PFUEL,PTRY,DFOX,DGE0,IAXIAL	MOMENT	877
	GO TO 2800	MOMENT	878
2980	WRITE (NOUT,3140) IAXIAL,GSUCK,PSUCK,WANT	MOMENT	879
	GO TO 2800	MOMENT	880
3000	WRITE (NOUT,3160) IAXIAL,SPEED,PTRY,PSONIC,VSONIC,SWITCH,GIMIK,PEX	MOMENT	881
	+IT(M)	MOMENT	882
	GO TO 2800	MOMENT	883
C		MOMENT	884
3020	FORMAT (102H 10 ITERATIONS HAVE OCCURRED FOR LOOPJ,YOU INDEED HAVE	MOMENT	885
	+ BEEN TREATED POORLY, KEEP THE CHIN UP(MOMENT.398)//9H IAXIAL =,I2	MOMENT	886
	+X,3X,8HGJACK1 =,E10.4,3X,8HGJACK2 =,E10.4,3X,7HFJACK =,E10.4,3X,8H	MOMENT	887
	+NUPINS =,I8,7H ABLE =,E10.4,3X,8HCHARLY =,E10.4,3X,7HXTM =,E10.4	MOMENT	888
	+)	MOMENT	889
3040	FORMAT (102H ITERATION HAS EXCEEDED 41 IN LOOP RESULTING IN THE BU	MOMENT	890
	+M THAT YOU JUST OBSERVED DON'T GUSS TOO LOOJLY//9H IAXIAL =,I2,3	MOMENT	891
	+X,7HLOPE =,E10.4,3X,7HSAVEP =,E10.4,3X,7HSAVEG =,E10.4,3X,10H40M	MOMENT	892
	+NT.092)	MOMENT	893
3060	FORMAT (95H 41 ITERATIONS HAVE BEEN CARRIED OUT ON MOOP RESULTING	MOMENT	894
	+IN THIS 8044 (MOMENT.724)//9H IAXIAL =,I2,3X,8HGLJH =,E10.4,3X,7H	MOMENT	895
	+HIGH =,E10.4,3X,8HPTRY =,E10.4,3X,8HJZAP =,I5,7H TER42(JZAP) =,I1	MOMENT	896
	+2.4,3X,8H00P =,E10.4,3X,8HPCOP =,E10.4,3X,8HGENW =,E10.4,3X,8HSLU	MOMENT	897

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+PCL =,E10.4) MOMENT 898
3080 FORMAT (" BOMB OCCURRED BECAUSE COMPUTER DID NOT WANT TO ITERATE M MOMENT 899
+OKE THAN 21 TIMES IN LOOPE(MOMENT.000 OR 002)"/9H IJTYPE =,I2,3X,8 MOMENT 900
+H,WITH =,I3,3X,7H6IMIK =,E10.4,3X,8HAXIAL =,I3,3X,8HPTRY =,E12.0 MOMENT 901
+,,/9H 6IMIK0 =,E12.0,3X,8HERROR =,E12.0,3X,8HJZAP =,I3,3X,7HIDAR MOMENT 902
+M =,I3) MOMENT 903
3100 FORMAT (9H GUESS WHAT ITERATION IN LOOP4 HAS EXCEEDED 41 LIMIT(4 MOMENT 904
+MOMENT./7)/9H IJTYPE =,I3,3X,8HPTRIED =,E10.4,3X,8HPPAS =,E10.4, MOMENT 905
+3X,8HPPAS =,E10.4,3X,7HPPHIG =,E10.4,3X,8HFLOW =,E10.4,7H 1TSK =, MOMENT 906
+I3,3X,7HIDAR =,I3,3X,7HSL00P =,E10.4,3X,8HSL00P =,E10.4,3X,8HPTR MOMENT 907
+Y =,E10.4,3X,7H 0JELL(1) =,E10.4,3X,10H0JELL(2) =,E10.4,3X,10H0J MOMENT 908
+ELL(3) =,E10.4) MOMENT 909
3120 FORMAT (9H YOUR RUN JUST BOMBED BECAUSE OF LOOPIING IN FULL SQUIRT MOMENT 910
+ING LOOPE(MOMENT.222)/9H FOX =E10.4,3X,8H0URGE =,E10.4,3X, MOMENT 911
+7HPPULL =,E10.4,3X,8HPTRY =,E10.4,3X,8H0FOX =,E10.4,7H0H0GEU =,E10 MOMENT 912
+0.4,3X,8HAXIAL =,I3) MOMENT 913
3140 FORMAT (10H YOU HAVE JUST TERMINATED 31 TIMES IN LOOP4 (MOMENT.400) MOMENT 914
+MOMENT.400) AS YOU CAN READILY SEE, QUITE SUCCESSFULLY BOMBED,7H IAXIAL MOMENT 915
+I =,I2,3X,7H0SUCK =,E10.4,3X,7H0SUCK =,E10.4,3X,8H0H0NT =,E10.4) MOMENT 916
3160 FORMAT (9H SONIC LOOPE(LOOPS) SPUN AROUND 31 UNSUCCESSFUL TIMES TO MOMENT 917
+40 AVAILABLE BUT TO BOMB (MOMENT.071)/9H IAXIAL =,I2,3X,7H0PLED = MOMENT 918
+E10.4,3X,8HPTRY =,E10.4,3X,8HPPSONIC =,E10.4,3X,8HVS0NIC =,E10.4,7H MOMENT 919
+9H SWITCH =,E10.4,3X,8H0IMICK =,E10.4,3X,7H0PLXII =,E10.4) MOMENT 920
3180 FORMAT (" ENTERING MOMENT") MOMENT 921
3200 FORMAT (" WHAT INLET FLOW IS NEEDED"/9H PTRY="E12.0," 6IMIK="E12.0, MOMENT 922
+TRIED="E12.0," 0LOW="E12.0," 0HIGH="E12.0) MOMENT 923
3220 FORMAT (" TRYING TO ADJUST P 00BLE FOR PROPER P ENDU"/9H PTRY="E12. MOMENT 924
+0," PLOW="E12.0," NA VOL="E10.4," FG="E10.4," PLOW="E12.0," PHIGH= MOMENT 925
+"E12.0) MOMENT 926
3240 FORMAT (" TRYING TO GET INTERF AND MOMENT TO AGREE"/9H PTRY="E12.0, MOMENT 927
+PLOW="E10.4," UPP K MOD="I3," FRACTION="E10.4," LOWER MOUE="I3, MOMENT 928
+FRACTION="E10.4," FG="E10.4," NA="E10.4) MOMENT 929
3260 FORMAT (" MOMENT SAYS IT LIKES PTRY="E12.0) MOMENT 930
END MOMENT 931

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SUBROUTINE ENERGY, RETURNS (IERROR)
LOGICAL OKAY, LOGIC
COMMON /FRUG/IJCHAN, IJTYPE, LOOP9, LOOPS, LOOPJ, KOOP
COMMON /HANG/A150, A151, A152, A153, A154
+ , KKK, A155
COMMON /TRGAP/DJUMP(20), RF01(20), FMOL(5), ACON(5,3), CLADOK, CLADIR,
+ PULSSV, ALFAF1, ALFAF2, ALFAC1, ALFAC2, YMODF1, YMODF2, YMODU1, YMODC2
+ , NTGAP
EQUIVALENCE (CGAPA, LAXIAL)
COMMON /ADD/LOOPP, YRTP, JZAP, IBITTY, IBATTY, KUP, KDOWN, PGOOD,
+ LOOP4, LOGIC, MOOF
+ , VGAS, VVOID, VLIQ, TOTMEL, LOOPT, LOOPS5, LOOPF, NCOREN
+ , GAP3, A93, A92
DIMENSION DSAVE(15,2)
0****
C**** COMMON DECK "GASPAR" CONTAINING THE CASE PARAMETERS
DIMENSION SLOB(1)
REAL KINSRT, KNTHDR
LOGICAL PRINT, DONE, SCRAM
COMMON
JONE, ISTAT, IIN, SLOW(3),
+ IBLOCK, H(2), T(2), HREDO, ICHAN, VOIUK(2),
+ DUMPPK(2), COLAPK(2), NEW, IOLO, NOUT, TERROR,
+ GERROR, PEKXT(3), PERKUR, PKINT, DELTIM, PY(2),
+ PBOIT(3,2), IACTIV(20), FLOW(3,2), TOPT(3,2), TOPEN(3), WOLF(3),
+ LOOP(20), IJUL, NTRAT, IKINET, TOUT, HMAX,
+ TIMEIN(50), UKIN(50), TIMOUT(50), DKOUT(50), IPAIR2, AY(2),
+ IPAIR3, COUNT, RH(2), BBO100, RHUSHZ, NGROUP,
+ C(6,2), MLIFE, ALPH(6), GAM(6), B(6), AL(6),
+ J3, SCRAM, TSCRAM(2), PERIOD, RSLOPE, ERROR,
+ KINSRT(2), KNTHDR(2), KEDUCE, PRINT1, PRINT2, RMIN,
COMMON
+ ANLOW, TQUIT, LSTEP, JSTEP, ANIC, TKGS,
+ IPLOT, ERRORI, TERY(13), TITLE(8), HUTPIM, SPCB,
+ SPCC, LINESL, KSTEP, NCHAN, MSTEP,
+ IPRINT, MPRINT, IDUMP, UGEN(2), ANI, ANSCRM,
+ TDELAY, NLOOPS, RHOCCE(3), VOLTOP(3), HEAD(3), PRESTM(3),
+ PRESUR(3,3), IPAIR4, PD(3), RUNTIM, VER, EIAU(4),
+ KBLOCK, JBLOCK, MBLOCK, N12, N13, EXTRA,
+ GJACK(3), VJACK(2),
+ HMIN, N22, NIN, INPUT, N2, N4,
+ NZ, N8, KPRINT, POWSS, HMAX3, HMAXF,
+ TRIPFW(3), TRIPPP(3), TRIPFF(3), TRIPOT(3), DELAYF,
EQUIVALENCE (QMOL, TERM(4)), (TMOL, TERM(5)), (GMOL, TERM(6)), (PERMOL, T
+ERM(7)), (SLOB, DONE)
0****
C****
0**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA
DIMENSION S(1), SORC(1), IS(1), EPYT(15,20), GIL(8), XLIQ(11,20,2)
INTEGER SMLP
COMMON
TCOUL(7,2), RLOG(22,20), UU(3), ULIQ(7),
+ UVAF(7), DLX(7),
+ AFLOW(75), JS(4,20), HCAPS(4,2), DSAVE1(4,5,2), DSAVE2(7,2),
+ DSAVE3(15,20,2), DSAVE4(7,2), POW(16,20), VOLUME(15,20), HCAPF(15,20),
+ TEMPER(15,20,2), TSINK(4,5,2), VOLOV(20), VLEN, PLEN(2),
+ RFLN(2), G(7,2), RHOU(7,2), VOLG(2),
+ VOLF(2), GTC, GT1, GT2, GT3, GAS3U(2,2),
+ GAS3U(2,2), FUELB0(2), FUELB1(2), FANN(75), P(7,2), RHOG(7,2),
+ RHUF(75,2), WF(7), WC(7), NUPINS, NAXIAL, NBORE,
+ NTOR=, VTOP(7), TYP(15,20), IGAS(2), NBFLEN,
+ IFUEL(2), IBOL(2), IGASD(2,2), IGASU(2,2), IFUEL0(2), IFUEL1(2),
+ IJUL(2,2), IJULU(2,2), NBOIL(2), NGAS(2), RLC, RLV,
COMMON
+ CLC, CLV, CVC, CVV, BASIST(5), CONDU(3),
+ ZI, IPAIR1, CGAPA, CGAPB, CGAPC, CGAPJ, STEMP(6),
+ STI(6,2), TSM(30), ST2(30), UNSEN, DENSE(2), TMAGIC,

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+TSAT	,AHOLE	,HAXF	,HAXL	,HAXV	,PSAT	,CHNDAT	22
+RLIQ	,RLQF	,FTRY	,FVOID	,IFUELS	,JFUELS	,CHNDAT	23
+TGASS	,TSUPER	,TFUELS	,TMELTH	,TMELTL	,GAMMA	,CHNDAT	24
+PINTEN(20,2)	,GAPR(20)	,GAPRE	,CLVC	,DOPCOE(20,2)		,CHNDAT	25
+BASENA	,JOPPW	,RNASLC	,SPC2(2)	,HFUSEE	,JKNV(20,2)	,CHNDAT	26
+WALTAR(75)	,PARIAN(20)	,IGAP				,CHNDAT	27
+COMMON		KFUELS	,SFC3(13)	,HI(75)	,CLADKT	,CHNDAT	28
+RLV2	,CLV2	,CVV2	,HAXL1	,HAXL2	,GAPB2	,CHNDAT	29
+CLADK	,CAPS(75)	,TSIRUK(75,2)	,USTL(75)	,USTV(75)	,JSAVE6(75,2)	,CHNDAT	30
+CLIQ(15)	,CLIQT(15)	,CVAP(15)	,CVAPT(15)	,HLLP(75)	,SHLLP(75)	,CHNDAT	31
+KHOUNA(75,2)	,TW(11)	,UOLU(75)	,IDILL	,JBILL	,BOX(25,4)	,CHNDAT	32
+DUPERC(3,20)	,FORUS(3,20)	,YEHYEH(11,20)	,SPC4	,IOUT(20,6)		,CHNDAT	33
+COMMON	IBAX,ITAX,LUP,LOWN,LUPU,LOWNC,DUP,DOWN,DUPU,DOWNC,					,CHNDAT	34
+ALFA(20,2)	,RHOR(20,2)	,V(20,2)	,AKLAH(20,2)	,AREAX(20,2)	,UJOF(20,2)	,CHNDAT	35
+FIN(20,2)	,AAA(20,2)	,HTPY(20,2)	,UMASS(20)	,QHEAT(20)	,ULIQIN(20)	,CHNDAT	36
+GASI(20)	,TBAR(20)	,VVELT2(20)	,VGAS1(20)	,VGAS2(20)	,GASIN1,GASIN2,	,CHNDAT	37
+NINFIN						,CHNDAT	38
+EQUIVALENCE	(ULIQ(1),VFUELS),(ULIQ(75),GRIFIC),(UVAP(1),KHUSGF),					,CHNDAT	39
+G(75,1)	,FQSONR),(G(75,2),IZOP),(MTYPE(1,1),LPTYM(1,1)),(DOPCOE(1,					,CHNDAT	40
+P)	,JOFFD),(DOPCOE(2,2),DOPDEL),(DOPCOE(3,2),JIL),(UVAP(75),GTOL)					,CHNDAT	41
+,(USTL,IZAP),(JSTV,IZUP),(GGAPM,LAXIAL),(XLIQ,USAVE3)						,CHNDAT	42
+,(S,CORE,IS,TCOOL),(SCOTT,IFUELS)						,CHNDAT	43
+EQUIVALENCE	(TW(1),SKEW),(TW(2),RHORAT),(TW(3),DETAIL)					,CHNDAT	44
+EQUIVALENCE	(TW(4),PLEL),(TW(5),FSTART),(TW(6),TREAT)					,CHNDAT	45
+EQUIVALENCE	(TW(7),FACTN),(TW(8),SPREAD),(TW(9),VORIG)					,CHNDAT	46
+EQUIVALENCE	(TW(10),AKLA),(TW(11),FRIC)					,CHNDAT	47
*****						,CHNDAT	48
*****						BCOM	2
*****	BLANK COMMON SCATCH PAD					BCOM	3
	INITIAL STATE					BCOM	4
	COMMON STATE(7)					BCOM	5
	+ LIQ(75),TER41(75),TER42(75),TER43(75),TER44(75),TER45(75),					BCOM	6
	+TER46(75),TER47(75),TER48(75),A1(15,75),D1(15,75),A2(75),					BCOM	7
	+J2(75),DROT(75),VMELT(20),VMUSH(20),GAP(20),VNOH(75),					BCOM	8
	+ACCEL(75),SUB(2),FOHK(75),U(15,20),A3(75),D3(75),					BCOM	9
	+TER411(75),TER4111(75),Q(75),BLUPER(75),OLL(2,75),BUMBUM(15)					BCOM	10
	+),BLUB(55)					BCOM	11
*****						BCOM	12
*****	DATA 4101/0.7,CAPS/0.7					ENERGY	19
*****						ENERGY	20
*****	ENERGY SUBROUTINE					ENERGY	21
*****						ENERGY	22
*****	CALCULATE "OLD T RAS" FOR FUEL -IF NECESSARY- BASED ON CURRENT					ENERGY	23
*****	MASS OF FUEL IN THE JOLE					ENERGY	24
	IF (ICHAN.EQ.IGHTST.AND.NEW.EQ.NEWTST) GO TO 240					ENERGY	25
	NEWTST=NEW					ENERGY	26
	IGHTST=ICHAN					ENERGY	27
*****	COMPUTE HEAT TRANSFER COEFFICIENTS "U"					ENERGY	28
	M=TOP(NBCORE)					ENERGY	29
	MM5=M-					ENERGY	30
	DO 220 I=1,NBCORE					ENERGY	31
	IAXIAL=I+NBCORE-1					ENERGY	32
	K=MING(2,MOJ(MTYPE(1,1),6))					ENERGY	33
	CALL CURVE (CON1,TEMPER(1,I,IOLD),BASICT,CONDU(1,K),IPAIR1,I19)					ENERGY	34
	ISCRUP=30					ENERGY	35
	IF (I19.GT.0) GO TO 2520					ENERGY	36
	DO 120 IRAU=1,MM5					ENERGY	37
	K=MING(2,MOJ(MTYPE(IRAU+1,I),6))					ENERGY	38
	CALL CURVE (CON2,TEMPER(IRAU+1,I,IOLD),BASICT,CONDU(1,K),IPAIR1,I					ENERGY	39
	+19)					ENERGY	40
	ISCRUP=40					ENERGY	41
	IF (I19.GT.0) GO TO 2540					ENERGY	42
	U(1+I,1)=1./((LOG(2*IRAU-1,I)/CON1/YEHYEH(IRAU,I)+LOG(2*IRAU,I)/					ENERGY	43
	+CON2/YEHYEH(IRAU+1,I))					ENERGY	44
	IF (MTYPE(IRAU+1,I).EQ.3) CALL CURVE (CON2,TEMPER(IRAU+1,I,IOLD),B					ENERGY	45
	+ASICT,CONDU(1,K),IPAIR1,I19)					ENERGY	46
	ISCRUP=50					ENERGY	47

IF (I19.GT.0) GO TO 2040	ENERGY	+8
120 CON1=CON2	ENERGY	49
U(M-4,I)=YEHYEH(M-4,I)*CON2/RLOG(2*M-9,I)	ENERGY	50
U(M-3,I)=GAPR(I)	ENERGY	51
U(M-2,I)=UU(2)*(CLAJK+CLAJKT*TEMPER(M-1,I,IOLD))	ENERGY	52
U(M-1,I)=UU(3)*(CLAJK+CLAJKT*TEMPER(M-1,I,IOLD))	ENERGY	53
L=STATE(IAXIAL)	ENERGY	54
IF (L.EQ.1) U(M,I)=ULIQ(IAXIAL)	ENERGY	55
IF (L.EQ.4) U(M,I)=ULIQ(IAXIAL)*FUELBO(IOLD)	ENERGY	56
IF (L.EQ.5) U(M,I)=ULIQ(IAXIAL)*(1.-FUELBU(IOLD))	ENERGY	57
IF (L.EQ.14) U(M,I)=UVAP(IAXIAL)	ENERGY	58
C**** NOW COMPUTE GLU TERMS	ENERGY	59
TSTART=0.	ENERGY	60
MM1=M-1	ENERGY	61
DO 140 IRAD=1,MM1	ENERGY	62
TEND=U(IRAD,I)*(TEMPER(IRAD,I,IOLD)-TEMPER(IRAD+1,I,IOLD))	ENERGY	63
AMNT=1.0	ENERGY	64
IF (IRAD.LE.M-4) AMNT=YEHYEH(IRAD,I)	ENERGY	65
USAVE5(IRAD,I)=AMNT*PN(IOLD)*POW(IRAD,I)+TSTART-TEND	ENERGY	66
TSTART=TEND	ENERGY	67
140 CONTINUE	ENERGY	68
TEND=U(M,I)*(TEMPER(M,I,IOLD)-TCOOL(IAXIAL,IOLD))	ENERGY	69
IF (L.EQ.1.OR.L.EQ.14) GO TO 160	ENERGY	70
IF (L.EQ.4) DELL=(1.-FUELBO(IOLD))	ENERGY	71
IF (L.EQ.5) DELL=FUELBU(IOLD)	ENERGY	72
IF (A131.EQ.0.) A131=12130./(10.51-ALOG(PTRY/1.013E+6))	ENERGY	73
TEND=TEND+UVAP(IAXIAL)*DELL*(TEMPER(M,I,IOLD)-A131)	ENERGY	74
160 DSAVE5(M,I)=PN(IOLD)*POW(M,I)+TSTART-TEND	ENERGY	75
C**** COMPUTE NEW GAP COEFFICIENTS	ENERGY	76
IF (ITRGAP.EQ.0) GO TO 200	ENERGY	77
SUM=0.0	ENERGY	78
TFBAR=0.	ENERGY	79
MM4=M-4	ENERGY	80
DO 180 IRAD=1,MM4	ENERGY	81
N=1+MOD(MTYPE(IRAD,1)-1,2)	ENERGY	82
ABLE=VOLUME(IRAD,I)*DENSE(N)	ENERGY	83
SUM=SUM+ABLE	ENERGY	84
TFBAR=TFBAR+TEMPER(IRAD,I,IOLD)*ABLE	ENERGY	85
180 CONTINUE	ENERGY	86
TFBAR=TFBAR/SUM	ENERGY	87
TCBAR=TEMPER(M-1,I,IOLD)	ENERGY	88
TGAP=0.5*(TEMPER(M-2,I,IOLD)+TEMPER(M-3,I,IOLD))	ENERGY	89
PGAS=PPLN(1)	ENERGY	90
CALL TRHGAP (I,GAPR,TFBAR,TCBAR,TGAP,PGAS)	ENERGY	91
200 CONTINUE	ENERGY	92
220 CONTINUE	ENERGY	93
240 CONTINUE	ENERGY	94
C**** IF TREAT RUN SET UP INLET CONDITIONS	ENERGY	95
IF (INTREAT.EQ.0) GO TO 300	ENERGY	96
IF (INTREAT.GT.0) GO TO 200	ENERGY	97
IF (JSTEP.NE.1) GO TO 300	ENERGY	98
GO TO 280	ENERGY	99
200 TCOOL(1,NEW)=TCOOL(NAXIAL+1,IOLD)	ENERGY	100
280 CALL CURVE (ABLE,TCOOL(1,IOLD),CLIQ,CLIQ,15,I19)	ENERGY	101
ISCPUP=101	ENERGY	102
IAXIAL=1	ENERGY	103
IF (I19.GT.0) GO TO 2000	ENERGY	104
H_LP(1)=ABLE*TCOOL(1,IOLD)	ENERGY	105
300 CONTINUE	ENERGY	106
IF (CVC.LT.-50.) GGAS=G(LAXIAL-1,NEW)	ENERGY	107
C****	ENERGY	108
C**** IF FULL SQUIRTING HAS BEGUN COMPUTE BUBBLE PRESSURE AND	ENERGY	109
C**** TEMPERATURE CONDITIONS AND TERMS FOR INCLUSION IN ENERGY	ENERGY	110
C**** BALANCES FOR NODES CONTAINING INTERFACES	ENERGY	111
IF (IGAS(NEW).EQ.0.AND.IFUEL(IOLD).EQ.0) GO TO 400	ENERGY	112

FACTOR=C.	ENERGY	113
B151=OIL(NEW+2)+OIL(NLW)*DELX(NBCORE)	ENERGY	114
IF (B151.NE.0.) FACTOR=OIL(NEW+2)/B151	ENERGY	115
IF (LOOPP.LT.2) B151=PTRY	ENERGY	116
APTRY=.5*(PTRY+B151)	ENERGY	117
B151=APTRY	ENERGY	118
A151=12130./(10.51-ALOG(APTRY/1.013E+6))	ENERGY	119
IF (FACTOR.EQ.0.0) A151=TCOOL(KUP-1,IOLD)	ENERGY	120
I=SMELP(2)	ENERGY	121
IF (I.EQ.KUP) GO TO 320	ENERGY	122
WING=AFLOW(I)*.5*(HLLP(KUP)+HLLP(I-1))	ENERGY	123
HOOKEY=DELX(I)*RHODNA(I,IOLD)	ENERGY	124
GO TO 340	ENERGY	125
320 WING=AFLOW(I)*HLLP(KUP)	ENERGY	126
HOOKEY=WALTAR(I)/AFLOW(I)	ENERGY	127
340 I=SMELP(3)	ENERGY	128
IF (I.EQ.KDOWN) GO TO 360	ENERGY	129
WING=AFLOW(I)*.5*(HLLP(KDOWN)+HLLP(I+1))	ENERGY	130
CROCK=DELX(I)*RHODNA(I,IOLD)	ENERGY	131
GO TO 380	ENERGY	132
360 WING=AFLOW(I)*HLLP(KDOWN)	ENERGY	133
CROCK=WALTAR(I)/AFLOW(I)	ENERGY	134
380 ELF=AFLOW(I-1)/AFLOW(I)	ENERGY	135
C****	ENERGY	136
C****	ENERGY	137
C**** RETURN TO HERE IF TEMPERATURES HAVE CHANGED	ENERGY	138
C**** WORK UP THE CHANNEL ELIMINATING VARIABLES	ENERGY	139
400 CONTINUE	ENERGY	140
C**** INITIALIZE SOME VARIABLES	ENERGY	141
130=33	ENERGY	142
GO 420 139=40,7.	ENERGY	143
IF (SMELP(139).EQ.1) GO TO 440	ENERGY	144
420 CONTINUE	ENERGY	145
440 139=139+1	ENERGY	146
OKAY=.TRUE.	ENERGY	147
UPR=10.	ENERGY	148
C****	ENERGY	149
C****	ENERGY	150
C**** COMPUTE HEAT CAPACITY AND 1/(THERMAL RESISTANCE) AT FIRST UPPER	ENERGY	151
C**** NOMIAL BOUNDARY	ENERGY	152
L=STATL(2)	ENERGY	153
IF (L.EQ.0.0OR.L.EQ.14) GO TO 460	ENERGY	154
HAXU2=AFLOW(2)*2./DELX(2)*(HAXL+TCOOL(2,NEW)*(HAXL1+TCOOL(2,NEW)*H	ENERGY	155
*AXL2)	ENERGY	156
CALL CURVE (CAP4,TCOOL(2,NEW),CLIQT,CLIO,15,I19)	ENERGY	157
ISCRUP=157	ENERGY	158
MAXIAL=2	ENERGY	159
IF (I19.GT.0) GO TO 2000	ENERGY	160
GO TO 450	ENERGY	161
460 HAXU2=0.0	ENERGY	162
CAP4=0.0	ENERGY	163
OPR=0.0	ENERGY	164
C****	ENERGY	165
480 IF (U(1,NEW)) 500,520,520	ENERGY	166
500 HAXU1=HAXU2	ENERGY	167
CAP3=CAP4	ENERGY	168
IF (OPR.LT.0.) OPR=TCOOL(2,NEW)	ENERGY	169
GO TO 540	ENERGY	170
520 HAXU1=AFLOW(1)*2./DELX(1)*(HAXL+TCOOL(1,NEW)*(HAXL1+TCOOL(1,NEW)*H	ENERGY	171
*AXL2)	ENERGY	172
CALL CURVE (CAP3,TCOOL(1,NEW),CLIQT,CLIO,15,I19)	ENERGY	173
ISCRUP=173	ENERGY	174
MAXIAL=1	ENERGY	175
IF (I19.GT.0) GO TO 2000	ENERGY	176
OPR=TCOOL(1,NEW)	ENERGY	177
540 OPR=0.0	ENERGY	178
C****	ENERGY	179

C****		ENERGY	186
C****	FOR EACH AXIAL NODE COMPUTE TERMS FOR INCLUSION IN SOLUTION	ENERGY	187
C****	MATRIX FOR TEMPERATURES	ENERGY	188
	DO 1580 IAXIAL=2,NAXIAL	ENERGY	189
C****	PUT SOME INTERMEDIATE TERMS	ENERGY	190
	IF (TCOOL(IAXIAL+1,NEW).LT.CLIQT(1)) TCOOL(IAXIAL+1,NEW)=TCOOL(IAXIAL+1,NEW)	ENERGY	191
	HUM3=0.0	ENERGY	192
	HUM4=0.0	ENERGY	193
	IF (CVC.LT.-50..AND.IAXIAL.EQ.LAXIAL) G(LAXIAL-1,NEW)=TMAGIC	ENERGY	194
	TERM9=0.0	ENERGY	195
	TERM7(IAXIAL)=0.0	ENERGY	196
C****		ENERGY	197
C****	SET 1./(THERMAL RESISTANCE) AND HEAT CAPACITY AT LOWER NODAL	ENERGY	198
C****	BOUNDARY EQUAL TO THOSE AT PREVIOUS UPPER NODAL BOUNDARY	ENERGY	199
	HAXU1=HAXU1	ENERGY	200
	HAXU2=HAXU2	ENERGY	201
	CAP1=CAP3	ENERGY	202
	CAP2=CAP4	ENERGY	203
C****		ENERGY	204
C****	COMPUTE HEAT CAPACITY AND 1./(THERMAL RESISTANCE) INTO UPPER	ENERGY	205
C****	NODAL BOUNDARY	ENERGY	206
	L=STATE(IAXIAL)	ENERGY	207
	IF (L.EQ.4.OR.L.EQ.14) GO TO 208	ENERGY	208
	HAXU1=AFLOW(IAXIAL)*2./DELX(IAXIAL)*(HAXL+TCOOL(IAXIAL,NEW)*(HAXL1	ENERGY	209
	+TCOOL(IAXIAL,NEW)*HAXL2))	ENERGY	210
	CALL CURVE (CAP3,TCOOL(IAXIAL,NEW),CLIQT,CLIQ,15,I19)	ENERGY	211
	ISCRUP=200	ENERGY	212
	IF (I19.GT.0) GO TO 213	ENERGY	213
	GO TO 214	ENERGY	214
208	HAXU1=0.0	ENERGY	215
	CAP3=J.0	ENERGY	216
****		ENERGY	217
****		ENERGY	218
C****	COMPUTE HEAT CAPACITY AND 1./(THERMAL RESISTANCE) OUT OF UPPER	ENERGY	219
C****	NODAL BOUNDARY	ENERGY	220
210	IF (IAXIAL-NAXIAL) 620,600,620	ENERGY	221
600	HAXU2=HAXU1	ENERGY	222
	I=LOOP(ICHAN)	ENERGY	223
	CALL CURVE (CAP+,TOPT(I,NEW),CLIQT,CLIQ,15,I19)	ENERGY	224
	IF (I19.GT.0) GO TO 225	ENERGY	225
	GO TO 600	ENERGY	226
620	L=STATE(IAXIAL+1)	ENERGY	227
	IF (L.EQ.5.OR.L.EQ.14) GO TO 640	ENERGY	228
	HAXU2=AFLOW(IAXIAL+1)*2./DELX(IAXIAL+1)*(HAXL+TCOOL(IAXIAL+1,NEW)*	ENERGY	229
	+HAXL1+TCOOL(IAXIAL+1,NEW)*HAXL2))	ENERGY	230
	CALL CURVE (CAP+,TCOOL(IAXIAL+1,NEW),CLIQT,CLIQ,15,I19)	ENERGY	231
	ISCRUP=220	ENERGY	232
	IF (I19.GT.0) GO TO 233	ENERGY	233
	GO TO 600	ENERGY	234
640	CAP+=J.0	ENERGY	235
	HAXU2=0.0	ENERGY	236
C****		ENERGY	237
C****		ENERGY	238
C****	COMPUTE 1./(THERMAL RESISTANCE) THROUGH UPPER AND LOWER NODAL	ENERGY	239
C****	BOUNDARIES	ENERGY	240
600	CUC=0.	ENERGY	241
	IF ((HAXU1+HAXU2).NE.0.) CUC=HAXU2/(HAXU1+HAXU2)	ENERGY	242
	TERM1(IAXIAL)=HAXU1*CUC	ENERGY	243
	CUC=J.	ENERGY	244
	IF ((HAXU1+HAXU2).NE.0.) CUC=HAXU1/(HAXU1+HAXU2)	ENERGY	245
	TERM2(IAXIAL)=CUC*HAXU1	ENERGY	246
	IF (G(IAXIAL-1,NEW)) 680,700,720	ENERGY	247
C****		ENERGY	248
C****	COMPUTE CONVECTIVE TERM FOR "OLD" TIME AT LOWER NODAL BOUNDARY	ENERGY	249

680	TERM3(IAXIAL)=.5*G(IAXIAL-1,NEW)*AFLOW(IAXIAL-1)*CAP2	ENERGY	245
	CDC=0.	ENERGY	246
	IF (CAP2.NE.0.) CDC=TERM3(IAXIAL)/CAP2	ENERGY	247
	ACCEL(IAXIAL)=CDC*HELPI(IAXIAL)	ENERGY	248
	GO TO 740	ENERGY	249
700	TERM3(IAXIAL)=0.0	ENERGY	250
	ACCEL(IAXIAL)=0.0	ENERGY	251
	GO TO 740	ENERGY	252
720	TERM3(IAXIAL)=.5*G(IAXIAL-1,NEW)*AFLOW(IAXIAL-1)*CAP1	ENERGY	253
	CDC=0.	ENERGY	254
	IF (CAP1.NE.0.) CDC=TERM3(IAXIAL)/CAP1	ENERGY	255
	ACCEL(IAXIAL)=CDC*HELPI(IAXIAL-1)	ENERGY	256
C****		ENERGY	257
C****	COMPUTE CONVECTIVE TERM FOR "OLD" TIME AT UPPER NODAL BOUNDARY	ENERGY	258
C****	AND DIFFERENCE BETWEEN UPPER AND LOWER BOUNDARIES	ENERGY	259
740	IF (G(IAXIAL,NEW)) /60,780,800	ENERGY	260
760	TERM4(IAXIAL)=.5*G(IAXIAL,NEW)*AFLOW(IAXIAL)*CAP4	ENERGY	261
	T42=0.	ENERGY	262
	IF (CAP4.NE.0.) T42=TERM4(IAXIAL)/CAP4	ENERGY	263
	ACCEL(IAXIAL)=ACCEL(IAXIAL)-T42*HELPI(IAXIAL+1)	ENERGY	264
	GO TO 820	ENERGY	265
780	TERM4(IAXIAL)=0.0	ENERGY	266
	GO TO 820	ENERGY	267
800	TERM4(IAXIAL)=.5*G(IAXIAL,NEW)*AFLOW(IAXIAL)*CAP3	ENERGY	268
	T42=0.	ENERGY	269
	IF (CAP3.NE.0.) T42=TERM4(IAXIAL)/CAP3	ENERGY	270
	ACCEL(IAXIAL)=ACCEL(IAXIAL)-T42*HELPI(IAXIAL)	ENERGY	271
C****		ENERGY	272
C****	DETERMINE HEAT TRANSFER TERM TO COOLANT NODE BASED ON STATE OF	ENERGY	273
C****	NODE	ENERGY	274
820	MENTOP(IAXIAL)	ENERGY	275
	L=STATL(IAXIAL)	ENERGY	276
	OKAY=.FALSE.	ENERGY	277
	IF (L.EQ.4) GO TO 1000	ENERGY	278
	IF (L.EQ.5) GO TO 1080	ENERGY	279
	IF (L.EQ.14) GO TO 1100	ENERGY	280
	UCLL=DELX(IAXIAL)	ENERGY	281
	BAKER=RLC+TCOOL(IAXIAL,NEW)*(RLV+TCOOL(IAXIAL,NEW)*RLV2)	ENERGY	282
840	TERM5(IAXIAL)=ULIQ(IAXIAL)*DELL	ENERGY	283
	TERM10(IAXIAL)=JSTL(IAXIAL)*DELL	ENERGY	284
	CALL CURVE=(ABLE,TCOOL(IAXIAL,NEW),CLIQT,CLIQ,15,I19)	ENERGY	285
	ISCRUP=280	ENERGY	286
	IF (I19.GT.0) GO TO 2000	ENERGY	287
	TERM11(IAXIAL)=ABLE	ENERGY	288
	TERM6(IAXIAL)=UCLL*ABLE*BAKER*AFLOW(IAXIAL)	ENERGY	289
C****	ADJUST CONVECTIVE TERMS IN NODES THRU WHICH I.F. PASSED	ENERGY	290
	IF (IAXIAL.NE.SMELP(I38)) GO TO 900	ENERGY	291
	IF (I38.NE.38) GO TO 900	ENERGY	292
	T42=0.	ENERGY	293
	IF (CAP3.NE.0.) T42=TERM4(IAXIAL)/CAP3	ENERGY	294
	ACCEL(IAXIAL)=ACCEL(IAXIAL)+T42*HELPI(IAXIAL)	ENERGY	295
	R_BOP=G(IAXIAL-1,NEW)*AFLOW(IAXIAL-1)+(WALTAR(IAXIAL)-DELX(IAXIAL)	ENERGY	296
	+*AFLOW(IAXIAL)*BAKER)/H(NEW)	ENERGY	297
	GO TO 890	ENERGY	298
860	ACCEL(IAXIAL)=0.0	ENERGY	299
	TERM3(IAXIAL)=TERM4(IAXIAL-1)	ENERGY	300
	R_BOP=R_BOP+(WALTAR(IAXIAL)-DELX(IAXIAL)*AFLOW(IAXIAL)*BAKER)/H(NEW)	ENERGY	301
	+4)	ENERGY	302
880	TERM4(IAXIAL)=R_BOP*CAP3	ENERGY	303
	I38=I39-1	ENERGY	304
	GO TO 920	ENERGY	305
900	IF (IAXIAL.NE.SMELP(I39)) GO TO 920	ENERGY	306
	ACCEL(IAXIAL)=0.0	ENERGY	307
	TERM3(IAXIAL)=TERM4(IAXIAL-1)	ENERGY	308
	R_BOP=R_BOP+(WALTAR(IAXIAL)-DELX(IAXIAL)*AFLOW(IAXIAL)*BAKER)/H(NEW)	ENERGY	309
	+4)	ENERGY	310
	TERM4(IAXIAL)=R_BOP*CAP4	ENERGY	311

139=139-1	ENERGY	312
920 CONTINUE	ENERGY	313
C**** IF NODE IS IN CORE REGION SET TERM7 EQUAL TO POWER INPUT INTO	ENERGY	314
C**** COOLANT NODE = DIRECT PLUS POWER INTO PLATED FUEL	ENERGY	315
N=IAXIAL-NBCORE+1	ENERGY	316
IF (IAXIAL.LT.NBCORE.OR.IAXIAL.GT.NTCORE) GO TO 1120	ENERGY	317
TERM7(IAXIAL)=JELX(IAXIAL)*PN(NEW)*POW(M+1,N)	ENERGY	318
IF (STATE(IAXIAL).EQ.1.AND.RHOG(IAXIAL,1).GT.0.0) TERM7(IAXIAL)=T	ENERGY	319
*RM7(IAXIAL)*POW(M+1,N)*CGAPD*RHOG(IAXIAL,1)*DELX(IAXIAL)*PN(NEW)	ENERGY	320
GO TO 1120	ENERGY	321
940 ACCEL(IAXIAL)=ACCEL(IAXIAL)+DING*(-G(IAXIAL-1,NEW)*ELF-(CROOK-DELL	ENERGY	322
*BAKE)/H(NEW)	ENERGY	323
GO TO 840	ENERGY	324
960 IF (KDOWN.EQ.SM.LP(3)) GO TO 980	ENERGY	325
ACCEL(IAXIAL)=0.0	ENERGY	326
TERM3(IAXIAL)=CAP1*JELL*AFLOW(IAXIAL)*BAKE/H(NEW)	ENERGY	327
GO TO 840	ENERGY	328
980 IF (IFUEL(NEW).NE.IFUEL(NEW)) GO TO 840	ENERGY	329
HOKUM=G(IAXIAL-1,NEW)*AFLOW(IAXIAL-1)*H(NEW)+WALTAR(IAXIAL)	ENERGY	330
POKUM=(RLC+TCOOL(IAXIAL,NEW)*(RLV+TCOOL(IAXIAL,NEW)*RLV2))*JELL*AF	ENERGY	331
*LOW(IAXIAL)	ENERGY	332
HOKUM=(HOKUM-POKUM)*./H(NEW)	ENERGY	333
ACCEL(IAXIAL)=ACCEL(IAXIAL)-HOKUM*HELP(IAXIAL)	ENERGY	334
TERM4(IAXIAL)=HOKUM*CAP2	ENERGY	335
GO TO 840	ENERGY	336
1000 IF (IFUEL(NEW).NE.IFUEL(NEW)) GO TO 1020	ENERGY	337
IOP=SMELP(3)	ENERGY	338
IPO=SMELP(2)	ENERGY	339
WING=J2(IOP)*TERM1(IOP)*AFLOW(IPO)	ENERGY	340
1020 ACCEL(IAXIAL)=ACCEL(IAXIAL)+WING*(G(IAXIAL,NEW)-(HOOKY-DELL*BAKE	ENERGY	341
)/H(NEW))	ENERGY	342
GO TO 840	ENERGY	343
1040 IF (KUP.EQ.SMELP(2)) GO TO 840	ENERGY	344
ACCEL(IAXIAL)=0.0	ENERGY	345
3.BOP=-DELL*AFLOW(IAXIAL)*BAKE/H(NEW)	ENERGY	346
TERM4(IAXIAL)=3.BOP*CAP4	ENERGY	347
GO TO 840	ENERGY	348
1060 JELL=JELX(IAXIAL)*FUELBD(NEW)	ENERGY	349
HUM1=UVAP(IAXIAL)*(JELX(IAXIAL)-DELL)/DELX(IAXIAL)*FACTOR	ENERGY	350
FOHR(IAXIAL)=HUM1	ENERGY	351
HUM2=HUM1*A151	ENERGY	352
HUM3=JSTV(IAXIAL)*(JELX(IAXIAL)-DELL)/DELX(IAXIAL)*FACTOR	ENERGY	353
Q(IAXIAL)=HUM3	ENERGY	354
HUM4=HUM3*A151	ENERGY	355
BAKER=RLC+TCOOL(IAXIAL,NEW)*(RLV+TCOOL(IAXIAL,NEW)*RLV2)	ENERGY	356
IF (G(IAXIAL-1,NEW)) 940,940,960	ENERGY	357
BAKER=RLC+TCOOL(IAXIAL,NEW)*(RLV+TCOOL(IAXIAL,NEW)*RLV2)	ENERGY	358
DELL=JELX(IAXIAL)*(1.-FUELBU(NEW))	ENERGY	359
HUM1=UVAP(IAXIAL)*(JELX(IAXIAL)-DELL)/DELX(IAXIAL)*FACTOR	ENERGY	360
FOHR(IAXIAL)=HUM1	ENERGY	361
HUM2=HUM1*A151	ENERGY	362
HUM3=JSTV(IAXIAL)*(JELX(IAXIAL)-DELL)/DELX(IAXIAL)*FACTOR	ENERGY	363
Q(IAXIAL)=HUM3	ENERGY	364
HUM4=HUM3*A151	ENERGY	365
IF (G(IAXIAL,NEW)) 1040,1040,1060	ENERGY	366
C**** VAPOR NODE CALCULATION	ENERGY	367
1100 TERM5(IAXIAL)=UVAP(IAXIAL)*DELX(IAXIAL)	ENERGY	368
TERM10(IAXIAL)=USTV(IAXIAL)*JELX(IAXIAL)	ENERGY	369
TERM16(IAXIAL)=0.0	ENERGY	370
TERM11(IAXIAL)=3.3	ENERGY	371
1120 CONTINUE	ENERGY	372
C****	ENERGY	373
C****	ENERGY	374
C**** DETERMINE IF NODE IS IN CORE REGION	ENERGY	375

IF (LIST(IAXIAL)) 1320,1320,1140	ENERGY	370
1140 IF (IAXIAL-NBCORE) 1180,1260,1140	ENERGY	377
1160 IF (IAXIAL-NTCORE) 1260,1260,1200	ENERGY	378
1180 I=IAXIAL	ENERGY	379
GO TO 1220	ENERGY	380
1200 I=IAXIAL-NTCORE+NBCORE-1	ENERGY	381
C****	ENERGY	382
C**** COMPUTE A'S AND B'S FOR PIN TEMPERATURE SOLUTION MATRIX FOR	ENERGY	383
C**** REGION NOT IN CORE	ENERGY	384
1220 APRCV=0.0	ENERGY	385
OPREV=0.0	ENERGY	386
DO (1,I)=TERMS(IAXIAL)/DELX(IAXIAL)	ENERGY	387
DO 1240 IRAJ=1,M	ENERGY	388
UENOM=HCAPS(IRAJ,I)/H(NEW)+US(IRAJ,I)+APREV	ENERGY	389
A1(IRAJ,IAXIAL)=US(IRAJ,I)/UENOM	ENERGY	390
B1(IRAJ,IAXIAL)=(OPREV+HCAPS(IRAJ,I)*TSINK(IRAJ,I,IOLD)/H(NEW)+DSA	ENERGY	391
+VF1(IRAJ,I,IOLD)/UENOM	ENERGY	392
APREV=(1.-A1(IRAJ,IAXIAL))*US(IRAJ,I)	ENERGY	393
1240 OPREV=U1(IRAJ,IAXIAL)*US(IRAJ,I)	ENERGY	394
C**** CORRECT A'S AND B'S FOR PARTIAL LIQUID NODE IN NON CORE REGION	ENERGY	395
IF (STATE(IAXIAL).EQ.1.OR.STATE(IAXIAL).EQ.14) GO TO 1320	ENERGY	396
HUM=DENOM+HUM1	ENERGY	397
A1(M,IAXIAL)=A1(M,IAXIAL)*DENOM/HUM	ENERGY	398
B1(M,IAXIAL)=(B1(M,IAXIAL)*DENOM+HUM2)/HUM	ENERGY	399
GO TO 1320	ENERGY	400
C****	ENERGY	401
C**** COMPUTE HEAT TRANSFER COEFFICIENTS "US" IN FUEL REGION	ENERGY	402
1260 CONTINUE	ENERGY	403
I=IAXIAL-NBCORE+1	ENERGY	404
MM3=M-3	ENERGY	405
K=MINJ(2,M00(MTYPE(1,I),6))	ENERGY	406
CALL SUBC (CON1,TEMPER(1,I,NEW),BASICT,CONJUC(1,K),IPAIR1,119)	ENERGY	407
ISCUP=407	ENERGY	408
IF (I19.GT.0) GO TO 2020	ENERGY	409
DO 1280 IRAJ=1,MM3	ENERGY	410
K=MINJ(2,M00(MTYPE(IRAJ+1,I),5))	ENERGY	411
CALL SUBC (CON2,TEMPER(IRAJ+1,I,NEW),BASICT,CONJUC(1,K),IPAIR1,119)	ENERGY	412
+9)	ENERGY	413
ISCUP=412	ENERGY	414
IF (I19.GT.0) GO TO 2040	ENERGY	415
U(IRAJ,I)=1./RLOG(2*IRAJ-1,I)/CON1/YLHYEH(IRAJ,I)+RLOG(2*IRAJ,1)/	ENERGY	416
+CON2/YLHYEH(IRAJ+1,I))	ENERGY	417
IF (MTYPE(IRAJ+1,I).EQ.3) CALL CURVE (CON2,TEMPER(IRAJ+1,I,NEW),JA	ENERGY	418
+SICU,CONJUC,IPAIR1,119)	ENERGY	419
ISCUP=419	ENERGY	420
IF (I19.GT.0) GO TO 2040	ENERGY	421
1280 CON1=CON2	ENERGY	422
U(1-4,I)=CON2/RLOG(2*M-9,1)	ENERGY	423
U(M-3,1)=GAPK(I)	ENERGY	424
U(M-2,1)=UU(2)*(CLAJK+CLAJKT*TEMPER(M-1,I,NEW))	ENERGY	425
U(1-1,I)=UU(3)*(CLAJK+CLAJKT*TEMPER(M-1,I,NEW))	ENERGY	426
U(M,I)=TERMS(IAXIAL)/DELX(IAXIAL)	ENERGY	427
C****	ENERGY	428
C**** COMPUTE A'S AND B'S FOR SOLUTION MATRIX FOR FUEL TEMPERATURES	ENERGY	429
APREV=0.0	ENERGY	430
OPREV=0.0	ENERGY	431
MM3=M-3	ENERGY	432
DO 1300 IRAJ=1,M	ENERGY	433
WINK=1.	ENERGY	434
IF (IRAJ.GT.MM3) WINK=YLHYEH(IRAJ,I)	ENERGY	435
UENOM=WINK*HCAPF(IRAJ,I)/H(NEW)+U(IRAJ,I)+APREV	ENERGY	436
A1(IRAJ,IAXIAL)=U(IRAJ,I)/UENOM	ENERGY	437
B1(IRAJ,IAXIAL)=(OPREV+WINK*FN(NEW)*POW(IRAJ,I)+WINK*HCAPF(IRAJ,I)	ENERGY	438
+7/H(NEW)*TEMPER(IRAJ,I,IOLD)+DSAVL3(IRAJ,I)/UENOM	ENERGY	439
WINK=1.	ENERGY	440
APREV=(1.-A1(IRAJ,IAXIAL))*U(IRAJ,I)*WINK	ENERGY	441
OPREV=U1(IRAJ,IAXIAL)*U(IRAJ,I)*WINK	ENERGY	442
1300 CONTINUE	ENERGY	443

C****	CORRECT A'S AND B'S FOR PARTIAL LIQUID NODE	ENERGY	444
	IF (STATE(IAXIAL).EQ.1.OR.STATE(IAXIAL).EQ.14) GO TO 1320	ENERGY	445
	HUM=DENOM+HUM1	ENERGY	446
	A1(M,IAXIAL)=A1(M,IAXIAL)*DENOM/HUM	ENERGY	447
	U1(M,IAXIAL)=(U1(M,IAXIAL)*DENOM+HUM2)/HUM	ENERGY	448
C****		ENERGY	449
C****		ENERGY	450
C****	CALCULATE COEFFICIENTS FOR STRUCTURAL TEMPERATURE CALCULATIONS	ENERGY	451
1320	A3L=TERM10(IAXIAL)/DCLX(IAXIAL)	ENERGY	452
	BAKER=CAPS(IAXIAL)/H(NEW)	ENERGY	453
	DENUM=ABLE+BAKER+HUM13	ENERGY	454
	IF (DENUM) 1340,1340,1360	ENERGY	455
1340	A3(IAXIAL)=0.0	ENERGY	456
	D3(IAXIAL)=0.0	ENERGY	457
	GO TO 1380	ENERGY	458
1360	CONTINUE	ENERGY	459
	A3(IAXIAL)=ABLE/DENUM	ENERGY	460
	U3(IAXIAL)=(BAKER*TSRUK(IAXIAL,IOLD)+DSAVE6(IAXIAL,IOLD)+HUM4)/D-	ENERGY	461
	NUM	ENERGY	462
1380	CONTINUE	ENERGY	463
C****		ENERGY	464
C****	COMBINE TERMS FOR COOLANT NODE TO OBTAIN COEFFICIENTS OF SOLUTION	ENERGY	465
C****	MATRIX OF COOLANT TEMPERATURES	ENERGY	466
	DENUM=TERM6(IAXIAL)+H(NEW)*(TERM2(IAXIAL)*(1.-A1(M,IAXIAL))+TERM1(I	ENERGY	467
	+IAXIAL)*(1.-APR2)+TERM2(IAXIAL)+TERM9+TERM10(IAXIAL)*(1.-A3(IAXIAL	ENERGY	468
	)))	ENERGY	469
	ANUM=TERM2(IAXIAL)*H(NEW)	ENERGY	470
	DNUM=H(NEW)*(DSAVE2(IAXIAL,IOLD)+TERM7(IAXIAL)+ACCEL(IAXIAL)+TERM1	ENERGY	471
	+(IAXIAL)*DPR2+TERM5(IAXIAL)*U1(1,IAXIAL)+TERM9*TYELTL+TERM10(IAXIA	ENERGY	472
	+L)*D3(IAXIAL))+DSAVE4(IAXIAL,IOLD)	ENERGY	473
	IF (.NOT.LOGICAL.ND.IAXIAL.GT.KDOWN.AND.IAXIAL.LE.SHELP(3)) DNUM=DN	ENERGY	474
	+UM-DSAVE4(IAXIAL,IOLD)-H(NEW)*DSAVE2(IAXIAL,IOLD)	ENERGY	475
	IF (G(IAXIAL-1,NEW)) 1420,1420,1400	ENERGY	476
1400	DNUM=DNUM+TERM3(IAXIAL)*DPR2*H(NEW)	ENERGY	477
	DENUM=DENUM-TERM3(IAXIAL)*APR2*H(NEW)	ENERGY	478
	GO TO 1440	ENERGY	479
1420	DNUM=DENUM-TERM3(IAXIAL)*H(NEW)	ENERGY	480
1440	IF (G(IAXIAL,NEW)) 1460,1460,1480	ENERGY	481
1460	ANUM=ANUM-TERM4(IAXIAL)*H(NEW)	ENERGY	482
	GO TO 1500	ENERGY	483
1480	DNUM=DENUM+TERM4(IAXIAL)*H(NEW)	ENERGY	484
1500	IF (STATE(IAXIAL)-15) 1540,1520,1520	ENERGY	485
1520	TERM2(IAXIAL)=0.0	ENERGY	486
	A2(IAXIAL)=0.0	ENERGY	487
	D2(IAXIAL)=0.0	ENERGY	488
	GO TO 1560	ENERGY	489
1540	A2(IAXIAL)=ANUM/DENUM	ENERGY	490
	D2(IAXIAL)=DNUM/DENUM	ENERGY	491
1560	CONTINUE	ENERGY	492
	APR2=A2(IAXIAL)	ENERGY	493
	DPR2=D2(IAXIAL)	ENERGY	494
1580	CONTINUE	ENERGY	495
	IF (CVC.LT.-50.) G(LAXIAL-1,NEW)=GBASE	ENERGY	496
C****		ENERGY	497
C****	DETERMINE TEMPERATURE JUST ABOVE LAST NODE	ENERGY	498
	IF (G(NAXIAL,NEW)) 1600,1620,1620	ENERGY	499
1600	I=LOOP(ICHAN)	ENERGY	500
	TCOOL(NAXIAL+1,NEW)=TUPT(1,NEW)	ENERGY	501
	GO TO 1640	ENERGY	502
1620	TCOOL(NAXIAL+1,NEW)=D2(NAXIAL)/(1.-A2(NAXIAL))	ENERGY	503
1640	CONTINUE	ENERGY	504
C****		ENERGY	505
C****		ENERGY	506
C****	BEGINNING WITH TEMPERATURE JUST ABOVE LAST NODE WORK BACK DOWN	ENERGY	507
C****	THE CHANNEL SUBSTITUTING	ENERGY	508

DO 2030 I921X=2,NAXIAL	ENERGY	509
C**** GLT COOLANT TEMPERATURE (TCOOL) AT IAXIAL	ENERGY	510
IAXIAL=NAXIAL+2-I921X	ENERGY	511
CHARLY=TCOOL(IAXIAL,NEW)	ENERGY	512
TCOOL(IAXIAL,NEW)=A2(IAXIAL)*TCOOL(IAXIAL+1,NEW)+D2(IAXIAL)	ENERGY	513
IF (STATE(IAXIAL).EQ.14) TCOOL(IAXIAL,NEW)=A151	ENERGY	514
C****	ENERGY	515
C**** IS AXIAL NODE IN CORE REGION	ENERGY	516
IF (IAXIAL-NTCORE) 1600,1920,1680	ENERGY	517
1600 IF (IAXIAL-N3CORE) 1680,1820,1820	ENERGY	518
1680 CONTINUE	ENERGY	519
C****	ENERGY	520
C**** COMPUTE TEMPERATURE IN PIN OUTSIDE CORE REGION	ENERGY	521
C**** AND SAVE "OLD" TERMS FOR NON FUEL PIN NODE (DSAVE1)	ENERGY	522
BAKER=TCOOL(IAXIAL,NEW)	ENERGY	523
LIST(IAXIAL)=3	ENERGY	524
M=NTOP(IAXIAL)	ENERGY	525
IF (IAXIAL-N3CORE) 1700,1720,1720	ENERGY	526
1700 I=IAXIAL	ENERGY	527
GO TO 1740	ENERGY	528
1720 I=IAXIAL-NTCORE+N3CORE-1	ENERGY	529
1740 DO 1760 I930X=1,M	ENERGY	530
IRAD=M+1-I930X	ENERGY	531
TSINK(IRAD,I,NEW)=A1(IRAD,IAXIAL)*BAKER+D1(IRAD,IAXIAL)	ENERGY	532
1760 BAKER=TSINK(IRAD,I,NEW)	ENERGY	533
TSTART=0.0	ENERGY	534
M1=1-1	ENERGY	535
IF (M1.EQ.0) GO TO 1900	ENERGY	536
DO 1780 IRAU=1,M1	ENERGY	537
TEND=US(IRAU,1)*(TSINK(IRAU,I,NEW)-TSINK(IRAU+1,I,NEW))	ENERGY	538
DSAVE1(IRAU,I,NEW)=TSTART-TEND	ENERGY	539
1780 TSTART=TEND	ENERGY	540
1800 TEND=US(M,1)*(TSINK(M,I,NEW)-TCOOL(IAXIAL,NEW))	ENERGY	541
IF (STATE(IAXIAL).EQ.14 OR STATE(IAXIAL).EQ.5) TEND=TEND+FCHR(IAXIAL	ENERGY	542
+1)*(TSINK(M,I,NEW)-A151)	ENERGY	543
DSAVE1(M,I,NEW)=TSTART-TEND	ENERGY	544
GO TO 2020	ENERGY	545
1820 CONTINUE	ENERGY	546
C****	ENERGY	547
C**** COMPUTE FUEL TEMPERATURES AND HEAT CAPACITIES	ENERGY	548
C**** SET UP LOOP COUNTERS	ENERGY	549
LIST(IAXIAL)=0	ENERGY	550
M=NTOP(IAXIAL)	ENERGY	551
I=IAXIAL-N3CORE+1	ENERGY	552
BAKER=TCOOL(IAXIAL,NEW)	ENERGY	553
DO 2030 I930X=1,M	ENERGY	554
C****	ENERGY	555
C****	ENERGY	556
C**** COMPUTE TEMPERATURE OF FUEL	ENERGY	557
IRAU=M+1-I930X	ENERGY	558
ABLE=A1(IRAU,IAXIAL)*BAKER+D1(IRAU,IAXIAL)	ENERGY	559
IF (HCAPF(IRAU,1)) 1840,1860,1840	ENERGY	560
1840 IF (A33(ABLE-TEMPER(IRAU,I,NEW))-TEKOR) 1900,1900,1880	ENERGY	561
1860 TEMPER(IRAU,I,NEW)=ABLE	ENERGY	562
GO TO 2000	ENERGY	563
C****	ENERGY	564
C**** SET RETRY SWITCH FOR ERROR TO LARGE	ENERGY	565
C**** COMPUTE HEAT CAPACITY OF FUEL	ENERGY	566
1880 LIST(IAXIAL)=1	ENERGY	567
SHOOT1=ABS(ABLE-TEMPER(IRAU,1,NEW))	ENERGY	568
SHOOT2=ABLE	ENERGY	569
1900 CASH=HCAPF(IRAU,I)	ENERGY	570
IF (ABS(ABLE-TEMPER(IRAU,1,IOLD)).LT.0.1) GO TO 1960	ENERGY	571
IF (IRAU-M+1) 1920,1960,1960	ENERGY	572
1920 K=1+MOD(MTYPE(IRAU,1)-1,2)	ENERGY	573
CALL CURVE (STOREB,TEMPER(IRAU,I,IOLD),STEMP,ST1(1,K),60,I19)	ENERGY	574
IF (I19.GT.0) GO TO 2000	ENERGY	575

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      IF (TEMPER(IRAD,I,IOLU).LT.TMELT).OR.(TEMPER(IRAD,I,IOLD).GT.TMELT) ENERGY 576
*) GO TO 1940 ENERGY 577
      CALL CURVE (STORE,ABLE,STEMP,ST1(1,K),60,I19) ENERGY 578
      IF (I19.GT.0) GO TO 2080 ENERGY 579
      HCAPF(IRAD,I)=(STORE-STOREB)*VOLUME(IRAD,I)/(ABLE-TEMPER(IRAD,I,IOLU)) ENERGY 580
*) LD)) ENERGY 581
      IF (IJTYPE.NE.1.OR.LIST(IAXIAL).EQ.0) GO TO 1860 ENERGY 582
      WRITE (NOUT,2780) IRAD,I,STORE,STOREB,ABLE,EASY,HCAPF(IRAD,I) ENERGY 583
      GO TO 1860 ENERGY 584
1940 STORE=HCAPF(IRAD,I)*(ABLE-TEMPER(IRAD,I,IOLD))/VOLUME(IRAD,I) ENERGY 585
      STOREB=STORE+STORE ENERGY 586
      CALL CURVE (DOUG,STOREB,ST1(1,K),STEMP,60,I19) ENERGY 587
      IF (I19.GT.0) GO TO 2730 ENERGY 588
      HCAPF(IRAD,I)=EASY*(ABLE-TEMPER(IRAD,I,IOLD))/(DOUG-TEMPER(IRAD,I,IOLD)) ENERGY 589
*) OLD)) ENERGY 590
      IF (LOOP1.GT.10) HCAPF(IRAD,I)=.5*(EASY+HCAPF(IRAD,I)) ENERGY 591
      IF (IJTYPE.NE.1.OR.LIST(IAXIAL).EQ.0) GO TO 1960 ENERGY 592
      WRITE (NOUT,2300) IRAD,I,STORE,STOREB,ABLE,DOUG,EASY,HCAPF(IRAD,I) ENERGY 593
      GO TO 1860 ENERGY 594
1960 CALL CURVE (STOREB,TEMPER(IRAD,I,IOLD),TSEMP,ST2,30,I19) ENERGY 595
      IF (I19.GT.0) GO TO 2720 ENERGY 596
      IF (TEMPER(IRAD,I,IOLD).LT.TSEMP(16).OR.TEMPER(IRAD,I,IOLD).GT.TSEMP(17)) GO TO 1980 ENERGY 597
*) LD)) ENERGY 598
      CALL CURVE (STORE,ABLE,TSEMP,ST2,30,I19) ENERGY 599
      IF (I19.GT.0) GO TO 2740 ENERGY 600
      HCAPF(IRAD,I)=(STORE-STOREB)*VOLUME(IRAD,I)/(ABLE-TEMPER(IRAD,I,IOLD)) ENERGY 601
*) LD)) ENERGY 602
      GO TO 1860 ENERGY 603
1980 STORE=HCAPF(IRAD,I)*(ABLE-TEMPER(IRAD,I,IOLD))/VOLUME(IRAD,I) ENERGY 604
      STOREB=STORE+STORE ENERGY 605
      CALL CURVE (DOUG,STOREB,ST2,TSEMP,30,I19) ENERGY 606
      IF (I19.GT.0) GO TO 2760 ENERGY 607
      HCAPF(IRAD,I)=EASY*(ABLE-TEMPER(IRAD,I,IOLD))/(DOUG-TEMPER(IRAD,I,IOLD)) ENERGY 608
*) OLD)) ENERGY 609
      GO TO 1860 ENERGY 610
2000 BAKER=TEMPER(IRAD,I,NEW) ENERGY 611
C**** CHECK CONVERGENCE OF COOLANT TEMPERATURE ENERGY 612
2020 IF (STAT(IAXIAL)-1) 2040,2030,2080 ENERGY 613
2040 IF (ABS(CHARLY-TCOOL(IAXIAL,NEW))-TERROR) 2080,2030,2000 ENERGY 614
2060 LIST(IAXIAL)=2 ENERGY 615
      SHOOT1=ABS(CHARLY-TCOOL(IAXIAL,NEW)) ENERGY 616
      SHOOT2=CHARLY ENERGY 617
2080 CONTINUE ENERGY 618
C**** ENERGY 619
C**** ENERGY 620
C**** ALL TEMPERATURES CALCULATED ENERGY 621
C**** INCREMENT LOOP COUNTER ENERGY 622
C**** AND CHECK TO SEE IF ALL TEMPERATURES OK ENERGY 623
C**** IF NOT TRY AGAIN BY LOOPING TO STATEMENT 400 ENERGY 624
      LOOP1=LOOP1+1 ENERGY 625
      JO 2120 IAXIAL=2,NAXIAL ENERGY 626
      IF (LIST(IAXIAL)) 2120,2120,2100 ENERGY 627
2100 IF (LOOP1.GT.30) GO TO 2520 ENERGY 628
      GO TO 400 ENERGY 629
2120 CONTINUE ENERGY 630
C**** ENERGY 631
C**** ENERGY 632
C**** TEMPERATURES ALL OK ENERGY 633
C**** SAVE HEAT STORAGE RATES AND RATE OF CHANGE TEMPERATURE ENERGY 634
      A104=J.0 ENERGY 635
      A13=J.0 ENERGY 636
      IF (INTRAT.GT.0) FACTOR=7.*FACTOR ENERGY 637
      DO 2500 IAXIAL=2,NAXIAL ENERGY 638
C**** ENERGY 639
C**** COMPUTE STRUCTURAL TEMPERATURES AND SAVE "OLD" TEMPS FOR ENERGY 640
C**** STRUCTURAL NODES (USAVE) ENERGY 641

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TSTRUK(IAXIAL,NLW)=A3(IAXIAL)*TCOOL(IAXIAL,NEW)+D3(IAXIAL)	ENERGY	042
USAVE2(IAXIAL,NLW)=TERM10(IAXIAL)/DELX(IAXIAL)*(TCOOL(IAXIAL,NEW)-	ENERGY	043
TSTRUK(IAXIAL,NLW))	ENERGY	044
IF (STATE(IAXIAL).EQ.4.OR.STATE(IAXIAL).EQ.5) USAVE2(IAXIAL,NEW)=D	ENERGY	045
+SAVE2(IAXIAL,NEW)+Q(IAXIAL)*(A151-TSTRUK(IAXIAL,NEW))	ENERGY	046
C****	ENERGY	047
C**** SAVE "OLD" TERMS IN COOLANT FOR NON GAS NODE (USAVE2)	ENERGY	048
MENTOP(IAXIAL)	ENERGY	049
IF (STATE(IAXIAL).GT.1) GO TO 2140	ENERGY	050
USAVE2(IAXIAL,NLW)=TERM2(IAXIAL)*(TCOOL(IAXIAL+1,NEW)-TCOOL(IAXIAL	ENERGY	051
+NEW))-TERM1(IAXIAL)*(TCOOL(IAXIAL,NEW)-TCOOL(IAXIAL-1,NEW))+TERM/	ENERGY	052
+(IAXIAL)-TERM10(IAXIAL)*(TCOOL(IAXIAL,NEW)-TSTRUK(IAXIAL,NEW))	ENERGY	053
2140 CONTINUE	ENERGY	054
C****	ENERGY	055
C**** DETERMINE IF NODE IS IN CORE REGION	ENERGY	056
C**** AND COMPUTE APPROPRIATE I INDEX	ENERGY	057
IF (IAXIAL-NBCORE) 2150,2180,2200	ENERGY	058
2150 I=IAXIAL	ENERGY	059
GO TO 2240	ENERGY	060
2180 I=IAXIAL-NBCORE+1	ENERGY	061
GO TO 2300	ENERGY	062
2200 IF (IAXIAL-NTCORE) 2180,2180,2220	ENERGY	063
2220 I=IAXIAL-NTCORE+NBCORE-1	ENERGY	064
2240 IF (STATE(IAXIAL).EQ.1) GO TO 2340	ENERGY	065
IF (STATE(IAXIAL).GT.1) 2260,2280,2300	ENERGY	066
2260 JELL=1.-FUELB0(NEW)	ENERGY	067
GO TO 2320	ENERGY	068
2280 JELL=FUELB0(NEW)	ENERGY	069
GO TO 2320	ENERGY	070
2300 JELL=1.	ENERGY	071
C****	ENERGY	072
C**** COMPUTE HEAT TRANSFER TERMS TO BUBBLE IN NON CORE REGION AND	ENERGY	073
C**** ADJUST USAVE2	ENERGY	074
2320 AXY=DELX(IAXIAL)*JELL*H(NEW)*2.*FACTOR	ENERGY	075
3XY=AXY*UVAP(IAXIAL)	ENERGY	076
A155=A155+3XY	ENERGY	077
A154=A154+3XY*(A151-TSINK(M,I,NEW))	ENERGY	078
3XY=AXY*USTV(IAXIAL)	ENERGY	079
A155=A155+3XY	ENERGY	080
A154=A154+3XY*(A151-TSTRUK(IAXIAL,NEW))	ENERGY	081
IF (JELL.LT.1.) GO TO 2340	ENERGY	082
3LOPER(IAXIAL)=1.	ENERGY	083
USAVE2(IAXIAL,NLW)=1.	ENERGY	084
GO TO 2300	ENERGY	085
2340 USAVE2(IAXIAL,NLW)=USAVE2(IAXIAL,NEW)+TERM1(IAXIAL)*(TSINK(M,I,NEW	ENERGY	086
)-TCOOL(IAXIAL,NEW))	ENERGY	087
GO TO 2430	ENERGY	088
2360 IF (STATE(IAXIAL).EQ.1) GO TO 2400	ENERGY	089
IF (STATE(IAXIAL).GT.1) 2380,2400,2420	ENERGY	090
2380 JELL=1.-FUELB0(NEW)	ENERGY	091
GO TO 2440	ENERGY	092
2400 JELL=FUELB0(NEW)	ENERGY	093
GO TO 2440	ENERGY	094
2420 JELL=1.	ENERGY	095
C****	ENERGY	096
C**** COMPUTE HEAT TRANSFER TERMS TO BUBBLE IN FUEL REGION	ENERGY	097
2440 AXY=DELX(IAXIAL)*JELL*H(NEW)*2.*FACTOR	ENERGY	098
3XY=AXY*UVAP(IAXIAL)	ENERGY	099
A155=A155+3XY	ENERGY	100
A154=A154+3XY*(A151-TMPEX(M,I,NEW))	ENERGY	101
3XY=AXY*USTV(IAXIAL)	ENERGY	102
A155=A155+3XY	ENERGY	103
A154=A154+3XY*(A151-TSTRUK(IAXIAL,NEW))	ENERGY	104
A154=A154-POH(M+1,I)*UGAP0*(VY0W(IAXIAL)*RHOF(IAXIAL,NEW)+RHOG(IAX	ENERGY	105
+IAL,1)*JELL*DELX(IAXIAL))*PN(NEW)*H(NEW)	ENERGY	106
IF (JELL.LT.1.) GO TO 2460	ENERGY	107

3LOPE=2(IAXIAL)=0.0	ENERGY	700
JSAVE2(IAXIAL,N=H)=0.0	ENERGY	709
GO TO 2500	ENERGY	710
C**** ADJUST JSAVE2	ENERGY	711
2460 JSAVE2(IAXIAL,N=H)=JSAVE2(IAXIAL,NEW)+TERMS(IAXIAL)*(TEMPER(I,I,NEW)	ENERGY	712
+H)-TCOOL(IAXIAL,N=H))	ENERGY	713
2480 BLOPE=2(IAXIAL)=TERM11(IAXIAL)*TCOOL(IAXIAL,NEW)	ENERGY	714
2500 CONTINUE	ENERGY	715
RETURN	ENERGY	716
C****	ENERGY	717
C****	ENERGY	718
C**** ERROR PRINTOUTS	ENERGY	719
2520 IF (LIST(IAXIAL).EQ.2) GO TO 2560	ENERGY	720
WRITE (NOUT,2860) SHOOT1,SHOOT2,TEMPER(IRA0,I,NEW)	ENERGY	721
IJTYPE=1	ENERGY	722
2540 CONTINUE	ENERGY	723
WRITE (NOUT,3040) ICHAN,IAXIAL	ENERGY	724
RETURN ERROR	ENERGY	725
2560 WRITE (NOUT,2820) SHOOT1,SHOOT2,TCOOL(IAXIAL,NEW)	ENERGY	726
IJTYPE=5	ENERGY	727
GO TO 2540	ENERGY	728
2580 WRITE (NOUT,3000) TOPT(I,NEW),CLIQT(1),CLIQT(15)	ENERGY	729
GO TO 2540	ENERGY	730
2600 WRITE (NOUT,2840) TCOOL(IAXIAL,NEW),CLIQT(1),CLIQT(15),ISCRUP	ENERGY	731
GO TO 2540	ENERGY	732
2620 WRITE (NOUT,3020) TEMPER(1,I,NEW),BASICT(1),BASICT(IPAIR1),IAXIAL,	ENERGY	733
+ICHAN,I19,ISCRUP	ENERGY	734
GO TO 2540	ENERGY	735
2640 WRITE (NOUT,3020) TEMPER(IRA0+1,I,NEW),BASICT(1),BASICT(IPAIR1),IA	ENERGY	736
+XIAL,ICHAN,ISCRUP	ENERGY	737
GO TO 2540	ENERGY	738
2660 WRITE (NOUT,2880) TEMPER(IRA0,I,IOL0),STEMP(1),STEMP(60)	ENERGY	739
GO TO 2540	ENERGY	740
2680 WRITE (NOUT,2900) ABLL,STEMP(1),STEMP(60)	ENERGY	741
GO TO 2540	ENERGY	742
2700 WRITE (NOUT,2920) STORCB,ST1(1,K),ST1(60,K)	ENERGY	743
GO TO 2540	ENERGY	744
2720 WRITE (NOUT,2900) TEMPER(IRA0,I,IOL0),STEMP(1),STEMP(30)	ENERGY	745
GO TO 2540	ENERGY	746
2740 WRITE (NOUT,2980) ABLL,STEMP(1),STEMP(30)	ENERGY	747
GO TO 2540	ENERGY	748
2760 WRITE (NOUT,2940) STORCB,ST2(1),ST2(30)	ENERGY	749
GO TO 2540	ENERGY	750
C	ENERGY	751
2780 FORMAT (" AT ENERGY.533 IRA0="I3," I="I3," STORC="E10.4," STORCB="	ENERGY	752
+E10.4," NEW T="F6.0," OLD C="E10.4," NEW C="E10.4)	ENERGY	753
2800 FORMAT (" AT ENERGY.533 IRA0="I3," I="I3," STORC="E10.4," STORCB="	ENERGY	754
+E10.4," NEW T="F6.0," PROJECT T="F6.0," OLD C="E10.4," NEW C="E10.4)	ENERGY	755
2820 FORMAT (60H TEMPERATURE ERROR CRITERIA CANNOT BE SATISFIED, LOOPIN	ENERGY	756
+G HAS OCCURRED,(SEE ENERGY.614),//60H DIFFERENCE BETWEEN CALCULATED	ENERGY	757
+G AND REFERENCE COOLANT TEMPERATURE=F10.4,3X,12HTCOOL(CALC)=F10	ENERGY	758
+4,4//12H TCOOL(REF)=F10.4)	ENERGY	759
2840 FORMAT (60H CLIQT TEMPERATURE TABLE DOES NOT ENCOMPASS TCOOL TEMPE	ENERGY	760
+RATUR_//,3H TCOOL=F10.4,3X,12HCLIQT(MIN)=F10.4,3X,12HCLIQT(MAX)	ENERGY	761
+ =F10.4,3X,"See ENERGY."I3)	ENERGY	762
2860 FORMAT (" TEMPERATURE ERROR CRITERIA CANNOT BE SATISFIED, LOOPING	ENERGY	763
+ HAS OCCURRED,(SEE ENERGY.661)//" DIFFERENCE BETWEEN CALCULATED	ENERGY	764
+ AND REFERENCE FUEL TEMPERATURE="F10.4," TFUEL(CALC)="F10.4// TF	ENERGY	765
+UEL(REF)="F10.4)	ENERGY	766
2880 FORMAT (60H STEMP TEMPERATURE TABLE DOES NOT ENCOMPASS TEMPER VALU	ENERGY	767
+E(ENERGY.674)//3H TEMPER=F10.4,3X,12HSTEMP(MIN)=F10.4,3X,12HST	ENERGY	768
+EMP(MAX)=F10.4)	ENERGY	769
2900 FORMAT (60H TSEMP TEMPERATURE TABLE DOES NOT ENCOMPASS TEMPER VALU	ENERGY	770
+E(ENERGY.695)//3H TEMPER=F10.4,3X,12HTSEMP(MIN)=F10.4,3X,12HT	ENERGY	771
+SEMP(MAX)=F10.4)	ENERGY	772

2920	FORMAT (80H INTERNAL ENERGY(STORE3) OUTSIDE OF INTERPOLATION LIMIT ENERGY	773
	+S OF ENTHALPY(ST1) (ENERGY.587),//,9H STORE3 =,F10.4,3X,10HST1(MIN ENERGY	774
	+) =,F10.4,3X,10HST1(MAX) =,F10.4) ENERGY	775
2940	FORMAT (90H INTERNAL ENERGY(STORE8) OUTSIDE OF INTERPOLATION LIMIT ENERGY	776
	+SOF CLAD ENTHALPY(ST2) (ENERGY.606),//,9H STORE8 =,F10.4,3X,10HST2 ENERGY	777
	+ (MIN) =,F10.4,3X,10HST2(MAX) =,F10.4) ENERGY	778
2960	FORMAT (74H FUEL TEMPERATURE EXCEEDS INTERPOLATION LIMITS OF STEMP ENERGY	779
	+ TABLE (ENERGY.578),//,8H TFUEL =,F10.4,3X,12HSTEMP(MIN) =,F10.4,3 ENERGY	780
	+X,12HSTEMP(MAX) =,F10.4) ENERGY	781
2980	FORMAT (74H FUEL TEMPERATURE EXCEEDS INTERPOLATION LIMITS OF TSEMP ENERGY	782
	+ TABLE (ENERGY.599),//,8H TFUEL =,F10.4,3X,12HTSEMP(MIN) =,F10.4,3 ENERGY	783
	+X,12HTSEMP(MAX) =,F10.4) ENERGY	784
3000	FORMAT (63H TEMPERATURE OF OUTLET PLENUM EXCEEDS CLAD LISTING(ENE ENERGY	785
	+RGY.219),//7H TOPT =,F10.4,3X,12HSTEMP(MIN) =,F10.4,3X,12HSTEMP(MA ENERGY	786
	+X =,F10.4) ENERGY	787
3020	FORMAT (58H TEMPERATURE NOT IN INTERPOLATION LIMITS OF BASICT LIBR ENERGY	788
	+ARY//,8H TEMPER=E12.6,3X,10HBASICT(1)=,E12.6,3X,12HBASICT(MAX)=,E12 ENERGY	789
	+E.6, /13H AXIAL LEVEL=,I2,3X,8HCHANNEL=,I2,3X,7HERROR=,I1,3X,7HENER ENERGY	790
	+GY.,I3) ENERGY	791
3040	FORMAT (" ICHAN "I3," IAXIAL "I3)	792
	END ENERGY	793

SUBROUTINE ORBIT, RETURNS (ERROR)	ORBIT	2
EXTERNAL JULLY	ORBIT	3
COMMON/IFRESR/IPRESR(20)	ORBIT	4
COMMON/FIT/FIT(30)	ORBIT	5
COMMON /FRUG/IJCHAN, IJTYPE, LOOP9, LOOPS, LOOPJ, KOOP	ORBIT	6
COMMON/NTABZZ/NTAB3(49)	ORBIT	7
COMMON/GOLLY/IJUNIT, GEEWIZ(20)	ORBIT	8
LOGICAL LOGIC	ORBIT	9
COMMON/BANG/A150, A151, A152, A153, A154	ORBIT	10
*, KAXIAL, MORL	ORBIT	11
DIMENSION HFAIL(20)	ORBIT	12
COMMON/ADJ/LOOP9, YRTP, JZAP, IBATTY, IBATTY, KUP, KDOWN, PGJUD,	ORBIT	13
+LOOP4, LOGIC, MOUF	ORBIT	14
*, VGAS, VVOID, VLIQ, TOTHEL, LOOPT, LOOP5, LOOPF	ORBIT	15
*, NCORE=N	ORBIT	16
*, GAP3, AY3, AY2	ORBIT	17
C****	CASPAR	2
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS	CASPAR	3
DIMENSION SLOB(1)	CASPAR	4
REAL KINSRT, KWTDR	CASPAR	5
LOGICAL PRINT, DONE, SCRAM	CASPAR	6
COMMON	CASPAR	7
*, I3LOCK, H(2), T(2), HREJO, ICHAN, VVOID(2),	CASPAR	8
+DOPPK(2), COLAPK(2), NEW, ICLO, NOUT, TERROR, CASPAR	CASPAR	9
+GLRKR, PEXIT(3), PERROR, PRINT, DELTIM, PY(2), CASPAR	CASPAR	10
+P80TT(3,2), IACTIV(20), FLOW(3,2), TOPT(3,2), TORM(3), WOLF(3), CASPAR	CASPAR	11
+LOOP(20), IOUTL, NTREAT, IKINET, TOUT, HMAX, CASPAR	CASPAR	12
+TMEIN(50), JKIN(50), T1OUT(50), OKOUT(50), IPAIR2, AY(2), CASPAR	CASPAR	13
+IPAIR3, KOJNT, RH(2), BB0100, KHUSHZ, NGROUP, CASPAR	CASPAR	14
+C(6,2), ALIFE, ALPH(6), GAM(6), 3(6), AL(6), CASPAR	CASPAR	15
*, JB, SCRAM, TSCRAM(2), PERIOD, KSLUPE, ERROR, CASPAR	CASPAR	16
*, KINSRT(2), KWTDR(2), REDUCE, PRINT1, PRINT2, RMIN, CASPAR	CASPAR	17
COMMON	CASPAR	18
*, ANLOW, TQUIT, LSTEP, JSTEP, ANLO, TKG, CASPAR	CASPAR	19
*, IFLOT, ERROR1, TERM(13), TITLE(8), HOTPIN, SPCB, CASPAR	CASPAR	20
*, SPCG, SPCJ, LINESL, LSTEP, NCHAN, MSTEP, CASPAR	CASPAR	21
*, IPRINT, MPRINT, IDUMP, QGEN(2), ANI, ANSCRM, CASPAR	CASPAR	22
*, TDELAY, NLOOPS, KHUCAL(3), VULTOP(3), HEAD(3), PRESTM(50), CASPAR	CASPAR	23
*, PRESUR(50,3), IPAIR4, PD(3), RUNTIM, VER, CTAU(4), CASPAR	CASPAR	24
*, K8LOCK, J8LOCK, M8LOCK, N12, N13, EXTRA, CASPAR	CASPAR	25
*, GJACK(3), VJACK(2)	CASPAR	26
*, HMIN, N22, NIN, INPUT, N2, N4, CASPAR	CASPAR	27
*, N7, N8, KPRINT, POWSS, HMAX3, HMAXF, CASPAR	CASPAR	28
*, TRIPFW(3), TRIPPP(3), TRIPPF(3), TRIPOT(3), N-1AYF, CASPAR	CASPAR	29
EQUIVALENCE (GMOL, TERM(4)), (TMOL, TERM(5)), (GMOL, TERM(6)), (PERMOL, T	CASPAR	30
+ERM(7)), (SLOB, DONE)	CASPAR	31
C****	CASPAR	32
C****	CHNDAT	2
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA	CHNDAT	3
DIMENSION S(1), CORE(1), IS(1), LPYTH(15,20), OIL(8), XLIQ(11,20,2)	CHNDAT	4
INTEGER SMELP	CHNDAT	5
COMMON	CHNDAT	6
*, TCOOL(75,2), KLOG(22,20), UU(3), ULIQ(75), CHNDAT	CHNDAT	7
*, UAP(75), ULLX(75), CHNDAT	CHNDAT	8
*, AFLOW(75), US(4,55), HCOMP(4,55), USAVE1(4,55,2), DSAVE2(75,2), CHNDAT	CHNDAT	9
*, DSAVE3(15,20,2), DSAVE4(75,2), POW(16,20), VOLUME(15,20), HCAPF(15,20), CHNDAT	CHNDAT	10
*, TEMPER(15,20,2), TSINK(4,55,2), VVOIDV(20), VPLEN, PPLEN(2), CHNDAT	CHNDAT	11
*, RLEN(2), G(75,2), RHOD(75,2), VJL(2), CHNDAT	CHNDAT	12
*, VOLF(2), GT0, GT1, GT2, GT3, GADJ(2,2), CHNDAT	CHNDAT	13
*, GADJ(2,2), FUELBU(2), FUELBU(2), FMNN(75), P(75,2), RHOD(75,2), CHNDAT	CHNDAT	14
*, KHUF(75,2), WF(75), WC(75), NUFINS, NAXIAL, NJCORE, CHNDAT	CHNDAT	15
*, NTGCR, NTOF(75), NTYPE(15,20), IGAS(2), NJPLEN, CHNDAT	CHNDAT	16
*, IFUEL(2), I8U(2), IGASU(2,2), IGASU(2,2), IFUEL(2), IFUEL(2), CHNDAT	CHNDAT	17
*, I8U(2,2), I8U(2,2), NJU(2), NGAS(2), RLC, RLV, CHNDAT	CHNDAT	18
COMMON	CHNDAT	19
*, CLC, CLV, CVC, CVV, BASILT(50), GUNJUC(50), CHNDAT	CHNDAT	20

+2),IPAIH1	,CGAPA	,CGAPB	,CGAPC	,CGAPD	,STEMP(60)	,CHNDAT	20
+ST1(60,2)	,TSEMP(30)	,ST2(30)	,DENSEE	,DENSE(2)	,TMAGIC	,CHNDAT	21
+TSAT	,AMOLE	,HAXF	,HAXL	,HAXV	,PSAT	,CHNDAT	22
+RLIQ	,RLQF	,PTRY	,PVOID	,IFUELS	,JFUELS	,CHNDAT	23
+TGASS	,TSUPER	,TFUELS	,TMELTH	,TMELTL	,GAMMA	,CHNDAT	24
+PINTEN(20,2)	,GAPRI(20)	,GAPRL	,CLVC	,DOPUDE(20,2)		,CHNDAT	25
+BASENA	,DUPPH	,KBASLC	,SFC2(2)	,HFUSEE	,OKNA(20,2)	,CHNDAT	26
+WALTAR(70)	,PARTAN(20)	,IGAP				,CHNDAT	27
COMMON		KFUELS	,SFC3(13)	,HI(70)	,CLAJKT	,CHNDAT	28
+RLV2	,CLV2	,GVV2	,HAXL1	,HAXL2	,CGAPB2	,CHNDAT	29
+CLACK	,CAFS(70)	,TSTRUK(70,2)	,USTL(75)	,USTV(70)	,DSAVE20(70,2)	,CHNDAT	30
+CLLIQ(15)	,CLLIQT(10)	,GVAPT(10)	,HELPL(70)	,SMELPL(70)		,CHNDAT	31
+RHOCNA(70,2)	,TN(11)	,UOLJ(75)	,IBILL	,JBILL	,BJX(20,4)	,CHNDAT	32
+CCPERC(3,20)	,PORUS(3,20)	,YEHYEH(11,20)	,SPG4	,IDUT(200)		,CHNDAT	33
COMMON	IBAX,ITAX,LUF,LOWN,LUPD,LOWNG,DUP,DOWN,DUPD,DOWNQ,					,CHNDAT	34
+ALFA(20,2)	,RHOH(20,2)	,V(20,2)	,AREAH(20,2)	,AREAX(20,2)	,DHJF(20,2)	,CHNDAT	35
+FIN(20,2)	,AAA(20,2)	,LNTPY(20,2)	,QMASS(20)	,QHEAT(20)	,DLIQIN(20)	,CHNDAT	36
+GASIN(20)	,TBAR(20)	,VMELT2(20)	,VGAS1(20)	,VGAS2(20)	,GASIN1,GASIN2,	,CHNDAT	37
+NINPIN						,CHNDAT	38
EQUIVALENCE (ULIQ(1),VFUELS), (ULIQ(70),GRIFIC), (UVAP(1),RHOSQF),						,CHNDAT	39
+ (G(70,1),FQSOHR), (G(70,2),LZOP), (MYPE(1,1),EPTYM(1,1)), (DOPCOL(1,						,CHNDAT	40
+ 2),DOPPO), (DOPCOE(2,2),DOPDEL), (DOPCOE(3,2),OIL), (UVAP(75),GTOL)						,CHNDAT	41
+ , (USTL,IZAP), (USTV,IZUP), (CGAPA,LAXIAL), (XLIQ,DSAVE3)						,CHNDAT	42
+ , (S,COKE,IS,TCOOL), (SCOTT,IFUELS)						,CHNDAT	43
EQUIVALENCE (TW(1),SKEW), (TW(2),RHORAT), (TW(3),DETAIL)						,CHNDAT	44
EQUIVALENCE (TW(4),PEEL), (TW(5),PSTART), (TW(6),TREAT)						,CHNDAT	45
EQUIVALENCE (TW(7),FRACTN), (TW(8),SPREAD), (TW(9),VORIG)						,CHNDAT	46
EQUIVALENCE (TW(10),AREA), (TW(11),FRICT)						,CHNDAT	47
C****						,CHNDAT	48
C****						BCOM	2
C****	BLANK COMMON SCRATCH PAD					BCOM	3
	INTEGER STATE					BCOM	4
	COMMON STATE(70)					BCOM	5
+ LIST(70)	,TERM1(70)	,TERM2(70)	,TERM3(70)	,TERM4(70)	,TERM5(70)	,BCOM	6
+ TERM6(70)	,TERM7(70)	,TERM8(70)	,A1(15,70)	,D1(10,70)	,A2(75)	,BCOM	7
+ D2(70)	,DOUT(70)	,VMELT(20)	,VMUSH(20)	,GAP(20)	,VNUH(70)	,BCOM	8
+ ACCEL(70)	,SUB(2)	,FOHR(70)	,U(15,20)	,A3(75)	,D3(75)	,BCOM	9
+ TERM10(70)	,TERM11(70)	,Q(75)	,BLOPER(70)	,DEL(2,75)	,BUMBUM(10)	,BCOM	10
+),BLOB(600)						BCOM	11
C****						BCOM	12
C****	GAS CONSTANT FOR FISSION GAS R=RG/AM=8.3107E+7/120.2					ORBIT	21
	DATA R/C.05001E+6/					ORBIT	22
C****						ORBIT	23
C****						ORBIT	24
C****	BEGIN ORBIT SUBROUTINE					ORBIT	25
	NCOR=NITCOR=N3COR+1					ORBIT	26
C****	GET ENTHALPY AT FUEL MELTING POINT					ORBIT	27
	DO 120 N=1,2					ORBIT	28
	CALL CURVE (SUB(N),TMELTL,STEMP,ST1(1,N),60,I19)					ORBIT	29
	IF (I19.GT.0) GO TO 2700					ORBIT	30
120	CONTINUE					ORBIT	31
C****	COMPUTE VOLUME IN COOLANT NODE					ORBIT	32
	DO 140 IAXIAL=2,NAXIAL					ORBIT	33
	DOUT(IAXIAL)=DELX(IAXIAL)*AFLOW(IAXIAL)					ORBIT	34
140	CONTINUE					ORBIT	35
	IF (TW(0).GE.0.0) GO TO 180					ORBIT	36
	ENUF=0.0					ORBIT	37
	DO 160 I=1,NCORLN					ORBIT	38
	IF (VOLDV(I).GT.0.0) LNUF=ENUF+VOIDV(I)					ORBIT	39
160	CONTINUE					ORBIT	40
	LNUF=LNUF*PVOID					ORBIT	41
180	CONTINUE					ORBIT	42
C****	DETERMINE LAST NODE ABOVE CURL HAVING FUEL WORTH .GT.0 (EQUALS					ORBIT	43
C****	KAXIAL)					ORBIT	44
	DO 200 KAXIAL=NICORL,NAXIAL					ORBIT	45
	IF (WF(KAXIAL)) 220,220,200					ORBIT	46
200	CONTINUE					ORBIT	47

220	CONTINUE	ORBIT	48
C****	INITIALIZE STEP COUNTER AND DISK ARRAY POINTER	ORBIT	49
	IFIZZ=20*(NEW-1)+ICHAN	ORBIT	50
	ISTEPS=1	ORBIT	51
C****	SAVE ORIGINAL RUN VALUES WHILE IN ORBIT	ORBIT	52
	H(NEW)=H(NEW)	ORBIT	53
	I(NEW)=NEW	ORBIT	54
	G(NEW)=H(I(NEW))	ORBIT	55
	F(NEW)=T(NEW)	ORBIT	56
	J(NEW)=IACTIV(ICHAN)	ORBIT	57
	Z(NEW)=T(I(NEW))	ORBIT	58
	G(NEW)=PN(I(NEW))	ORBIT	59
	B(NEW)=PN(NEW)	ORBIT	60
	A(NEW)=PBOTT(1,I(NEW))	ORBIT	61
	D(NEW)=PBOTT(2,I(NEW))	ORBIT	62
	O(NEW)=PBOTT(3,I(NEW))	ORBIT	63
C****		ORBIT	64
C****	IF FUEL HAS FAILED COMPUTE NUMBER OF ORBIT SUB TIME STEPS PER	ORBIT	65
C****	RUN TIME STEP	ORBIT	66
	IF (IACTIV(ICHAN).LE.0) GO TO 240	ORBIT	67
	ABLE=HMAXF*(1+.1*OIL(7))	ORBIT	68
	I=H(NEW)/ABLE	ORBIT	69
	IF (I*ABLE.LT.H(NEW)) I=I+1	ORBIT	70
	IF (MOD(I,2).EQ.0) I=I+1	ORBIT	71
	ISTEPS=I	ORBIT	72
C****		ORBIT	73
C****	COMPUTE VALUES OF TIME, DELT, PRESSURE, ETC. BASED IN ISTEP	ORBIT	74
C****	AT SUB INTERVAL POINT	ORBIT	75
	DELPOW=(PN(NEW)-PN(I(NEW)))/ISTEPS	ORBIT	76
	MZM=LOOP(ICHAN)	ORBIT	77
	DELPR=(PBOTT(MZM,NEW)-PBOTT(MZM,I(NEW)))/ISTEPS	ORBIT	78
	IF (INTREAT.LE.0) PBOTT(MZM,NEW)=PBOTT(MZM,I(NEW))+DELPR	ORBIT	79
	PN(NEW)=PN(I(NEW))+DELPOW	ORBIT	80
	H(NEW)=H(NEW)/ISTEPS	ORBIT	81
	T(NEW)=T(I(NEW))+H(NEW)	ORBIT	82
	OIL(7)=OIL(7)+1.	ORBIT	83
	GO TO 260	ORBIT	84
240	OIL(7)=0.0	ORBIT	85
C****		ORBIT	86
C****		ORBIT	87
C****	MAIN ORBIT LOOP	ORBIT	88
C****	DO THE INITIALIZATION	ORBIT	89
C****	INTERCHANGE "IOLD" AND "NEW" AND UPDATE TIMES AND PRESSURES	ORBIT	90
260	DO 1620 I TIMES=1,ISTEPS	ORBIT	91
	IF (ITIMES.EQ.1) GO TO 280	ORBIT	92
	I=NEW	ORBIT	93
	NEW=IOLD	ORBIT	94
	IOLD=I	ORBIT	95
	OIL(7)=OIL(7)+1.	ORBIT	96
	H(NEW)=H(IOLD)	ORBIT	97
	T(NEW)=T(IOLD)+H(NEW)	ORBIT	98
	PN(NEW)=PN(IOLD)+DELPOW	ORBIT	99
	IF (INTREAT.LE.0) PBOTT(MZM,NEW)=PBOTT(MZM,IOLD)+DELPR	ORBIT	100
C****	INITIALLY SET SUM "NEW" VALUES TO THE CURRENT "IOLD" VALUES	ORBIT	101
280	CONTINUE	ORBIT	102
	IFUELU(NEW)=IFUELU(IOLD)	ORBIT	103
	IFUELU(NEW)=IFUELU(IOLD)	ORBIT	104
	FUELDJ(NEW)=FUELDJ(IOLD)	ORBIT	105
	FUELDJ(NEW)=FUELDJ(IOLD)	ORBIT	106
	VOLG(NEW)=VOLG(IOLD)	ORBIT	107
	VOLF(NEW)=VOLF(IOLD)	ORBIT	108
	OIL(NEW)=OIL(IOLD)	ORBIT	109
	OIL(NEW+2)=OIL(IOLD+2)	ORBIT	110
	IF (IFUELU(NEW).GE.KAXIAL) OIL(14)=1.	ORBIT	111
C****	SET P1 EQUAL TO PRESSURE AT THE BOTTOM	ORBIT	112

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      I=LOOP(ICHAN)
      P(1,NEW)=PBOTT(I,NEW)
C**** KUP EQUALS UPWARD NODE CONTAINING LIQUID INTERFACE AT LAST
C**** TIME STEP
      KUP=SMELP(2)
C**** KDOWN EQUALS DOWNWARD NODE CONTAINING LIQUID LAST STEP
      KDOWN=SMELP(3)
      STATE(1)=1
      STATL(NAXIAL+1)=1
C**** HELP EQUALS ENTHALPY OF SODIUM IN OUTLET PLENUM
      IF (G(1,IOLD)) 300,320,320
      300 CONTINUE
      M=LOOP(ICHAN)
      CALL SUBR(3BAKEK,TUPT(M,NEW),CLIQT,CLIQ,15,I19)
      IF (I19.GT.0) GO TO 2100
      HELP(NAXIAL+1)=3BAKEK*TUPT(M,NEW)
      320 CONTINUE
C**** EXTRAPOLATE FUEL TEMPERATURES FOR NEW TRIAL VALUES
      I=0
      DO 340 J=NBCORE,NTCORE
      I=I+1
      M=NTUP(J)
      DO 340 K=1,M
      340 TEMPER(K,I,NEW)=TEMPER(K,I,IOLD)
C****
C**** START OFF WITH OLD VALUES
C**** RHOO EQUALS DENSITY OF MATERIAL AT UPWARD END OF NODE
C**** TCOOL EQUALS COOLANT NOZZLE TEMPERATURE
C**** P EQUALS COOLANT NOZZLE PRESSURE
      DO 360 IAXIAL=2,NAXIAL
      RHOO(IAXIAL,NEW)=RHOO(IAXIAL,IOLD)
      TCOOL(IAXIAL,NEW)=TCOOL(IAXIAL,IOLD)
      P(IAXIAL,NEW)=P(IAXIAL,IOLD)
      360 G(IAXIAL,NEW)=G(IAXIAL,IOLD)
      G(1,NEW)=G(1,IOLD)
C****
C**** DO CALCULATIONS FOR IZUP NOT ZERO
      IF (IZUP.EQ.0) GO TO 420
      380 I=IZUP-1
      IZUP=0
      IF (IFUEL(NEW).GT.0) GO TO 440
C**** LOWER THE FLOW RATES BELOW INJECTION POINT AS AN AID TO
C**** CONVERGENCE
      ABLL=G(1,NEW)*AFLOW(1)/RHOO(1,NEW)
      DO 400 J=1,I
      400 G(J,NEW)=G(J,NEW)-ABLL*RHOO(J,NEW)/AFLOW(J)
      GO TO 440
C****
C**** DO CALCULATIONS FOR IZUP NOT ZERO
      420 IF (IZUP.EQ.0) GO TO 440
      IZUP=IZUP
      IZUP=J
      ISATTY=1
      PTRKY=2.E+9
      30X(1,1)=T(NEW)-H(NEW)
      ISILL=2
      JSILL=1
      GO TO 380
      440 CONTINUE
C****
C**** SET UP FOR "STATE" DETERMINATION AND SET INITIAL DELTAZ*DELTAT
C**** LOGIC WILL BE TRUE IF NOTHING IS HAPPENING
      LOGIC=IFUEL(IOLD).EQ.0.AND.IGAS(IOLD).EQ.0
      IF (.NOT.LOGIC) GO TO 480
      IF (INACTIV(ICHAN).GT.0) INACTIV(ICHAN)=0
      IGAS(NEW)=0
      IFUEL(NEW)=0

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ORBIT 179

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      NGAS(NEW)=0
      OIL(NEW)=0.0
      OIL(NEW+2)=0.0
      BOX(NEW+8,4)=0.0
      DO 400 I=1,NAXIAL
        DEL(2,I)=DELX(I)/H(NEW)
400  STATE(I)=1
490  CONTINUE
      LOOPP=0
C****
C****
C**** MAIN ORBIT ITERATIVE LOOP
C**** RETURN TO THIS POINT WITH NEW TRIAL FLOWS AND PRESSURES
      DO 500 CONTINUE
        LOOP4=0
        LOOPT=0
C**** LIST(I)=1 MEANS TEMPERATURES NOT RIGHT
        DO 520 I=2,NAXIAL
          >20 LIST(I)=1
          IF (LOGIC) GO TO 1100
C**** GET INTERFACE MOVEMENT
          CALL INTERF
          IF (IPRINT.LT.KPRINT) KPRINT=IPRINT+1
C**** SET UP FOR CASE WHERE EITHER IBOIL OR IGAS.NE.0
          IF (IFUEL(NEW).NE.0) GO TO 540
          IFUEL(NEW)=1
          IFUELJ(NEW)=NAXIAL
          IFUEL0(NEW)=NAXIAL
          >40 CONTINUE
          J=1
          K=1
C****
C**** DETERMINE THE STATE OF EACH COOLANT NODE
          DO 1000 IAXIAL=2,NAXIAL
            VNOW(IAXIAL)=ORBIT(IAXIAL)
            ABLE=DELX(IAXIAL)/H(NEW)
            IF (IFUEL(NEW)) 8+0,8+0,500
          >00 IF (IAXIAL-IFUEL0(NEW)) 8+0,580,720
          >40 CONTINUE
            IF (IBOIL(NEW)) 600,600,600
C**** LIQUID ON BOTTOM FULL ON TOP
          600 STATE(IAXIAL)=4
            IF (IAXIAL.EQ.IFUEL0(NEW)) GO TO 620
            VNOW(IAXIAL)=VNOW(IAXIAL)*(1.-FUEL0(NEW))
            DEL(1,IAXIAL)=ABLE*FUEL0(NEW)
            DEL(2,IAXIAL)=ABLE-DEL(1,IAXIAL)
            GO TO 1000
C**** BUBBLE HAS COLLAPSED SET STATE TO ALL LIQUID
          620 STATE(IAXIAL)=1
            IF (IFUEL(NEW).EQ.1) GO TO 640
            I10=IFUEL0(NEW)
            WALTAR(I10)=ORBIT(I10)*RHOONA(I10,IOLD)
            OSAVE+(I10,IOLD)=WALTAR(I10)*HELP(I10)
            I10=I10-1
            WALTAR(I10)=ORBIT(I10)*RHOONA(I10,IOLD)
            OSAVE+(I10,IOLD)=WALTAR(I10)*HELP(I10)
          >40 CONTINUE
            LOOPP=0
            I10=KFUELS+NBCCORE-1
            IFUEL(NEW)=0
            IFUEL(IOLD)=0
            IFUEL0(NEW)=NAXIAL+1
            IFUEL0(IOLD)=IFUEL0(NEW)
            IFUEL0(NEW)=0
            IFUELJ(IOLD)=0

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JEL(2, IAXIAL)=ABLE
LOGIC=.TRUE.
IACTIV(ICHAN)=-10
OIL(17)=0.0
OIL(1)=0.0
OIL(2)=0.0
OIL(3)=0.0
OIL(4)=0.0
OIL(18)=0.0
OIL(15)=0.0
OIL(11)=0.0
OIL(7)=0.0
OIL(9)=0.0
OIL(5)=0.0
OIL(13)=0.0
DO 600 I=1,4
DO 600 II=1,20
600 JOX(II,I)=0.0
JOX(1,1)=T(NEW)-H(NEW)
JFILL=2
JFILL=1
OIL(14)=0.0
OIL(12)=VOLG(IOLD)

OIL(13)=8.6*VOLG(IOLD)-RHOG(40,2)
IAS(NEW)=0
NAG(NEW)=0
GO TO 1000
600 IF (IAXIAL-IBOILU(J,NEW)) 600,700,600
C**** VAPOR BOTTOM, FUEL TOP
700 STATE(IAXIAL)=4
VLOW(IAXIAL)=VLOW(IAXIAL)*(1.-FUELB0(NEW))
JEL(1,IAXIAL)=ABLE*FUELB0(NEW)
JEL(2,IAXIAL)=ABLE-JEL(1,IAXIAL)
J=2
GO TO 1000
720 IF (IAXIAL-IFUELU(NEW)) 740,700,840
C**** ALL VAPOR
740 STATE(IAXIAL)=1+
JEL(2,IAXIAL)=ABLE
GO TO 1000
760 CONTINUE
IF (IBOIL(NEW)) 780,730,800
C**** FUEL BOTTOM, LIQUID TOP
780 STATE(IAXIAL)=5
VLOW(IAXIAL)=VLOW(IAXIAL)*FUELB0(NEW)
JEL(1,IAXIAL)=ABLE*FUELB0(NEW)
JEL(2,IAXIAL)=ABLE-JEL(1,IAXIAL)
GO TO 1000
800 IF (IAXIAL-IBOILU(J,NEW)) 780,820,780
C**** FUEL BOTTOM, VAPOR TOP
820 IF (IBOILU(J,NEW).EQ.IBOILU(J,NEW)) J=2
VLOW(IAXIAL)=VLOW(IAXIAL)*FUELB0(NEW)
JEL(1,IAXIAL)=ABLE*FUELB0(NEW)
JEL(2,IAXIAL)=ABLE-JEL(1,IAXIAL)
STATE(IAXIAL)=1+
GO TO 1000
840 CONTINUE
IF (IBOIL(NEW)) 860,800,880
C**** ALL LIQUID
860 STATE(IAXIAL)=1
JEL(2,IAXIAL)=ABLE
GO TO 1000
880 IF (IAXIAL-IBOILU(J,NEW)) 860,900,920
C**** LIQUID BOTTOM, VAPOR TOP
900 STATE(IAXIAL)=6
JEL(2,IAXIAL)=ABLE
IF (IAXIAL.EQ.IBOILU(J,NEW)) J=2

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GO TO 1000	ORBIT	312
920 IF (IAXIAL-IBOILU(J,NEW)) 940,960,980	ORBIT	313
C**** ALL VAPOR	ORBIT	314
940 STATE(IAXIAL)=8	ORBIT	315
ULL(2,IAXIAL)=ABLE	ORBIT	316
GO TO 1000	ORBIT	317
C**** VAPOR BOTTOM, LIQUID TOP	ORBIT	318
960 J=2	ORBIT	319
JEL(2,IAXIAL)=ABLE	ORBIT	320
STATE(IAXIAL)=7	ORBIT	321
GO TO 1000	ORBIT	322
980 IF (J-2) 880,860,880	ORBIT	323
1000 CONTINUE	ORBIT	324
C**** LOCATE INTERFACES	ORBIT	325
DO 1020 I=2,NAXIAL	ORBIT	326
IF (STATE(I).GT.8) GO TO 1040	ORBIT	327
IF (STATE(I).GT.1.AND.STATE(I).LT.6) GO TO 1040	ORBIT	328
1020 CONTINUE	ORBIT	329
I=NAXIAL	ORBIT	330
1040 SMELP(3)=I	ORBIT	331
DO 1060 I921X=2,NAXIAL	ORBIT	332
I=NAXIAL+2-I921X	ORBIT	333
IF (STATE(I).GT.8) GO TO 1080	ORBIT	334
IF (STATE(I).GT.1.AND.STATE(I).LT.6) GO TO 1080	ORBIT	335
1060 CONTINUE	ORBIT	336
I=2	ORBIT	337
1080 SMELP(2)=I	ORBIT	338
C****	ORBIT	339
C****	ORBIT	340
C**** GET NEW TEMPERATURES WITH CURRENT FLOWS AND PRESSURES	ORBIT	341
1100 CALL ENERGY, RETURNS (2540)	ORBIT	342
C****	ORBIT	343
C****	ORBIT	344
C**** UPDATE FUEL MELTING	ORBIT	345
MOOP=0	ORBIT	346
L=IFUEL(IOLD)	ORBIT	347
VVOID=OIL(6)/DELX(NBCORE)	ORBIT	348
VGAS=0.0	ORBIT	349
VLIQ=0.0	ORBIT	350
A92=0.0	ORBIT	351
A93=0.0	ORBIT	352
A94=0.0	ORBIT	353
TUTMEL=0.0	ORBIT	354
J=NBCORE-1	ORBIT	355
DO 1240 IAXIAL=1,NGOREN	ORBIT	356
IF (TEMPER(1,IAAXIAL,IOLD).GT.TMELTL.AND.TW(3).LT.0.0) VOIDV(IAAXIAL	ORBIT	357
+) =ABS(VOIDV(IAAXIAL))	ORBIT	358
EASY=AMAX1(0.0,VOIDV(IAAXIAL))	ORBIT	359
CHARLY=0.0	ORBIT	360
VVOID=VVOID+EASY	ORBIT	361
A92AXL=A92	ORBIT	362
A93AXL=A93	ORBIT	363
VGASAXL=VGAS	ORBIT	364
ABLE2=0.0	ORBIT	365
M=NTOP(IAAXIAL+J)-4	ORBIT	366
DO 1220 IRAJ=1,M	ORBIT	367
C****	ORBIT	368
C**** DETERMINE FRACTION OF THE NODE WHICH IS LIQUID = XLIQ	ORBIT	369
C**** IF TEMPER IS BELOW TMELTL, NODE IS ALL SOLID	ORBIT	370
IF (TEMPER(IRAJ,IAAXIAL,NEW).GT.TMELTL) GO TO 1120	ORBIT	371
XLIQ(IRAJ,IAAXIAL,NEW)=0.	ORBIT	372
GO TO 1200	ORBIT	373
C**** IF TEMPER IS ABOVE TMELTL, NODE IS ALL LIQUID	ORBIT	374
1120 IF (TEMPER(IRAJ,IAAXIAL,NEW).LT.TMELTL) GO TO 1140	ORBIT	375
XLIQ(IRAJ,IAAXIAL,NEW)=1.	ORBIT	376

GO TO 1200	ORBIT	377
C**** IF ORIGINAL AMOUNT OF MATERIAL IS STILL THERE XLIQ=F(TEMPER) ONLY	ORBIT	378
1140 TF=(TEMPER(IRAD,IAXIAL,NEW)-TMELTL)/(TMELTH-TMELTL)	ORBIT	379
IF (YEHYEH(IRAD,IAXIAL,NEW).NE.1.) GO TO 1180	ORBIT	380
1160 XLIQ(IRAD,IAXIAL,NEW)=TF	ORBIT	381
GO TO 1200	ORBIT	382
1180 TO=TEMPER(IRAD,IAXIAL,IOLD)	ORBIT	383
IF (TO.LT.TMELTL) GO TO 1160	ORBIT	384
IF (TO.GT.TMELTH) GO TO 1160	ORBIT	385
C**** IF TEMPER(IOLD) ALSO IN MELTING RANGE XLIQ=F(TEMPER(IOLD,NEW))	ORBIT	386
XLIQ(IRAD,IAXIAL,NEW)=TF-(TO-TMELTL)/(TMELTH-TMELTL)+XLIQ(IRAD,IAXIAL,IOLD)	ORBIT	387
1200 ABLE=VOLUME(IRAD,IAXIAL)	ORBIT	388
N=1+MOD(MTYPE(IRAD,IAXIAL)-1,2)	ORBIT	389
CALL CURVE (BAKER,TEMPER(IRAD,IAXIAL,NEW),STEMP,ST1(1,N),00,I19)	ORBIT	390
ISCRUP=391	ORBIT	391
IF (I19.GT.0) GO TO 2/20	ORBIT	392
ENSY=ENSY+ABLE-(1.-XLIQ(IRAD,IAXIAL,NEW))*ABLE*YEHYEH(IRAD,IAXIAL)	ORBIT	393
N=MOD(MTYPE(IRAD,IAXIAL),4)	ORBIT	394
ABLE=ABLE*DENSE(N)	ORBIT	395
DOG=ABLE*DELX(NBCORL)*YEHYEH(IRAD,IAXIAL)	ORBIT	396
DOG=DOG*XLIQ(IRAD,IAXIAL,NEW)	ORBIT	397
ABLE2=ABLE2+POW(IRAD,IAXIAL)*DOG/ABLE	ORBIT	398
	ORBIT	399
A92=A92+DOG	ORBIT	400
A93=A93+DOG*TEMPER(IRAD,IAXIAL,NEW)	ORBIT	401
A94=A94+DOG/DENSE(N)*(BAKER-SJB(N))	ORBIT	402
ABLE=ABLE-(1.-XLIQ(IRAD,IAXIAL,NEW))*ABLE*YEHYEH(IRAD,IAXIAL)	ORBIT	403
CHARLY=CHARLY+ABLE	ORBIT	404
VGAS=VGAS+ABLE/DENSE(N)*(POROS(NM,IAXIAL)+CUPERC(NM,IAXIAL))*TMELT	ORBIT	405
+L/293.*1.013L+0	ORBIT	406
1220 CONTINUE	ORBIT	407
VMUSH(IAXIAL)=ENSY	ORBIT	408
TOTMEL=TOTMEL+VMUSH(IAXIAL)	ORBIT	409
VMELT(IAXIAL)=CHARLY	ORBIT	410
VLIQ=VLIQ+VMELT(IAXIAL)/RLQF	ORBIT	411
IF (HOTPI1.EQ.0.) GO TO 1240	ORBIT	412
APEMH(IAXIAL,NEW)=VMUSH(IAXIAL)	ORBIT	413
A92AXL=A92-A92AXL	ORBIT	414
A93AXL=A93-A93AXL	ORBIT	415
IF (A92AXL.EQ.0.) TBAR(IAXIAL)=TMELTL	ORBIT	416
IF (A92AXL.NE.0.) TBAR(IAXIAL)=A93AXL/A92AXL	ORBIT	417
OLIQIN(IAXIAL)=(VMELT(IAXIAL)-VMELT2(IAXIAL))/H(NEW)	ORBIT	418
VGAS1(IAXIAL)=VGAS-VGASAX	ORBIT	419
GASIN(IAXIAL)=(VGAS1(IAXIAL)-VGAS2(IAXIAL))/(R*TMELTL*H(NEW))	ORBIT	420
IF (GASIN(IAXIAL).LT.0.) GASIN(IAXIAL)=0.	ORBIT	421
IF (A92AXL.NE.0.) ABLE2=ABLE2/A92AXL	ORBIT	422
QHEAT(IAXIAL)=2.*FN(N,H)*ABLE2*1.E+7	ORBIT	423
1240 CONTINUE	ORBIT	424
VCAV=TOTMEL	ORBIT	425
TOTMEL=TOTMEL-VVOID	ORBIT	426
VGAS=AMAX1(VGAS,RHUG(42,2))	ORBIT	427
IF (IHW(2).LT.0.) PVOID=ENUF/VVOID	ORBIT	428
C****	ORBIT	429
C****	ORBIT	430
C**** GET NEW FLOWS AND PRESSURES WITH EXISTING TEMPERATURES	ORBIT	431
C**** RETURN TO STATEMENT 500 WHEN MOMENT HAD TO CHANGE FLOWS AND	ORBIT	432
C**** PRESSURES (SWITCH = 2)	ORBIT	433
CALL MOMENT, RETURNS (2340,500)	ORBIT	434
C****	ORBIT	435
C**** COMPUTE NEW VALUES FOR AMOUNT OF FUEL AND LIQUID IN NODES	ORBIT	436
IF (VLIQ.EQ.0.) GO TO 1340	ORBIT	437
IF (VOLF(NEW).EQ.0.) GO TO 1340	ORBIT	438
SIG2=(VLIQ-VOLF(NEW))/TOTMEL*RLQF	ORBIT	439
A92=0.	ORBIT	440
A93=0.	ORBIT	441
A94=0.	ORBIT	442
GO 1320 IAXIAL=1,NCORLN	ORBIT	443

DO 1300 IRAD=1,4	ORBIT	444
N=1+MOD(MTYPE(IRAD, IAXIAL)-1,2)	ORBIT	445
IF (XLIQ(IRAD, IAXIAL, NEW).EQ.0.) GO TO 1300	ORBIT	446
IF (XLIQ(IRAD, IAXIAL, NEW).LT.1.) GO TO 1200	ORBIT	447
YCHYEH(IRAD, IAXIAL)=SIG2/DENSE(N)	ORBIT	448
GO TO 1280	ORBIT	449
1260 CHARLY=(1.-XLIQ(IRAD, IAXIAL, NEW))*YCHYEH(IRAD, IAXIAL)	ORBIT	450
XLIQ(IRAD, IAXIAL, NEW)=1./(1.+CHARLY*DENSE(N)/SIG2/(1.-CHARLY))	ORBIT	451
YCHYEH(IRAD, IAXIAL)=1./(1.+XLIQ(IRAD, IAXIAL, NEW)*(DENSE(N)/SIG2-1.	ORBIT	452
+))	ORBIT	453
1280 ABLE=VOLUME(IRAD, IAXIAL)*DENSE(N)*YCHYEH(IRAD, IAXIAL)*XLIQ(IRAD, I	ORBIT	454
+AXIAL, NEW)*DELX(NBCORE)	ORBIT	455
A92=A92+ABLE	ORBIT	456
A93=A93+ABLE*TEMPER(IRAD, IAXIAL, NEW)	ORBIT	457
CALL CURVE (BAKER, TEMPER(IRAD, IAXIAL, NEW), STMP, ST1(1, N), 00, I19)	ORBIT	458
A94=A94+ABLE/DENSE(N)*(BAKER-SUB(N))	ORBIT	459
1300 CONTINUE	ORBIT	460
IF (HOTPI4.EQ.0.) GO TO 1320	ORBIT	461
ALFA(IAXIAL, IOLD)=ALFA(IAXIAL, NEW)	ORBIT	462
RHOH(IAXIAL, IOLD)=RHOH(IAXIAL, NEW)	ORBIT	463
PIN(IAXIAL, IOLD)=PIN(IAXIAL, NEW)	ORBIT	464
V(IAXIAL, IOLD)=V(IAXIAL, NEW)	ORBIT	465
AREAH(IAXIAL, IOLD)=AREAH(IAXIAL, NEW)	ORBIT	466
ARLAX(IAXIAL, IOLD)=ARLAX(IAXIAL, NEW)	ORBIT	467
AA(IAXIAL, IOLD)=AA(IAXIAL, NEW)	ORBIT	468
ENTPY(IAXIAL, IOLD)=ENTPY(IAXIAL, NEW)	ORBIT	469
OHDP(IAXIAL, IOLD)=OHDP(IAXIAL, NEW)	ORBIT	470
1320 CONTINUE	ORBIT	471
1340 CONTINUE	ORBIT	472
IF (HOTPI4.EQ.0.) GO TO 1380	ORBIT	473
LUPJ=LUP	ORBIT	474
LOWN=LOWN	ORBIT	475
LOPJ=LOPJ	ORBIT	476
LOWN=LOWN	ORBIT	477
GASIN1=GASIN2	ORBIT	478
DO 1350 IAXIAL=1, NDOWN	ORBIT	479
VMELT2(IAXIAL)=VMELT(IAXIAL)	ORBIT	480
VGAS2(IAXIAL)=VGAS1(IAXIAL)	ORBIT	481
1350 CONTINUE	ORBIT	482
1380 CONTINUE	ORBIT	483
C****	ORBIT	484
C**** CHECK FOR PLENUM RUPTURE	ORBIT	485
IF (IFUEL(NEW).EQ.0.OR.IGAS(NEW).NE.0) GO TO 1480	ORBIT	486
LL=NTOP(N3PLEN)	ORBIT	487
LL=N3PLEN+N3CORE-NICORE-1	ORBIT	488
IF (TSINK(LL, LL, NEW)-TGASS) 1480, 1499, 1400	ORBIT	489
1400 IF (PPLEN(NEW)-P(N3PLEN, NEW)) 1480, 1480, 1420	ORBIT	490
1420 IGAS(NEW)=N3PLEN	ORBIT	491
IF (LINE=SL-1) 1440, 1400, 1460	ORBIT	492
1440 CALL 4=DD (5)	ORBIT	493
WRITE (NOUT, 2600)	ORBIT	494
LINE=SL-57	ORBIT	495
1460 KK=N3PLEN-1	ORBIT	496
WRITE (NOUT, 2700) T(NEW), KK, ICHAN	ORBIT	497
LINE=SL-1	ORBIT	498
NGAS(NEW)=1	ORBIT	499
IZOP=1	ORBIT	500
1480 CONTINUE	ORBIT	501
I101=IFUEL(NEW)	ORBIT	502
I3ILL=MOD(I3ILL, 2)+1	ORBIT	503
J3ILL=MOD(J3ILL, 2)+1	ORBIT	504
OIL(19)=OIL(11)	ORBIT	505
C****	ORBIT	506
C**** GET VELOCITIES, MASSES, ENTHALPIES OF COOLANT IN AXIAL NODE	ORBIT	507

DO 1000 I=2,NAXIAL	ORBIT	508
IF (STATE(I).EQ.1) GO TO 1500	ORBIT	509
IF (STATE(I).EQ.4) GO TO 1520	ORBIT	510
IF (STATE(I).EQ.5) GO TO 1560	ORBIT	511
UOLD(I)=UOLD(I-1)	ORBIT	512
HELP(I)=0.0	ORBIT	513
WALTAR(I)=0.0	ORBIT	514
DSAVE+(I,NEW)=0.0	ORBIT	515
GO TO 1000	ORBIT	516
1500 UOLD(I)=G(I,NEW)/RHOO(I,NEW)	ORBIT	517
WALTAR(I)=URDT(I)*RHOONA(I,NEW)	ORBIT	518
GO TO 1580	ORBIT	519
1520 TS=12130./(10.51-ALOG(PTRY/1.013E+6))	ORBIT	520
IF (TCOOL(I,NEW).LT.TS.OR.FUELBD(NEW).EQ.0.0) GO TO 1540	ORBIT	521
ABLE=DELX(I)*AFLOW(I)*FUELBD(NEW)	ORBIT	522
FUELBD(NEW)=0.0	ORBIT	523
OIL(9)=OIL(9)+ABLE	ORBIT	524
ABLE=ABLE*RHOONA(I,NEW)	ORBIT	525
WALTAR(I)=0.0	ORBIT	526
DSAVE+(I,NEW)=0.0	ORBIT	527
HELP(I)=0.0	ORBIT	528
UOLD(I)=UOLD(I-1)	ORBIT	529
OIL(10)=OIL(10)+A154+ABLE	ORBIT	530
BOX(NEW+5,4)=BOX(NEW+5,4)+ABLE*1.3*(TCOOL(I,NEW)-TS)/3794.	ORBIT	531
GO TO 1000	ORBIT	532
1540 CONTINUE	ORBIT	533
WALTAR(I)=URDT(I)*FUELBD(NEW)*RHOONA(I,NEW)	ORBIT	534
OIL(10)=OIL(10)+A154	ORBIT	535
IF (OIL(17).EQ.0.0) GO TO 1580	ORBIT	536
OIL(9)=OIL(9)+G(I101-1,NEW)*AFLOW(I101-1)*H(NEW)/RHOO(I101-1,NEW)+	ORBIT	537
BOX(15,4)	ORBIT	538
GO TO 1580	ORBIT	539
1560 UOLD(I)=G(I,NEW)/RHOO(I,NEW)	ORBIT	540
WALTAR(I)=URDT(I)*(1.-FUELBD(NEW))*RHOONA(I,NEW)	ORBIT	541
1580 HELP(I)=BLGPXR(I)	ORBIT	542
DSAVE+(I,NEW)=WALTAR(I)*HELP(I)	ORBIT	543
1600 CONTINUE	ORBIT	544
C****	ORBIT	545
C**** SAVE PRINTOUT	ORBIT	546
IF (LOGIC.AND..NOT.PRINT) GO TO 1620	ORBIT	547
L=1FUEL(NEW)	ORBIT	548
DOG=OIL(NEW)*DELX(L)	ORBIT	549
C	ORBIT	550
CALL ONDISK (1FIZZ)	ORBIT	551
1620 CONTINUE	ORBIT	552
IF (IFUEL(NEW).EQ.0.AND.TEMPER(1,NGUREN,NEW).GE.TMELTL) OIL(6)=TH(	ORBIT	553
++)	ORBIT	554
C**** MOVE DISK POINTERS TO TELL WHERE NEXT CHANNEL IS TO WRITE	ORBIT	555
NTAB(41)=NTAB(41)+MPRINT*IOUT(1)	ORBIT	556
NTAB(42)=NTAB(42)+MPRINT*IOUT(2)	ORBIT	557
NTAB(43)=NTAB(43)+MPRINT*IOUT(3)	ORBIT	558
NTAB(44)=NTAB(44)+MPRINT*NAXIAL	ORBIT	559
NTAB(45)=NTAB(45)+3*MRINT	ORBIT	560
NTAB(46)=NTAB(46)+10*MPRINT	ORBIT	561
NTAB(47)=NTAB(47)+4*MPRINT	ORBIT	562
C**** RESTORE RUN VALUES SAVED ABOVE	ORBIT	563
H(NEW)=HELLO	ORBIT	564
H(IOLD)=GELLO	ORBIT	565
I(NEW)=FELLO	ORBIT	566
T(IOLD)=LELLO	ORBIT	567
PN(IOLD)=UELLO	ORBIT	568
PN(NEW)=BULLO	ORBIT	569
PHOT(1,IOLD)=ALLO	ORBIT	570
PHOT(2,IOLD)=DELLO	ORBIT	571
PHOT(3,IOLD)=OLLO	ORBIT	572
C**** SAVE VOLUMES OF GAS AND LIQUID SQUIRTED, ETC. FOR THE NEXT TIME	ORBIT	573

C****	THROUGH. USED IN FUEL MELTING UPDATE	ORBIT	574
	IF (VOLF(NEW).EQ.0.0.AND.VOLG(NEW).EQ.0.0) GO TO 1640	ORBIT	575
	RHOG(1,2)=VOLF(NEW)/VLIQ	ORBIT	576
	RHOG(1,2)=VGAS	ORBIT	577
1640	CONTINUE	ORBIT	578
C****		ORBIT	579
C****		ORBIT	580
C****	STEP COMPLETE - GET REACTIVITY CONTRIBUTION	ORBIT	581
	CALL REACT (ABLE,BAKER)	ORBIT	582
	IF (.NOT.PRINT) GO TO 1660	ORBIT	583
	IF (G=HIZ(8).GT.0.0) GO TO 1560	ORBIT	584
	IUNIT=8	ORBIT	585
	TERM1(1)=T(NEW)	ORBIT	586
	TERM1(2)=ABLE	ORBIT	587
	TERM1(3)=BAKER	ORBIT	588
	IWA=3*IPRINT+3*MPRINT*(ICHAN-1)+1	ORBIT	589
C****		ORBIT	590
C****	PUT VALUES ON DISK FOR PRINTOUT LATER	ORBIT	591
	CALL PUT (FIT(1,6),TERM1,30,IWA,0,0,JOLLY)	ORBIT	592
	CALL R=HND (FIT(1,6))	ORBIT	593
1660	CONTINUE	ORBIT	594
C****		ORBIT	595
C****	COMPUTE INTERMEDIATE VALUES FOR CHANNEL TOTALS OF LIQUID FUEL,	ORBIT	596
C****	LIQUID FUEL TIMES TEMPERATURE, POWER DISSIPATED IN LIQUID FUEL	ORBIT	597
	G MOL=G MOL+A92*NOPINS	ORBIT	598
	T MOL=T MOL+A93*NOPINS	ORBIT	599
	Q MOL=Q MOL+A94*NOPINS	ORBIT	600
	IF (IACTIV(ICHAN).EQ.1.AND.IFJELU(NEW).GE.NTCORE) IACTIV(ICHAN)=2	ORBIT	601
	IF (IACTIV(ICHAN).EQ.2) OIL(7)=1000.	ORBIT	602
C****		ORBIT	603
C****		ORBIT	604
C****	SEE IF FUEL SQUIRTING IS TO BEGIN	ORBIT	605
C****	HAS FIN FAILED ALREADY	ORBIT	606
	IF (IFUEL(IOLD).GT.0) GO TO 2360	ORBIT	607
	IF (VOLG(NEW).GT.0.0.OR.VOLF(NEW).GT.0.0) GO TO 2020	ORBIT	608
	IF (KFUELS.GT.0) GO TO 2020	ORBIT	609
	TADD=0.0	ORBIT	610
	IF (IACTIV(ICHAN).LT.0) TADD=-.5	ORBIT	611
	IF (SCOTT) 1580,1700,1700	ORBIT	612
C****		ORBIT	613
C****	CHECK FOR FUEL FAILURE AT TIME "--SCOTT"	ORBIT	614
1680	HH=T(NEW)+SCOTT	ORBIT	615
	IF (HH.LT.0.) GO TO 2360	ORBIT	616
	IF (HH.LT.HMIN) GO TO 2020	ORBIT	617
	HREDO=-SCOTT-T(IOLD)	ORBIT	618
	HREDO=AINT(HREDO/HMIN+1.000001)*HMIN	ORBIT	619
	IF (IACTIV(ICHAN).EQ.0.OR.IACTIV(ICHAN).EQ.-5) GO TO 2420	ORBIT	620
	GO TO 2420	ORBIT	621
1700	IF (IFUELS.LT.12) GO TO 1900	ORBIT	622
C****		ORBIT	623
C****	CHECK FOR FUEL FAILURE BY ENTHALPY CRITERIA	ORBIT	624
	N=NBCORE-1	ORBIT	625
C****	COMPUTE TOTAL ENTHALPY IN FUEL AT AXIAL NODE	ORBIT	626
	DO 1740 I=1,NCOREN	ORBIT	627
	EPYTH(NEW+11,I)=0.0	ORBIT	628
	SUMTOT=0.0	ORBIT	629
	NN=NTOP(I+N)-4	ORBIT	630
	DO 1720 J=1,NN	ORBIT	631
	K=1+MOD(MTYPE(J,I)-1,2)	ORBIT	632
	SUMTOT=SUMTOT+VOLUME(J,I)*DENSEL(K)	ORBIT	633
	CALL CURVE (BAKER,TEMPER(J,I,NEW),STEMP,SI1(1,K),00,I19)	ORBIT	634
	ISCRJP=634	ORBIT	635
	IF (I19.GT.0) GO TO 2080	ORBIT	636
1720	EPYTH(NEW+11,I)=EPYTH(NEW+11,I)+BAKER*VOLUME(J,I)	ORBIT	637
1740	EPYTH(NEW+11,I)=EPYTH(NEW+11,I)/SUMTOT	ORBIT	638

HR=00=H(NEW)	ORBIT	039
0**** CHECK FOR FAILURE FROM ENTHALPY CORRELATION	ORBIT	040
K=0	ORBIT	041
L=NTOP(NBCORE)-1	ORBIT	042
DO 1850 I=1,NBCORE	ORBIT	043
ABLE=EPYTM(14,I)+EPYTM(15,I)*TEMPER(L,I,NEW)**2	ORBIT	044
IF (SCOTT.NE.2.) GO TO 1825	ORBIT	045
AXPOW=0.0	ORBIT	046
DO 1750 J=1,NN	ORBIT	047
AXPOW=AXPOW+POWSS*2.0*POW(J,I)*30.48/1000.0	ORBIT	048
1750 CONTINUE	ORBIT	049
IF (AXPOW.GT.9.0) GO TO 1780	ORBIT	050
A=2455.0+11.33*AXPOW	ORBIT	051
GO TO 1800	ORBIT	052
1780 A=214.0+264.0*AXPOW	ORBIT	053
1800 ABLE=A-1.33*(TEMPER(L,I,NEW)*1.8-460.0)	ORBIT	054
1820 HFAIL(I)=ABLE	ORBIT	055
EPYTM(NEW+11,I)=ABLE-EPYTM(NEW+11,I)	ORBIT	056
IF (-EPYTM(NEW+11,I)-.ADD) 1850,1840,1840	ORBIT	057
1840 IF (TEMPER(1,I,NEW).LT.TMELTL) GO TO 1860	ORBIT	058
K=1	ORBIT	059
0**** SELECT LATER OF TWO TIMES - MELTED TIME OR FAILURE TIME	ORBIT	060
BAKER=H(NEW)*EPYTM(IOLD+11,I)/(EPYTM(IOLD+11,I)-EPYTM(NEW+11,I))	ORBIT	061
CHARLY=H(NEW)*(TMELTL-TEMPER(1,I,IOLD))/(TEMPER(1,I,NEW)-TEMPER(1,I,IOLD))	ORBIT	062
	ORBIT	063
IF (TEMPER(1,I,IOLD).GE.TMELTL) CHARLY=0.	ORBIT	064
BAKER=AMAX1(BAKER,CHARLY)	ORBIT	065
IF (BAKER.LE.HR=00) KFUELS=I	ORBIT	066
H=00=AMIN1(HR=00,BAKER)	ORBIT	067
IF (SCOTT.NE.2.) GO TO 1860	ORBIT	068
IF (AXPOW.LT.9.0.AND.TEMPER(L,I,NEW).LT.841.0) WRITE (NOUT,2780) 1	ORBIT	069
IF (AXPOW.LT.9.0.AND.TEMPER(L,I,NEW).GT.1563.0) WRITE (NOUT,2780) 1	ORBIT	070
IF (AXPOW.GT.9.0.AND.TEMPER(L,I,NEW).LT.901.0) WRITE (NOUT,2780) 1	ORBIT	071
IF (AXPOW.GT.9.0.AND.TEMPER(L,I,NEW).GT.1564.0) WRITE (NOUT,2780) 1	ORBIT	072
1860 CONTINUE	ORBIT	073
IF (K.EQ.0) GO TO 2360	ORBIT	074
H=00=AINT(HR=00/HMIN+1.000001)*HMIN	ORBIT	075
IF (IACTIV(ICHAN).EQ.0.OR.IACTIV(ICHAN).EQ.-5) GO TO 2420	ORBIT	076
TFAIL=I(IOLD)+H=00	ORBIT	077
KK=KFUELS+NBCORE-2	ORBIT	078
WRITE (NOUT,2800) TFAIL,KK,ICHAN	ORBIT	079
CALL H=00 (2)	ORBIT	080
WRITE (NOUT,2820) ICHAN	ORBIT	081
DO 1950 I=1,NBCORE	ORBIT	082
BAKER=HFAIL(I)-EPYTM(NEW+11,I)	ORBIT	083
KK=NBCORE-2+I	ORBIT	084
WRITE (NOUT,2840) KK,TEMPER(L,I,NEW),BAKER,HFAIL(I)	ORBIT	085
1840 CONTINUE	ORBIT	086
CALL H=00 (3)	ORBIT	087
WRITE (NOUT,2880)	ORBIT	088
LINE=57	ORBIT	089
GO TO 2020	ORBIT	090
0****	ORBIT	091
0**** CHECK FOR FAILURE BY TEMPERATURE	ORBIT	092
1900 CONTINUE	ORBIT	093
IF (JFUELS) 1940,1940,1920	ORBIT	094
1920 K=JFUELS+NBCORE-1	ORBIT	095
I=JFUELS	ORBIT	096
IF (TEMPER(IFUELS,JFUELS,NEW)-TFUELS-TADD) 2360,2000,2000	ORBIT	097
1940 I=0	ORBIT	098
TFAIL=0.	ORBIT	099
J=0	ORBIT	100
DO 1930 K=NBCORE,NTCORE	ORBIT	101
J=J+1	ORBIT	102
IF (TEMPER(IFUELS,J,NEW)-TFUELS-TADD) 1980,1980,1960	ORBIT	103

1960	IF (TFAIL.GT. TEMPER(IFUELS,J,NEW)) GO TO 1980	ORBIT	704
	TFAIL=TEMPER(IFUELS,J,NEW)	ORBIT	705
	I=J	ORBIT	706
1980	CONTINUE	ORBIT	707
	IF (I.EQ.0) GO TO 2300	ORBIT	708
2000	IF (IACTIV(ICHAN).EQ.0.OR. IACTIV(ICHAN).EQ.-5) GO TO 2400	ORBIT	709
	KK=IABS(KFUELS)+NBCORE-2	ORBIT	710
	WRITE (NOUT,2860) T(NEW),KK,ICHAN	ORBIT	711
	KKK=1+NBCORE-2	ORBIT	712
	WRITE (NOUT,2920) TEMPER(IFUELS,I,NEW),IFUELS,KKK	ORBIT	713
C****		ORBIT	714
C****	CHECK ENOUGH PRESSURE IN PIN TO SQUIRT	ORBIT	715
2020	CONTINUE	ORBIT	716
	KFUELS=IABS(KFUELS)	ORBIT	717
	ABLE=VGAS+PVOID*VVOID-VOLG(NEW)	ORBIT	718
	BAKER=VLIQ-TOTML-VVOID-VOLF(NEW)	ORBIT	719
	K=KFUELS+NBCORE-1	ORBIT	720
	IACTIV(ICHAN)=-10	ORBIT	721
	IF (ABLE/P(K,NEW)+BAKER.LE.0.0) GO TO 2380	ORBIT	722
	IF (HOTIM.EQ.1.0.AND.VMUSH(KFUELS).LT.0.01) GO TO 2380	ORBIT	723
C****	PRINT OUT THAT FUEL SQUIRT HAS STARTED	ORBIT	724
	IF (LINESL-1) 2040,2060,2060	ORBIT	725
2040	CALL HEND (0)	ORBIT	726
	WRITE (NOUT,2880)	ORBIT	727
	LINESL=57	ORBIT	728
2060	KK=KFUELS+NBCORE-2	ORBIT	729
	WRITE (NOUT,2900) T(NEW),KK,ICHAN	ORBIT	730
	LINESL=LINESL-1	ORBIT	731
C****		ORBIT	732
C****	INITIALIZE ALL VARIABLES POINTERS SWITCHES, ETC. WHEN SQUIRT	ORBIT	733
C****	BEGINS	ORBIT	734
	K=KFUELS+NBCORE-1	ORBIT	735
	IFUEL(NEW)=K	ORBIT	736
	IFUEL(NEW)=K	ORBIT	737
	IZUP=K	ORBIT	738
	IFULLJ(NEW)=K+1	ORBIT	739
	SMELP(3)=K	ORBIT	740
	SMELP(2)=K+1	ORBIT	741
	KK=KFUELS	ORBIT	742
	M=INTOP(K)-4	ORBIT	743
	ABLL=0.0	ORBIT	744
	BAKER=0.0	ORBIT	745
	DO 2030 I=1,M	ORBIT	746
	N=1+MOD(MTYPE(I,KK)-1,2)	ORBIT	747
	ABLC=ABLE+POW(I,KK)	ORBIT	748
	BAKER=BAKER+VOLUME(I,KK)*DENSE(N)	ORBIT	749
2080	CONTINUE	ORBIT	750
	CGAPD=ABLE/(BAKER*POW(M+5,KK))	ORBIT	751
	FUELOJ(NEW)=.00001	ORBIT	752
	FUELOJ(NEW)=.99999	ORBIT	753
	IACTIV(ICHAN)=1	ORBIT	754
	TOUT=AMIN1(TJUT,T(NEW)+HMAXF)	ORBIT	755
	IF (TW(5)) 2100,2240,2120	ORBIT	756
2100	TW(5)=0.0	ORBIT	757
	GO TO 2240	ORBIT	758
2120	ABLL=(VGAS+VVOID*PVOID)/TW(5)+VLIQ-TOTML	ORBIT	759
	VVOIDH=ABLL	ORBIT	760
	VCAJ=VGAV-VVOID+ABLL	ORBIT	761
	WRITE (NOUT,2940) ABLL,VVOID	ORBIT	762
	IF (ABLL.LT.0.0) GO TO 2240	ORBIT	763
	PVOID=PVOID*VVOID/ABLL	ORBIT	764
	IF (VVOID) 2140,2140,2180	ORBIT	765
2140	ABLL=ABLL/NBCORE	ORBIT	766
	DO 2150 I=1,NBCORE	ORBIT	767

2160	VOIDV(I)=ABLC	ORBIT	768
	GO TO 2240	ORBIT	769
2180	ABLC=ABLC/VVOID	ORBIT	770
	DO 2200 I=1,NBCORE	ORBIT	771
	VMUSH(I)=VMUSH(I)+VOIDV(I)*(ABLC-1.)	ORBIT	772
	AREAH(1,NEW)=VMUSH(I)	ORBIT	773
2200	VOIDV(I)=VOIDV(I)*ABLC	ORBIT	774
	IF (IBOIL(NEW)) 2240,2240,2220	ORBIT	775
2220	IF (K.LE.IBOILO(1,NEW).OR.K.GE.IBOILU(1,NEW)) GO TO 2380	ORBIT	776
	IBOIL(2,NEW)=K	ORBIT	777
	IBOILU(2,NEW)=IBOILU(1,NEW)	ORBIT	778
	IBOILU(1,NEW)=K	ORBIT	779
	NBOIL(NEW)=2	ORBIT	780
2240	IF (HUTPIH.NE.1.0) GO TO 2440	ORBIT	781
C****		ORBIT	782
C****	HUTPIH INITIALIZATION	ORBIT	783
	IBAX=0	ORBIT	784
	DO 2260 IAXIAL=1,NBCORE	ORBIT	785
	IF (VMUSH(IAXIAL).EQ.0.0) GO TO 2260	ORBIT	786
	IF (IBAX.EQ.0) IBAX=IAXIAL	ORBIT	787
	ITAX=IAXIAL	ORBIT	788
2260	CONTINUE	ORBIT	789
	LUP=MIN0(KFUELS+1,ITAX)	ORBIT	790
	LOWN=MAX0(KFUELS-1,IBAX)	ORBIT	791
	JUP=FUEAT(KFUELS)*DELX(NBCORE)	ORBIT	792
	DOWN=JUP-DELX(NBCORE)	ORBIT	793
	LUPC=0	ORBIT	794
	LOWNC=0	ORBIT	795
	IF (ITAX).LE.0.1) VVOIDH=VVOID	ORBIT	796
	ABLC=VGRS+VVOID*VVOIDH	ORBIT	797
	BAKER=TOTAL+VVOIDH-VLIQ	ORBIT	798
	PAV=ABLC/BAKER	ORBIT	799
	ALFAV=1.0-VLIQ/CAV	ORBIT	800
	GASIND=0.0	ORBIT	801
	DO 2300 JA=IBAX,ITAX	ORBIT	802
	IAXIAL=ITAX+1-JA	ORBIT	803
	RHOAV=DEEPER(ALFAV,PAV,TBAR(IAXIAL))	ORBIT	804
	CALL HUFFER (IAXIAL,PAV,RHOAV,ALFAV,AAV,HAV,DHOPAV,TBAR(IAXIAL))	ORBIT	805
	DO 2800 I=1,2	ORBIT	806
	V(IAXIAL,I)=0.0	ORBIT	807
	ALFA(IAXIAL,I)=ALFAV	ORBIT	808
	RHO(IAXIAL,I)=RHOAV	ORBIT	809
	PA(IAXIAL,I)=PAV	ORBIT	810
	AA(IAXIAL,I)=AAV	ORBIT	811
	HA(IAXIAL,I)=HAV	ORBIT	812
	DHOP(IAXIAL,I)=DHOPAV	ORBIT	813
2280	CONTINUE	ORBIT	814
	GASIND=GASIND+AREAH(IAXIAL,NEW)/TBAR(IAXIAL)	ORBIT	815
2300	CONTINUE	ORBIT	816
	GASIND=GASIND*PAV*ALFAV/R	ORBIT	817
	GASIND=GASIND	ORBIT	818
	IB=IBAX+1	ORBIT	819
	IT=ITAX-1	ORBIT	820
	DO 2340 I=1,2	ORBIT	821
	AREAH(IB,I)=(VMUSH(IB)-VMUSH(LOWX))/DELX(NBCORE)	ORBIT	822
	AREAH(IT,I)=(VMUSH(ITAX)-VMUSH(IT))/DELX(NBCORE)	ORBIT	823
	DO 2320 IAXIAL=IB,II	ORBIT	824
2320	AREAH(IAXIAL,I)=0.5*(VMUSH(IAXIAL+1)-VMUSH(IAXIAL-1))/DELX(NBCORE)	ORBIT	825
2340	CONTINUE	ORBIT	826
	GO TO 2440	ORBIT	827
2360	CONTINUE	ORBIT	828
	IF (IATIV(ICHAN).EQ.-10) IATIV(ICHAN)=-5	ORBIT	829
2380	CONTINUE	ORBIT	830
	GO TO 2440	ORBIT	831
C****		ORBIT	832
C****	COMPUTE TIME STEP TO FAILURE BY LINEAR INTERPOLATION IN FUEL	ORBIT	833

C**** ENTHALPY TABLE	ORBIT	834
2400 M=1+MOD(MTYPE(IFUELS,I)-1,2)	ORBIT	835
CALL CURVE (ABLE,TFUELS,STEMP,ST1(1,M),00,I19)	ORBIT	836
ISCRUP=830	ORBIT	837
IF (I19.GT.0) GO TO 2000	ORBIT	838
CALL CURVE (BAKER,TEMPER(IFUELS,I,IOLD),STEMP,ST1(1,M),00,I19)	ORBIT	839
ISCRUP=839	ORBIT	840
IF (I19.GT.0) GO TO 2520	ORBIT	841
CALL CURVE (CHARLY,TEMPER(IFUELS,I,NEW),STEMP,ST1(1,M),00,I19)	ORBIT	842
ISCRUP=842	ORBIT	843
IF (I19.GT.0) GO TO 2540	ORBIT	844
HREDU=H(NEW)*(ABLE-BAKER)/(CHARLY-BAKER)	ORBIT	845
HREDU=AMT(HREDU/HMIN+1.000001)*HMIN	ORBIT	846
C**** SET INACTIV FLAG TO MINUS 10 INDICATING FAILURE UNDER WAY	ORBIT	847
C**** AND TELL RUN TO REDU TIME STEP (HREDU.NE.0.)	ORBIT	848
C**** CONTINUE	ORBIT	849
2420 INACTIV(ICHAN)=-10	ORBIT	850
KFUELS=-IABS(KFUELS)	ORBIT	851
IF (HREDU.LE.PRINT2) GO TO 2520	ORBIT	852
INACTIV(ICHAN)=-5	ORBIT	853
HREDU=JELTIM	ORBIT	854
GO TO 2520	ORBIT	855
2440 HREDU=0.0	ORBIT	856
C**** COMPUTE CHANNELS AND LOOP FLOWS	ORBIT	857
I=LOOP(ICHAN)	ORBIT	858
FLOW(I,NEW)=FLOW(I,NEW)+G(1,NEW)*AFLOW(2)*NUPINS	ORBIT	859
WOLF(I)=WOLF(I)+G(NAXIAL,NEW)*AFLOW(NAXIAL)*H(NEW)*NUPINS/RHO0(NAXIAL,NEW)	ORBIT	860
C**** COMPUTE ENERGY OF SODIUM ONLY EXITTING CORE REGION	ORBIT	861
C**** IF (STATE(NAXIAL)-14) 2400,2490,2400	ORBIT	862
2400 TOPEN(I)=TOPEN(I)+G(NAXIAL,NEW)*AFLOW(NAXIAL)*H(NEW)*TCOOL(NAXIAL,NEW)*CAP3*NUPINS	ORBIT	863
GO TO 2500	ORBIT	864
C**** COMPUTE ENERGY OF SODIUM PLUS FUEL EXITTING CORE REGION	ORBIT	865
2430 CALL CURVE (ABLE,THLLTH,STEMP,ST1,00,I19)	ORBIT	866
IF (I19.GT.0) GO TO 2500	ORBIT	867
CALL CURVE (BAKER,TOFT(1,NEW),STEMP,ST1,00,I19)	ORBIT	868
IF (I19.GT.0) GO TO 2000	ORBIT	869
TOPEN(I)=TOPEN(I)+G(NAXIAL,NEW)*AFLOW(NAXIAL)*H(NEW)*NUPINS*(ABLE-BAKER)/RHO0(NAXIAL,NEW)	ORBIT	870
2500 CONTINUE	ORBIT	871
C**** ERROR AND NORMAL RETURNS	ORBIT	872
2520 CONTINUE	ORBIT	873
RETURN	ORBIT	874
2540 WRITE (NOUT,3000) LOOP4,KOOP,MOOP,LOOP9,LOOPF,LOOPJ,LOOPS,LOOPF	ORBIT	875
WRITE (NOUT,3000) LOOPT,ICHAN	ORBIT	876
C**** RESTORE RUN VARIABLES ON ERROR CONDITION	ORBIT	877
IOLD=1	ORBIT	878
NEW=IELLO	ORBIT	879
IF (NEW.EQ.1) IOLD=2	ORBIT	880
T(NEW)=FELLO	ORBIT	881
H(NEW)=HELLO	ORBIT	882
H(IOLD)=GELLO	ORBIT	883
T(IOLD)=FELLO	ORBIT	884
PN(IOLD)=VELLO	ORBIT	885
INACTIV(ICHAN)=JELLO	ORBIT	886
PN(NEW)=SELLO	ORBIT	887
POOTT(1,IOLD)=ALLO	ORBIT	888

P30TT(2,IOLD)=D_LLO	ORBIT	899
P30TT(3,IOLD)=D_LLO	ORBIT	900
RETURN LCROR	ORBIT	901
2500 WRITE (NOUT,2960) TOPT(4,NEW),CLIQT(1),CLIQT(15)	ORBIT	902
GO TO 2540	ORBIT	903
2580 WRITE (NOUT,2980) TMLTH,STEMP(1),STEMP(60)	ORBIT	904
GO TO 2540	ORBIT	905
2600 WRITE (NOUT,3000) TOPT(1,NEW),STEMP(1),STEMP(60)	ORBIT	906
GO TO 2540	ORBIT	907
2620 WRITE (NOUT,3020) TEMPER(IFUELS,I,IOLD),STEMP(1),STEMP(60),ISCRUP	ORBIT	908
GO TO 2540	ORBIT	909
2640 WRITE (NOUT,3020) TEMPER(IFUELS,I,NEW),STEMP(1),STEMP(60),ISCRUP	ORBIT	910
GO TO 2540	ORBIT	911
2660 WRITE (NOUT,3040) TFUELS,STEMP(1),STEMP(60),ISCRUP	ORBIT	912
GO TO 2540	ORBIT	913
2680 WRITE (NOUT,3020) TEMPER(IJ,I,NEW),STEMP(1),STEMP(60),ISCRUP	ORBIT	914
GO TO 2540	ORBIT	915
2700 WRITE (NOUT,2740) TMLTH,STEMP(1),STEMP(60)	ORBIT	916
GO TO 2540	ORBIT	917
2720 WRITE (NOUT,3020) TEMPER(IRAD,IAXIAL,NEW),STEMP(1),STEMP(60),ISCRUP	ORBIT	918
*P	ORBIT	919
GO TO 2540	ORBIT	920
C	ORBIT	921
2740 FORMAT (9H FUEL SOLIDUS TEMPERATURE EXCEEDS INTERPOLATION LIMITS	ORBIT	922
+OF STEMP TEMPERATURE TABLE (ORBIT.029),//,9H TMLTH =,F10.4,3X,12H	ORBIT	923
+STEMP(MIN) =,F10.4,3X,12HSTEMP(MAX) =,F10.4)	ORBIT	924
2760 FORMAT (32H FISSION GAS SQUIRTING STARTS AT,1PE10.3,18H SEC AT AXI	ORBIT	925
+AL NODE,13,11H IN CHANNEL,I3)	ORBIT	926
2780 FORMAT (" CLAD TEMP. OUT OF FAILURE MODEL RANGE-AXIAL LEVEL",I3)	ORBIT	927
2800 FORMAT (" PIN FAILURE BY ENTHALPY CRITERIA OCCURS AT "1PE11.4," SE	ORBIT	928
+C AT AXIAL NODE "I3," IN CHANNEL "I2)	ORBIT	929
2820 FORMAT (" CHANNEL "I3," PIN ENTHALPIES AND CLAD TE",TEMPERATURES AT	ORBIT	930
+FAILURE"/"/AXIAL CLAD PIN FAILURE"/" LEVEL TEMPERA	ORBIT	931
+URE ENTHALPY ENTHALPY"/"IX)	ORBIT	932
2840 FORMAT (1X,I3,3F11.1)	ORBIT	933
2860 FORMAT (" PIN FAILURE BY TEMPERATURE CRITERIA OCCURS AT "1PE11.4,"	ORBIT	934
+SEC AT AXIAL NODE "I3," IN CHANNEL "I2)	ORBIT	935
2880 FORMAT (80H FUEL LIQUIDUS TEMPERATURE EXCEEDS INTERPOLATION LIM	ORBIT	936
+ITS OF STEMP TABLE (ORBIT.872),//,9H TMLTH =,F10.4,3X,12HSTEMP(MIN) =	ORBIT	937
+F10.4,3X,12HSTEMP(MAX) =,F10.4)	ORBIT	938
3000 FORMAT (84H TEMPERATURE OF OUTLET PLENUM EXCEEDS INTERPOLATION LIM	ORBIT	939
+ITS OF STEMP TABLE (ORBIT.874),//,9H TOPT =,F10.4,3X,12HSTEMP(MIN) =,	ORBIT	940
+F10.4,3X,12HSTEMP(MAX) =,F10.4)	ORBIT	941
3020 FORMAT (72H FULL TEMPERATURE EXCEEDS INTERPOLATION LIMITS STEMP TA	ORBIT	942
+BLE	ORBIT	943
+//,9H TEMPER =,F10.4,3X,12HSTEMP(MIN) =,F10.4,3X,	ORBIT	944
+12HSTEMP(MAX) =,F10.4,3X,"(ORBIT,"I3)"")	ORBIT	945
3040 FORMAT (72H TFUELS TEMPERATURE EXCEEDS INTERPOLATION LIMITS OF ST	ORBIT	946
+EMP TABLE	ORBIT	947
+//,9H TFUELS =,F10.4,3X,12HSTEMP(MIN) =,F10.4,3X	ORBIT	948
+12HSTEMP(MAX) =,F10.4,3X,"See ORBIT,"I3)"")	ORBIT	949
3060 FORMAT (8H LOOP =,12,3X,6HKOOP =,12,3X,6HMOOP =,12,3X,7HLOOUP =,1	ORBIT	950
+2,3X,7HLOOFP =,12,3X,7HLOOUP =,12,3X,7HLOOUP =,12,3X,7HLOOUP =,12)	ORBIT	951
3080 FORMAT (" LOOPT ="I2," ICHAN ="I2)	ORBIT	952
END	ORBIT	953

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SUBROUTINE READ, RETURNS (IERROR)
DIMENSION SIZZL(15)
COMMON/COMMON/TRIGGER,ZU1,ZU2,ZU3,VRC1,VRC2,VRC3,FNODES,ALPHAL,
+TLE(3,20,2),PERSEG,LPAD,ACCU2,TEA(20),ACCU1,AMAX,AMIN
EQUIVALENCE (SIZZL,TRIGGER)
COMMON/TRGAP/DJUMP(20),RF01(23),FMOL(5),ACON(5,3),CLADOK,CLADIR,
+PUISSN,ALFAF1,ALFAF2,ALFAC1,ALFAC2,YMODF1,YMODF2,YMODC1,YMODC2
+NTGAP
DIMENSION TGAP(12)
EQUIVALENCE (TGAP,DJUMP)
COMMON/FIT/FIT(30)
COMMON/GOLLY/LUNIT,GELWIZ(20)
COMMON/IPRCSR/IPRCSR(20)
C****
C**** COMMON DECK "GASPAR" CONTAINING THE CASE PARAMETERS
DIMENSION SLOB(1)
REAL KINSRT,KWTHDR
LOGICAL PRINT,DONE,SCRAM
COMMON DUNE,ISTAT,IIN,SLOW(3),
+IBLOCK,H(2),T(2),HREDO,ICHAN,VOLCK(2),
+JUPPK(2),COLAPK(2),NEW,IOLU,NOUT,TLROR,
+GERROK,PLXIT(3),PERKOR,PPRINT,DELTIM,PN(2),
+PHOTI(3,2),INOTIV(20),FLOW(3,2),TOPT(3,2),TOPEN(3),WOLF(3),
+LOOP(2),IOUTL,NTRCAT,IKINET,TOUT,HMAX,
+TIMLIN(50),JKIN(50),TIOUT(50),DKOUT(50),IPAIR2,AV(2),
+IPAIR3,KOUNT,KH(2),BBUIC,RHUSWZ,NGROUP,
+G(5,2),ALIFL,ALPH(6),GAM(6),B(6),AL(6),
+J3,SCRAM,TSCRAY(2),PERIOD,KSLUP,LRKOR,
+KINSRT(2),KWTHDR(2),KJUDGE,PRINT1,PRINT2,RTIN,
COMMON
+ANLOW,TQUIT,LSTEP,JSTEP,ANIG,TGGS,
+IFLUT,ERROR1,TERK(13),TITLE(8),HOTPLM,SPCB,
+SPGC,SPCJ,LINSL,KSTEP,NCHAN,MSTEP,
+IFPRINT,MPRINT,JDUMP,OGLEN(2),ANI,ANJRM,
+TULLAY,NLOOPS,RHOGEL(3),VOLTOF(3),HEMO(3),PKESTM(50),
+PRESUR(50,3),IPAIR4,PD(3),KUNTIM,VER,ETAU(4),
+KBLCK,JBLCK,MBLOCK,N12,N13,EXTRA,
+GJACK(3),VJACK(2),NIN,INPUT,N2,N,
+HMIN,N22,KPRINT,PCWSS,HMAXB,HMAXF,
+N7,N8,TRIPF(3),TRIPF(3),TRIPF(3),TRIPOT(3),DELAYF,
EQUIVALENCE (QMDL,TERM(4)),(TMOL,TERM(5)),(GMOL,TERM(6)),(PERMOL,T
+ERM(7)),(SLOB,DONE)
C****
C****
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA
DIMENSION S(1),CORE(1),IS(1),PYTH(15,20),GIL(3),XLIQ(11,20,2)
INTEGER SMLP
COMMON TCOOL(7,2),RLOG(22,20),UU(3),ULIQ(7),
+UVA(7),OLX(7),
+AFLOW(7),US(4,2),HCAPS(4,2),DSAVE1(4,5,2),DSAVE2(7,2),
+DSAVE3(15,23,2),DSAVE4(75,2),PUW(10,20),VOLUME(13,20),HCAPF(15,23),
+TEMPER(15,20,2),TSANK(4,2,2),VOLDV(20),VPLEN,PPLEN(2),
+RPLEN(2),G(7,2),RHOD(7,2),VOLG(2),
+VOLF(2),GT0,GT1,GT2,GT3,GASBO(2,2),
+GASBU(2,2),FUELBO(2),FUELBU(2),FANN(75),P(7,2),RHOG(7,2),
+RHOF(7,2),WF(7),WC(7),NGPINS,NAXIAL,NBOUR,
+NICORE,NTOP(75),MTYPE(15,20),IGAS(2),NPLEN,
+IFULL(2),IBOIL(2),IGASU(2,2),IGASU(2,2),IFUEL(2),IFUELU(2),
+IBOILU(2,2),IBOILU(2,2),NBOIL(2),NGAS(2),RLC,RLV,
COMMON
+CLC,CLV,CVC,CVV,BASIST(50),CONJUC(50),
+2),IPAIR1,CGAPA,CGAFB,CGAPC,CGAPJ,STEMP(50),
+ST1(5,2),TSEMP(30),ST2(30),DENSEC,DENSE(2),TMAIC,
+TSAT,AHOLC,HAXF,HAXL,HAXV,PJAT,

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+RLIQ	,RLQF	,FRY	,PVOID	,IFUELS	,JFUELS	,CHNDAT	23
+TGASS	,TSUPER	,TFUELS	,TMELTH	,TMELTL	,GAMMA	,CHNDAT	24
+PINTM(20,2)	,GAPR(20)	,GAPRE	,CLVC	,DOPOGE(20,2)		,CHNDAT	25
+BASENA	,DOPPW	,RBASEC	,SPC2(2)	,HFUSEC	,JKA(20,2)	,CHNDAT	26
+HMTAR(75)	,PARTAN(20)	,IGAP				,CHNDAT	27
COMMON		,KFUELS	,SPC3(13)	,HI(75)	,CLAUKT	,CHNDAT	28
+RLV2	,CLV2	,CVV2	,HAXL1	,HAXL2	,CGAPB2	,CHNDAT	29
+CLAUK	,CAP(75)	,TSTRUK(75,2)	,USTL(75)	,USTV(75)	,JSAVE(75,2)	,CHNDAT	30
+CLLIQ(15)	,CLLIQT(15)	,CVAP(15)	,CVAPT(15)	,HLLP(75)	,SMELP(75)	,CHNDAT	31
+RHODNA(75,2)	,TW(11)	,UCLD(75)	,IBILL	,JBILL	,BOX(25,4)	,CHNDAT	32
+CGPLOC(3,20)	,POROS(3,20)	,YCHYLH(11,20)	,SPC4	,IOUT(250)		,CHNDAT	33
COMMON	IBAX,ITAX,LUP,LOWN,LUPC,LCHNC,DUP,DOWN,DOUP,DOWNG,					,CHNDAT	34
+ALFA(20,2)	,RHCH(20,2)	,V(20,2)	,AREAH(20,2)	,AREAX(20,2)	,DHDP(20,2)	,CHNDAT	35
+PIN(20,2)	,AAA(20,2)	,LTPY(20,2)	,UMASS(20)	,UHLAT(20)	,ULIGIN(20)	,CHNDAT	36
+GASIN(20)	,TBAR(20)	,VELT2(20)	,VGAS1(20)	,VGAS2(20)	,GASIN1,GASIN2,	,CHNDAT	37
+HINPAN						,CHNDAT	38
EQUIVALENCE	(ULIQ(1),VFUELS),(ULIQ(75),ORIFLG),(UVAP(1),RHOSQF),					,CHNDAT	39
+G(75,1),FQSDHR),(G(75,2),IZOP),(MTYPE(1,1),EPTYM(1,1)),(DOPOGE(1,						,CHNDAT	40
2),DOFPU),(DOPOGE(2,2),DOPUCL),(DOPOGE(3,2),OIL),(UVAP(75),GTOL)						,CHNDAT	41
),(USTL,IZAP),(USTV,IZUP),(CGAPM,LAXIAL),(XLIQ,DSAVE3)						,CHNDAT	42
),(S,CORE,LS,TGOOL),(SCOTT,IFUELS)						,CHNDAT	43
EQUIVALENCE	(TW(1),SKCH),(TW(2),RHORAT),(TW(3),G-TAIL)					,CHNDAT	44
EQUIVALENCE	(TW(4),PCLL),(TW(5),PSTART),(TW(6),TREAT)					,CHNDAT	45
EQUIVALENCE	(TW(7),FRACTN),(TW(8),SPREAU),(TW(9),VORIG)					,CHNDAT	46
EQUIVALENCE	(TW(10),AREA),(TW(11),FRICT)					,CHNDAT	47
C****						,CHNDAT	48
C****						READ	49
C****	READ SPECIFICATION STATEMENTS					READ	50
	DIMENSION CH(100),CW(100),FH(100),FW(100),GP(3),GAPU(20),LS1(203)					READ	51
	REAL IZZY					READ	52
	LATEVAL JOLLY					READ	53
	COMMON LISTT(20),BLOCK(697),ZILCH(743),ZAF(3),JAKE(29),FINLET(3)					READ	54
	EQUIVALENCE	(IS1,IOUT(4))				READ	55
	EQUIVALENCE	(GP,PJ),(FORJIS,INTRLAT)				READ	56
	EQUIVALENCE	(ZILCH(1),CH),(ZILCH(101),CW)				READ	57
	EQUIVALENCE	(ZILCH(201),FH),(ZILCH(301),FW)				READ	58
	EQUIVALENCE	(ZILCH(401),DOPPW1),(ZILCH(402),DOPPU1)				READ	59
	EQUIVALENCE	(ZILCH(403),RBASE1),(ZILCH(404),SKCH1)				READ	60
	EQUIVALENCE	(ZILCH(707),AHULL1),(ZILCH(708),PVOID1)				READ	61
	EQUIVALENCE	(ZILCH(709),GAMMA1),(ZILCH(710),PCLLP)				READ	62
	EQUIVALENCE	(ZILCH(711),AUN),(ZILCH(712),BUN)				READ	63
	EQUIVALENCE	(ZILCH(713),ALA),(ZILCH(714),BLA)				READ	64
	EQUIVALENCE	(ZILCH(717),AS),(ZILCH(718),BS)				READ	65
	EQUIVALENCE	(ZILCH(723),NBPL1),(ZILCH(719),IFUELI)				READ	66
	EQUIVALENCE	(ZILCH(721),ORIF11),(ZILCH(722),GTOL1)				READ	67
	EQUIVALENCE	(ZILCH(723),KFUEL1),(ZILCH(724),GAPU)				READ	68
	EQUIVALENCE	(ZILCH(702),IFUELI),(ZILCH(703),JFUELI)				READ	69
	EQUIVALENCE	(ZILCH(405),RHORAT1),(ZILCH(406),JETA11)				READ	70
	EQUIVALENCE	(ZILCH(407),PCLL1),(ZILCH(408),PSTART1)				READ	71
	EQUIVALENCE	(ZILCH(409),TREAT1),(ZILCH(410),FRACT1)				READ	72
	EQUIVALENCE	(ZILCH(411),SPREAU1),(ZILCH(412),VORIG1)				READ	73
	EQUIVALENCE	(ZILCH(413),AREA1),(ZILCH(414),FRICT1)				READ	74
	EQUIVALENCE	(ZILCH(701),SCOTT1),(ZILCH(715),TGASS1)				READ	75
	NAMELIST/ALL/ IKINLT,HMAX,ILMAIN,UKIN,IFAIR2,TIMOUT,UKOUT,IPAIR3,					READ	76
	+AN1,ANIS,PHUSWZ,NRGOUP,ALIFE,3,AL,BB,ERROR,CLJUE,PRINT1,PRINT2,					READ	77
	+R11,ANLOW,IJUIT,LSICP,ERROR1,KSTEP,ANSCKM,PERIOD,TDELAY,					READ	78
	+NLOOPS,RHULL,VOLTOP,HEAD,PRESM,PRESUR,IFAIR4,UP,TERKOR,					READ	79
	+PERROR,LOUP,PEXIT					READ	80
	+HMAXF,IJUMP					READ	81
	+TRIPFH,TRIPPH,TRIPFF,TRIPUT,DELAYF					READ	82
	+MPHINT					READ	83
	+IPLUT,ROUTIM,LISIT					READ	84
	+JLUA					READ	85
	+TINLIT					READ	86
	+ZU1,ZU2,ZU3,VRG1,VRG2,VRG3,P-ROEG,LPAD,FNOJLS,ALPHAL,AMIN,HMAX,IX					READ	87
	+IGGR					READ	88
	+ITRUP					READ	89

*,HOTPI4	READ	58
DATA IZZY/1GHRESTART /,BLANK/10H	READ	59
C****	READ	60
C****	READ	61
C**** BEGIN READ SUBROUTINE	READ	62
ETAD(+)=0.0	READ	63
N=LOCFT(TINLET(3))-LOCFT(S)+1	READ	64
DO 120 I=1,N	READ	65
S(I)=0.	READ	66
120 CONTINUE	READ	67
C**** GET TITLE AND COMPUTE TIME TO DO PLOTS	READ	68
IUNIT=1	READ	69
CALL FIRST	READ	70
C**** SET DEFAULT MAX. NO. WRAPUP PRINTOUTS	READ	71
MPRINT=300	READ	72
INPUT=N2	READ	73
C****	READ	74
C**** IF RESTART RUN FILL // COMMON AND /UUMDUH/ COMMON AND TRANSFER	READ	75
C**** CHANNEL STEADY STATE FUEL TEMPERATURE DATA TO DRUM UNIT NUMBER 1	READ	76
IF (TITLE(1).NE.IZZY) GO TO 240	READ	77
DO 140 I=1,8	READ	78
140 BLOCK(I)=TITLE(I)	READ	79
READ (INPUT) (SLOB(I),I=1,M5BLOCK)	READ	80
DO 160 I=2,8	READ	81
160 TITLE(I)=BLOCK(I)	READ	82
IF (ETAD(4).EQ.0) GO TO 200	READ	83
READ (INPUT) (SIZZLE(I),I=1,105)	READ	84
IF (ETAD(4).EQ.1.) GO TO 200	READ	85
DO 180 I=1,NCHAN	READ	86
READ (INPUT) (BLOCK(J),J=1,300)	READ	87
WRITE (1) (BLOCK(J),J=1,300)	READ	88
180 CONTINUE	READ	89
200 CONTINUE	READ	90
READ (NIN,ALL)	READ	91
TITLE(1)=BLANK	READ	92
IJKL=2	READ	93
C****	READ	94
C**** FOR TREAT RUN DO SPECIAL INITIALIZATION	READ	95
IF (NDRUMS) 220,400,400	READ	96
220 EXTRA=0.0	READ	97
GJACK(1)=0.0	READ	98
GJACK(2)=0.0	READ	99
GJACK(3)=0.0	READ	100
VJACK(1)=0.0	READ	101
VJACK(2)=0.0	READ	102
GO TO 400	READ	103
C****	READ	104
C**** READ IN NAME LIST "ALL" FOR A NON RESTART RUN	READ	105
240 IJKL=1	READ	106
READ (NIN,ALL)	READ	107
C****	READ	108
C****	READ	109
C**** DO INITIALIZATION FOR A NON RESTART RUN	READ	110
NLW=1	READ	111
IOLU=2	READ	112
NDRUMS=0	READ	113
EXTRA=0.0	READ	114
VJACK(1)=0.0	READ	115
VJACK(2)=0.0	READ	116
DO 200 I=1,3	READ	117
FLOW(I,IOLU)=0.0	READ	118
TOPT(I,IOLU)=0.0	READ	119
WOLF(I)=0.0	READ	120
TOPEN(I)=0.0	READ	121
GJACK(I)=0.0	READ	122

200	ZAP(I)=0.0	READ	123
	SUM=0.0	READ	124
	DO 280 I=1,NGROUP	READ	125
280	SUM=SUM+B(I)	READ	126
	SUM=83/SUM	READ	127
	KOUNT=0	READ	128
	DO 300 I=1,NGROUP	READ	129
300	B(I)=3(I)*SUM	READ	130
	IF (I<INET-1) 320,360,360	READ	131
320	DO 340 I=1,NGROUP	READ	132
	C(I,1)=ANI*B(I)/(ALIFL*AL(I))	READ	133
	C(I,2)=C(I,1)	READ	134
	GAM(I)=0.0	READ	135
340	ALPH(I)=0.0	READ	136
	GO TO 400	READ	137
360	DO 380 I=1,NGROUP	READ	138
	C(I,1)=ANI*B(I)/AL(I)	READ	139
380	C(I,2)=C(I,1)	READ	140
400	CONTINUE	READ	141
	DO 420 I=1,2	READ	142
	KH(I)=0.0	READ	143
	T(I)=0.0	READ	144
	KWTHDR(I)=0.0	READ	145
	K1NSKT(I)=0.0	READ	146
	VOIUK(I)=0.0	READ	147
	DOUPK(I)=0.0	READ	148
	CULAFK(I)=0.0	READ	149
	UGEN(I)=0.0	READ	150
	TGUM(I)=0.0	READ	151
	H(I)=HMAX	READ	152
	AN(I)=ANI	READ	153
420	PA(I)=AN(I)+ANIC	READ	154
	PWJJS=PM(I)	READ	155
	WJLUP=0.0	READ	156
	330130=100./83	READ	157
	TOUT=PRINT1	READ	158
	WJGUC=0.0	READ	159
	DO 440 I=1,20	READ	160
440	IACU1V(I)=0	READ	161
	TKGJ=0.0	READ	162
	JSTLP=0	READ	163
460	IACUUM=0	READ	164
C****		READ	165
C****	GET TIME AND DATE AND CENTER TITLE FOR PLOTS AND PRINTOUT	READ	166
	CALL DATE (CTMD)	READ	167
	CALL TIME (CTMD(2))	READ	168
	CALL CENTER (TITLE,8)	READ	169
	JACUUM=0	READ	170
	KACUUM=0	READ	171
	MACUUM=0	READ	172
C****		READ	173
C****		READ	174
C****	PRINT OUT PAGE FORMAT NUMBER 1	READ	175
	CALL FJSD (1)	READ	176
	WRITE (NOUT,3840)	READ	177
	WRITE (NOUT,3860)	READ	178
	WRITE (NOUT,3880) IJUMP	READ	179
	WRITE (NOUT,3900) IPLUT	READ	180
	WRITE (NOUT,3920) ITRGAP	READ	181
	WRITE (NOUT,3940) HJTFIM	READ	182
	WRITE (NOUT,3960) KSTLP	READ	183
	WRITE (NOUT,3980) PRINT1	READ	184
	WRITE (NOUT,4000) PRINT2	READ	185
	WRITE (NOUT,4020) MPRINT	READ	186
	NUM=0	READ	187
	DO 480 I=1,20	READ	188
	IF (LISTT(I).EQ.0) GO TO 500	READ	189

490	NUM=NUM+1	READ	190
500	CONTINUE	READ	191
	IF (NUM.EQ.0) GO TO 520	READ	192
	WRITE (NOUT,4000) (LIST(I),I=1,NUM)	READ	193
520	CONTINUE	READ	194
	WRITE (NOUT,4060)	READ	195
	WRITE (NOUT,4080) HMAXF	READ	196
	WRITE (NOUT,4100) HMAX	READ	197
	WRITE (NOUT,4120) KEOUC	READ	198
	WRITE (NOUT,4140) ERROR	READ	199
	WRITE (NOUT,4160) ERROR1	READ	200
	WRITE (NOUT,4180) TERROR	READ	201
	WRITE (NOUT,4200) PLROR	READ	202
	WRITE (NOUT,4220) K1IN	READ	203
	WRITE (NOUT,4240) ANLOW	READ	204
	WRITE (NOUT,4260) TQUIT	READ	205
	WRITE (NOUT,4280) LSTEP	READ	206
	WRITE (NOUT,4300) KUNTIM	READ	207
	WRITE (NOUT,4320)	READ	208
	WRITE (NOUT,4340) ANI	READ	209
	WRITE (NOUT,4360) ANIG	READ	210
C****		READ	211
C****		READ	212
C****	PRINT OUT PAGE FORMAT NUMBER 2	READ	213
	CALL MEND (2)	READ	214
	WRITE (NOUT,3840)	READ	215
	WRITE (NOUT,4380)	READ	216
	WRITE (NOUT,4400) IKINET	READ	217
	WRITE (NOUT,4420) NGROUP	READ	218
	WRITE (NOUT,4440) ALIFE	READ	219
	WRITE (NOUT,4460) KHOWWZ	READ	220
	WRITE (NOUT,4480) B3	READ	221
	WRITE (NOUT,4500)	READ	222
	DO 540 I=1,NGROUP	READ	223
	WRITE (NOUT,4520) 1,B(1),AL(I)	READ	224
540	CONTINUE	READ	225
	WRITE (NOUT,4540) ANSCRM	READ	226
	WRITE (NOUT,4560) FRIOU	READ	227
	WRITE (NOUT,4580) TUELAY	READ	228
	WRITE (NOUT,4600) IPAIR2	READ	229
	WRITE (NOUT,4620)	READ	230
	DO 560 I=1,IPAIR2,12	READ	231
	K=I+11	READ	232
	IF (K.GT.IPAIR2) K=IPAIR2	READ	233
	WRITE (NOUT,4640) (TIMEIN(J),J=1,K)	READ	234
	WRITE (NOUT,4660) (UKIN(J),J=1,K)	READ	235
560	CONTINUE	READ	236
	WRITE (NOUT,4680) IPAIR3	READ	237
	WRITE (NOUT,4700)	READ	238
	DO 580 I=1,IPAIR3,12	READ	239
	K=I+11	READ	240
	IF (K.GT.IPAIR3) K=IPAIR3	READ	241
	WRITE (NOUT,4720) (TIMEOUT(J),J=1,K)	READ	242
	WRITE (NOUT,4740) (UKOUT(J),J=1,K)	READ	243
580	CONTINUE	READ	244
C****		READ	245
C****		READ	246
C****	FOR RUN WHICH INCLUDES RADIAL AND/OR EXPANSION EFFECTS PRINT OUT	READ	247
C****	PAGE FORMAT NUMBER 24	READ	248
	TRIGGER=AMAX1(LTAD(4),TRIGGER)	READ	249
	LTAD(4)=TRIGGER	READ	250
	IF (TRIGGER.LT.1.) GO TO 620	READ	251
	WRITE (NOUT,4760) TRIGGER	READ	252
	IF (TRIGGER.EQ.2.) GO TO 600	READ	253
	WRITE (NOUT,4780) ZU1,ZU2,ZU3,VRC1,VRC2,VRC3	READ	254

WRITE (NOUT,+800) PLFJEG	READ	255
WRITE (NOUT,+820) HMAX	READ	256
WRITE (NOUT,+840) AMIN	READ	257
WRITE (NOUT,+860) LPA0	READ	258
600 IF (TRIGG.EQ.1.) GO TO 620	READ	259
WRITE (NOUT,+880) FNOUES	READ	260
WRITE (NOUT,+900) ALPHAL	READ	261
620 CONTINUE	READ	262
C****	READ	263
C****	READ	264
C**** PRINT OUT PAGE FORMAT NUMBER 3	READ	265
CALL HEND (3)	READ	266
WRITE (NOUT,+920)	READ	267
WRITE (NOUT,+940) NLOOPS	READ	268
WRITE (NOUT,+960) (1,I=1,NCHAN)	READ	269
WRITE (NOUT,+980) (LOOP(I),I=1,NCHAN)	READ	270
DO 700 I=1,NLOOPS	READ	271
WRITE (NOUT,+5000) I	READ	272
WRITE (NOUT,+5020) RHOLEC(I)	READ	273
WRITE (NOUT,+5040) VOLTOP(I)	READ	274
WRITE (NOUT,+5060) PEXIT(I)	READ	275
WRITE (NOUT,+5080) HEAD(I)	READ	276
WRITE (NOUT,+5100) OF(I)	READ	277
WRITE (NOUT,+5120) TRIPFW(I)	READ	278
WRITE (NOUT,+5140) TRIPPF(I)	READ	279
WRITE (NOUT,+5160) TRIPPF(I)	READ	280
WRITE (NOUT,+5180) TRIPUT(I)	READ	281
WRITE (NOUT,+5200) DELAYF	READ	282
WRITE (NOUT,+5220) SLOW(I)	READ	283
IF (INLET(I)) 660,660,640	READ	284
640 WRITE (NOUT,+5240) INLET(I)	READ	285
660 CONTINUE	READ	286
WRITE (NOUT,+5260) IPAIR4	READ	287
WRITE (NOUT,+5280)	READ	288
DO 680 J=1,IPAIR4,12	READ	289
K=J+11	READ	290
IF (K.GT.IPAIR4) K=IPAIR4	READ	291
WRITE (NOUT,+5300) (PRESTM(L),L=J,K)	READ	292
WRITE (NOUT,+5320) (PRESUR(L,I),L=J,K)	READ	293
680 CONTINUE	READ	294
700 CONTINUE	READ	295
C****	READ	296
C****	READ	297
C**** BEGIN LOOP TO INPUT VALUES FROM NAME LIST "EACH" WHICH OVERRIDE	READ	298
C**** VALUES COMING FROM A PREVIOUS STEADY STATE OR RESTART RUN AND	READ	299
C**** PRINT OUT VALUES THAT HAVE BEEN CHANGED	READ	300
LINECL=0	READ	301
ILIST=1	READ	302
C**** SAVE PREVIOUS VALUE OF IBLOCK (NUMBER OF WORDS ON START FILE	READ	303
C**** PER CHANNEL) AND COMPUTE NEW VALUE DEPENDING ON SWITCHES	READ	304
IBLKSV=IBLOCK	READ	305
IF (NOTPI4.EQ.1.0) IBLOCK=9000	READ	306
DO 3700 ICHAN=1,NCHAN	READ	307
IKC=0	READ	308
C****	READ	309
C**** INITIALIZE AREA OF MEMORY INTO WHICH NAME LIST "EACH" INPUT IS	READ	310
C**** STORED TO -100.	READ	311
C****	READ	312
C**** INPUT STEADY STATE OR RESTART FILE AND READ NAME LIST "EACH"	READ	313
READ (INPUT) (S(I),I=1,IBLKSV)	READ	314
IF (TRGAP.EQ.1) READ (INPUT) TGAP	READ	315
CALL NLEACH (NIN)	READ	316
MZM=LOOP(ICHAN)	READ	317
IF (INLET(MZM)) 740,740,720	READ	318
720 TCOOL(1,1)=INLET(MZM)	READ	319
TCOOL(1,2)=INLET(MZM)	READ	320
	READ	321

740	CONTINUE	READ	322
C****		READ	323
C****	COMPUTE INITIAL LOOP PRESSURES AND TEMPERATURES. ETC. FOR NON	READ	324
C****	RESTART CASE	READ	325
	IF (IJKL.EQ.2) GO TO 800	READ	326
	DO 760 I=1,20	READ	327
760	JKNA(I,1)=PINTEN(I,1)	READ	328
	LOOPF=LOOP(ICHAN)	READ	329
	PBOTT(LOOPF,NEW)=P(1,1)	READ	330
	PBOTT(LOOPF,IOLD)=P(1,1)	READ	331
	FLOW(LOOPF,IOLD)=FLOW(LOOPF,IOLD)+G(1,1)*AFLOW(1)*NOPINS	READ	332
	FLO=G(NAXIAL,1)*AFLOW(NAXIAL)*NOPINS	READ	333
	TCPT(LOOPF,IOLD)=TCPT(LOOPF,IOLD)+FLO*TCOOL(NAXIAL,1)	READ	334
	ZAP(LOOPF)=ZAP(LOOPF)+FLO	READ	335
C****		READ	336
C****	SET UP TEMPERATURES OF LOW PAD FOR COMPUTATION OF RADIAL	READ	337
C****	EXPANSION REACTIVITY CONTRIBUTIONS IF TRIGGER EQUAL TO ONE	READ	338
C****	OR THREE	READ	339
	IF (TRIGGER.LT.1.) GO TO 800	READ	340
	TLA(ICHAN)=TCOOL(LPAD+1,1)	READ	341
	DO 780 I=1,2	READ	342
	DO 780 J=1,3	READ	343
780	TEC(J,ICHAN,I)=TCOOL(LPAD+1,1)	READ	344
	IF (TRIGGER.LT.2.) GO TO 800	READ	345
	WRITE (1) ((TEMPER(I,J,1),I=1,15),J=1,20)	READ	346
	MCCU2=MCCU2+NUPINS	READ	347
800	CONTINUE	READ	348
	NCOOREN=NTCORE-NBCORE+1	READ	349
	IF (CH(2)) 960,980,920	READ	350
C****		READ	351
C****	INTERPOLATE COOLANT WORTHS FOR AXIAL NODES FROM CW CABLE	READ	352
820	HIGH=0.0	READ	353
	IKE=IKE+1	READ	354
	JAKL(IKE)=1	READ	355
	J1=1	READ	356
	J2=2	READ	357
	DO 940 IAXIAL=2,NAXIAL	READ	358
	HIGH=HIGH+.5*DELX(IAXIAL)	READ	359
840	IF (HIGH-CH(J2)) 860,980,900	READ	360
860	WC(IAXIAL)=((CW(J2)-CH(J1))/(CH(J2)-CH(J1))*(HIGH-CH(J1))+CH(J1))*	READ	361
	+1.E-3*AFLOW(IAXIAL+1)*DELX(IAXIAL)	READ	362
	GO TO 940	READ	363
880	WC(IAXIAL)=CH(J2)*1.E-3*AFLOW(IAXIAL+1)*DELX(IAXIAL)	READ	364
	GO TO 940	READ	365
900	IF (CH(J2)) 860,880,920	READ	366
920	J1=J1+1	READ	367
	J2=J2+1	READ	368
	GO TO 840	READ	369
940	HIGH=HIGH+.5*DELX(IAXIAL)	READ	370
960	IF (FH(2)) 1140,1140,980	READ	371
C****		READ	372
C****	INTERPOLATE FUEL WORTHS AT AXIAL NODE FROM FW	READ	373
980	HIGH=0.0	READ	374
	IKE=IKE+1	READ	375
	JAKL(IKE)=2	READ	376
	J1=1	READ	377
	J2=2	READ	378
	DO 1100 IAXIAL=2,NAXIAL	READ	379
	HIGH=HIGH+.5*DELX(IAXIAL)	READ	380
1000	IF (HIGH-FH(J2)) 1020,1040,1060	READ	381
1020	WF(IAXIAL)=((FW(J2)-FH(J1))/(FH(J2)-FH(J1))*(HIGH-FH(J1))+FH(J1))*	READ	382
	+1.E-3*JELX(IAXIAL)	READ	383
	GO TO 1100	READ	384
1040	WF(IAXIAL)=FH(J2)*1.E-3*DELX(IAXIAL)	READ	385
	GO TO 1100	READ	386
		READ	387

1000 IF (F4(J2)) 1040,1040,1080	READ	330
1080 J1=J1+1	READ	339
J2=J2+1	READ	340
GO TO 1000	READ	341
1100 HIGH=HIGH+.5*DELX(1AXIAL)	READ	342
0 STEADY STATE SODIUM WORTH	READ	343
BASENA=0.0	READ	344
00 1120 1AXIAL=2,4AXIAL	READ	345
1120 BASENA=BASENA+WF(1AXIAL+60)*RHOO(1AXIAL,1)	READ	346
0****	READ	347
0**** STOP WET AND DRY DOPPLER COEFFICIENTS	READ	348
1140 IF (DOPPW1.NE.-100.) GO TO 1100	READ	349
IF (DOPPD1.NE.-100.) GO TO 1100	READ	350
IF (RBASE1.LT.-100.) GO TO 1100	READ	351
1100 IF (DOPPW1.LT.-10.) DOPPW1=DOPPW	READ	352
IF (DOPPD1.LT.-10.) DOPPD1=DOPPD	READ	353
IF (RBASE1.LT.-10.) RBASE1=RBASEC	READ	354
DOPDEL=(DOPPW1-DOPPD1)/RBASE1	READ	355
DOPPL=DOPPD1	READ	356
DOPPW=DOPPW1	READ	357
RBASEC=RBASE1	READ	358
IKL=IKL+1	READ	359
JAKL(IKL)=3	READ	360
0****	READ	410
0**** STOP PARAMETERS CHANGED BY NAME LIST "EACH" INPUT	READ	411
1150 CONTINUE	READ	412
IF (SPRCLAI) 1220,1200,1200	READ	413
SPRCLAI=SPRCLAI	READ	414
IKL=IKL+1	READ	415
JAKL(IKL)=9	READ	416
1220 IF (FRACUT1) 1200,1240,1240	READ	417
FRACUT1=FRACUT1	READ	418
IKL=IKL+1	READ	419
JAKL(IKL)=21	READ	420
IF (DAPU(1)) 1320,132,1280	READ	421
1200 IKL=IKL+1	READ	422
JAKL(IKL)=5	READ	423
00 1300 1=1,400REN	READ	424
1300 SPR(I)=SAFU(I)	READ	425
1320 2=11,10	READ	426
IF (HJDL(1)) 1300,1340,1340	READ	427
1340 400L=400L1	READ	428
IKL=IKL+1	READ	429
JAKL(IKL)=12	READ	430
1300 IF (PVJ101) 1400,1350,1380	READ	431
1350 PVJ101=PVJ101	READ	432
IKL=IKL+1	READ	433
JAKL(IKL)=24	READ	434
1400 IF (GMMMA1) 1440,1440,1420	READ	435
1420 G12=(GMMMA1-1.)/GMMMA1	READ	436
IKL=IKL+1	READ	437
JAKL(IKL)=11	READ	438
G11=1./G11	READ	439
G11=1./((GMMMA1+1.)*(1./G11))	READ	440
G12=GMMMA1-G12	READ	441
G11H=GMMMA1	READ	442
1440 IF (PLEN1) 1400,1400,1400	READ	443
1400 ABLE=PLEN(1)	READ	444
PLEN(1)=PLEN1	READ	445
PLEN(2)=PLEN1	READ	446
PLEN(1)=PLEN(1)*PLEN1/ABLE	READ	447
PLEN(2)=PLEN(1)	READ	448
IKL=IKL+1	READ	449
JAKL(IKL)=10	READ	450
1400 IF (SCUT11.EQ.-100.) GO TO 1550	READ	451
IF (SCUT11.EQ.0.) GO TO 1580	READ	452
SCUT1=SCUT11	READ	453

IKE=IKE+1	READ	454
JAKE(IKE)=15	READ	455
IF (SCOTT.LT.0.) GO TO 1600	READ	456
IF (SCOTT.EQ.2) GO TO 1570	READ	457
DO 1500 I=1,20	READ	458
IF (MTYPE(1,I)-2) 1500,1520,1540	READ	459
1500 EPYTM(14,I)=AUN	READ	460
EPYTM(15,I)=BUN	READ	461
GO TO 1500	READ	462
1520 EPYTM(14,I)=AS	READ	463
EPYTM(15,I)=BS	READ	464
GO TO 1560	READ	465
1540 EPYTM(14,I)=AEA	READ	466
EPYTM(15,I)=BEA	READ	467
1560 CONTINUE	READ	468
CRUMB=AEA	READ	469
A=A-100.	READ	470
1570 KFUELS=0	READ	471
GO TO 1700	READ	472
1580 IF (IFUELI) 1620,1640,1660	READ	473
1600 IFUELS=IFUELI	READ	474
IKE=IKE+1	READ	475
JAKE(IKE)=15	READ	476
EPYTM(15,I)=0.0	READ	477
1620 IF (JFUELI) 1600,1640,1660	READ	478
1640 JFUELS=JFUELI	READ	479
IKE=IKE+1	READ	480
JAKE(IKE)=10	READ	481
1660 IF (KFUELI) 1700,1680,1680	READ	482
1680 KFUELS=KFUELI	READ	483
IF (IACTIV(ICHAN).EQ.0) KFUELS=-KFUELI	READ	484
IKE=IKE+1	READ	485
JAKE(IKE)=17	READ	486
IF (IACTIV(ICHAN).NE.1) GO TO 1700	READ	487
KKZ=IFUEL(NW)+1-NBSCORE	READ	488
KKKZ=IFUEL(NW)	READ	489
KKKKZ=NTOP(KKKZ)+1	READ	490
KZ=KFUELI+NBSCORE-1	READ	491
LKZ=NTOP(KZ)+1	READ	492
CGAPJ=CGAPD*POW(KKKKZ,KKZ-1)/POW(LKZ,KFUELI-1)	READ	493
IFULL(NW)=KZ	READ	494
IFULLD(NW)=KZ	READ	495
IFULLU(NW)=KZ+1	READ	496
DUPGOE(18,2)=KZ	READ	497
IZUP=KZ	READ	498
SLF(2)=KZ+1	READ	499
SMF(3)=KZ	READ	500
1700 IF (TGASSI) 1740,1740,1720	READ	501
1720 TGASS=TGASSI	READ	502
IKE=IKE+1	READ	503
JAKE(IKE)=13	READ	504
1740 CONTINUE	READ	505
IF (TFUELI) 1780,1780,1700	READ	506
1760 TFUELS=TFUELI	READ	507
IKE=IKE+1	READ	508
JAKE(IKE)=18	READ	509
1780 CONTINUE	READ	510
IF (NJPLEN) 1820,1820,1800	READ	511
1800 NJPLEN=NJPLEN+1	READ	512
IKE=IKE+1	READ	513
JAKE(IKE)=14	READ	514
1820 IF (OXFII) 1860,1860,1840	READ	515
1840 IKE=IKE+1	READ	516
JAKE(IKE)=20	READ	517
OXIFIG=OXIFII	READ	518

1800	IF (GTOLI.EQ.-10.) GO TO 1880	READ	219
	IKL=IKL+1	READ	220
	JAKE(IKE)=20	READ	221
	GTOL=GTOLI	READ	222
1880	CONTINUE	READ	223
	IF (SK=MI) 1920,1920,1900	READ	224
1900	SK=K=SK=MI	READ	225
	IKL=IKL+1	READ	226
	JAKE(IKE)=19	READ	227
1920	IF (FEEL=1) 1900,1940,1940	READ	228
1940	PEL=PEELI	READ	229
	IF (FEEL.EQ.0.0) GO TO 1960	READ	230
	PEL=PEL+1	READ	231
	JAKE(IKE)=20	READ	232
	IF (H=MI) 2000,1940,1980	READ	233
	PEL=PEL+1	READ	234
	JAKE(IKE)=4	READ	235
	IF (OUT=MI) 2040,2040,2020	READ	236
	PEL=PEL+1	READ	237
	IF (OUT=MI.EQ.0.0) GO TO 2040	READ	238
	IKL=IKL+1	READ	239
	JAKE(IKE)=22	READ	240
2040	IF (OUT=MI) 2000,2000,2080	READ	241
2060	IF (OUT=MI.EQ.-100.) GO TO 2100	READ	242
2080	OUT=OUT+1	READ	243
	IF (OUT=MI.EQ.0.0) GO TO 2100	READ	244
	IKL=IKL+1	READ	245
	JAKE(IKE)=27	READ	246
2100	IF (IT=MI.EQ.-100.) GO TO 2120	READ	247
	IT=IT+1	READ	248
	IF (IT=MI.EQ.0.0) GO TO 2120	READ	249
	IT=IT+1	READ	250
	JAKE(IKE)=25	READ	251
	IF (IT=MI.EQ.0.0) GO TO 2120	READ	252
	IT=IT+1	READ	253
	JAKE(IKE)=25	READ	254
	IF (IT=MI.EQ.0.0) GO TO 2120	READ	255
	IT=IT+1	READ	256
	JAKE(IKE)=25	READ	257
2120	IF (IKL=MI.EQ.0) GO TO 2180	READ	258
	IKL=IKL+1	READ	259
	IF (IKL=MI.EQ.0) GO TO 2180	READ	260
	IKL=IKL+1	READ	261
	JAKE(IKE)=25	READ	262
	IF (IKL=MI.EQ.0) GO TO 2180	READ	263
	IKL=IKL+1	READ	264
	JAKE(IKE)=25	READ	265
	IF (IKL=MI.EQ.0) GO TO 2180	READ	266
	IKL=IKL+1	READ	267
	JAKE(IKE)=25	READ	268
	IF (IKL=MI.EQ.0) GO TO 2180	READ	269
	IKL=IKL+1	READ	270
	JAKE(IKE)=25	READ	271
	IF (IKL=MI.EQ.0) GO TO 2180	READ	272
	IKL=IKL+1	READ	273
	JAKE(IKE)=25	READ	274
	IF (IKL=MI.EQ.0) GO TO 2180	READ	275
	IKL=IKL+1	READ	276
	JAKE(IKE)=25	READ	277
	IF (IKL=MI.EQ.0) GO TO 2180	READ	278
	IKL=IKL+1	READ	279
	JAKE(IKE)=25	READ	280
	IF (IKL=MI.EQ.0) GO TO 2180	READ	281
	IKL=IKL+1	READ	282
	JAKE(IKE)=25	READ	283
	IF (IKL=MI.EQ.0) GO TO 2180	READ	284
	IKL=IKL+1	READ	285
	JAKE(IKE)=25	READ	286
	IF (IKL=MI.EQ.0) GO TO 2180	READ	287
	IKL=IKL+1	READ	288
	JAKE(IKE)=25	READ	289
	IF (IKL=MI.EQ.0) GO TO 2180	READ	290
	IKL=IKL+1	READ	291
	JAKE(IKE)=25	READ	292
	IF (IKL=MI.EQ.0) GO TO 2180	READ	293
	IKL=IKL+1	READ	294
	JAKE(IKE)=25	READ	295
	IF (IKL=MI.EQ.0) GO TO 2180	READ	296
	IKL=IKL+1	READ	297
	JAKE(IKE)=25	READ	298
	IF (IKL=MI.EQ.0) GO TO 2180	READ	299
	IKL=IKL+1	READ	300
	JAKE(IKE)=25	READ	301
	IF (IKL=MI.EQ.0) GO TO 2180	READ	302
	IKL=IKL+1	READ	303
	JAKE(IKE)=25	READ	304
	IF (IKL=MI.EQ.0) GO TO 2180	READ	305
	IKL=IKL+1	READ	306
	JAKE(IKE)=25	READ	307
	IF (IKL=MI.EQ.0) GO TO 2180	READ	308
	IKL=IKL+1	READ	309
	JAKE(IKE)=25	READ	310
	IF (IKL=MI.EQ.0) GO TO 2180	READ	311
	IKL=IKL+1	READ	312
	JAKE(IKE)=25	READ	313
	IF (IKL=MI.EQ.0) GO TO 2180	READ	314
	IKL=IKL+1	READ	315
	JAKE(IKE)=25	READ	316
	IF (IKL=MI.EQ.0) GO TO 2180	READ	317
	IKL=IKL+1	READ	318
	JAKE(IKE)=25	READ	319
	IF (IKL=MI.EQ.0) GO TO 2180	READ	320
	IKL=IKL+1	READ	321
	JAKE(IKE)=25	READ	322
	IF (IKL=MI.EQ.0) GO TO 2180	READ	323
	IKL=IKL+1	READ	324
	JAKE(IKE)=25	READ	325
	IF (IKL=MI.EQ.0) GO TO 2180	READ	326
	IKL=IKL+1	READ	327
	JAKE(IKE)=25	READ	328
	IF (IKL=MI.EQ.0) GO TO 2180	READ	329
	IKL=IKL+1	READ	330
	JAKE(IKE)=25	READ	331
	IF (IKL=MI.EQ.0) GO TO 2180	READ	332
	IKL=IKL+1	READ	333
	JAKE(IKE)=25	READ	334
	IF (IKL=MI.EQ.0) GO TO 2180	READ	335
	IKL=IKL+1	READ	336
	JAKE(IKE)=25	READ	337
	IF (IKL=MI.EQ.0) GO TO 2180	READ	338
	IKL=IKL+1	READ	339
	JAKE(IKE)=25	READ	340
	IF (IKL=MI.EQ.0) GO TO 2180	READ	341
	IKL=IKL+1	READ	342
	JAKE(IKE)=25	READ	343
	IF (IKL=MI.EQ.0) GO TO 2180	READ	344
	IKL=IKL+1	READ	345
	JAKE(IKE)=25	READ	346
	IF (IKL=MI.EQ.0) GO TO 2180	READ	347
	IKL=IKL+1	READ	348
	JAKE(IKE)=25	READ	349
	IF (IKL=MI.EQ.0) GO TO 2180	READ	350
	IKL=IKL+1	READ	351
	JAKE(IKE)=25	READ	352
	IF (IKL=MI.EQ.0) GO TO 2180	READ	353
	IKL=IKL+1	READ	354
	JAKE(IKE)=25	READ	355
	IF (IKL=MI.EQ.0) GO TO 2180	READ	356
	IKL=IKL+1	READ	357
	JAKE(IKE)=25	READ	358
	IF (IKL=MI.EQ.0) GO TO 2180	READ	359
	IKL=IKL+1	READ	360
	JAKE(IKE)=25	READ	361
	IF (IKL=MI.EQ.0) GO TO 2180	READ	362
	IKL=IKL+1	READ	363
	JAKE(IKE)=25	READ	364
	IF (IKL=MI.EQ.0) GO TO 2180	READ	365
	IKL=IKL+1	READ	366
	JAKE(IKE)=25	READ	367
	IF (IKL=MI.EQ.0) GO TO 2180	READ	368
	IKL=IKL+1	READ	369
	JAKE(IKE)=25	READ	370
	IF (IKL=MI.EQ.0) GO TO 2180	READ	371
	IKL=IKL+1	READ	372
	JAKE(IKE)=25	READ	373
	IF (IKL=MI.EQ.0) GO TO 2180	READ	374
	IKL=IKL+1	READ	375
	JAKE(IKE)=25	READ	376
	IF (IKL=MI.EQ.0) GO TO 2180	READ	377
	IKL=IKL+1	READ	378
	JAKE(IKE)=25	READ	379
	IF (IKL=MI.EQ.0) GO TO 2180	READ	380
	IKL=IKL+1	READ	381
	JAKE(IKE)=25	READ	382
	IF (IKL=MI.EQ.0) GO TO 2180	READ	383
	IKL=IKL+1	READ	384
	JAKE(IKE)=25	READ	385
	IF (IKL=MI.EQ.0) GO TO 2180	READ	386
	IKL=IKL+1	READ	387
	JAKE(IKE)=25	READ	388
	IF (IKL=MI.EQ.0) GO TO 2180	READ	389
	IKL=IKL+1	READ	390
	JAKE(IKE)=25	READ	391
	IF (IKL=MI.EQ.0) GO TO 2180	READ	392
	IKL=IKL+1	READ	393
	JAKE(IKE)=25	READ	394
	IF (IKL=MI.EQ.0) GO TO 2180	READ	395
	IKL=IKL+1	READ	396
	JAKE(IKE)=25	READ	397
	IF (IKL=MI.EQ.0) GO TO 2180	READ	398
	IKL=IKL+1	READ	399
	JAKE(IKE)=25	READ	400

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      CALL REWNO (FIT)
      IF (IKE.EQ.0) GO TO 3020
      MIKE=1
      IF (JAKE(1).GT.3) GO TO 2440
C****
C****
C**** PRINT OUT PAGE FORMAT 4A IF DOPPLER OF FUEL OR COOLANT WORTHS
C**** HAVE BEEN CHANGED
      CALL HEAD (24)
      WRITE (NOUT,5340)
      WRITE (NOUT,5300) ICHAN
      MM=MIN(IKE,3)
      LINESL=57
      DO 2220 I=1,MM
      IF (JAKE(I).EQ.3) GO TO 2240
2220 CONTINUE
      GO TO 2200
2240 WRITE (NOUT,5380) DOPPW,DOPPD,RBASEC
      LINESL=LINESL-4
      MIKE=MIKE+1
2260 IF (JAKE(1).GT.2) GO TO 2420
      WRITE (NOUT,5400)
      LINESL=LINESL-4
      MIKE=MIKE+1
      DO 2280 I=1,100
      I=101-I
      IF (CH(I)) 2280,2280,2300
2280 CONTINUE
      MIKE=MIKE-1
      I=0
2300 M2=1
      MIKE=MIKE+1
      DO 2320 I=1,100
      I=101-I
      IF (FH(I)) 2320,2320,2340
2320 CONTINUE
      MIKE=MIKE-1
      I=0
2340 M3=1
      MAX=MAX(M2,M3)
      DO 2400 I=1,MAX
      WRITE (NOUT,5420)
      IF (M2.EQ.0) GO TO 2360
      WRITE (NOUT,5440) CH(M2),CH(M3)
      M2=M2-1
2360 IF (M3.EQ.0) GO TO 2390
      WRITE (NOUT,5460) FH(M3),FH(M3)
      M3=M3-1
2380 CONTINUE
2400 LINESL=LINESL-1
      WRITE (NOUT,5420)
      LINESL=LINESL-1
2420 CONTINUE
      IF (MIKE.GT.IKE) GO TO 3020
      IF (LINESL-IKE+MIKE-1) 2460,2460,2480
2440 IF (LINESL-IKE+MIKE-4) 2460,2480,2480
C****
C****
C**** PRINT OUT PAGE FORMAT 4 CONTAINING CHANGES MADE BY NAMELIST
C**** "EACH"
2460 CALL HEAD (4)
      WRITE (NOUT,5340)
      LINESL=57
2480 WRITE (NOUT,5300) ICHAN
      WRITE (NOUT,5420)

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      READ 534
      READ 585
      READ 586
      READ 587
      READ 588
      READ 589
      READ 590
      READ 591
      READ 592
      READ 593
      READ 594
      READ 595
      READ 596
      READ 597
      READ 598
      READ 599
      READ 600
      READ 601
      READ 602
      READ 603
      READ 604
      READ 605
      READ 606
      READ 607
      READ 608
      READ 609
      READ 610
      READ 611
      READ 612
      READ 613
      READ 614
      READ 615
      READ 616
      READ 617
      READ 618
      READ 619
      READ 620
      READ 621
      READ 622
      READ 623
      READ 624
      READ 625
      READ 626
      READ 627
      READ 628
      READ 629
      READ 630
      READ 631
      READ 632
      READ 633
      READ 634
      READ 635
      READ 636
      READ 637
      READ 638
      READ 639
      READ 640
      READ 641
      READ 642
      READ 643
      READ 644
      READ 645
      READ 646
      READ 647
      READ 648

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3000	LINE\$=LINE\$-1	READ	718
3020	CONTINUE	READ	719
	N1=3	READ	720
	N2=3	READ	721
C****		READ	722
C****		READ	723
C****	SET UP AND INITIALIZE DISK UNIT TO HOLD TEMPERATURES OF NONCOOLANT	READ	724
C****	NON CORE NODES	READ	725
	IF (IS1(1)-1000) 3100,3040,3040	READ	726
3040	L=0	READ	727
	K=2	READ	728
	BLOCK(1)=T(NEW)	READ	729
	DO 3120 I=2,NAXIAL	READ	730
	IF (I-NBCORE) 3080,3120,3060	READ	731
3080	IF (I-NTCORE) 3120,3120,3080	READ	732
3080	M=NTOP(I)	READ	733
	L=L+1	READ	734
	DO 3100 J=1,M	READ	735
	BLOCK(K)=TSINK(J,L+1,NEW)	READ	736
3100	K=K+1	READ	737
3120	CONTINUE	READ	738
	N1=3	READ	739
3140	K=K-1	READ	740
	IWA=1+JACCUM	READ	741
	IUNIT=1	READ	742
	JACCUM=JACCUM+K*MPRINT	READ	743
	CALL PUT (FIT(240),BLOCK,10*K,IWA,0,0,JOLLY)	READ	744
	IF (GEHWIZ(1).GT.0.0) GO TO 3820	READ	745
	CALL REWIND (FIT(240))	READ	746
	GO TO 3220	READ	747
3160	IF (IS1(1)) 3220,3220,3180	READ	748
3180	K=2	READ	749
	BLOCK(1)=T(NEW)	READ	750
	N1=3+IS1(1)	READ	751
	DO 3200 I=4,N1	READ	752
	INDEX=IOUT(I+)	READ	753
	BLOCK(K)=TSINK(INDEX,1,NEW)	READ	754
3200	K=K+1	READ	755
	GO TO 3140	READ	756
3220	CONTINUE	READ	757
C****		READ	758
C****		READ	759
C****	SET UP AND INITIALIZE DISK UNIT TO CONTAIN CORE TEMPERATURE DATA	READ	760
	IF (IS1(2)-1000) 3300,3240,3240	READ	761
3240	L=-1	READ	762
	K=2	READ	763
	BLOCK(1)=T(NEW)	READ	764
	DO 3320 I=2,NAXIAL	READ	765
	IF (I-NBCORE) 3320,3280,3260	READ	766
3260	IF (I-NTCORE) 3280,3280,3320	READ	767
3280	M=NTOP(I)	READ	768
	L=L+1	READ	769
	DO 3300 J=1,M	READ	770
	BLOCK(K)=TEMPER(J,L+1,NEW)	READ	771
3300	K=K+1	READ	772
3320	CONTINUE	READ	773
	N2=N1	READ	774
3340	K=K-1	READ	775
	IWA=1+KACCUM	READ	776
	IUNIT=2	READ	777
	KACCUM=KACCUM+K*MPRINT	READ	778
	CALL PUT (FIT(281),BLOCK,10*K,IWA,0,0,JOLLY)	READ	779
	IF (GEHWIZ(2).GT.0.0) GO TO 3320	READ	780
	CALL REWIND (FIT(281))	READ	781
	GO TO 3420	READ	782

3300 IF (IOJT(0)) 3420,3420,3380	K=AU	783
3380 K=2	K=AD	784
BLOCK(1)=T(NEW)	K=AD	785
N2=IOJT(0)+N1	K=AU	786
N1=N1+1	K=AD	787
DO 3400 I=N1,N2	K=AD	788
INDEX=IOJT(I+4)	K=AD	789
BLOCK(K)=TEMPER(INDEX,1,NEW)	K=AD	790
3400 K=K+1	K=AU	791
GO TO 3340	K=AD	792
3420 CONTINUE	K=AD	793
C****	K=AD	794
C****	K=AD	795
C**** SET UP AND INITIALIZE DISK UNIT TO HOLD COOLANT TEMPERATURE DATA	K=AD	796
IF (IS1(3)-1000) 3500,3440,3440	K=AD	797
3440 K=2	K=AD	798
BLOCK(1)=T(NEW)	K=AD	799
DO 3460 I=2,NAXIAL	K=AD	800
3460 BLOCK(I)=TCOOL(I,NEW)	K=AD	801
K=NAXIAL	K=AD	802
IWA=1+IACCUY	K=AD	803
IUNIT=3	K=AD	804
IACCUY=IACCUY+K*MPRINT	K=AD	805
3480 CALL PJT (FIT(316),BLOCK,10*K,IWA,0,0,JOLLY)	K=AD	806
IF (GE=HIZ(3).GT.0.0) GO TO 3820	K=AD	807
CALL R=WND (FIT(316))	K=AD	808
GO TO 3500	K=AD	809
3500 IF (IS1(3)) 3500,3500,3520	K=AD	810
3520 K=2	K=AD	811
BLOCK(1)=T(NEW)	K=AD	812
N3=N2+IS1(3)	K=AD	813
N2=N2+1	K=AD	814
DO 3540 I=N2,N3	K=AD	815
INDEX=IOJT(I+4)	K=AD	816
BLOCK(K)=TCOOL(INDEX,NEW)	K=AD	817
3540 K=K+1	K=AD	818
K=K-1	K=AD	819
IWA=1+IACCUY	K=AD	820
IUNIT=3	K=AD	821
IACCUY=IACCUY+K*MPRINT	K=AD	822
GO TO 3480	K=AD	823
C****	K=AD	824
C****	K=AD	825
C**** SET UP AND INITIALIZE DISK UNIT TO HOLD COOLANT PRESSURE DATA	K=AD	826
3560 IF (IPR=SR(ICHAN).EQ.0) GO TO 3600	K=AD	827
BLOCK(1)=T(NEW)	K=AD	828
I10=500+75*(NEW-1)	K=AD	829
DO 3580 I=2,NAXIAL	K=AD	830
3580 BLOCK(I)=P(I,NEW)	K=AD	831
IWA=1+MACCUY	K=AD	832
IUNIT=4	K=AD	833
MACCUY=MACCUY+NAXIAL*MPRINT	K=AD	834
CALL PJT (FIT(211),BLOCK,10*NAXIAL,IWA,0,0,JOLLY)	K=AD	835
IF (GE=HIZ(4).GT.0.0) GO TO 3820	K=AD	836
CALL R=WND (FIT(211))	K=AD	837
C****	K=AD	838
C****	K=AD	839
C**** SET UP AND INITIALIZE DISK UNIT TO STORE FLOW AND TEMPERATURE DATA	K=AD	840
3600 CONTINUE	K=AD	841
BLOCK(1)=T(NEW)	K=AD	842
BLOCK(2)=G(1,NEW)/RHO0(1,NEW)	K=AD	843
BLOCK(3)=G(NAXIAL,NEW)/RHO0(NAXIAL,NEW)	K=AD	844
IWA=1+3*MPRINT*(ICHAN-1)	K=AD	845
IUNIT=5	K=AD	846
CALL PJT (FIT(170),BLOCK,30,IWA,0,0,JOLLY)	K=AD	847
IF (GE=HIZ(5).GT.0.0) GO TO 3820	K=AD	848
CALL R=WND (FIT(170))	K=AD	849

C****		READ	850
C****		READ	851
C****	SET UP AND INITIALIZE DISK UNIT TO STORE SLUG INTERFACE	READ	852
C****	INFORMATION FOR LATER PRINTOUT	READ	853
	IF (IJKL.EQ.2) GO TO 3600	READ	854
	DO 3620 I=1,17	READ	855
3620	BLOCK(I)=0.0	READ	856
3640	IWA=1+10*MPRINT*(ICCHAN-1)	READ	857
	IUNIT=6	READ	858
	CALL PUT (FIT(351),BLOCK,100,IWA,0,0,JOLLY)	READ	859
	IF (GEHWIZ(6).GT.0.0) GO TO 3920	READ	860
	CALL REWIND (FIT(351))	READ	861
	GO TO 3680	READ	862
3680	READ (INPUT) (BLOCK(I),I=1,17)	READ	863
	GO TO 3640	READ	864
C****		READ	865
C****		READ	866
C****	SET UP AND INITIALIZE DISK UNIT TO HOLD GAS AND VAPOR VOLUMES IN	READ	867
C****	CHANNEL AND DISK UNIT TO HOLD FUEL AND VOID REACTIVITIES IN	READ	868
C****	CHANNEL FOR LATER PRINTOUT	READ	869
3690	CONTINUE	READ	870
	IF (IJKL.EQ.2) GO TO 3720	READ	871
	DO 3700 I=1,17	READ	872
3700	BLOCK(I)=0.0	READ	873
3720	IWA=1+4*MPRINT*(ICCHAN-1)	READ	874
	IUNIT=7	READ	875
	CALL PUT (FIT(71),BLOCK(11),43,IWA,0,0,JOLLY)	READ	876
	IF (GEHWIZ(7).GT.0.0) GO TO 3820	READ	877
	CALL REWIND (FIT(71))	READ	878
	IUNIT=8	READ	879
	IWA=1+3*MPRINT*(ICCHAN-1)	READ	880
	CALL PUT (FIT(106),BLOCK(15),30,IWA,0,0,JOLLY)	READ	881
	IF (GEHWIZ(8).GT.0.0) GO TO 3820	READ	882
	CALL REWIND (FIT(106))	READ	883
3740	CONTINUE	READ	884
C****		READ	885
C****		READ	886
C****	SET UP AND INITIALIZE DISK UNIT TO HOLD FUEL AND COOLANT	READ	887
C****	REACTIVITY INFORMATION FOR LATER PRINTOUT	READ	888
	IF (IJKL.EQ.2) GO TO 3800	READ	889
	DO 3750 I=1,NLOOPS	READ	890
	TOPT(I,NEW)=TOPT(I,IOLD)/ZAF(I)	READ	891
	FLOW(I,NEW)=FLOW(I,IOLD)	READ	892
3750	TOPT(I,IOLD)=TOPT(I,NEW)	READ	893
	TKGS=.01*TKGS	READ	894
	DO 3740 I=1,13	READ	895
3740	TERM(1)=0.0	READ	896
	TERM(2)=PN(1)	READ	897
3800	IWA=1	READ	898
	IUNIT=9	READ	899
	CALL PUT (FIT(141),TERM,130,IWA,0,0,JOLLY)	READ	900
	IF (GEHWIZ(9).GT.0.0) GO TO 3820	READ	901
	CALL REWIND (FIT(141))	READ	902
C****		READ	903
C****		READ	904
C****	PRINT OUT HEADING FOR PAGE FORMAT NUMBER 5	READ	905
	CALL HEAD (5)	READ	906
	WRITE (NOUT,5120)	READ	907
	WRITE (NOUT,5140) JSTEP,(TERM(I),I=1,13)	READ	908
	LINESL=55	READ	909
	IFPRINT=1	READ	910
	IIN=N13	READ	911
	IGOUTL=N12	READ	912
	REWIND INPUT	READ	913
	MSTEP=JSTEP+KSTEP	READ	914

RETURN	READ	915
C****	READ	916
C****	READ	917
C**** WRITE OUT MESSAGE INDICATING DISK PROBLEM AND ERROR RETURN	READ	918
3820 WRITE (NOUT,5100) IUNIT	READ	919
RETURN IERROR	READ	920
C	READ	921
3840 FORMAT (63X,"INFUT")	READ	922
3860 FORMAT (4H0***,10X,15HOUTPUT CONTROLS)	READ	923
3880 FORMAT (1H0,+X,5HIDUMP,9X,71HRESTART OPTION (0/1/-1=DO NOT/DO JUMP A	READ	924
+T END/DO JUMP AT START OF FAILURE),9X,1H=,I2)	READ	925
3900 FORMAT (5X,5HISLOT,9X,25HISLOT OPTION (0/1=DO NOT/DO),55X,1H=,I2)	READ	926
3920 FORMAT (5X,6HIT+GAP,8X,46HTRANSIENT GAP CONDUCTANCE OPTION (0/1=DO	READ	927
+NT/DO),34X,1H=,I2)	READ	928
3940 FORMAT (5X,6HHOTPI4,8X,58HHOTPI4 INTERNAL FUEL HYDRODYNAMICS MODEL	READ	929
+ (0.0/1.0=DO NOT/DO),22X,1H=,F3.1)	READ	930
3960 FORMAT (1H0,+X,1HKSTEP,9X,28HPRINT ON EVERY KSTEP TH STEP,52X,1H=,	READ	931
+1+)	READ	932
3980 FORMAT (5X,6HPRINT1,8X,76HSAVE VALUES FOR LATTER PRINTING AT THIS	READ	933
+TIME INTERVAL IF LITTLE ACTION (SEC),4X,1H=,1PE9.3)	READ	934
4000 FORMAT (5X,6HPRINT2,8X,77HSAVE VALUES FOR LATTER PRINTING AT THIS	READ	935
+TIME INTERVAL IF LOTS OF ACTION (SEC),3X,1H=,1PE9.3)	READ	936
4020 FORMAT (5X,6HMPRINT,8X,"MAXIMUM NUMBER OF WRAPUP PRINTOUTS",40X,1H	READ	937
+ =,I3)	READ	938
4040 FORMAT (1H04X11HLIST (CHAN)3X00HLIST OF CHANNELS WHOSE TEMPERATURE	READ	939
+ OUTPUT IS TO BE CHANGED= 19I3/79XI3)	READ	940
4060 FORMAT (4H0***,10X,43HTIME, CONVERGENCE, AND TERMINATION CONTROLS)	READ	941
4080 FORMAT (5X,5HHMAXF,9X,39HMAXIMUM TIME STEP IF CORE FAILURE (SEC),4	READ	942
+1X,1H=,1PE9.3)	READ	943
4100 FORMAT (5X,5HHMAX,10X,44HMAXIMUM TIME STEP IF NONE OF THE ABOVE IS	READ	944
+EC),35X,1H=,1PE9.3)	READ	945
4120 FORMAT (5X,4HREDUCE,8X,45HFACTOR USED TO INCREASE OR DECREASE TIME	READ	946
+ STEP,35X,1H=,1PE9.3)	READ	947
4140 FORMAT (1H0,4X,5HERROR,9X,46HERROR CRITERION FOR ORIGINAL POWER MA	READ	948
+TCH,40X,1H=,1PE9.3)	READ	949
4160 FORMAT (5X,5HERROR,1,3X,42HERROR CRITERION FOR OUTER LOOP POWER MA	READ	950
+TCH,38X,1H=,1PE9.3)	READ	951
4180 FORMAT (5X,5HTECRROR,8X,42HCONVERGENCE CRITERION FOR TEMPERATURES (	READ	952
+K),38X,1H=,1PE9.3)	READ	953
4200 FORMAT (5X,5HTECRROR,8X,48HCONVERGENCE CRITERION FOR PRESSURE (OUNL	READ	954
+S/CM**2),32X,1H=,1PE9.3)	READ	955
4220 FORMAT (1H0,4X,4HMIN,10X,40HMINIMUM REACTIVITY TERMINATION (DELTA	READ	956
+ K),40X,1H=,1PE10.3)	READ	957
4240 FORMAT (5X,5HMIN,9X,30HMINIMUM POWER TERMINATION (MW),55X,1H=,1P	READ	958
+E9.3)	READ	959
4260 FORMAT (5X,5HTQUIT,9X,28HMAXIMUM TRANSIENT TIME (SEC),52X,1H=,1PE9	READ	960
+E9.3)	READ	961
4280 FORMAT (5X,5HSTEP,9X,26HMAXIMUM NUMBER OF TIME STEPS,52X,1H=,I+)	READ	962
4300 FORMAT (5X,6HUNTIM8X13HJOB RUN TIME (SEC)52X1H=1PE10.4)	READ	963
4320 FORMAT (4H0***,10X,5HPOWER)	READ	964
4340 FORMAT (1H0,+X,3HMAX,11X,28HINITIAL NEUTRONIC POWER (MW),52X,1H=,1	READ	965
+PE9.3)	READ	966
4360 FORMAT (5X,5HMAX,10X,18HMAXIMUM HEATING (MW),52X,1H=,1PE9.3)	READ	967
4380 FORMAT (4H0***,10X,16HASIC NEUTRONICS)	READ	968
4400 FORMAT (1H0,+X,5HISLOT,8X,55HISLOTICS MODEL USED (0/1/2/3 = FINIT	READ	969
+E/ZERO/MIXED/POWER),25X,1H=,I2)	READ	970
4420 FORMAT (5X,6HNGROUP,8X,32HNUMBER OF DELAYED NEUTRON GROUPS,40X,1H=	READ	971
+ ,I2)	READ	972
4440 FORMAT (5X,5HALIFE,9X,36HPROMPT NEUTRON GENERATION TIME (SEC),44X,	READ	973
+1H=,1PE9.3)	READ	974
4460 FORMAT (5X,6HHRUSHZ,8X,55HREACTIVITY SWITCHING LEVEL FOR ZERO LIFE	READ	975
+ APPRXX (CENTS),25X,1H=,1PE9.3)	READ	976
4480 FORMAT (5X,2HDB,12X,33HTOTAL DELAYED NEUTRON FRACTION,55X,1H=,1PE9	READ	977
+E9.3)	READ	978
4500 FORMAT (1H ,/19X,5HGROUP,5X,13HB(I)=FRACTION,3X,29HAL(I)=DECAY CON	READ	979
+STANT (1/SEC))	READ	980
4520 FORMAT (21X,I1,5PF10.5,1PE20.3)	READ	981

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4540 FORMAT (1H3,4X,6HANSCKM,8X,27HPOWER LEVEL SCRAM TRIP (MW),53X,1H=, READ 984
+1PE9.3) READ 985
4560 FORMAT (5X,6HPE<100,8X,17HPERIOD SCRAM TRIP,63X,1H=,1PE9.3) READ 986
4580 FORMAT (5X,6HTD<LAY,8X,60HTIME< DELAY BETWEEN SCRAM TRIP AND REACTI READ 987
+VITY INSEKION (SEC),20X,1H=,1PE9.3) READ 988
4600 FORMAT (5X,6HPIA<2,8X,45HNUMBER OF ENTRIES IN REACTIVITY INPUT LI READ 989
+BRARY,35X,1H=,I3) READ 990
4620 FORMAT (19X,19HTIME<IN = TIME (SEC),11X,14HDKIN = DELTA K) READ 991
4640 FORMAT (7HOTIME<OUT,2X,1P12<10.3) READ 992
4660 FORMAT (5X,6HDKIN,4X,1P12<10.3) READ 993
4680 FORMAT (1H6,4X,6HPIA<3,8X,45HNUMBER OF ENTRIES IN SCRAM REACTIVIT READ 994
+Y LIBRARY,35X,1H=,I3) READ 995
4700 FORMAT (19X,19HTIME<OUT = TIME (SEC),11X,15HDKOUT = DELTA K) READ 996
4720 FORMAT (7HOTIME<OUT,2X,1P12<10.3) READ 997
4740 FORMAT (6H DKOUT,3X,1P12<10.3) READ 998
4760 FORMAT (5X,6HTRIG<8X7.HRADIAL AND/OR AXIAL EXPANSION EFFECTS (U/1/ READ 999
+2/3=NONE/RADIAL/AXIAL/BOTH),9X,2H=,F3.0) READ 1000
4780 FORMAT (5X,6HLOAD PAD DATA (3 NODES,ORDER-ADIABATIC TO COOLANT)/20 READ 1001
+X25HHEAT TRANSFER COEFFICIENT,4X13HHEAT CAPACITY/13X3HZU117X3HZU21 READ 1002
+7X3HZU317X4HVC115X4HVC215X4HVC3/6<20.4) READ 1003
4800 FORMAT (5X,6HPE<6X2.HDELTA K PER DEGREE KELVIN53X1H=10.4) READ 1004
4820 FORMAT (5X,6HAMAX10X36HMAXIMUM DELTA K FROM RADIAL MOVEMENT43X1H=1 READ 1005
+C.4) READ 1006
4840 FORMAT (5X,6HAMIN10X36HMINIMUM DELTA K FROM RADIAL MOVEMENT43X1H=1 READ 1007
+C.4) READ 1008
4860 FORMAT (5X,6HLPAL10X36HAXIAL NODE CONTAINING LOAD PAD53X1H=14) READ 1009
4880 FORMAT (5X,6HFNODES8X56HNUMBER OF OUTER RADIAL NODES WHICH CONTROL READ 1010
+AXIAL EXPANSION22X1H=F4.0) READ 1011
4900 FORMAT (5X,6HALPHAL8X36HFUEL COEFFICIENT OF LINEAR EXPANSION44X1H=L READ 1012
+1L.4) READ 1013
4920 FORMAT (4H0***,10X,14HFLOW LOOP INFO) READ 1014
4940 FORMAT (1H6,4X,6HNLLOOPS,8X,32HNUMBER OF INDEPENDENT FLOW LOOPS,48X READ 1015
+1H=,I2) READ 1016
4960 FORMAT (5X,4HLOOP,10X,36HLIST OF LOOP EACH CHANNEL IS PART OF,19X READ 1017
+7HCHANNEL,3X,20I3) READ 1018
4980 FORMAT (19X,4HLOOP,6X,20I3) READ 1019
5000 FORMAT (4H0***,10X,4HLOOP,I2) READ 1020
5020 FORMAT (1H6,4X,6HKHUC<E,8X,60HVOLUME<RIC HEAT CAPACITY OF COOLANT READ 1021
+IN UPPER PLENUM (J/CC-K),20X,1H=,1PE9.3) READ 1022
5040 FORMAT (5X,6HVOLTUP,8X,39HVOLUME OF COOLANT IN OUTLET PLENUM (CC), READ 1023
+41X,1H=,1PE9.3) READ 1024
5060 FORMAT (5X,6HPEXIT,9X,36HOUTLET PLENUM PRESSURE (DYNES/CM**2),44X, READ 1025
+1H=,1PE9.3) READ 1026
5080 FORMAT (5X,4HHEAD,1X,63HSTATIC HEAD FROM TOP TO BOTTOM OF CHANNEL READ 1027
+ IN LOOP (DYNES/CM**2),17X,1H=,1PE9.3) READ 1028
5100 FORMAT (5X,2HOP,12X,96HMULTIPLIER OF LOOP FLOW (GM/SEC) SQUARED TO READ 1029
+ GIVE PUMP HEAD LOSS (DYNES/CM**2)/(GM/SEC)**2),11X,1H=,1PE9.3) READ 1030
5120 FORMAT (5X,6HTRIPFW,8X,29HLOOP LOW FLOW TRIP (GMS/SEC),51X,1H=,1P READ 1031
+10.3) READ 1032
5140 FORMAT (5X,6HTRIPPP,8X,33HPOWER TO LOOP INLET PRESSURE TRIP, (MW)/ READ 1033
+(DYNES/CM**2),27X,1H=,1PE10.3) READ 1034
5160 FORMAT (5X,6HTRIPPF,8X,39HPOWER TO LOOP FLOW TRIP, (MW)/(GMS/SEC), READ 1035
+41X,1H=,1PE10.3) READ 1036
5180 FORMAT (5X,6HTRIPUT,8X,33HLOOP OUTLET TEMPERATURE TRIP, (K),47X,1H READ 1037
+1H=,1PE9.3) READ 1038
5200 FORMAT (5X,6HDELAYF,8X,49HTIME< DELAY, SCRAM SIGNAL TO PUMP COASTING READ 1039
+WN, (SEC),31X,1H=,1PE9.3) READ 1040
5220 FORMAT (5X,7HSLDA(1)/X27HSUM OF LENGTH/AREA FOR LOOP53X1H=1PE10.3) READ 1041
5240 FORMAT (5X,6HTIN<ET8X26HLOOP INLET TEMPERATURE (K)54X1H=1PE10.3) READ 1042
5260 FORMAT (5X,6HPIA<4,8X,36HNUMBER OF ENTRIES IN TIME-HEAD LIBRARY,4 READ 1043
+2X,1H=,I3) READ 1044

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2280 FORMAT (19X,19HPRESTM = TIME (SEC),11X,40HFRESUR = NO FLOW PUMP ME READ 1043
+AD (DYNES/CM**2)) READ 1044
5300 FORMAT (7HCPRESTM,2X,1P12E10.3) READ 1045
5320 FORMAT (7H FRESUR,2X,1P12E10.3) READ 1046
5340 FORMAT (40X,"EACH MODIFICATIONS TO BASE DATA") READ 1047
5360 FORMAT (6H0****,10X,7HCHANNEL,I3) READ 1048
5380 FORMAT (1H0,4X,7H0FPW,9X,23HNET DOPPLER COEFFICIENT,57X,1H=,1PE9. READ 1049
+3/5X,7H0OPD,9X,23HURY DOPPLER COEFFICIENT,57X,1H=,1PE9.3,7,5X,6H READ 1050
+BASEC,9X,43HCOOLANT DENSITY FOR NET DOPPLER (G/GC),37X,1H=,1PE9.3) READ 1051
5400 FORMAT (5X,7HLCW(AXIAL),5X,49HCOOLANT VOID WORTH AT HEIGHT CH(AXIAL READ 1052
+),DELTA K/KG,7,5X,9HFW(AXIAL),5X,40HFUEL WORTH AT HEIGHT FH(AXIAL) READ 1053
+DELTA K/KG/10X2HCH7X2HCH8X2HFM8X2HFM/10X2HLM4X7HD=LK/KG5X2HLM5X8HJ READ 1054
+LL K/KG) READ 1055
5420 FORMAT (1H ) READ 1056
5440 FORMAT (1H+CXF6.1,1PE12.3) READ 1057
5460 FORMAT (1H+,20X,F0.1,1PE12.3) READ 1058
5480 FORMAT (5X6HHRORAT8X4JHMAXIMUM FUEL SQUIRTING VOLUME PER SECOND40X READ 1059
+1H=E10.4) READ 1060
5500 FORMAT (5X4HGAPU10X47HNEW GAP HEAT TRANSFER COEFFICIENTS (J/SEC-CM READ 1061
+K)/(15X11E10.4)) READ 1062
5520 FORMAT (5X6HSPR=AD8X81HNO. OF MILLISECONDS FOR LIQUID FUEL TO READ 1063
+H COOLANT TEMPERATURE (LESS THAN 13.)=F5.0) READ 1064
5540 FORMAT (1H0,4X,7HPL=NP,9X,37HINITIAL PLENUM PRESSURE (DYNES/CM**2) READ 1065
+,43X,1H=,1PE9.3) READ 1066
5560 FORMAT (5X,7HGAMA,9X,27HATID CP/CV FOR FISSION GAS,53X,1H=,1PE9. READ 1067
+3) READ 1068
5580 FORMAT (5X,5HAGOLE,9X,47HPLENUM FAILURE - HOLE AREA(CM**2) * COEFF READ 1069
+ICIENT,33X,1H=,1PE9.3) READ 1070
5600 FORMAT (5X,7HGTGASS,9X,49HTEMPERATURE OF PLENUM CLAD INITIATING FAI READ 1071
+LURE (K),31X,1H=,1PE9.3) READ 1072
5620 FORMAT (5X,6HNBPLEN,8X,29HNODE IN GAS PLENUM THAT FAILS,51X,1H=,I2 READ 1073
+) READ 1074
5640 FORMAT (5X5HSCOTT9X,9HFUEL FAILURE TRIGGER(-1./0/1. = TIME/TEMPERAM READ 1075
+TURE/ENTHALPY) ,21X,1H=F7.3) READ 1076
5660 FORMAT (5X3H4UN11X48HUNRESTRICTURED FUEL ENTHALPY TRIP CONSTANT (J READ 1077
+/G)32X1H=F0.0) READ 1078
5680 FORMAT (5X3H5UN11X49HUNRESTRICTURED FUEL ENTHALPY TRIP COEF (J/G-K READ 1079
+**2)31X1H=1PE10.3) READ 1080
5700 FORMAT (5X3H6A11X43HQUI-AXED FUEL ENTHALPY TRIP CONSTANT (J/G)37 READ 1081
+X1H=F0.0) READ 1082
5720 FORMAT (5X3H3LA11X44HQUI-AXED FUEL ENTHALPY TRIP COEF (J/G-K**2)3 READ 1083
+6X1H=1PE10.3) READ 1084
5740 FORMAT (5X2HAS12X42HSINTERED FUEL ENTHALPY TRIP CONSTANT (J/G)33X1 READ 1085
+H=F0.0) READ 1086
5760 FORMAT (5X2HBS12X43HSINTERED FUEL ENTHALPY TRIP COEF (J/G-K**2)37X READ 1087
+1H=1PE10.3) READ 1088
5780 FORMAT (1H0,4X,6HFUELS,8X,40HFUEL FIN AXIAL NODE TO TEST FOR FAI READ 1089
+LURE,40X,1H=,I2) READ 1090
5800 FORMAT (5X,6HJFUELS,8X,81HIF NOT ZERO TEST ONLY THIS AXIAL POSITIO READ 1091
+IN (REL TO CORE BOT), OTHERWISE TEST ALL =,I2) READ 1092
5820 FORMAT (5X,6HKFUELS,8X,45HAXIAL LEVEL FOR FAILURE (REL. TO CORE BO READ 1093
+TOM),35X,1H=,I2) READ 1094
5840 FORMAT (44H * * * FUEL SQUIRTING LOCATION CHANGED * * *) READ 1095
5860 FORMAT (5X,6HTFUELS,8X,42HTEMPERATURE OF NODE INITIATING FAILURE ( READ 1096
+K),38X,1H=,1PE9.3) READ 1097
5880 FORMAT (5X4HSEW11X33HFUEL IN CHANNEL SKEWING FACTOR50X1H=F5.3) READ 1098
5900 FORMAT (5X4HPCEL10X46HMOLTEN FUEL AXIAL RELOCATION VOLUME (CC)4CX1 READ 1099
+H=E10.4) READ 1100
5920 FORMAT (5X6HFRACIN8X36HFRACIUNAL FUEL PLATE OUT PER SECOND44X1H=F READ 1101
+7.3) READ 1102
5940 FORMAT (5X6HDETALIL8X63HPRINT OUT DETAILED MOLTEN FUEL PLACEMENT AN READ 1103
+D REACTIVITY EFFECTS) READ 1104
5960 FORMAT (5X,54HVOID,9X,3,HPRESSURE IN CORE VOID (DYNES/CM**2),45X,1 READ 1105
+H=,1PE9.3) READ 1106
5980 FORMAT (5X,6HORIFIC,8X,48HSQUIRTING FUEL ORIFICE COEF. (DYNES/CC/ READ 1107
+SEC)**2),52X,1H=,1PE9.3) READ 1108

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6000	FORMAT (5X4HGTOL10X81HFRACTION OF MAXIMUM AMOUNT OF GAS THAT COULD READ	1109
	+ SQUIRT, DOES SQUIRT (A NEGATIVE VALUE/19X76HINDICATES THAT THE GAS READ	1110
	+FUEL RATIO TO USE IS THAT WHICH EXISTS WITHIN THE PIN+X1H=F6.3) READ	1111
6020	FORMAT (5X6HPSTART8X63H(NEGATIVE/0/POSITIVE = INCLUDE GAP IN CAVIT READ	1112
	+Y VOLUME/DO NOTHING//19X58HADJUST CAVITY VOLUME TO THIS FUEL FAILU READ	1113
	+RE PRESSURE (DYNES) 21X1H=L10.4) READ	1114
6040	FORMAT (5X5HTREAT9X24HTHIS IS A TREAT TEST RUN) READ	1115
6060	FORMAT (5X5HVORIG9X19HCHAMBER VOLUME (CC)61X1H=F5.0) READ	1116
6080	FORMAT (5X4HAREM10X36HCHAMBER CROSS SECTIONAL AREA (CM**2)+X1H=FJ READ	1117
	+2) READ	1118
6100	FORMAT (5X5HFRICT9X39HFRICTIONAL LOSS = FRICT*G**2/RHO*LENGTH+1X1H READ	1119
	+1PE10.3) READ	1120
6120	FORMAT (86X,21HREACTI/ITIES IN CENTS/8X,4HTIME,4X,5HPOWER,3X,46HGL READ	1121
	+NERATED MOLTEN MOLTEN MOLTEN MOLTEN/130H STEP SEC READ	1122
	+ MW MW SEC MW SEC DEG. K KGS. PERCENT NET P READ	1123
	+ROGRAED SCRAM DOPPLER COLLAPSE VOID) READ	1124
6140	FORMAT (1H0/,15,F8.4,2E10.4,F3.3,6F10.3) READ	1125
6160	FORMAT ("DISK PROBLEMS ON UNIT"13) READ	1126
	END READ	1127

SUBROUTINE TPUT										TPUT	2	
C****	COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS										CASPAR	2
C****	DIMENSION SLOJ(1)										CASPAR	3
	REAL KINSRT,KWTHDR										CASPAR	4
	LOGICAL PRINT,DONE,DCRAM										CASPAR	5
	COMMON										CASPAR	6
	DONL,ISTAT ,IIN ,SLOJ(3) ,										CASPAR	7
+ISLOCK	,H(2)	,T(2)	,HREDO	,ICHAN	,VJUK(2)	,CASPAR	8					
+JOPPK(2)	,COLAPK(2)	,NEW	,IGLU	,NOUT	,TERROR	,CASPAR	9					
+GLRROR	,PLXLT(3)	,PERKOR	,PFRINT	,DLTIM	,PN(2)	,CASPAR	10					
+POUT(3,2)	,IACTIV(20)	,FLOW(3,2)	,TOPT(3,2)	,TOPLV(3)	,WJLF(3)	,CASPAR	11					
+LOOP(20)	,IGUTL	,NTRCAT	,IKINET	,TOUT	,HMAX	,CASPAR	12					
+TIMEIN(50)	,OKIN(50)	,TIMEOUT(50)	,OKOUT(50)	,IPAIR2	,AN(2)	,CASPAR	13					
+IPAIR3	,KUJNT	,RH(2)	,BBUIGC	,RHOSHZ	,NGROUP	,CASPAR	14					
+C(0,2)	,ALIFE	,ALPH(0)	,GAM(0)	,B(0)	,AL(0)	,CASPAR	15					
+B3	,SCRAM	,TSURAM(2)	,FACIOL	,RSLOPE	,LRROR	,CASPAR	16					
+KINSRT(2)	,KWTHDR(2)	,KEUULE	,FRINT1	,PRINT2	,KMIN	,CASPAR	17					
COMMON						CASPAR	18					
+ANLOW	,TQUIT	,LSTEP	,JSTEP	,ANIG	,TRUS	,CASPAR	19					
+IFLOT	,ERROR1	,TERM(13)	,TITLE(8)	,HOIPIM	,SPUD	,CASPAR	20					
+SFC	,SFCU	,LINEJL	,KSLP	,NCHAN	,MSLP	,CASPAR	21					
+IPRINT	,MPRINT	,IDUMP	,QGEN(2)	,ANI	,AVSCRM	,CASPAR	22					
+TDELAY	,NLOUPS	,RHOULE(3)	,VOLTOP(3)	,HEAD(3)	,PRESTM(5)	,CASPAR	23					
+FESUR(50,3)	,IPAIR4	,PD(3)	,RUNTIM	,VEX	,LIAU(4)	,CASPAR	24					
+KBLOCK	,JBLOCK	,MBLOCK	,N12	,N13	,EXTRA	,CASPAR	25					
+GJACK(3)	,VJACK(2)				,ITRUP	,CASPAR	26					
+HMIN	,N22	,NIN	,INFUT	,N2	,N+	,CASPAR	27					
+N1	,N8	,KPKINT	,PCWSS	,HMAXB	,HMAXF	,CASPAR	28					
+TRIPFW(3)	,TRIPFF(3)	,TRIPFF(3)	,TRIPOT(3)	,DLAYF		CASPAR	29					
	EQUIVALENCE (QMOL,TLM(4)), (TMOL,TEPM(5)), (GMOL,TLM(6)), (PERMOL,T										CASPAR	30
+EXM(7)), (SLOJ,DONL)						CASPAR	31					
C****											CASPAR	32
C****											CHNDAT	2
C****	COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA										CHNDAT	3
	DIMENSION S(1),CURE(1),IS(1),=PYTM(15,20),OIL(8),XLIQ(11,20,2)										CHNDAT	4
	INTEGER SMELP										CHNDAT	5
	COMMON										CHNDAT	6
	TCOOL(75,2),RLOG(22,20),UU(3)										CHNDAT	7
	UVAP(75)										CHNDAT	8
+AFLOW(75)	,US(4,55)	,HCAPS(4,55)	,USAVE1(4,55,2)	,USAVE2(75,2)		CHNDAT	9					
+USAVE3(15,2,2)	,USAVE4(75,2)	,POW(16,20)	,VOLUME(15,20)	,HCAPF(15,20)		CHNDAT	10					
+TEMPER(15,20,2)	,TSINK(4,55,2)	,VOIDV(20)	,VPLEN	,PPLEN(2)		CHNDAT	11					
+RPLEN(2)	,u(75,2)		,RHUG(75,2)	,VJLG(2)		CHNDAT	12					
+VJLF(2)	,GT0	,GT1	,GT2	,GT3	,GASBU(2,2)	CHNDAT	13					
+GASBU(2,2)	,FUELB(2)	,FUELB(2)	,FANN(75)	,P(75,2)	,RHUG(75,2)	CHNDAT	14					
+KHOF(75,2)	,WF(75)	,WC(75)	,NOPINS	,MAXIAL	,NGCORE	CHNDAT	15					
+NFCORE	,NTOP(75)	,NTYPE(15,20)		,IGAS(2)	,NPLEN	CHNDAT	16					
+IFUEL(2)	,I3OIL(2)	,IGASU(2,2)	,IGASU(2,2)	,IFUELU(2)	,IFUELU(2)	CHNDAT	17					
+I3OIL3(2,2)	,I3OILU(2,2)	,N3OIL(2)	,NGAS(2)	,RLU	,RLV	CHNDAT	18					
COMMON						CHNDAT	19					
+GLC	,CLV	,CVC	,CVV	,BASICT(5)	,CONJOU(50)	CHNDAT	20					
+2)	,IPAIF1	,CGAPA	,CGAPB	,CGAPC	,CGAPJ	CHNDAT	21					
+ST1(60,2)	,TSMF(30)	,ST2(30)	,DENSEE	,DENSEL(2)	,TMAGIC	CHNDAT	22					
+TSAT	,AMOLE	,MAXF	,MAXL	,MAXV	,PSAT	CHNDAT	23					
+RLIU	,RLQF	,PTRY	,PVOID	,IFUELS	,JFUELS	CHNDAT	24					
+TGASS	,TSUPR	,IFUELS	,TMELTH	,TMELTL	,GAMMA	CHNDAT	25					
+PINTM(20,2)	,GAPR(20)	,GAPRE	,CLVC	,DOPCE(20,2)		CHNDAT	26					
+BASEN4	,JOPPW	,KBASEC	,SFC2(2)	,HFUSEE	,UKNA(2,2)	CHNDAT	27					
+WALTAR(75)	,PARTAY(20)	,IGAP				CHNDAT	28					
COMMON						CHNDAT	29					
+RLV2	,CLV2	,CVV2	,HAXL1	,HAXL2	,CGAPB2	CHNDAT	30					
+CLAUK	,CAPS(75)	,TSIRUK(75,2)	,USTL(75)	,USTV(75)	,USAVEO(75,2)	CHNDAT	31					
+CLLIU(15)	,CLIT(15)	,CVAP(15)	,CVAPT(15)	,HLLP(75)	,SMELP(75)	CHNDAT	32					
+RHOUN4(75,2)	,TW(11)	,UOLU(75)	,ICILL	,JILL	,BUJ(25,4)	CHNDAT	33					
+CUPERQ(3,20)	,FORQ(3,20)	,YEHYEH(11,20)	,SPU4	,IOUT(200)		CHNDAT	34					
COMMON						CHNDAT	35					
	IBAX,ITAX,LUF,LOWH,LUPS,LOWNC,DUP,DOWN,JUPJ,DOWNJ,										CHNDAT	36

+ ALFA(20,2),XMH(20,2),V(20,2),AREAH(20,2),AREAX(20,2),OHDP(20,2),	CHNDAT	35
+ PIN(20,2),AAA(20,2),CENTPY(20,2),QMASS(20),QHEAT(20),DLIQIN(20),	CHNDAT	36
+ GASIN(20),TBAR(20),VVELT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2,	CHNDAT	37
+ NINPIN	CHNDAT	38
EQUIVALENCE (ULIQ(1),VFUELS),(ULIQ(7),ORIFIC),(UVAP(1),RHOSQF),	CHNDAT	39
+ (G(7,1),FQSOHR),(G(7,2),IZOP),(MTYPE(1,1),EPYTM(1,1)),(DOPCOL(1,	CHNDAT	40
+ 2),DOPPU),(DOPCOL(2,2),DOPDEL),(DOPCOL(3,2),OIL),(UVAP(7),GTOL)	CHNDAT	41
+, (USTL,IZAP),(USTV,IZUP),(CGMPA,LAXIAL),(XLIQ,USAVE3)	CHNDAT	42
+, (SCORE,IS,TCOOL),(SCOTT,IFUELS)	CHNDAT	43
EQUIVALENCE (TW(1),SKEW),(TW(2),RHORAT),(TW(3),DETAIL)	CHNDAT	44
EQUIVALENCE (TW(4),PEEL),(TW(5),PSTART),(TW(6),TREAT)	CHNDAT	45
EQUIVALENCE (TW(7),FRACTN),(TW(8),SPREAD),(TW(9),VORIG)	CHNDAT	46
EQUIVALENCE (TW(10),AREA),(TW(11),FRICT)	CHNDAT	47
C****	CHNDAT	48
COMMON ITS(400),ITF(400),ITC(75)	TPUT	5
NAMELIST/SPECIF/ITS,ITF,ITC	TPUT	6
READ (5,SPECIF)	TPUT	7
IKC=0	TPUT	8
JAKE=0	TPUT	9
IF (ITF(1).NE.400) GO TO 180	TPUT	10
IKC=1	TPUT	11
L=1	TPUT	12
DO 120 I=NBCORE,NTCORE	TPUT	13
ITF(2*L-1)=1	TPUT	14
ITF(2*L)=1-1	TPUT	15
120 L=L+1	TPUT	16
ITF(2*L-1)=0	TPUT	17
ITF(2*L)=0	TPUT	18
L=L+1	TPUT	19
K=NTOP(NBCORE)-3	TPUT	20
DO 140 I=NBCORE,NTCORE	TPUT	21
ITF(2*L-1)=K	TPUT	22
ITF(2*L)=1-1	TPUT	23
140 L=L+1	TPUT	24
ITF(2*L-1)=0	TPUT	25
ITF(2*L)=0	TPUT	26
L=L+1	TPUT	27
K=NTOP(NBCORE)-1	TPUT	28
DO 160 I=NBCORE,NTCORE	TPUT	29
ITF(2*L-1)=K	TPUT	30
ITF(2*L)=1-1	TPUT	31
160 L=L+1	TPUT	32
ITF(2*L-1)=-10	TPUT	33
180 IF (ITC(1).NE.400) GO TO 220	TPUT	34
L=1	TPUT	35
JAKE=1	TPUT	36
DO 200 I=NBCORE,NTCORE	TPUT	37
200 ITC(1)=I-1	TPUT	38
ITC(NTCORE)=-10	TPUT	39
220 CONTINUE	TPUT	40
J1=0	TPUT	41
J2=0	TPUT	42
J3=0	TPUT	43
IF (ITS(1)-100) 320,240,240	TPUT	44
240 ISUM=0	TPUT	45
DO 300 I=2,NAXIAL	TPUT	46
IF (I-NBCORE) 280,300,260	TPUT	47
260 IF (I-NTCORE) 300,300,280	TPUT	48
280 ISUM=ISUM+NTOP(I)	TPUT	49
300 CONTINUE	TPUT	50
ICUT(1)=ISUM	TPUT	51
ICUT(4)=1000	TPUT	52
N1=0	TPUT	53
GO TO 400	TPUT	54
320 DO 420 I=1,200	TPUT	55
IF (ITS(2*I-1)) 440,380,340	TPUT	56
340 IF (ITS(2*I)-NBCORE-1) 360,360,400	TPUT	57

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300 IOUT(I+5)=4*ITS(2*I)+ITS(2*I-1)
   GO TO 420
380 IF (I.EQ.1) GO TO 440
   IOUT(I+5)=0
   J1=J1+1
   GO TO 420
400 IOUT(I+5)=4*(ITS(2*I)-(NTCORE-NBCORE+1))+ITS(2*I-1)
420 CONTINUE
   I=201
440 IOUT(1)=I-1
   IOUT(4)=IOUT(1)
   N1=I+5
460 IF (ITF(1)-100) 520,480,480
480 ISUM=J
   DO 500 I=NBCORE,NTCORE
500 ISUM=ISUM+NTOP(I)
   IOUT(2)=ISUM
   IOUT(5)=1000
   NN=N1
   GO TO 600
520 DO 560 I=1,200
   IF (ITF(2*I-1)) 580,540,560
540 IF (I.EQ.1) GO TO 580
   ITF(2*I)=NBCORE-1
   J2=J2+1
560 IOUT(I+N1)=ITF(2*I-1)+15*(ITF(2*I)-NBCORE+1)
   I=201
580 IOUT(2)=I-1
   IOUT(5)=IOUT(2)
   NN=N1+I-1
600 IF (ITL(1)-100) 640,620,620
620 IOUT(3)=NAXIAL-1
   IOUT(6)=1000
   GO TO 740
640 DO 700 I=1,70
   IF (ITC(I)) 720,660,680
660 IF (I.EQ.1) GO TO 720
   IOUT(I+NN)=80
   J3=J3+1
   GO TO 700
680 IOUT(I+NN)=ITC(I)+1
700 CONTINUE
   I=70
720 IOUT(3)=I-1
   IOUT(6)=IOUT(3)
740 CONTINUE
   DO 760 I=1,3
   IF (IOUT(I).NE.C) IOUT(I)=IOUT(I)+1
760 CONTINUE
   RETURN
   END

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TPUT 58
TPUT 59
TPUT 60
TPUT 61
TPUT 62
TPUT 63
TPUT 64
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TPUT 102
TPUT 103
TPUT 104
TPUT 105
TPUT 106
TPUT 107
TPUT 108

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SUBROUTINE IN (I,A,IWA,IB,JB)	IN	2
CGET IB WORDS WITH A BUFFER SIZE JB	IN	3
EXTERNAL JOLLY	IN	4
DIMENSION A(2)	IN	5
COMMON/FIT/FIT(385)	IN	6
NOREAD=IB/JB	IN	7
IF (IB.GT.NOREAD*JB) GO TO 120	IN	8
L=JB	IN	9
GO TO 140	IN	10
120 L=IB-NOREAD*JB	IN	11
NOREAD=NOREAD+1	IN	12
140 J=1	IN	13
DO 160 K=1,NOREAD	IN	14
CALL GET (FIT(I),A(J),IWA,J,0,10*L,JOLLY)	IN	15
IWA=IWA+L	IN	16
J=J+L	IN	17
160 L=JB	IN	18
RETURN	IN	19
END	IN	20


```

SUBROUTINE OUT (I,A,IWA,IB,JB)
C PUT IB WORDS WITH A BUFFER SIZE OF JB
EXTERNAL JOLLY
DIMENSION A(2)
COMMON/FIT/FIT(385)
NOREAD=IB/JB
IF (IB.GT.NOREAD*JB) GO TO 12J
L=JB
GO TO 140
120 L=IB-NOREAD*JB
NOREAD=NOREAD+1
140 J=1
DO 160 K=1,NOREAD
CALL PUT (FIT(I),A(J),10*L,IWA,C,0,JOLLY)
IWA=IWA+L
J=J+L
160 L=JB
RETURN
END

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OUT      2
OUT      3
OUT      4
OUT      5
OUT      6
OUT      7
OUT      8
OUT      9
OUT     10
OUT     11
OUT     12
OUT     13
OUT     14
OUT     15
OUT     16
OUT     17
OUT     18
OUT     19
OUT     20

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SUBROUTINE PRE
C****
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS
DIMENSION SLOJ(1)
REAL KINSRT,KWTHOR
LOGICAL PRINT,DUNE,SCRAM
COMMON
DUNL,ISTAT,IAN,SLOJ(3),
+IBLOCK,H(2),T(2),HKEGO,ICHAN,VOLUK(2),CASPAR
+DUPPK(2),COLAPK(2),NCH,IOLQ,NOUT,TERKOR,CASPAR
+GLROR,PEXJ(3),PERROR,PRINT,DELTIM,PN(2),CASPAR
+PHOTT(3,2),IACTIV(2),FLOW(3,2),TOUT(3,2),TOPEN(3),WOLF(3),CASPAR
+LOOP(20),IOJTL,NTRAT,IKINET,TOUT,HMAX,CASPAR
+TIMEIN(50),KIN(50),TIMEOUT(50),OKOUT(50),IPAIR2,AY(2),CASPAR
+IPAIR3,KOUNT,RH(2),BO100,RHOSHZ,NGROUP,CASPAR
+G(6,2),ALIFE,ALPH(6),GAY(6),B(6),AL(6),CASPAR
+B3,SCRAM,TSCRAM(2),PERIOD,RSDPE,ERROR,CASPAR
+KINSRT(2),KWTHOR(2),REDUCE,PRINT1,PRINT2,RMIN,CASPAR
COMMON
+ALUM,TQUIT,LETP,JSTEP,ANLU,TGS,CASPAR
+IFLOT,KRUR1,TERM(13),TITLE(8),HUTPIM,SPCB,CASPAR
+SPCG,SPCD,LINESL,KSTEP,NCHAN,MSLP,CASPAR
+IPRINT,IFRINT,IJUMP,QGEN(2),ANI,ANSURM,CASPAR
+TDELAY,LOOPJ,RHODE(3),VULTOP(3),HEAD(3),PRESTM(1),CASPAR
+PRESUR(50,3),IPARK,PD(3),KUNTIM,VER,ETAU(4),CASPAR
+KULOCK,JBLOCK,MBLOCK,N12,N13,EXTRA,CASPAR
+GJACK(3),JACK(2),ITRGA,CASPAR
+HMIN,V22,NIN,INPUT,N2,N4,CASPAR
+N7,V8,KPRINT,POWSS,HMAX3,HMAXF,CASPAR
+TRIPFW(3),TRIPPP(3),TRIPPF(3),TRIPOT(3),DELAY,CASPAR
EQUIVALENCE (QMOL,TERM(4)),(TMOL,TERM(5)),(UMOL,TERM(6)),(PERMUL,T
+ERM(7)),(SLOJ,DUNE)
C****
C****
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA
DIMENSION S(1),CORE(1),IS(1),PYTM(15,20),OIL(8),XLIQ(11,20,2)
INTEGER SMELP
COMMON
TCOOL(75,2),RLOG(22,2),UU(3),ULIQ(7),CHNDAT
+UVAP(75),ULX(75),CHNDAT
+AFLOW(75),US(4,55),HCAPS(4,55),USAVE1(4,55,2),DSAVE2(75,2),CHNDAT
+USAVE3(15,2,2),DSAVE4(75,2),POW(16,20),VOLUME(15,20),HCAPF(15,20),CHNDAT
+TEMPER(15,20,2),TSINK(4,55,2),VOLUV(20),VPLEN,VPLEN(2),CHNDAT
+RFLEN(2),G(7,2),RHOG(75,2),VOLG(2),CHNDAT
+VOLF(2),GT0,GT1,GT2,GT3,GASBO(2,2),CHNDAT
+GASBU(2,2),FUELB(2),FUELB(2),FANN(75),P(75,2),RHOG(75,2),CHNDAT
+RHOF(75,2),WF(75),WC(75),NUPINS,NAXIAL,N3CORE,CHNDAT
+NICORE,VTOP(75),ITYPL(15,20),IGAS(2),N3PLEN,CHNDAT
+IFUEL(2),ISU(2),IGASD(2,2),IGASU(2,2),IFUELU(2),IFUELU(2),CHNDAT
+ISU(2,2),ISU(2,2),N3OIL(2),NGAS(2),RLC,RLV,CHNDAT
COMMON
+CLC,CLV,CVC,CVV,BASIT(5),CONJUL(5),CHNDAT
+2),IPALM1,CAPM,CAPB,CAPC,CAPD,STEMP(6),CHNDAT
+ST1(6,2),TEMP(3),ST2(30),ULNSEE,JENSE(2),TMAGIC,CHNDAT
+TSAT,MHOLE,HAXF,HAXL,HAXV,PSAT,CHNDAT
+RLIQ,RLQF,PTRY,PVOID,IFULLS,JFULLS,CHNDAT
+TGASS,TSUPER,TFUELS,TMELTH,TMELT,GMMA,CHNDAT
+PNTLY(20,2),GAPR(20),GAPR,CLVC,DUPCUE(20,2),CHNDAT
+BASLN4,DUPFW,KASLC,SFG2(2),HFUSEE,JKNA(20,2),CHNDAT
+WALTAR(75),PARTAN(20),IGAP,CHNDAT
COMMON
+KUELS,SFG3(13),HI(7),CLWKT,CHNDAT
+RLV2,CLV2,CVV2,HAXL1,HAXL2,CAP32,CHNDAT
+CLWKT,CAPS(75),STRUK(75,2),USTL(75),USIV(75),DSAVE(75,2),CHNDAT
+CLIQ(15),CLIT(15),CVAP(10),CVAPT(10),HLLF(75),SMELP(75),CHNDAT
+RHONA(75,2),TH(11),UDLU(75),IBALL,JBALL,BJX(2,4),CHNDAT
+CCPERC(3,20),POW(3,20),YFHYLH(11,20),SPC4,IOUT(250),CHNDAT
COMMON
+IAX,IAX,LUP,LWN,LUP,LWN,DUP,DUN,DUP,DUN,DUN,
+ALFA(20,2),RHOF(20,2),V(20,2),ARAH(20,2),ARAX(20,2),DHUP(20,2),CHNDAT

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+ FIN(20,2),AAA(20,2),ENTPY(20,2),QMASS(20),QHEAT(20),OLIQIN(20),	CHNDAT	30
+ GASIN(20),TBAR(20),VELT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2,	CHNDAT	37
+ NINPIN	CHNDAT	38
EQUIVALENCE (ULIQ(1),VFUELS),(ULIQ(75),ORIFIC),(UVAP(1),RHOSQF),	CHNDAT	39
+ (G(75,1),FQSDHR),(G(75,2),IZOP),(NTYPE(1,1),EPTYM(1,1)),(DOPCOE(1,	CHNDAT	40
+ 2),DOFFO),(DOPCOE(2,2),DOPDEL),(DOPCOE(3,2),OIL),(UVAP(75),GTOL)	CHNDAT	41
+,(USTL,IZAF),(USTV,IZUP),(CGAPA,LAXIAL),(XLIQ,OSAVE3)	CHNDAT	42
+,(IS,CORE,IS,TCOOL),(SCOTT,IFUELS)	CHNDAT	43
EQUIVALENCE (TW(1),SKEW), (TW(2),RHORAT),(TW(3),DETAIL)	CHNDAT	44
EQUIVALENCE (TW(4),PEEL), (TW(5),PSTART),(TW(5),TREAT)	CHNDAT	45
EQUIVALENCE (TW(7),FALTN),(TW(8),SPREAD),(TW(9),VORIG)	CHNDAT	46
EQUIVALENCE (TW(10),AREA), (TW(11),FRICT)	CHNDAT	47
C****	CHNDAT	48
DIMENSION AXPFF(20),RAJPF(15)	PRE	5
NAMELIST/PIINPUT/AXPF,RAJPF,POWC,POWE,POWF	PRE	6
READ (5,PIINFJT)	PRE	7
NBCORE=NTOCORE-NBCORE+1	PRE	8
SUM=0.0	PRE	9
DO 120 I=1,NBCORE-N	PRE	10
120 SUM=SUM+AXPF(I)	PRE	11
SUM=.5E+6/(7.*SUM*DELX(NBCORE))	PRE	12
DO 140 I=1,NBCORE-N	PRE	13
140 AXPFF(I)=AXPF(I)*SUM	PRE	14
N=NTUP(NBCORE)+1	PRE	15
DO 160 I=1,NBCORE-N	PRE	16
POW(N,I)=POWC*AXPF(I)	PRE	17
160 POW(N-2,I)=POWE*AXPF(I)	PRE	18
N=N-2	PRE	19
DO 220 I=1,NBCORE-N	PRE	20
SUM=0.0	PRE	21
DO 180 J=1,N	PRE	22
K=1+MOD(MTYPE(J,I)-1,2)	PRE	23
180 SUM=SUM+VOLUME(J,I)*DENSE(K)*RAJPF(J)	PRE	24
SUM=POWF/SUM	PRE	25
DO 200 J=1,N	PRE	26
K=1+MOD(MTYPE(J,I)-1,2)	PRE	27
200 POW(J,I)=VOLUME(J,I)*DENSE(K)*SUM*AXPF(I)*RAJPF(J)	PRE	28
220 CONTINUE	PRE	29
END	PRE	30

	SUBROUTINE TRHGAP (I,GAPR,TFBAR,TCBAR,TGAP,PGAS)	TRHGAP	2
C	SUBROUTINE TRHGAP CALCULATES THE TRANSIENT FUEL-CLADDING GAP	TRHGAP	3
C	CONDUCTANCE WHICH IS DEPENDENT ON THE EFFECTIVE HOT GAP WIDTH,	TRHGAP	4
C	AVERAGE GAS THERMAL CONDUCTIVITY, AND FUEL-CLADDING CONTACT PRESS	TRHGAP	5
	DIMENSION GAPR(20)	TRHGAP	6
	COMMON/TRGAP/DJUMP(20),KF01(20),FMOL(5),ACON(5,3),CLADJCR,CLADJCR,	TRHGAP	7
	+POISSN,ALFAF1,ALFAF2,ALFAC1,ALFAC2,YMODF1,YMODF2,YMODC1,YMODC2	TRHGAP	8
	+NTGAP	TRHGAP	9
	HS=0.	TRHGAP	10
	TGAPC=TGAP-273.16	TRHGAP	11
	TFBARC=TFBAR-273.16	TRHGAP	12
	TCBARC=TCBAR-273.16	TRHGAP	13
	ALPHA1=ALFAF1+ALFAF2*TFBARC	TRHGAP	14
	ALPHA2=ALFAC1+ALFAC2*TCBARC	TRHGAP	15
	TERM=1.+ALPHA2*(TCBARC-20.)	TRHGAP	16
	RGO=CLADJCR*TERM	TRHGAP	17
	RGI=CLADJCR*TERM	TRHGAP	18
C	CALCULATE THERMAL CONDUCTIVITY OF FISSION GAS MIXTURE-BROKAW'S EQU	TRHGAP	19
C	FMOL(1)-(5) MOLE FRACTIONS OF HELIUM,XENON,KRIPION,NITROGEN,ARGON	TRHGAP	20
	KK=0.	TRHGAP	21
	XUVK=0.	TRHGAP	22
	DO 120 J=1,5	TRHGAP	23
	U=ACON(J,1)+ACON(J,2)*TGAPC+ACON(J,3)*TGAPC*TGAPC	TRHGAP	24
	KK=KK+U*FMOL(J)	TRHGAP	25
	XUVK=XUVK+FMOL(J)/C	TRHGAP	26
120	CONTINUE	TRHGAP	27
	GASCON=.5*KK+.5/XUVK	TRHGAP	28
	IF (KF01(1).NE.0.) GO TO 140	TRHGAP	29
C	INITIALIZE TRANSIENT GAP CONDUCTANCE MODEL TO GIVE SAME VALUES OF	TRHGAP	30
C	GAP CONDUCTANCE AS CALCULATED BY SIX	TRHGAP	31
	GAPR(I)=GAPR(I)/(3.14159*RGI)	TRHGAP	32
	GAP=GASCON/GAPR(I)-DJUMP(I)	TRHGAP	33
	IF (GAP.LT.0.) HS=GAPR(I)-GASCON/DJUMP(I)	TRHGAP	34
C	CALCULATE RADIUS OF FUEL AT ROOM TEMPERATURE	TRHGAP	35
	RFO=RGI-GAP	TRHGAP	36
	RF01(1)=KF01/(1.+ALPHA1*(TFBARC-20.))	TRHGAP	37
	GO TO 220	TRHGAP	38
140	CONTINUE	TRHGAP	39
C	CALCULATE TRANSIENT FUEL-CLADDING GAP CONDUCTANCE	TRHGAP	40
	RFO=RFO1(1)*(1.+ALPHA1*(TFBARC-20.))	TRHGAP	41
	GAP=RFO-RFO	TRHGAP	42
	IF (GAP.LT.0.) GO TO 160	TRHGAP	43
C	CONDUCTANCE FOR OPEN GAP	TRHGAP	44
	GAPR(I)=GASCON/(DJUMP(I)+GAP)	TRHGAP	45
	GO TO 220	TRHGAP	46
160	CONTINUE	TRHGAP	47
C	CALCULATE CONTACT PRESSURE BETWEEN FUEL AND CLADDING	TRHGAP	48
	YMODF=YMODF1+YMODF2*TFBARC	TRHGAP	49
	YMODC=YMODC1+YMODC2*TCBARC	TRHGAP	50
	RCSQ=RGO*RGO	TRHGAP	51
	RGISQ=RGI*RGI	TRHGAP	52
	RCSQ1=RCSQ+RGISQ	TRHGAP	53
	RCSQ2=RCSQ-RGISQ	TRHGAP	54
	TERM=YMODC/RGI/(RCSQ1/RCSQ2+POISSN+YMODC/YMODF*(1.-POISSN))	TRHGAP	55
C	YIELD STRENGTH FOR 316 STAINLESS STEEL CLADDING (PSI)	TRHGAP	56
	TCBARF=TCBAR*1.5+32.	TRHGAP	57
	IF (TCBARF.GT.1500.) GO TO 180	TRHGAP	58
	YIELD=90000.-20.*TCBARF	TRHGAP	59
	GO TO 200	TRHGAP	60
180	YIELD=158000.-85.*TCBARF	TRHGAP	61
200	CONTINUE	TRHGAP	62
	PGAP=(PGAS-GAP*TERM)/08947.	TRHGAP	63
	PMAX=YIELD/RCSQ2/RCSQ1	TRHGAP	64
	IF (PGAP.GT.PMAX) PGAP=PMAX	TRHGAP	65
C	CONDUCTANCE FOR CLOSED GAP	TRHGAP	66

```

HS=7000.*PGAP/YIELD
IF (HS.GT.1000.) HS=1000.
HS=HS/1761.8
GAPR(I)=GASCON/DJUMP(I)*HS
220 CONTINUE
GAPK(I)=GAPR(I)*3.14159*RCI
RETURN
END

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TRHGAP 67
TRHGAP 68
TRHGAP 69
TRHGAP 70
TRHGAP 71
TRHGAP 72
TRHGAP 73
TRHGAP 74

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SUBROUTINE HEDD (IPG)
C****
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS
      DIMENSION SLOJ(1)
      REAL KINSRT,KWTHDR
      LOGICAL PRINT,DONE,SGRAM
      COMMON
        DONE,ISTAT,IIN,SLOJ(3),
        *IJLOCK,M(2),T(2),HRED,ICHAN,VJLOCK(2),
        *JOPPK(2),COLAPK(2),NEW,IOLD,NOUT,TERROR,CASPAR
        *GERROR,PEXIT(3),PERROP,PRINT,DELTIM,PN(2),
        *PBOTT(3,2),IACTIV(20),FLOW(3,2),TGPT(3,2),TOPV(3),WOLF(3),
        *LOOP(20),IOUTL,NTRAT,IKINET,TOUT,HMAX,CASPAR
        *TIMEIN(50),DKIV(50),TIMOUT(50),DKOUT(50),IPAIR2,AV(2),
        *IPAIR3,KCOUNT,KH(2),BBOUO,RHOSHZ,NKROUP,CASPAR
        *C(6,2),ALIFE,ALPH(6),GAM(6),B(6),AL(6),
        *BB,SGRAM,TSGRAM(2),PERIOD,KSLOPE,ERROR,CASPAR
        *KINSRT(2),KWTHDR(2),REDUCE,PRINT1,PRINT2,RYIN,
      COMMON
        *ANLOW,TQUIT,LSTLF,JSTEP,ANIC,TGGS,
        *IPLUT,ERROR1,TERM(13),TITLE(8),HUTPIM,SPGB,
        *SPGC,SPGU,LINSL,KSTEP,NCHAN,MSTEP,CASPAR
        *IPRINT,MPRINT,IOMF,QGEN(2),ANI,ANSGRM,
        *TDELAY,NLUPFS,RHODE(3),VCLTOP(3),HCLD(3),PRST(5),
        *PRESUR(50,3),IPAIR,PJ(3),RUNTIM,VER,EIAD(4),
        *KJLOCK,JBLOCK,MBLOCK,N12,N13,EXTRA,CASPAR
        *GJACK(3),VJACK(2),ITRGAP,
        *HMIN,V22,NIN,INPUT,N2,N+,
        *N,N8,KPRINT,PCWSS,HMAX3,HMAXF,
        *TRIPFW(3),TRIPPP(3),TRIPPF(3),TRIPOT(3),DELAYF,
        EQUIVALENCE (QMOL,TERM(4)),(TMOL,TERM(5)),(GMOL,TERM(6)),(PERMOL,TERM(7)),(CLOJ,DONE)
C****
      DIMENSION PGID(2,30)
      DATA IPGNO /C/
      DATA PGID(1,1),PGID(2,1)/10HSTACK,10H,
      DATA PGID(1,2),PGID(2,2)/10HCONTROLS,10H,
      DATA PGID(1,3),PGID(2,3)/10HNEUTRONICS,10H,
      DATA PGID(1,4),PGID(2,4)/10HFLOW LOOP,10HINFO,
      DATA PGID(1,5),PGID(2,5)/10HSEACH MODI,10HIFICATIONS,
      DATA PGID(1,6),PGID(2,6)/10HRUN PRINTO,10HUT,
      DATA PGID(1,7),PGID(2,7)/10HMOLTEN FUE,10HHL INFO,
      DATA PGID(1,8),PGID(2,8)/10HREACTIVITI,10HES,
      DATA PGID(1,9),PGID(2,9)/10HIFO VELOCI,10HTIES,
      DATA PGID(1,10),PGID(2,10)/10HBELOW CORE,10H P,
      DATA PGID(1,11),PGID(2,11)/10HIN CORE P,10H,
      DATA PGID(1,12),PGID(2,12)/10HABOVE CORE,10H P,
      DATA PGID(1,13),PGID(2,13)/10HFUEL SQUIR,10HTINJ,
      DATA PGID(1,14),PGID(2,14)/10HTCOOL BELO,10HHCORE,
      DATA PGID(1,15),PGID(2,15)/10HTCOOL IN C,10HCORE,
      DATA PGID(1,16),PGID(2,16)/10HTCOOL ABOVE,10HHCORE,
      DATA PGID(1,17),PGID(2,17)/10HTCOOL,10H,
      DATA PGID(1,18),PGID(2,18)/10HRADIAL COR,10HE T,
      DATA PGID(1,19),PGID(2,19)/10HCORE T,10H,
      DATA PGID(1,20),PGID(2,20)/10HTPIN BLOW,10HCORE,
      DATA PGID(1,21),PGID(2,21)/10HTPIN ABOVE,10HCORE,
      DATA PGID(1,22),PGID(2,22)/10HNON CORE P,10HIN T,
      DATA PGID(1,23),PGID(2,23)/10HFISSION GA,10HHS,
      DATA PGID(1,24),PGID(2,24)/10HREACTIVITI,10HES,
      DATA PGID(1,25),PGID(2,25)/10HNEW FUEL W,10HRTHS,
      DATA PGID(1,26),PGID(2,26)/10HFAIL FUEL,10HENTHALPIES,
      IPGNO=IPGNO+1
      IF (IPG.LT.7.OR.IPG.GT.22.OR.IPG.EQ.12) GO TO 120
      W=ITE (NOUT,140) PGID(1,IPG+1),PGID(2,IPG+1),ICHAN,ETHD(1),IPGNO,T
      *ITL,ETHD(2)
      RE TURN

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120	CONTINUE	HEAD	37
	WRITE (NOUT,160) PGID(1,IPG+1),PGID(2,IPG+1),ETA0(1),IPGNO,TITLE,c	HEAD	38
	+TAD(2)	HEAD	39
	RETURN	HEAD	40
C		HEAD	41
140	FORMAT (1H1,2A10,"CH"12,96X,A10/" PAGE"14,12X,8A10,20X,A10)	HEAD	42
160	FORMAT (1H1,2A10,10JX,A10/" PAGE"14,12X,8A10,20X,A10)	HEAD	43
	END	HEAD	44

SUBROUTINE NLEACH (NI)	NLEACH	2
COMMON SKIP(103:2), ZILCH(743)	NLEACH	3
DIMENSION CH(10), CW(100), FH(100), FW(100), GAPU(20)	NLEACH	4
EQUIVALENCE (ZILCH(1), CH), (ZILCH(101), CW)	NLEACH	5
EQUIVALENCE (ZILCH(201), FH), (ZILCH(301), FW)	NLEACH	6
EQUIVALENCE (ZILCH(401), DOPPW), (ZILCH(402), DOPPD)	NLEACH	7
EQUIVALENCE (ZILCH(403), RBASEC), (ZILCH(404), SKEW)	NLEACH	8
EQUIVALENCE (ZILCH(707), AHOLE), (ZILCH(708), PVOID)	NLEACH	9
EQUIVALENCE (ZILCH(709), GAMMA), (ZILCH(710), PLENP)	NLEACH	10
EQUIVALENCE (ZILCH(711), AUN), (ZILCH(712), BUN)	NLEACH	11
EQUIVALENCE (ZILCH(715), AEA), (ZILCH(716), BEA)	NLEACH	12
EQUIVALENCE (ZILCH(717), AS), (ZILCH(718), BS)	NLEACH	13
EQUIVALENCE (ZILCH(723), N3PLEN), (ZILCH(719), TFUELS)	NLEACH	14
EQUIVALENCE (ZILCH(721), ORIFIC), (ZILCH(722), GTOL)	NLEACH	15
EQUIVALENCE (ZILCH(723), KFUELS), (ZILCH(724), GAPU)	NLEACH	16
EQUIVALENCE (ZILCH(702), IFUELS), (ZILCH(703), JFUELS)	NLEACH	17
EQUIVALENCE (ZILCH(405), RHORAT), (ZILCH(406), DETAIL)	NLEACH	18
EQUIVALENCE (ZILCH(407), PEEL), (ZILCH(408), PSTART)	NLEACH	19
EQUIVALENCE (ZILCH(409), TREAT), (ZILCH(410), FRACTN)	NLEACH	20
EQUIVALENCE (ZILCH(411), SPREAD), (ZILCH(412), VORIG)	NLEACH	21
EQUIVALENCE (ZILCH(413), AREA), (ZILCH(414), FRICT)	NLEACH	22
EQUIVALENCE (ZILCH(701), SCOTT), (ZILCH(13), TGASS)	NLEACH	23
NAMELIST/EACH/ CH, CW, FH, FW, RBASEC, FILM, GAMMA, PLENP, IFUELS, JFUELS,	NLEACH	24
* TFUELS, PVOID, FRACTN, ORIFIC, GTOL, DOPPW, DOPPD, KFUELS,	NLEACH	25
* SKEW, RHORAT, DETAIL, PEEL, PSTART, TREAT, VORIG, AREA,	NLEACH	26
* FRICT, SCOTT, AUN, BUN, AEA, BEA, AS, BS, SPREAD, GAPU,	NLEACH	27
* TGASS, AHOLE, N3PLEN	NLEACH	28
DO 120 I=1, 743	NLEACH	29
ZILCH(I)=-100.	NLEACH	30
120 CONTINUE	NLEACH	31
READ (NIN, EACH)	NLEACH	32
RETURN	NLEACH	33
END	NLEACH	34


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SUBROUTINE CHAR
REAL INTERP
CHAR 2
CHAR 3
C**** CASPAR 2
C**** CASPAR 3
COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS
CASPAR 4
DIMENSION SLOB(1)
CASPAR 5
REAL KINSKT,KWTHDR
CASPAR 6
LOGICAL PRINT,DONE,GRAM
CASPAR 7
COMMON
CASPAR 8
DUNE,ISTAT
CASPAR 9
,IIN
CASPAR 10
,SLOA(3)
CASPAR 11
,VUIOK(2)
CASPAR 12
,ICHAN
CASPAR 13
,TERROR
CASPAR 14
,NOUT
CASPAR 15
,PN(2)
CASPAR 16
,DELTIM
CASPAR 17
,WJLF(3)
CASPAR 18
,HMAX
CASPAR 19
,AN(2)
CASPAR 20
,IPAIR2
CASPAR 21
,RH(2)
CASPAR 22
,RH0100
CASPAR 23
,RH05WZ
CASPAR 24
,NGROUP
CASPAR 25
,AL(6)
CASPAR 26
,B(6)
CASPAR 27
,AL(6)
CASPAR 28
,RSLUP
CASPAR 29
,ERROR
CASPAR 30
,RMIN
CASPAR 31
,PKINT1
CASPAR 32
,PRINT2
CASPAR 33
,RMIN
CASPAR 34
,QUIT
CASPAR 35
,LISTP
CASPAR 36
,JSTEP
CASPAR 37
,ANIC
CASPAR 38
,TAGS
CASPAR 39
,SPUR1
CASPAR 40
,TCRM(13)
CASPAR 41
,TITLE(8)
CASPAR 42
,HOTPIH
CASPAR 43
,SPCG
CASPAR 44
,LINSL
CASPAR 45
,KSTEP
CASPAR 46
,NCHAN
CASPAR 47
,MSTEP
CASPAR 48
,MPRINT
CASPAR 49
,IDUMP
CASPAR 50
,QGEN(2)
CASPAR 51
,ANI
CASPAR 52
,ANSCHM
CASPAR 53
,NLOOPS
CASPAR 54
,RHOCE(3)
CASPAR 55
,VOLTOP(3)
CASPAR 56
,HEAD(3)
CASPAR 57
,PRESHM(50)
CASPAR 58
,IPAIR4
CASPAR 59
,FU(3)
CASPAR 60
,RUNTIM
CASPAR 61
,VER
CASPAR 62
,ETAD(4)
CASPAR 63
,JBLOCK
CASPAR 64
,MBLOCK
CASPAR 65
,N12
CASPAR 66
,N13
CASPAR 67
,EXTRA
CASPAR 68
,ITRGAP
CASPAR 69
,N22
CASPAR 70
,NIN
CASPAR 71
,INPUT
CASPAR 72
,N2
CASPAR 73
,N4
CASPAR 74
,N6
CASPAR 75
,KPRINT
CASPAR 76
,POWSS
CASPAR 77
,HMAX3
CASPAR 78
,HMAXF
CASPAR 79
,TRIPPF(3)
CASPAR 80
,TRIPOT(3)
CASPAR 81
,DELMYF
CASPAR 82
,QMOL,T,R,M(4)
CASPAR 83
,(TMOL,TERM(5))
CASPAR 84
,(GMOL,T,R,M(6))
CASPAR 85
,(PERMOL,T,R,M(7))
CASPAR 86
,(SLOB,DUNE)
CASPAR 87
C**** CASPAR 32
C**** CHNDAT 2
C**** CHNDAT 3
COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA
CHNDAT 4
DIMENSION S(1),CORE(1),IS(1),PYTH(15,20),OIL(8),XLIQ(11,20,2)
CHNDAT 5
INTEGER SMELP
CHNDAT 6
COMMON
CHNDAT 7
TCOOL(75,2),RLOG(22,20),UU(3)
CHNDAT 8
,ULIQ(75)
CHNDAT 9
,UVAP(75)
CHNDAT 10
,DELX(75)
CHNDAT 11
,US(4,55)
CHNDAT 12
,HCAPS(4,55)
CHNDAT 13
,OSAVE1(4,55,2)
CHNDAT 14
,OSAVE2(75,2)
CHNDAT 15
,OSAVE3(15,20,2)
CHNDAT 16
,OSAVE4(75,2)
CHNDAT 17
,POW(16,20)
CHNDAT 18
,VOLUME(15,20)
CHNDAT 19
,HCAPF(15,20)
CHNDAT 20
,TEMPER(15,20,2)
CHNDAT 21
,TSINK(4,55,2)
CHNDAT 22
,VOLDV(20)
CHNDAT 23
,VPLEN
CHNDAT 24
,PPLEN(2)
CHNDAT 25
,RPLEN(2)
CHNDAT 26
,G(75,2)
CHNDAT 27
,RHOG(75,2)
CHNDAT 28
,VOLG(2)
CHNDAT 29
,VOLF(2)
CHNDAT 30
,GT0
CHNDAT 31
,GT1
CHNDAT 32
,GT2
CHNDAT 33
,GT3
CHNDAT 34
,GASBU(2,2)
CHNDAT 35
,GASBU(2,2)
CHNDAT 36
,FUELB(2)
CHNDAT 37
,FUELB(2)
CHNDAT 38
,FANN(75)
CHNDAT 39
,P(75,2)
CHNDAT 40
,RHOG(75,2)
CHNDAT 41
,RHUF(75,2)
CHNDAT 42
,WF(75)
CHNDAT 43
,WC(75)
CHNDAT 44
,NGPINS
CHNDAT 45
,NAXIAL
CHNDAT 46
,N3CURL
CHNDAT 47
,NICORE
CHNDAT 48
,HTOP(75)
CHNDAT 49
,MTYPE(15,20)
CHNDAT 50
,IGAS(2)
CHNDAT 51
,N3PLEN
CHNDAT 52
,IFUEL(2)
CHNDAT 53
,IbOIL(2)
CHNDAT 54
,IGASU(2,2)
CHNDAT 55
,IGASU(2,2)
CHNDAT 56
,IFUELD(2)
CHNDAT 57
,IFUELU(2)
CHNDAT 58
,IbOILU(2,2)
CHNDAT 59
,IbOILU(2,2)
CHNDAT 60
,NBOIL(2)
CHNDAT 61
,NGAS(2)
CHNDAT 62
,RLO
CHNDAT 63
,RLV
CHNDAT 64
COMMON
CHNDAT 65
CLC
CHNDAT 66
,CLV
CHNDAT 67
,CVC
CHNDAT 68
,CVV
CHNDAT 69
,BASICT(50)
CHNDAT 70
,CONDUC(20)
CHNDAT 71
,IPAIR1
CHNDAT 72
,CGAPA
CHNDAT 73
,CGAPB
CHNDAT 74
,CGAPC
CHNDAT 75
,CGAPD
CHNDAT 76
,STAMP(60)
CHNDAT 77
,ST1(60,2)
CHNDAT 78
,TEMP(30)
CHNDAT 79
,ST2(30)
CHNDAT 80
,DENSEE
CHNDAT 81
,DENSE(2)
CHNDAT 82
,TMAGIC
CHNDAT 83
,TSAT
CHNDAT 84
,ACHLE
CHNDAT 85
,HAXF
CHNDAT 86
,HAXL
CHNDAT 87
,HAXV
CHNDAT 88
,PSAT
CHNDAT 89
,RLIQ
CHNDAT 90
,RLQF
CHNDAT 91
,PTRY
CHNDAT 92
,PVOIO
CHNDAT 93
,IFUELS
CHNDAT 94
,JFUELS
CHNDAT 95
,IGASS
CHNDAT 96
,TSUPER
CHNDAT 97
,TFUELS
CHNDAT 98
,TMELTH
CHNDAT 99
,TMELTL
CHNDAT 100
,GAMMA
CHNDAT 101
,PINTLM(20,2)
CHNDAT 102
,GAPR(20)
CHNDAT 103
,GAPRE
CHNDAT 104
,CLVC
CHNDAT 105
,DOPCDE(2,2)
CHNDAT 106
,JASNA
CHNDAT 107
,JUPFW
CHNDAT 108
,RBASEC
CHNDAT 109
,SPC2(2)
CHNDAT 110
,HFUSEE
CHNDAT 111
,OKNA(20,2)
CHNDAT 112
,WALTAK(75)
CHNDAT 113
,PARIAM(20)
CHNDAT 114
,IGAF
CHNDAT 115
COMMON
CHNDAT 116
KFUELS
CHNDAT 117
,SPC3(13)
CHNDAT 118
,HI(75)
CHNDAT 119
,CLAUKT
CHNDAT 120
,CLV2
CHNDAT 121
,CLV2
CHNDAT 122
,CVV2
CHNDAT 123
,HAXL1
CHNDAT 124
,HAXL2
CHNDAT 125
,CGAPB2
CHNDAT 126
,CLADK
CHNDAT 127
,CAPL(75)
CHNDAT 128
,TSTKUK(75,2)
CHNDAT 129
,USTL(75)
CHNDAT 130
,USTV(75)
CHNDAT 131
,OSAVE0(75,2)
CHNDAT 132
,XLIQ(15)
CHNDAT 133
,CLIQT(15)
CHNDAT 134
,CVAP(15)
CHNDAT 135
,CVAPT(15)
CHNDAT 136
,HELP(75)
CHNDAT 137
,SMELP(75)
CHNDAT 138
,RHOGNA(75,2)
CHNDAT 139
,TW(11)
CHNDAT 140
,UOLU(75)
CHNDAT 141
,IBILL
CHNDAT 142
,JBILL
CHNDAT 143
,BDX(25,4)
CHNDAT 144
,COPER(3,20)
CHNDAT 145
,POROS(3,20)
CHNDAT 146
,YEMCH(11,20)
CHNDAT 147
,SPC4
CHNDAT 148
,IOUT(200)
CHNDAT 149

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COMMON IBAX,ITAX,LUP,LOWN,LUP0,LOWN0,DUP,DOWN,DUP0,DOWN0,	CHNDAT	34
+ ALFA(20,2),RHOH(20,2),V(20,2),AREAH(20,2),AREAX(20,2),DHDP(20,2),	CHNDAT	35
+ PIN(20,2),AAA(20,2),ENTPY(20,2),QMASS(20),QHEAT(20),ULIQIN(20),	CHNDAT	36
+ GASIN(20),T3AR(20),VMELT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2,	CHNDAT	37
+ NINPIN	CHNDAT	38
EQUIVALENCE (ULIQ(1),VFUELS),(ULIQ(7),ORIFIC),(UVAH(1),RHOSQF),	CHNDAT	39
+ (G(7),1),FQSCHK),(G(7),2),IZOP),(MTYPE(1,1),EPYTM(1,1)),(DOPCOE(1,	CHNDAT	40
+ 2),DOPPD),(DOPCOE(2,2),DOPDEL),(DOPCOE(3,2),OIL),(UVAH(7),GTOL)	CHNDAT	41
+ (USTL,IZAP),(USTV,IZUP),(CGAPA,LAXIAL),(KLIQ,OSAVE3)	CHNDAT	42
+ (SCORC,IS,TCOOL),(SCOTT,IFUELS)	CHNDAT	43
EQUIVALENCE (TW(1),SKEW), (TW(2),RHORAT),(TW(3),DETAIL)	CHNDAT	44
EQUIVALENCE (TW(4),PEEL), (TW(5),PSTART),(TW(6),TREAT)	CHNDAT	45
EQUIVALENCE (TW(7),FRACTN),(TW(8),SPREAD),(TW(9),VORIG)	CHNDAT	46
EQUIVALENCE (TW(10),AREA), (TW(11),FRICT)	CHNDAT	47
C****	CHNDAT	48
COMMON/BOX/NIX,NITER,ROB(20),DRHO(20),DROSAV(20),DROMAX,DTIME,	CHAR	6
+ PAU,PAP,PCU,PCD,VAU,VAJ,VCU,VCD,RHCAU,RHOAJ,RHOCJ,RHOCU,MAU,AAG,	CHAR	7
+ ACU,ACD,ARLAU,AREMAU,AREACU,AREACD,ARAXAU,ARAXAJ,ARAXCU,ARAXCD,	CHAR	8
+ DHDPJ,DHDPD,DHDPJCU,DHDPJCD,HAU,HAD,HCU,HCD,AREAT(20)	CHAR	9
DIMENSION ALF0(20),F0(20),V0(20),AREAJ(20),AREAX0(20),	CHAR	10
+ AD(20),H0(20),DHDPJ(20)	CHAR	11
DIMENSION SLIP(20),UGAS(20)	CHAR	12
DIMENSION PZ(3),VZ(3),RHOZ(3),AREAZ(3),AZ(3),ALFAZ(3),HZ(3)	CHAR	13
DATA NITER,SIZE,DROMAX/20,0.0,0.001/	CHAR	14
INTLXP(TERM1,TERM2,DX)=DX*TERM2+(1.-DX)*TERM1	CHAR	15
DTIME=H(NEW)	CHAR	16
JELL=JELX(N3JORE)	CHAR	17
LUP=LUP	CHAR	18
LOWN=LOWN	CHAR	19
DUP=DUP	CHAR	20
DOWN=DOWN	CHAR	21
NEW=NEW	CHAR	22
C SUBTRACT SUM OF DRHO FROM RHO(I,IOLD) TO REDUCE ROUNDING ERRORS	CHAR	23
DO 120 I=IBAX,ITAX	CHAR	24
ROB(I)=RHOH(I,IOLD)	CHAR	25
ALF0(I)=ALFA(I,IOLD)	CHAR	26
F0(I)=PIN(I,IOLD)	CHAR	27
V0(I)=V(I,IOLD)	CHAR	28
AREAJ(I)=AREAH(I,IOLD)	CHAR	29
AREAX0(I)=AREAX(I,IOLD)	CHAR	30
AL(I)=AAA(I,IOLD)	CHAR	31
H0(I)=ENTPY(I,IOLD)	CHAR	32
DHDPJ(I)=DHDP(I,IOLD)	CHAR	33
120 DRHO(I)=0.0	CHAR	34
IB=IBAX+1	CHAR	35
IT=ITAX-1	CHAR	36
C TEND = TIME AT END OF STEP	CHAR	37
C TOLD = TIME AT BEGINNING OF AN ITERATION SMALLER THAN TEND	CHAR	38
DTIME=DTIME	CHAR	39
TOLD=0.	CHAR	40
DO 140 I=IBAX,ITAX	CHAR	41
QMASS(I)=GASIN(I)+ULIQIN(I)	CHAR	42
140 AREAT(I)=(AREAH(I,NEW)-AREAH(I,IOLD))/DTIME	CHAR	43
QK=QMASS(KFUELS)	CHAR	44
160 NST=1	CHAR	45
C NIX = AXIAL LEVEL MOST LIKELY TO DIVERGE, SO IT IS DONE FIRST	CHAR	46
NIX=LOWN	CHAR	47
C COME BACK TO HERE IF TIME STEP WAS TOO LARGE	CHAR	48
180 DTIME=(TEND-TOLD)/NST	CHAR	49
DO 200 I=IBAX,ITAX	CHAR	50
200 AREAH(I,NEW)=AREAH(I,IOLD)+AREAT(I)*DTIME	CHAR	51
DO 220 I=IB,IT	CHAR	52
220 AREAX(I,NEW)=(AREAH(I+1,NEW)-AREAH(I-1,NEW))/(2.*JELL)	CHAR	53
AREAX(IBAX,NEW)=(AREAH(IB,NEW)-AREAH(IBAX,NEW))/JELL	CHAR	54
AREAX(ITAX,NEW)=(AREAH(ITAX,NEW)-AREAH(IT,NEW))/JELL	CHAR	55
C SOLVE SYSTEM FIRST AT NIX, THEN FROM BOTTOM TO (KFUELS-2), FROM TOP	CHAR	56
C TO (KFUELS+2), AND FINALLY NEAR KFUELS	CHAR	57

IF (NIX.EQ.KFUELS) GO TO 240	CHAR	28
I=NIX	CHAR	29
CALL STEP (I,ITER,NSTEP,0.), RETURNS (180,240)	CHAR	60
240 KDN=MAX0(KFUELS-2,IBAX)	CHAR	61
KUP=MIN0(KFUELS+2,ITAX)	CHAR	62
IF (LOWN.GT.KDN) GO TO 280	CHAR	63
C BOTTOM TO KDN	CHAR	64
DO 260 I=LOWN,KDN	CHAR	65
IF (I.EQ.NIX) GO TO 260	CHAR	66
CALL STEP (I,ITER,NSTEP,0.), RETURNS (160,260)	CHAR	67
260 CONTINUE	CHAR	68
280 IF ((ITAX-KFUELS).LE.1) GO TO 320	CHAR	69
IF (LUP.LT.KUP) GO TO 320	CHAR	70
DO 300 J=KUP,LUP	CHAR	71
I=LUP+KUP-J	CHAR	72
IF (I.EQ.NIX) GO TO 300	CHAR	73
CALL STEP (I,ITER,NSTEP,0.), RETURNS (180,300)	CHAR	74
300 CONTINUE	CHAR	75
C SMALLER TIME STEP NEAR KFUELS	CHAR	76
C TALL = OLD TIME STEP, UTIME=NEW STEP	CHAR	77
C TART = TNOW/TALL = FRACTION OF WAY THROUGH TALL	CHAR	78
C PARAMETERS FOR KFUELS+-2 LINEARLY INTERPOLATED FROM TNOW=0. TO TALL	CHAR	79
320 TALL=)TIME	CHAR	80
PAU=PIN(KDN,NEW)	CHAR	81
PAO=PIN(KDN,IOLD)	CHAR	82
PCU=PIN(KUP,NEW)	CHAR	83
PCO=PIN(KUP,IOLD)	CHAR	84
VAU=V(KDN,NEW)	CHAR	85
VAO=V(KDN,IOLD)	CHAR	86
VCU=V(KUP,NEW)	CHAR	87
VCU=V(KUP,IOLD)	CHAR	88
RHOAU=RHOM(KDN,NEW)	CHAR	89
RHOAO=RHOM(KDN,IOLD)	CHAR	90
RHOCU=RHOM(KUP,NEW)	CHAR	91
RHOCO=RHOM(KUP,IOLD)	CHAR	92
AAU=AAA(KDN,NEW)	CHAR	93
AAO=AAA(KDN,IOLD)	CHAR	94
ACU=AAA(KUP,NEW)	CHAR	95
ACO=AAA(KUP,IOLD)	CHAR	96
AREAAU=AREAH(KDN,NEW)	CHAR	97
AREAAO=AREAH(KDN,IOLD)	CHAR	98
AREACU=AREAH(KUP,NEW)	CHAR	99
AREACO=AREAH(KUP,IOLD)	CHAR	100
ARAXAU=AREAX(KDN,NEW)	CHAR	101
ARAXAO=AREAX(KDN,IOLD)	CHAR	102
ARAXCU=AREAX(KUP,NEW)	CHAR	103
ARAXCO=AREAX(KUP,IOLD)	CHAR	104
DHOF AU=DHOF(KDN,NEW)	CHAR	105
DHOF AO=DHOF(KDN,IOLD)	CHAR	106
DHOF CU=DHOF(KUP,NEW)	CHAR	107
DHOF CO=DHOF(KUP,IOLD)	CHAR	108
HOU=ENTPY(KDN,NEW)	CHAR	109
HOO=ENTPY(KDN,IOLD)	CHAR	110
HCU=ENTPY(KUP,NEW)	CHAR	111
HCO=ENTPY(KUP,IOLD)	CHAR	112
KDN=MAX0(KFUELS-1,IBAX)	CHAR	113
KUP=MIN0(KFUELS+1,ITAX)	CHAR	114
C SAVE OLD PARAMETER VALUES AS NEW/IOLD CHANGE IN SUBINTERVALS	CHAR	115
DO 340 I=KDN,KUP	CHAR	116
IZ=I+1-KDN	CHAR	117
PZ(IZ)=PIN(I,IOLD)	CHAR	118
VZ(IZ)=V(I,IOLD)	CHAR	119
RHOZ(IZ)=RHOM(I,IOLD)	CHAR	120
AREAZ(IZ)=AREAH(I,IOLD)	CHAR	121
AZ(IZ)=AAA(I,IOLD)	CHAR	122

	HZ(IZ)=ENTPY(I,IOLD)	CHAR	123
340	ALFAZ(IZ)=ALFA(1,IOLD)	CHAR	124
	NORE=1	CHAR	125
360	NORE=2*NORE	CHAR	126
	NSTEP=1	CHAR	127
380	MORE=NORE*NSTEP	CHAR	128
	OTIME=TALL/FLOAT(MORE)	CHAR	129
C	ITERATE NEAR FAILURE MORE TIMES	CHAR	130
	TNOW=0.	CHAR	131
	DO 000 J=1,MORE	CHAR	132
	DO 400 K=KON,KUP	CHAR	133
400	AREAH(K,NEW)=AREAH(K,IOLD)+AREAT(K)*OTIME	CHAR	134
	IF (KON.EQ.IBAX) GO TO 420	CHAR	135
	AREAX(KON,NEW)=(AREAH(KFUELS,NEW)-INTERP(AREAH(KON-1,IOLD),AREAH(K	CHAR	136
	+ON-1,NEW),TART))/(2.*DELL)	CHAR	137
	GO TO 440	CHAR	138
420	AREAX(KON,NEW)=(AREAH(KFUELS,NEW)-INTERP(AREAH(KON,IOLD),AREAH(KON	CHAR	139
	+NEW),TART))/DELL	CHAR	140
440	IF (KFUELS.NE.IBAX.AND.KFUELS.NE.ITAX) AREAX(KFUELS,NEW)=(AREAH(KU	CHAR	141
	+P,NEW)-AREAH(KON,NEW))/(2.*DELL)	CHAR	142
	IF (KUP.EQ.ITAX) GO TO 460	CHAR	143
	AREAX(KUP,NEW)=(INTERP(AREAH(KUP+1,IOLD),AREAH(KUP+1,NEW),TART)-A	CHAR	144
	+EAX(KFUELS,NEW))/(2.*DELL)	CHAR	145
	GO TO 480	CHAR	146
460	AREAX(KUP,NEW)=(INTERP(AREAH(KUP,IOLD),AREAH(KUP,NEW),TART)-AREAH(	CHAR	147
	+KFUELS,NEW))/DELL	CHAR	148
480	CONTINUE	CHAR	149
	IF (OTIME.GE.1.E-8) GO TO 500	CHAR	150
	OTIME=1.E-8	CHAR	151
	QUICK=DIRTY	CHAR	152
500	QF=FIN(KFUELS,IOLD)-PTRY	CHAR	153
	IF (QF.LE.0.) QUICK=0.	CHAR	154
	IF (QF.LE.0.OR.OTIME.LE.1.E-8) GO TO 520	CHAR	155
C	MASS SQUIRTED CANNOT EXCEED CHOKED CONDITIONS	CHAR	156
	ACAVTY=2.*AREAH(KFUELS,IOLD)	CHAR	157
	IF (KFUELS.EQ.ITAX.OR.KFUELS.EQ.IBAX) ACAVTY=.5*ACAVTY	CHAR	158
	QUICK=AMIN1(AMIN1(ORIFIC,ACAVTY)*AAA(KFUELS,IOLD),ORIFIC*SQRT(2.*D	CHAR	159
	+P/RHOH(KFUELS,IOLD)))/DELL	CHAR	160
	DIRTY=AREAH(KFUELS,IOLD)/(8.*OTIME)	CHAR	161
C	IF MASS SQUIRTED .GT. TOTAL MASS IN NOUET/8., TAKE SMALLER TIME STEP	CHAR	162
	IF (QUICK.GT.DIRTY) GO TO 360	CHAR	163
520	QSINK=QUICK*RHOH(KFUELS,IOLD)	CHAR	164
	QMASS(KFUELS)=QK-QSINK	CHAR	165
	TNOW=TNOW+OTIME	CHAR	166
	TART=TNOW/TALL	CHAR	167
	NCOUNT=0	CHAR	168
540	CONTINUE	CHAR	169
	IF (NIX.LT.KON.OR.NIX.GT.KUP) GO TO 560	CHAR	170
	I=NIX	CHAR	171
	CALL STAIR (I,ITER,NSTEP,TART), RETURNS (380,560)	CHAR	172
560	CONTINUE	CHAR	173
	DO 500 I=KON,KUP	CHAR	174
	IF (I.EQ.NIX) GO TO 580	CHAR	175
	CALL STAIR (I,ITER,NSTEP,TART), RETURNS (380,580)	CHAR	176
580	CONTINUE	CHAR	177
	IF (QUICK.EQ.0.) GO TO 640	CHAR	178
	IF (FIN(KFUELS,IOLD).GE.PTRY.AND.PIN(KFUELS,NEW).GE.PTRY) GO TO 64	CHAR	179
	+0	CHAR	180
	NCOUNT=NCOUNT+1	CHAR	181
	IF (NCOUNT.GT.10) GO TO 640	CHAR	182
	QSINK=FLOAT(10-NCOUNT)*QUICK*RHOH(KFUELS,IOLD)/10.	CHAR	183
	QMASS(KFUELS)=QK-QSINK	CHAR	184
	IF (NIX.LT.KON.OR.NIX.GT.KUP) GO TO 600	CHAR	185
	JRHO(NIX)=GRHO(NIX)-OROSAV(NIX)	CHAR	186
600	CONTINUE	CHAR	187
	DO 620 K=KON,KUP	CHAR	188
	IF (K.EQ.NIX) GO TO 620	CHAR	189

DRHU(K)=DRHU(K)-DRUSAV(K)	CHAR	190
020 CONTINUE	CHAR	191
GO TO 540	CHAR	192
040 CONTINUE	CHAR	193
NEW=3-NEW	CHAR	194
060 IOLO=3-IOLO	CHAR	195
C RETURN PARAMETERS TO VALUES AT TNOW=0.	CHAR	196
DTIME=TALL	CHAR	197
DO 080 I=KON,KUP	CHAR	198
IZ=I+1-KON	CHAR	199
PIN(I,NEW)=PIN(I,IOLO)	CHAR	200
PIN(I,IOLO)=PZ(IZ)	CHAR	201
V(I,NEW)=V(I,IOLO)	CHAR	202
V(I,IOLO)=VZ(IZ)	CHAR	203
RHOH(I,NEW)=RHOH(I,IOLO)	CHAR	204
RHOH(I,IOLO)=RHOZ(IZ)	CHAR	205
AREAH(I,NEW)=AREAH(I,IOLO)	CHAR	206
AREAH(I,IOLO)=AREAZ(IZ)	CHAR	207
AAH(I,NEW)=AAH(I,IOLO)	CHAR	208
AAH(I,IOLO)=AZ(IZ)	CHAR	209
ENTPY(I,NEW)=ENTPY(I,IOLO)	CHAR	210
ENTPY(I,IOLO)=HZ(IZ)	CHAR	211
OHOF(I,NEW)=OHOF(I,IOLO)	CHAR	212
ALFA(I,NEW)=ALFA(I,IOLO)	CHAR	213
030 ALFA(I,IOLO)=ALFAZ(IZ)	CHAR	214
C LET BUBBLES FLOW WITH DRIFT VELOCITY	CHAR	215
IF (SIZE.LQ.3.) GO TO 830	CHAR	216
IF (SIZE-J.0) 700,700,720	CHAR	217
700 VFIN=1.-SIZE/0.9	CHAR	218
GO TO 740	CHAR	219
720 VFIN=0.12/SIZE/SIZE	CHAR	220
740 DO 820 I=IBAX,I1	CHAR	221
VINF=-(2./DELL)*(PIN(I+1,IOLO)*AREAH(I+1,IOLO)-PIN(I,IOLO)*AREAH(I	CHAR	222
+,IOLO))/(RHOH(I+1,IOLO)*AREAH(I+1,IOLO)+RHOH(I,IOLO)*AREAH(I,IOLO)	CHAR	223
*)	CHAR	224
IF (VINF) 760,800,730	CHAR	225
760 VINF=-5.25*(-VINF)**0.70	CHAR	226
GO TO 830	CHAR	227
780 VINF=5.25*VINF**0.70	CHAR	228
800 AAVG=(AREAH(I+1,IOLO)+AREAH(I,IOLO))/2.	CHAR	229
RBUBL=SIZE*SQR(AAVG/3.14159)	CHAR	230
VINF=VINF*RBUBL**1.28	CHAR	231
ALFA(I,IOLO)=AMIN1(1.,AMAX1(0.,ALFA(I,IOLO)))	CHAR	232
SLIP(I)=VFIN*VINF*ALFA(I,IOLO)*(1.-ALFA(I,IOLO))**1.75	CHAR	233
820 OGAS(I)=0.0	CHAR	234
DO 840 I=IBAX,I1	CHAR	235
GASUP=SLIP(I)*(AREAH(I,IOLO)+AREAH(I+1,IOLO))/2.	CHAR	236
OGAS(I)=OGAS(I)+GASUP	CHAR	237
840 OGAS(I+1)=OGAS(I+1)+GASUP	CHAR	238
DO 860 I=IBAX,I1AX	CHAR	239
ALFAR=ALFA(I,NEW)+OGAS(I)*DTIME/(AREAH(I,IOLO)*DELL)	CHAR	240
ALFAR=AMIN1(1.,AMAX1(0.,ALFAR))	CHAR	241
RHOH(I,NEW)=GEOPER(ALFAR,PIN(I,NEW),IBAR(I))	CHAR	242
860 ALFA(I,NEW)=ALFAR	CHAR	243
880 CONTINUE	CHAR	244
C NO CHANGE OCCURS AT DISTANCES FROM KFUELS .GT. SONIC SPEED*TIME.	CHAR	245
C TOP AND BOTTOM OF REFRACTION WAVE AT HEIGHT DUP AND DOWN, WHICH ARE	CHAR	246
C LOCATED IN NODES LUP AND LOWN	CHAR	247
DOWN=AMAX1(FLOAT(IBAX-1)*DELL,DOWN+(V(LOWN,IOLO)-AAA(LOWN,IOLO))*J	CHAR	248
+TIME)	CHAR	249
LOWN=MAX0(IBAX,INT(DOWN/DELL)+1)	CHAR	250
DUP=AMIN1(FLOAT(ITAX)*DELL,DUP+(V(LUP,IOLO)+AAA(LUP,IOLO))*JTIME)	CHAR	251
LUP=MIN0(ITAX,INT(DUP/DELL)+1)	CHAR	252
TOLD=TOLD+DTIME	CHAR	253

C	IF TIME STEP FINISHED, RETURN. IF NOT, TAKE NEW SUBINTERVAL	CHAR	254
	IF ((TEND-TOLD).LE.(URUMAX*TEND)) GO TO 890	CHAR	255
	NEW = 3-NEW	CHAR	256
	IOLD = 3-IOLD	CHAR	257
	GO TO 180	CHAR	258
890	CONTINUE	CHAR	259
C	RESET IOLD VALUE	CHAR	260
	IF (NEWIN.EQ.NEW) GO TO 920	CHAR	261
	NEW=3-NEW	CHAR	262
	IOLD=3-IOLD	CHAR	263
	DO 900 I=IBAX,ITAX	CHAR	264
	RH0H(I,NEW)=RH0H(I,IOLD)	CHAR	265
	ALFA(I,NEW)=ALFA(I,IOLD)	CHAR	266
	PIN(I,NEW)=PIN(I,IOLD)	CHAR	267
	V(I,NEW)=V(I,IOLD)	CHAR	268
	AREAH(I,NEW)=AREAH(I,IOLD)	CHAR	269
	AREAX(I,NEW)=AREAX(I,IOLD)	CHAR	270
	AAA(I,NEW)=AAA(I,IOLD)	CHAR	271
	ENTPY(I,NEW)=ENTPY(I,IOLD)	CHAR	272
	OHDP(I,NEW)=OHDP(I,IOLD)	CHAR	273
900	CONTINUE	CHAR	274
920	CONTINUE	CHAR	275
	DO 940 I=IBAX,ITAX	CHAR	276
	RH0H(I,IOLD)=R0H(I)	CHAR	277
	ALFA(I,IOLD)=ALF0(I)	CHAR	278
	PIN(I,IOLD)=P0(I)	CHAR	279
	V(I,IOLD)=V0(I)	CHAR	280
	AREAH(I,IOLD)=AREAS(I)	CHAR	281
	AREAX(I,IOLD)=AREASX(I)	CHAR	282
	AAA(I,IOLD)=AG(I)	CHAR	283
	ENTPY(I,IOLD)=H0(I)	CHAR	284
	OHDP(I,IOLD)=OHDP0(I)	CHAR	285
940	CONTINUE	CHAR	286
	RETURN	CHAR	287
	END	CHAR	288

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SUBROUTINE STEP (I,ITER,NSTEP,TART), RETURNS (A1,A3)
REAL INTERP
C****
C**** COMMON DECK "CASPAR" CONTAINING THE CASE PARAMETERS
DIMENSION SLOB(1)
REAL KINSRT,KWTHDR
LOGICAL PRINT,DONL,SURAM
COMMON
DONL,ISTAT,IIN,SLUA(3),
+IBLOCK,H(2),T(2),HRED,IHAY,VJUK(2),CASPAR
+JOPPK(2),COLAPK(2),NEW,ILO,NOUT,TERRDR,CASPAR
+GERROR,PEXIT(3),PERGR,PRINT,ULTIM,PN(2),CASPAR
+PBOTT(3,2),IACIV(20),FLOW(3,2),TGPT(3,2),TUPV(3),WOLF(3),CASPAR
+LUOF(20),IOUTL,NTRAT,IKINE1,TOUT,HMAX,CASPAR
+TIMEIN(50),DKIN(50),TIMOUT(50),DKOUT(50),IPAIR2,AV(2),CASPAR
+IPAIR3,KOJNT,RH(2),BGOIG,RHUSWZ,NORUUP,CASPAR
+C(6,2),ALIFE,ALPH(6),GAM(6),B(6),AL(6),CASPAR
+BB,SGRAM,TSGRAM(2),PERIOD,RSLUP,EKOR,CASPAR
+KINSRT(2),KWTHDR(2),REJUGL,PPINT1,PRINT2,RMIN,CASPAR
COMMON
+ANLOW,TQUIT,LSTEP,JSTEP,ANLU,TGGS,CASPAR
+IPLOT,EQRUR1,TERM(13),TITL(8),HOTPIM,SFGD,CASPAR
+SPCC,SPCU,LINESL,KSTEP,NCHAN,MSTEP,CASPAR
+IPRINT,MPRINT,IDUMP,QGEN(2),ANI,AVSCKM,CASPAR
+TDELAY,NLOOPS,RHUGEE(3),VLTOP(3),HAJ(3),PKLSTM(50),CASPAR
+PRESUR(50,3),IPAIK,PJ(3),RUNTIM,VLR,EIAJ(+),CASPAR
+KBLUCK,JBLUCK,MJLOCK,N12,N13,EXTK,CASPAR
+GJACK(3),VJACK(2),ITRGAP,CASPAR
+HMIN,N22,NIN,INPUT,N2,N,CASPAR
+N7,N8,KPRINT,POWSS,HMAX3,HMAXF,CASPAR
+TRIPFW(3),TRIPFP(3),TRIPF(3),TRIPOT(3),DELAYF,CASPAR
EQUIVALENCE (QMUL,TERM(4)),(TMUL,TERM(5)),(GMOL,TERM(6)),(PERMUL,T
+ERM(7)),(SLOB,DONL)
C****
C****
C**** COMMON DECK "CHNDAT" CONTAINING THE CHANNEL DATA
DIMENSION S(1),CORE(1),IS(1),LPTM(15,20),GIL(8),XLIQ(11,20,2)
INTEGER SMELP
COMMON
TCOOL(75,2),RLOG(22,20),UU(3),ULIQ(75),CHNDAT
+UVAP(75),DCLX(75),CHNDAT
+AFLOW(75),JS(4,55),HCAPS(4,55),DSAVE1(4,55,2),DSAVE2(75,2),CHNDAT
+DSAVE3(15,20,2),DSAVE4(75,2),POW(15,20),VOLUME(15,20),HLAPT(15,20)CHNDAT
+,TEMPK(15,20,2),TSINK(4,55,2),VOIDV(20),VPLEN,PPLEN(2),CHNDAT
+RPLEN(2),G(75,2),RHOD(75,2),VOLG(2),CHNDAT
+VOLF(2),GT0,GT1,GT2,GT3,GASD(2,2),CHNDAT
+GASBU(2,2),FUELB(2),FUELBU(2),FANN(75),P(75,2),RHUG(75,2),CHNDAT
+RHOF(75,2),WF(75),WC(75),NCPINS,NAXIAL,N3CURL,CHNDAT
+NTLOCK,NTUF(75),ITYPE(15,20),IGAS(2),N3PLEN,CHNDAT
+IFUEL(2),IJOIL(2),IGASU(2,2),IFULLD(2),IFUELU(2),CHNDAT
+IJOILJ(2,2),IJOILU(2,2),NGAS(2),KLC,RV,CHNDAT
COMMON
+CLC,CLV,CVL,CVV,BASIST(50),CONJUG(50),CHNDAT
+2),IPAIK1,CGAFA,CGAPB,CGAFC,CGAPJ,STEMP(60),CHNDAT
+ST1(60,2),TSEMP(30),ST2(30),DNSEE,DENSE(2),TMAGI,CHNDAT
+TSAT,AMOLL,HAXF,HAXL,HAXV,P3AT,CHNDAT
+RLIQ,RLUF,PRY,PVOIU,IFUELS,JFUELS,CHNDAT
+TGASS,TSUPLE,IFULLS,TMELTH,TMELTL,G4MA,CHNDAT
+PNTMEM(20,2),GAPR(20),CLVC,DJPCDE(2,2),CHNDAT
+BASENA,DUPW,RBASEC,SFL2(2),HFUSC,UKNA(20,2),CHNDAT
+WALTAX(75),PARTAN(20),IGAF,CHNDAT
COMMON
+KFULS,SFG3(13),H1(75),CLAUKT,CHNDAT
+RLV2,CLV2,CVV2,HAXL1,HAXL2,CGAPB2,CHNDAT
+CLAUK,CAPS(75),TSTRUK(75,2),USTL(75),USTV(75),DSAVE(75,2)CHNDAT
+,ULIQ(15),CLIT(15),CVAP(15),CVAPT(15),MLLP(75),SMELP(75),CHNDAT
+RHODN(75,2),TW(11),UOLU(75),IBLL,JBILL,BUX(20,2),CHNDAT
+CCPK(3,20),FORDS(3,20),Y=HYLH(11,20),SPC+,IOUT(200)CHNDAT

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COMMON IBAX,ITAX,LUP,LOWN,LUPG,LCHNG,DUP,DOWN,DUPJ,DWNG,	CHNDAT	34
+ ALFA(20,2),RHOM(20,2),V(20,2),AREAH(20,2),AREAX(20,2),DHOP(20,2),	CHNDAT	35
+ PIN(20,2),AAA(20,2),ENTPY(20,2),QMASS(20),QHEAT(20),ULIQIN(20),	CHNDAT	36
+ GASIN(20),TBAR(20),VMELT2(20),VGAS1(20),VGAS2(20),GASIN1,GASIN2,	CHNDAT	37
+ NINPIN	CHNDAT	38
EQUIVALENCE (ULIQ(1),VFUELS),(ULIQ(75),ORIFIC),(UVAP(1),RHOSQF),	CHNDAT	39
+ (G(75,1),FQSQHR),(G(75,2),IZOP),(MTYPE(1,1),EPYTH(1,1)),(DOPCOE(1,	CHNDAT	40
+ 2),DOPPO),(DOPCOE(2,2),DOPDELI),(DOPCOE(3,2),QIL),(UVAP(75),GTOL)	CHNDAT	41
+, (USTL,IZAP),(USTV,IZUP),(CGAPA,LAXIAL),(XLIQ,DSAVE3)	CHNDAT	42
+, (SCORE,IS,TCOOL),(SCOTT,IFUELS)	CHNDAT	43
EQUIVALENCE (TW(1),SKEW), (TW(2),RHORAT),(TW(3),DETAIL)	CHNDAT	44
EQUIVALENCE (TW(4),PEEL), (TW(5),FSTART),(TW(6),TREAT)	CHNDAT	45
EQUIVALENCE (TW(7),FRACTN),(TW(8),SPREAD),(TW(9),VORIG)	CHNDAT	46
EQUIVALENCE (TW(10),AREA), (TW(11),FRICT)	CHNDAT	47
C****	CHNDAT	48
COMMON/BOX/NIX,NITER,ROB(20),ORHO(20),OROSAV(20),OROMAX,DTIME,	STEP	6
+ PAU,PAD,PCU,PCD,VAU,VAD,VCU,VCJ,RHCAU,RHOAU,RHOCJ,RHOCU,AAU,AAU,	STEP	7
+ ACU,AGU,AREAAU,AREAAU,AREAAU,AREAAU,AREAAU,AREAAU,AREAAU,AREAAU,	STEP	8
+ DHOPAU,DHOPAD,DHOPCU,DHOPCU,HAU,HAD,HCU,HCU,AREAT(20)	STEP	9
DATA RJ,AM,GRAV,BS,H0/8.3167E+7,126.2,980.733,+.7E+11,0.11E+11/	STEP	10
INTERP(TERM1,TERM2,DX)=DX*TERM2+(1.-DX)*TERM1	STEP	11
C INITIALIZE PARAMETERS FOR NODES NOT NEAR KFUELS	STEP	12
IJTYPE=0	STEP	13
120 CONTINUE	STEP	14
IF (I.NE.IBAX) GO TO 140	STEP	15
PA=PIN(I,IOLD)	STEP	16
VA=0.	STEP	17
RHOA=RHOH(I,IOLD)	STEP	18
AA=AAA(I,IOLD)	STEP	19
AREAA=0.	STEP	20
AREAX4=0.	STEP	21
DHOPA=DHOP(I,IOLD)	STEP	22
HA=ENTPY(I,IOLD)	STEP	23
GO TO 160	STEP	24
140 PA=PIN(I-1,IOLD)	STEP	25
VA=V(I-1,IOLD)	STEP	26
RHOA=RHOH(I-1,IOLD)	STEP	27
AA=AAA(I-1,IOLD)	STEP	28
AREAA=AREAH(I-1,IOLD)	STEP	29
AREAX4=AREAX(I-1,IOLD)	STEP	30
DHOPA=DHOP(I-1,IOLD)	STEP	31
HA=ENTPY(I-1,IOLD)	STEP	32
160 PB=PIN(I,IOLD)	STEP	33
VB=V(I,IOLD)	STEP	34
RHOB=RHOH(I,IOLD)	STEP	35
AB=AAA(I,IOLD)	STEP	36
AREAB=AREAH(I,IOLD)	STEP	37
AREAX3=AREAX(I,IOLD)	STEP	38
DHOPB=DHOP(I,IOLD)	STEP	39
H3=ENTPY(I,IOLD)	STEP	40
IF (I.NE.ITAX) GO TO 180	STEP	41
PC=PIN(I,IOLD)	STEP	42
VC=0.	STEP	43
RHOC=RHOH(I,IOLD)	STEP	44
AC=AAA(I,IOLD)	STEP	45
AREAC=0.	STEP	46
AREAXC=0.	STEP	47
DHOPC=DHOP(I,IOLD)	STEP	48
HC=ENTPY(I,IOLD)	STEP	49
GO TO 200	STEP	50
180 PC=PIN(I+1,IOLD)	STEP	51
VC=V(I+1,IOLD)	STEP	52
RHOC=RHOH(I+1,IOLD)	STEP	53
AC=AAA(I+1,IOLD)	STEP	54
AREAC=AREAH(I+1,IOLD)	STEP	55
AREAXC=AREAX(I+1,IOLD)	STEP	56
DHOPC=DHOP(I+1,IOLD)	STEP	57

HC=ENTPY(I+1,IOLD)	STEP	68
200 NAX=0	STEP	69
AREABU=AREAH(I,NEW)	STEP	60
ARAXBU=AREAX(I,NEW)	STEP	61
GO TO 320	STEP	62
C INITIALIZE PARAMETERS FOR NODES NEAR KFUELS	STEP	63
ENTRY STAIR	STEP	64
IJTYPE=C	STEP	65
220 CONTINUE	STEP	66
IF (I.NE.(KFUELS+1).AND.I.NE.IBAX) GO TO 240	STEP	67
PA=INTERP(PAU,PAU,TART)	STEP	68
VA=INTERP(VAU,VAU,TART)	STEP	69
RHOA=INTERP(RHOAU,RHOAU,TART)	STEP	70
AA=INTERP(AAU,AAU,TART)	STEP	71
AREAA=INTERP(AREAAU,AREAAU,TART)	STEP	72
AREAXA=INTERP(ARAXAU,ARAXAU,TART)	STEP	73
DHUPA=INTERP(DHUPAU,DHUPAU,TART)	STEP	74
HA=INTERP(HAU,HAU,TART)	STEP	75
GO TO 200	STEP	76
240 PA=PIN(I-1,IOLD)	STEP	77
VA=V(I-1,IOLD)	STEP	78
RHOA=RHOH(I-1,IOLD)	STEP	79
AA=AAA(I-1,IOLD)	STEP	80
AREAA=AREAH(I-1,IOLD)	STEP	81
AREAXA=AREAX(I-1,IOLD)	STEP	82
DHUPA=DHUP(I-1,IOLD)	STEP	83
HA=ENTPY(I-1,IOLD)	STEP	84
260 IF (I.NE.(KFUELS+1).AND.I.NE.IBAX) GO TO 280	STEP	85
PC=INTERP(PCU,PCU,TART)	STEP	86
VC=INTERP(VCU,VCU,TART)	STEP	87
RHOC=INTERP(RHOCU,RHOCU,TART)	STEP	88
AC=INTERP(ACU,ACU,TART)	STEP	89
AREAC=INTERP(AREACU,AREACU,TART)	STEP	90
AREAXC=INTERP(ARAXCU,ARAXCU,TART)	STEP	91
DHUPC=INTERP(DHUPCU,DHUPCU,TART)	STEP	92
HC=INTERP(HCU,HCU,TART)	STEP	93
GO TO 300	STEP	94
280 PC=PIN(I+1,IOLD)	STEP	95
VC=V(I+1,IOLD)	STEP	96
RHOC=RHOH(I+1,IOLD)	STEP	97
AC=AAA(I+1,IOLD)	STEP	98
AREAC=AREAH(I+1,IOLD)	STEP	99
AREAXC=AREAX(I+1,IOLD)	STEP	100
DHUPC=DHUP(I+1,IOLD)	STEP	101
HC=ENTPY(I+1,IOLD)	STEP	102
300 PB=PIN(I,IOLD)	STEP	103
VB=V(I,IOLD)	STEP	104
RHOB=RHOH(I,IOLD)	STEP	105
AB=AAA(I,IOLD)	STEP	106
AREAB=AREAH(I,IOLD)	STEP	107
AREAXB=AREAX(I,IOLD)	STEP	108
AREABU=INTERP(AREAH(I,IOLD),AREAH(I,NEW),TART)	STEP	109
ARAXBU=INTERP(AREAX(I,IOLD),AREAX(I,NEW),TART)	STEP	110
DHUPB=DHUP(I,IOLD)	STEP	111
HB=ENTPY(I,IOLD)	STEP	112
NAX=1	STEP	113
320 OMAX=OROMAX	STEP	114
R=RG/AM	STEP	115
DELL=DELLX(INCOR=)	STEP	116
ITER=1	STEP	117
USCAR=0.	STEP	118
XMO=0.5	STEP	119
XFO=0.5	STEP	120
XDO=V3*DTIME/DELL	STEP	121

C	FIND VALUES ON T LINE AT A,B,C	STEP	122
	ROAA=RHOA*AA	STEP	123
	ROAB=RHOB*AB	STEP	124
	ROAC=RHOC*AC	STEP	125
	IF (I.NE.I3AX) GO TO 340	STEP	126
	PA=PB	STEP	127
	RHOA=RHOB	STEP	128
	AA=AB	STEP	129
	QHOPA=QHOPB	STEP	130
	HA=HB	STEP	131
	PSI1A=0.	STEP	132
	PSI2A=0.	STEP	133
	PSI3A=0.	STEP	134
	GO TO 360	STEP	135
340	PSI1A=AA*AA/AREAA*(QMASS(I-1)-RHOA*(AREAT(I-1)+VA*AREAXA))	STEP	136
	QSORCE=QLIQIN(I-1)+GASIN(I-1)	STEP	137
	QSINK=QSORCE-QMASS(I-1)	STEP	138
	QHEATS=QHLAT(I-1)*AREAA*RHOA	STEP	139
	PSI2A=-AA*AREAA*(QSORCE*VA+RHJA*AREAA*GRAV)	STEP	140
	PSI3A=(QHEATS+QSINK*PA/RHOA-QSORCE*(H0-HA+PA/RLQF-VA*VA/2.))+PA*ARE	STEP	141
	+AXA)/((QHOPA-1./RHOA)*RHOA*AREAA)	STEP	142
360	PSI1B=AB*AB/AREAB*(QMASS(I)-RHOB*(AREAT(I)+VB*AREAXB))	STEP	143
	QSORCE=QLIQIN(I)+GASIN(I)	STEP	144
	QSINK=QSORCE-QMASS(I)	STEP	145
	QHEATS=QHLAT(I)*AREAB*RHOB	STEP	146
	PSI2B=-AB/AREAB*(QSORCE*VB+RHJB*AREAB*GRAV)	STEP	147
	PSI3B=(QHEATS+QSINK*PB/RHOB-QSORCE*(H0-HB+PB/RLQF-VB*VB/2.))+PB*ARE	STEP	148
	+AXB)/((QHOPB-1./RHOB)*RHOB*AREAB)	STEP	149
	IF (I.NE.ITAX) GO TO 380	STEP	150
	PL=PB	STEP	151
	RHOB=RHOB	STEP	152
	AC=AB	STEP	153
	QHOPC=QHOPB	STEP	154
	HC=HB	STEP	155
	PSI1C=0.	STEP	156
	PSI2C=0.	STEP	157
	PSI3C=0.	STEP	158
	GO TO 400	STEP	159
380	PSI1C=AC*AC/AREAC*(QMASS(I+1)-RHOC*(AREAT(I+1)+VC*AREAXC))	STEP	160
	QSORCE=QLIQIN(I+1)+GASIN(I+1)	STEP	161
	QSINK=QSORCE-QMASS(I+1)	STEP	162
	QHEATS=QHEAT(I+1)*AREAC*RHOC	STEP	163
	PSI2C=-AC/AREAC*(QSORCE*VC+RHJC*AREAC*GRAV)	STEP	164
	PSI3C=(QHEATS+QSINK*PC/RHOC-QSORCE*(H0-HC+PC/RLQF-VC*VC/2.))+PC*ARE	STEP	165
	+AXC)/((QHOPC-1./RHOC)*RHOC*AREAC)	STEP	166
C	FIRST GUESS AT INTERSECTION POINTS	STEP	167
400	DXF=0.5	STEP	168
	DXM=0.5	STEP	169
	JXU=V3*UTIME/DELL	STEP	170
	VO=VB	STEP	171
C	BACK TO HERE WITH NEW INTERSECTION, INTERPOLATE TO FIND PARAMETERS	STEP	172
C	AT AB,BC	STEP	173
420	IF (I.NE.I3AX) GO TO 440	STEP	174
	IF (DXP.LT.0.5) VAB=V3*(1.-2.*DXP)	STEP	175
	IF (DXP.GT.0.5) VAB=0.	STEP	176
	GO TO 460	STEP	177
440	VAB=INTERP(VB,VA,DXP)	STEP	178
	IF (I.NE.ITAX) GO TO 460	STEP	179
	IF (DXM.LT.0.5) VBC=V3*(1.-2.*DXM)	STEP	180
	IF (DXM.GT.0.5) VBC=0.	STEP	181
	GO TO 480	STEP	182
460	VBC=INTERP(VB,VC,DXM)	STEP	183
480	RHOAB=INTERP(RHOB,RHOA,DXP)	STEP	184
	RHOBC=INTERP(RHOB,RHOC,DXM)	STEP	185
	AB=INTERP(AB,AA,DXP)	STEP	186

AUC=INTERP(AB,AC,DXM)	STEP	187
ROAAB=INTERP(ROAB,ROAA,DXP)	STEP	188
ROABC=INTERP(ROAB,ROAC,DXM)	STEP	189
PSI1A3=INTERP(PSI1B,PSI1A,DXP)	STEP	190
PSI1B3=INTERP(PSI13,PSI1C,DXM)	STEP	191
PSI2A3=INTERP(PSI2B,PSI2A,DXP)	STEP	192
PSI2B3=INTERP(PSI2B,PSI2C,DXM)	STEP	193
PSI3A3=INTERP(PSI3B,PSI3A,DXP)	STEP	194
PSI3B3=INTERP(PSI3B,PSI3C,DXM)	STEP	195
OX=ABS(OX0)	STEP	196
IF (OX0) 500,520,540	STEP	197
500 VO=INTERP(VB,VC,OX)	STEP	198
AO=INTERP(AB,AC,OX)	STEP	199
PSI30=INTERP(PSI3B,PSI3C,OX)	STEP	200
GO TO 560	STEP	201
520 VO=VB	STEP	202
AO=AB	STEP	203
PSI30=PSI3B	STEP	204
GO TO 560	STEP	205
540 VU=INTERP(VB,VA,OX)	STEP	206
AU=INTERP(AB,AA,OX)	STEP	207
PSI30=INTERP(PSI3B,PSI3A,OX)	STEP	208
560 CONTINUE	STEP	209
IF (ITER.GT.1) GO TO 580	STEP	210
VABR=VAB	STEP	211
VBCR=VBC	STEP	212
RHOABR=RHOAB	STEP	213
RHOBCR=RHOBC	STEP	214
AA3R=AA3	STEP	215
AB3R=AB3	STEP	216
ROAABR=ROAAB	STEP	217
ROABCR=ROABC	STEP	218
SI1ABR=PSI1AB	STEP	219
SI1BCR=PSI13C	STEP	220
SI2ABR=PSI2AB	STEP	221
SI2BCR=PSI2BC	STEP	222
SI3ABR=PSI3A3	STEP	223
SI3BCR=PSI33C	STEP	224
RHOR=RHOH(I,IOLD)	STEP	225
ALFAR=ALFA(I,IOLD)	STEP	226
AOR=AO	STEP	227
AR2=AO<AOR	STEP	228
VOR=VO	STEP	229
PSI30R=PSI30	STEP	230
GO TO 600	STEP	231
580 VABR=(VAB+VR)/2.	STEP	232
VBCR=(VBC+VR)/2.	STEP	233
RHOABR=(RHOAB+RHOA)/2.	STEP	234
RHOBCR=(RHOBC+RHOR)/2.	STEP	235
AA3R=(AA3+AR)/2.	STEP	236
AB3R=(AB3+AR)/2.	STEP	237
ROABR=RHOR*AR	STEP	238
ROABR=(ROAAB+ROABR)/2.	STEP	239
ROABCR=(ROABC+ROABR)/2.	STEP	240
PSI1R=AR*AR/AREABU*(QSORCE*VR+RHOR*AREABU*GRAV)	STEP	241
QSORCE=ULIQIN(I)+GAJIN(I)	STEP	242
QSINK=QSORCE-QMASS(I)	STEP	243
QHEATS=QHEAT(I)*AREABU*RHOR	STEP	244
PSI2R=-AK/AREABU*(QSORCE*VR+RHOR*AREABU*GRAV)	STEP	245
PSI3R=(QHEATS+QSINK*PR/RHOR-QSORCE*(HJ+HR+PR/RLQF-VR*VR/2.))+PR*ARA	STEP	246
+XBU)/((DHJPR-1./RHOR)*RHOR*AREABU)	STEP	247
SI1ABR=(PSI1AB+PSI1R)/2.	STEP	248
SI1BCR=(PSI1BC+PSI1R)/2.	STEP	249
SI2ABR=(PSI2AB+PSI2R)/2.	STEP	250
SI2BCR=(PSI2BC+PSI2R)/2.	STEP	251

SI3ABR=(PSI3AB+PSI3R)/2.	STEP	252
SI3BCR=(PSI3BC+PSI3R)/2.	STEP	253
AOR=(AO+AR)/2.	STEP	254
AR2=AOR*AGR	STEP	255
VOR=(VO+VR)/2.	STEP	256
PSI3OR=(PSI3O+PSI3R)/2.	STEP	257
C NEW VALUES OF VR, PR	STEP	258
600 VR=VB+(((PA-PB)+ROAABR*(VA-VB))*(VABR+AABR)+((PB-PC)+ROABCR*(VC-V	STEP	259
+B))*(AJCJ-VJCK))/DELL+SI1ABR-SI1BCR+SI2ABR+SI2BCR+SI3ABR-SI3BCR)*J	STEP	260
+TIME/(ROAABR+ROABCR)	STEP	261
PR=PB+(((FA-FB)/(UWABR+VA-VB)*(VABR+AABR)+((PC-PB)/(ROWBCR-VC+VB)*	STEP	262
+ABCR-VBCR))/DELL+(SI1ABR+SI2ABR+SI3ABR)/ROAABR+(SI1BCR-SI2BCR+SI3	STEP	263
+BCR)/ROABCR)*TIME/(1./ROAABR+1./ROABCR)	STEP	264
IF (PR.GE.0.) GO TO 620	STEP	265
C REDUCE TIME STEP IF PR .LT. 0.	STEP	266
NSTEP=2*NSTEP	STEP	267
NIX=1	STEP	268
IF (NSTEP.GT.1000) PRINT 900, I, NSTEP, PR	STEP	269
RETURN A1	STEP	270
620 IF (DX0) 040, 060, 080	STEP	271
040 SAM=(PC-PB)/AR2+RHOB-RHOC	STEP	272
GO TO 700	STEP	273
060 SAM=C.0	STEP	274
GO TO 700	STEP	275
080 SAM=(PB-PA)/AR2+RHOA-RHOB	STEP	276
C DENSITY CHANGE ALONG VOR CHARACTERISTIC	STEP	277
700 RHOX=(PR-PB)/AR2+(SAM*VOR/DELL-PSI3OR/AR2)*TIME	STEP	278
RHOR=DRHOR+RHOB	STEP	279
NUF=0	STEP	280
IF ((RHOR+DRUMAX).GT.0.) GO TO 720	STEP	281
C REDUCE TIME STEP IF NEW DENSITY .LE.0.	STEP	282
NSTEP=2*NSTEP	STEP	283
NIX=1	STEP	284
IF (NSTEP.GT.1000) PRINT 320, I, NSTEP, RHOR	STEP	285
RETURN A1	STEP	286
720 CONTINUE	STEP	287
RHOR=MAX1(RHOR, DRUMAX)	STEP	288
C FIND ALFA WHICH CORRESPONDS TO THIS RHOR	STEP	289
RHO1=DEFEK(C., PR, TBAR(1))	STEP	290
ALFA=(RH01-RHOR)/(RHO1-PR/(R*TBAR(1)))	STEP	291
CALL UPPER (1, PR, RHOR, ALFA, AR, HR, CHOPK, TBAR(1))	STEP	292
IF (IJTYPE.EQ.1) PRINT 940, ITER, RHOR, ALFA, PR, VR, DXM, DXP	STEP	293
IF (ABS(VR).LT.AR.0R.ITER.LE.5.0R.NUF.GT.NITER) GO TO 740	STEP	294
NUF=NUF+1	STEP	295
JP=(V*VR-AR*AR)/(AR*AR+R*TBAR(1)/2.)*PR	STEP	296
PR=PR+JP	STEP	297
V2=VR-JP/(RHOR*VR)	STEP	298
RHOR=RHOR*VR/V2	STEP	299
VR=V2	STEP	300
GO TO 720	STEP	301
740 CONTINUE	STEP	302
IF (ITER.EQ.1) GO TO 760	STEP	303
SAM=OSCAR	STEP	304
XMAS=XMO	STEP	305
XPAS=XPO	STEP	306
XOAS=XOO	STEP	307
XMO=DXM	STEP	308
XPO=DXP	STEP	309
XOO=DXO	STEP	310
OSCAR=DRHOR-DRDOLJ	STEP	311
RHONOW=R03(I)+DRHO(I)+DRHOR	STEP	312
C CHECK FOR CONVERGENCE	STEP	313
CHECK=ABS(OSCAR/RHONOW)	STEP	314
IF (CHECK.LE.DRDMAX) GO TO 880	STEP	315
IF (ITER.LE.NITER.0R.3RGOLD.GT.DRHOR) GO TO 760	STEP	316

PRINT 960, I, ITER	STEP	317
IF (IJTYPE.EQ.1) GO TO 880	STEP	318
ITER=1	STEP	319
IJTYPE=1	STEP	320
NAX=NAX+1	STEP	321
GO TO (120,220), NAX	STEP	322
760 DROOLD=DRHOR	STEP	323
ITER=ITER+1	STEP	324
IF (ITER.LE.5) GO TO 780	STEP	325
SAM=OSCAR/(OSCAR-SAM)	STEP	326
DXM=INTERP(XMU,XMAS,SAM)	STEP	327
DXP=INTERP(XPO,XPAS,SAM)	STEP	328
DXO=INTERP(XOO,XOAS,SAM)	STEP	329
GO TO 860	STEP	330
780 DXP=(VB+AB+VR+AR)/(2./DTIME+(VB+AB-VA-AA)/DELL)	STEP	331
DXM=(AB-VB+AK-VK)/(2./DTIME+(AB-VB-AC+VC)/DELL)	STEP	332
IF (DXO) 800,820,840	STEP	333
800 DXO=(VB+VR)/(2./DTIME+(VC-VB)/DELL)	STEP	334
GO TO 860	STEP	335
820 DXO=0.	STEP	336
GO TO 860	STEP	337
840 DXO=(VB+VR)/(2./DTIME+(VB-VA)/DELL)	STEP	338
C IF DXM AND DXP .LE.1. AND NO CONVERGENCE YET, REITERATE	STEP	339
860 IF (DXM.LE.1. AND DXP.LE.1.) GO TO 420	STEP	340
C IF DXM OR DXP .GT. 1., TAKE SMALLER STEP	STEP	341
NSTEP=(INT(A*MAX1(DXM,DXP))+1)*NSTEP	STEP	342
NIX=1	STEP	343
IF (NSTEP.GT.1000) PRINT 980, I, NSTEP, DXM, DXP	STEP	344
RETURN A1	STEP	345
C CONVERGENCE ACCOMPLISHED, STORE NEW PARAMETERS	STEP	346
880 PIN(I,NEW)=PR	STEP	347
V(I,NEW)=VR	STEP	348
J-OSAV(I)=DRHOR	STEP	349
DRHO(I)=DRHO(I)+DRHOR	STEP	350
RHOH(I,NEW)=ROB(I)+DRHO(I)	STEP	351
RAA(I,NEW)=AR	STEP	352
ENTPY(I,NEW)=HR	STEP	353
OHOP(I,NEW)=OHOPR	STEP	354
ALFA(I,NEW)=ALFAR	STEP	355
ITER=1	STEP	356
RETURN A3	STEP	357
C	STEP	358
900 FORMAT (" AT LEVEL "I2," , NSTEP = "I10," , PR = "1PE10.4")	STEP	359
920 FORMAT (" AT LEVEL "I2," , NSTEP = "I10," , RHOR = "F10.6")	STEP	360
940 FORMAT (" ITER = "I2," , RHO = "F8.5," , ALFA = "F8.5," , P = "1PL11.4,"	STEP	361
+ V = "1PE11.4," , DXM = "F9.5," , DXP = "F9.5")	STEP	362
960 FORMAT (/5X,"SOLUTION DID NOT CONVERGE AT AXIAL LEVEL"I2," IN "I2,	STEP	363
+ " ITERATIONS")	STEP	364
980 FORMAT (" AT LEVEL "I2," , NSTEP = "I10," , DXM = "F8.3," , DXP = "F8.	STEP	365
	STEP	366
+3)	STEP	367
END		

FUNCTION GEEPER (ALFA,P,T)	GEEPER	2
C GIVEN ALFA,P,T, FIND DENSITY OF 2-PHASE MIXTURE	GEEPER	3
DATA R0,AM/9.3167E+7,120.2/	GEEPER	4
DATA TMELTL,TMELTH,RSLOF,RLQF/3033.,3089.,10.84,8.6/	GEEPER	5
R=R0/AM	GEEPER	6
IF (T.LE.TMELTL) RHO1=RSLOF	GEEPER	7
IF (T.GT.TMELTL.AND.T.LT.TMELTH) RHO1=RSLOF-(RSLOF-RLQF)*(T-TMELTL	GEEPER	8
)/(TMELTH-TMELTL)	GEEPER	9
IF (T.GE.TMELTH) RHO1=RLQF	GEEPER	10
RHO2=P/(R*T)	GEEPER	11
GEEPER=ALFA*RHO2+(1.-ALFA)*RHO1	GEEPER	12
RETURN	GEEPER	13
END	GEEPER	14

	SUBROUTINE HOPPER (I,P,RHO,ALFA,A,H,OHDP,T)	HOPPER	2
C	GIVEN P,RHO,ALFA, FIND A, H, OHDP	HOPPER	3
	DATA R0,A1,BS/8.3167E+7,126.2,4.7E+11/	HOPPER	4
	DATA FCS,FVS,FV2S,FV3S,FCL,FVL,HFUSEF	HOPPER	5
	+ / .1937, .2626E-3, -.1807E-5, .047422E-9, .503, .0, 280. /	HOPPER	6
	DATA TMELTL, TMELTH, RSLDF, RLQF/3033, .3089, .13, 84, 8.6/	HOPPER	7
	R=R0/A1	HOPPER	8
	IF (ALFA.LT.1.) GO TO 120	HOPPER	9
	ALFA=1.	HOPPER	10
	T=TMELTL	HOPPER	11
	A=SQRT(1.006667*R*T)	HOPPER	12
	H=2.5*R*T	HOPPER	13
	OHDP=2.5/RHO	HOPPER	14
	RETURN	HOPPER	15
120	CONTINUE	HOPPER	16
	ALFA=AMAX1(0.,ALFA)	HOPPER	17
	IF (T.GT.TMELTL) GO TO 140	HOPPER	18
	RHO1=RSLDF	HOPPER	19
	H1=1.E+7*(FCS*T+.5*FVS*T+((FV2S/3.)*T*T+.25*FV3S*T**4)	HOPPER	20
	OHDP1=J.	HOPPER	21
	GO TO 180	HOPPER	22
140	CONTINUE	HOPPER	23
	H2=1.E+7*(FCS*TMELTL+.5*FVS*TMELTL**2+((FV2S/3.)*TMELTL**3+.25*FV3S	HOPPER	24
	*TMELTL**4)	HOPPER	25
	IF (T.GT.TMELTH) GO TO 160	HOPPER	26
	FRACT=(T-TMELTL)/(TMELTH-TMELTL)	HOPPER	27
	RHO1=RSLDF-FRACT*(RSLDF-RLQF)	HOPPER	28
	H1=H1+1.E+7*FRACT*HFUSEF	HOPPER	29
	OHDP1=.130	HOPPER	30
	GO TO 180	HOPPER	31
160	RHO1=RLQF	HOPPER	32
	H1=H1+1.E+7*(HFUSEF+FCL*(T-TMELTH)+.5*FVL*(T-TMELTH)**2)	HOPPER	33
	OHDP1=J.	HOPPER	34
180	CONTINUE	HOPPER	35
	A1=SQRT(BS/RHO1)	HOPPER	36
	IF (ALFA.NE.0.) GO TO 200	HOPPER	37
	A=A1	HOPPER	38
	H=H1	HOPPER	39
	OHDP=OHDP1	HOPPER	40
	RETURN	HOPPER	41
200	RHO2=P/(R*T)	HOPPER	42
	A2=SQRT(1.006667*R*T)	HOPPER	43
	A=1./SQRT((ALFA*RHO2+(1.-ALFA)*RHO1)*((1.-ALFA)/(RHO1*A1**4)+ALFA/	HOPPER	44
	+(RHO2*A2**4)))	HOPPER	45
	X=ALFA*RHO2/RHO	HOPPER	46
	H2=2.5*R*T	HOPPER	47
	H=X*H2+(1.-X)*H1	HOPPER	48
	CP=X*2.5*R+(1.-X)*(FCL+FVL*T)+1.E+7	HOPPER	49
	OHDP=(1.+T*CP/(A*A))/RHO	HOPPER	50
	RETURN	HOPPER	51
	END	HOPPER	52

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