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COMPUTER PROGRAM HEAT5G FOR CALCULATION OF DECAY POWER BASED UPON THE ANS 5.1 STANDARD

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Computer Program HEAT5G for Calculation of Decay Power Based
Upon the ANS 5.1 Standard

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The computer program HEAT5G calculates decay power based upon the ANS 5.1 Standard revised in 1978. Decay power and its uncertainty of fission products of ^{235}U , ^{238}U , and ^{239}Pu fissions can be calculated for an arbitrary irradiation history and cooling time. Actinide decay power is calculated for ^{239}U and ^{239}Np produced by neutron capture reaction of ^{238}U . Effects of neutron capture transformation of fission products on decay power can be considered based upon the calculation results by the DCHAIN code.

Keywords : Decay Power, Fission Products, Actinide, ANS 5.1 Standard,
Neutron Capture Effect, Summation Calculation, Computer Program

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A N S 5.1 にもとづく崩壊熱計算プログラム：
H E A T 5 G

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H E A T 5 Gは1978年に改訂されたA N S 5.1基準にもとづく崩壊熱計算のためのプログラムである。

^{235}U , ^{238}U , ^{239}Pu の核分裂にともなう崩壊熱を任意の照射履歴および冷却時間の関数として計算することが出来る。核分裂生成物と中性子捕獲反応により生成される ^{239}U および ^{239}Np の崩壊熱が計算される。崩壊熱の誤差も計算される。またD C H A I Nコードによる計算結果をもとに核分裂生成物の中性子捕獲による崩壊熱への影響も考慮できるようになっている。

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CONTENTS

1. INTRODUCTION	1
2. PROGRAM DESCRIPTION	3
2.1 General	3
2.2 Fission Product Decay Power	4
2.2.1 Definition of Terms	4
2.2.2 Determining Decay Power and Its Uncertainty from $F_i(t, \infty)$	5
2.2.3 Effect of Neutron Capture in Fission Products	8
2.3 ^{239}U and ^{239}Np Decay Power	9
2.4 Reference Irradiation Mode	10
3. INPUT AND OUTPUT FORMATS	11
3.1 Input Data	11
3.2 Output Data	14
4. SAMPLE CALCULATION	15
REFERENCES	16
Appendix 1 FORTRAN List of HEAT5G Program	27
Appendix 2 Input Data for Sample Calculation	33
Appendix 3 Output Data for Sample Calculation	36

目 次

1.	序	1
2.	計算プログラム	3
2.1	概 要	3
2.2	核分裂生成物の崩壊熱	4
2.2.1	定義	4
2.2.2	$F_i(t, \infty)$ からの崩壊熱およびその誤差の計算	5
2.2.3	核分裂生成物の中性子捕獲の崩壊熱への影響	8
2.3	^{239}U および ^{239}Np の崩壊熱	9
2.4	基準照射履歴	10
3.	入出力	11
3.1	入力データ	11
3.2	出力データ	14
4.	計算例	15
	参照文献	16
付録1	HEAT5Gプログラムのソースリスト	27
付録2	計算例の入力データ	33
付録3	計算例の出力データ	36

1. INTRODUCTION

The decay power of fission products is of great importance in the safety analysis of power reactors. The loss-of-coolant accident (LOCA) is a major issue today concerning the use of nuclear power. The major defense against a LOCA is the emergency core cooling system (ECCS), and one of the significant constraints on the power rating of a nuclear power reactor is the maximum amount of energy the ECCS can handle. Thus, accurate decay power data are important in evaluating how well the ECCS will work and in calculating the consequences of a LOCA. The primary objective of the Rig of Safety Assessment (ROSA)-III Experimental Program at the Japan Atomic Energy Research Institute (JAERI) is to provide experimental and analytical data to evaluate the adequacy and to improve the analytical methods currently used to predict the LOCA response of large boiling water reactors (BWR). Therefore, the accurate decay power data of fission products are important in the ROSA-III Experimental Program to assess the analytical models. Decay power also plays an important role in the design of spent-fuel containers and reprocessing facilities.

The American Nuclear Society Draft Standard ANS 5.1⁽¹⁾ (1971 and 1973) has been widely used for the specification of the decay power of fission products for the analysis of a LOCA. The ANS Draft Standard relies upon the work of K. Shure⁽²⁾; uncertainties are estimated to be +20 %, -40 % for the first 10^3 s after shutdown. Therefore, the Code of Federal Regulations⁽³⁾ requires that LOCA analysis for licensing purposes shall use ANS 5.1 plus 20 % for the fission-product decay power. This requirement has been reviewed to be excessively conservative and has promoted research to improve the accuracy of fission-product decay power.

Since 1973, four new measurements of fission-product decay power were initiated in the United States: (a) beta- and gamma-ray spectra measurement

at Oak Ridge National Laboratory (ORNL)⁽⁴⁾, (b) a fast-response calorimeter measurement at Los Alamos Scientific Laboratory (LASL)⁽⁵⁾, (c) a total absorption or nuclear calorimetric measurement at Intelcom Radiation Technology (IRT) Corporation⁽⁶⁾, and (d) a second calorimetric measurement using different techniques at the University of California, Berkeley (UCB)⁽⁷⁾.

The American Nuclear Society Proposed Standard ANS 5.1⁽⁸⁾ was revised in 1978 based upon a statistical evaluation of new experimental data described above and summation calculations. The first objective of the revision was a revision for LOCA applications (cooling time up to 10^4 seconds) in LWR's. The features that distinguish the Revised Standard from the original version are:

- a. The effect of neutron capture in fission products during reactor operation is accounted for in the Revised Standard.
- b. Data are prescribed for decay power from fission products from fissioning of the major fissionable nuclides present in LWR's, i.e., ^{235}U and ^{239}Pu thermal and ^{238}U fast.
- c. The uncertainty is expressed in a statistical sense as one standard deviation in a normal distribution.

The HEAT5G^{(9),(10)} program calculates decay power and its uncertainty based upon the Revised Standard ANS 5.1⁽⁸⁾. However, the correction for neutron capture effect is done by interpolating the summation calculation results⁽¹¹⁾ by the DCHAIN code^{(12),(13)}, because the Revised Standard⁽⁸⁾ specifies only an upper bound for the capture effect in cooling times greater than 10^4 seconds.

2. PROGRAM DESCRIPTION

The HEAT5G program calculates decay power of fission products and ^{239}U and ^{239}Np based upon ANS 5.1 Standard⁽⁸⁾. The neutron capture effect is taken into account by interpolating the separate summation calculation by the DCHAIN code⁽¹³⁾. The data base and calculation method of HEAT5G are described in this section. The FORTRAN list of the program is given in Appendix 1.

2.1 General

The scope and purpose of HEAT5G are similar to those of the Proposed ANS 5.1 Standard⁽⁸⁾. The standard sets forth values and uncertainties for the decay power from fission products and ^{239}U and ^{239}Np following shutdown of light water reactors containing ^{235}U , ^{238}U , and plutonium. The obtained information shall be used in design, performance evaluation, and assessment of the safety of light water reactors.

Decay power from other actinides and activation products in structural materials and fission power from delayed neutron-induced fission are not included in ANS 5.1 standard and shall be evaluated by the user and appropriately included in any analysis of shutdown power.

The variation of the spatial distribution of the decay power deposition is left to the users of ANS 5.1 standard. This standard relates local production of decay heat radiations in the shutdown condition to local fission power in the operating condition. Time dependence of radiation spectra in the shutdown reactor may cause variation in the spatial distribution of the gamma-ray energy deposition. This influence is beyond the scope of the present standard.

2.2 Fission Product Decay Power

2.2.1 Definition of Terms

The following notation defines the terms to be used in this section of the standard. Independent variables are enclosed in parentheses ().

T'	Time measured from initial reactor startup, seconds
T	Total operating period, including intermediate periods at zero power, seconds
t	Time after shutdown; cooling time, seconds
∞	Infinite time $T = 10^{13}$ seconds (for computational purposes)
$f_i(t)$	Decay power t seconds after a fission pulse from fissionable nuclide i , in MeV/s/fission
$\Delta f_i(t)$	One standard deviation in $f_i(t)$ MeV/s/fission
$F_i(t,T)$	Decay power t seconds after an operating period of T s at constant fission rate of nuclide i in the absence of neutron capture in fission products in (MeV/s)/(fission/s)
$\Delta F_i(t,T)$	One standard deviation in $F_i(t,T)$ in the same units as $F_i(t,T)$
Q_i	Total recoverable energy associated with one fission of nuclide i , MeV/fission*
ΔQ_i	One standard deviation in Q_i , MeV/fission
$P_{i\alpha}$	Average power from fissioning of nuclide i during operation period T_α , MeV/s
$\Delta P_{i\alpha}$	One standard deviation in $P_{i\alpha}$, MeV/s
α	An index specifying an operating period at constant power
$P_d(t,T)$	Total fission product decay power at t s after shutdown from an operating history of T s duration, MeV/s

* Includes fission fragment and neutron kinetic energy, prompt γ energy, γ and β radiation from complete decay of fission products and γ and β radiation from capture reactions in all fuel, coolant, and structural materials.

- $P'_d(t,T)$ Total fission product decay power corresponding to $P_d(t,T)$ but uncorrected for neutron capture in fission products, MeV/s
- $P'_{di}(t,T)$ Fission product decay power contribution to $P'_d(t,T)$ by i th fissionable nuclide, uncorrected for neutron capture in fission products, MeV/s
- $G(t)$ The factor which accounts for neutron capture in fission products
- ψ Fissions per initial fissile atom, dimensionless
- $P_i(T')$ The power generated by i th fissionable nuclide at T' , MeV/s
- $P(T')$ The total power at T' equals $\sum_i P_i(T')$, MeV/s
- $\Delta P(T')$ One standard deviation in $P(T')$, MeV/s

2.2.2 Determining Decay Power and Its Uncertainty from $F_i(t, \infty)$

Methods are prescribed below for obtaining the decay power $P'_d(t,T)$ for an arbitrary reactor power history without neutron capture in fission products. Neutron capture in fission products has a small effect upon decay power for $0 \leq t \leq 10^4$ s and is treated as a correction factor $G(t)$. The total decay power is given by:

$$P_d(t,T) = P'_d(t,T) \cdot G(t) \quad (1)$$

where

$$P'_d(t,T) = \sum_{i=1}^3 P'_{di}(t,T) \quad (2)$$

and $i = 1, 2, 3$ represent ^{235}U thermal, ^{238}U fast, and ^{239}Pu thermal.

When the reactor operating history can be represented by a histogram

of N time intervals with constant power, $P_{i\alpha}$, from fissionable nuclide i assigned to time interval α , then the decay power and its uncertainty may be computed from F_i and ΔF_i . An example is shown in Figure 1. Then the uncorrected decay heat power, P'_{di} , shall be calculated from

$$P'_{di}(t, T) = \sum_{\alpha=1}^N \frac{P_{i\alpha} F_i(t_\alpha, T_\alpha)}{Q_i} \quad (3)$$

where

$$t_1 = t, \quad t_2 = t + T_1, \quad t_N = t + \sum_{\alpha=1}^{N-1} T_\alpha, \quad (4)$$

$$T = \sum_{\alpha=1}^N T_\alpha$$

and

$$F_i(t_\alpha, T_\alpha) = F_i(t_\alpha, \infty) - F_i(t_\alpha + T_\alpha, \infty) \quad (5)$$

$F_i(t, \infty)$ is the decay power from fission products produced at a constant rate over an infinitely long operating period without neutron absorption in the fission products. Decay power $f(t)$ per fission following an instantaneous irradiation and $F(t, \infty)$ are expressed by exponential terms as follows.

$$f(t) = \sum_{j=1}^{23} \alpha_j e^{-\lambda_j t}, \quad (6)$$

$$F(t, \infty) = \sum_{j=1}^{23} \frac{\alpha_j}{\lambda_j} e^{-\lambda_j t} \quad (7)$$

Table 1 gives the parameters α_j and λ_j for the three fissionable nuclides.

The HEAT5G program can also calculate $F(t, \infty)$ by interpolating the tabular data to specified cooling time t by a linear function expressing both decay power F and cooling time t in logarithms. Decay power $F(t, \infty)$

after an infinite irradiation was calculated by the DCHAIN code⁽¹³⁾ for the thermal neutron fission of ^{235}U using the nuclear data of fission products evaluated by one of the authors⁽¹⁴⁾. The calculated results shown in Table 2 are given as input data to the HEAT5G program. Total, beta, and gamma decay powers are shown in Table 2 for thermal fission of ^{235}U , fast fission of ^{238}U , and thermal fission of ^{239}Pu . A separate evaluation of $F(t, \infty)$ is possible by using a different summation code and different nuclear data library considering a mixture of fissionable nuclides. The results can be used in HEAT5G.

The uncertainty in P_d is given by

$$\left(\frac{\Delta P_d}{P_d}\right)^2 = \left(\frac{\Delta P'_d}{P'_d}\right)^2 + \left(\frac{\Delta P}{P}\right)^2 \quad (8)$$

where

$$|\Delta P'_d| = \sum_{i=1}^3 |\Delta P'_{di}| \quad (9)$$

and ΔP shall be provided and justified by the user. The uncertainty in $P'_{di}(t, T)$ shall be determined as

$$\left(\frac{\Delta P'_{di}}{P'_{di}}\right)^2 = \left(\frac{\Delta Q_i}{Q_i}\right)^2 + \left[\frac{\sum_{\alpha=1}^N P_{i\alpha} \Delta F_i(t_\alpha, T_\alpha)}{Q_i P'_{di}} \right]^2 \quad (10)$$

where

$$\Delta F_i(t, T) = \Delta F_i(t, \infty) - \Delta F_i(t+T, \infty) \quad (11)$$

One standard deviations $\Delta F_i(t, \infty)$ in $F_i(t, \infty)$ for an infinite irradiation are shown in Table 3 for ^{235}U thermal, ^{238}U fast, and ^{239}Pu thermal.

2.2.3 Effect of Neutron Capture in Fission Products

For $t < 10^4$ s the ANS 5.1 Standard gives the factor $G(t)$ which accounts for neutron capture in fission products for t , T , and ψ defined in Section 2.2.1 as follows:

$$G(t) = 1.0 + (3.24 \times 10^{-6} + 5.23 \times 10^{-10} t) T^{0.4} \psi . \quad (12)$$

For 10^4 s $< t < 10^9$ s the ANS 5.1 Standard gives a list of factors, $G_{\max}(t)$, i.e., the maximum of $G(t)$.

The HEAT5G program does not follow the methodology of the ANS 5.1 Standard to take into account the neutron capture effect, but the program obtains the correction factor $G(t)$ by interpolating the calculated results⁽¹¹⁾ of $G(t)$ by the DCHAIN code⁽¹³⁾ and its nuclear data library⁽¹⁴⁾.

The correction factors $G(t)$ were calculated by DCHAIN parametrically for ^{235}U thermal for the irradiation time $T = 1, 2, 5$ yr, the thermal neutron flux

$$\phi_{\text{th}} = 1 \times 10^{12}, 1 \times 10^{13}, 2 \times 10^{13}, 5 \times 10^{13}, 1 \times 10^{14}, \\ 1 \times 10^{15} \quad \text{n}/(\text{cm}^2 \cdot \text{s}) \quad , \quad \text{and}$$

the cooling time $t = 0 \sim 1 \times 10^{13}$ s. The ratio A of the average thermal-neutron capture cross section to its 2200 m/s value was set as 0.75, and the epithermal index I_e , defined as the ratio of the epithermal-neutron flux per unit lethargy to the total thermal-neutron flux ϕ_{th} , was set as 0.2 corresponding to the neutron spectrum in a light water reactor. The calculated results are shown in Table 4 through 9. Tables 4, 5, and 6 show the neutron capture correction factors $G(t)$ for the total sensible decay power for the irradiation of 1, 2, and 5 years, respectively. Tables 7, 8 and 9 show the neutron capture effects separately for the beta and gamma decay powers for the irradiation of 1, 2, and 5 years, respectively.

The neutron capture correction factor $G(t)$ is obtained in HEAT5G by linear interpolation of the results for the cooling time t , total irradiation time T , and the average thermal-neutron flux ϕ_{th}^{av} during irradiation.

2.3 ^{239}U and ^{239}Np Decay Power

The ^{239}U and ^{239}Np contributions to the total decay power per fission per second shall be obtained from the following expressions:

$$F_{239\text{U}}(t, T) = E_{239\text{U}} R [1 - \exp(-\lambda_1 T)] \exp(-\lambda_1 t) \quad (13)$$

$$F_{239\text{Np}}(t, T) = E_{239\text{Np}} R \left\{ \frac{\lambda_1}{\lambda_1 - \lambda_2} [1 - \exp(-\lambda_2 T)] \exp(-\lambda_2 t) - \frac{\lambda_2}{\lambda_1 - \lambda_2} [1 - \exp(-\lambda_1 T)] \exp(-\lambda_1 t) \right\} \quad (14)$$

where:

- $E_{239\text{U}}$ = Average energy from the decay of one ^{239}U atom = 0.474 MeV
- $E_{239\text{Np}}$ = Average energy from the decay of one ^{239}Np atom = 0.419 MeV
- R = Atoms of ^{239}U produced per second per fission per second
evaluated for the reactor composition at the time of shutdown
- λ_1 = Decay constant for ^{239}U ($= 4.91 \times 10^{-4} \text{ s}^{-1}$)
- λ_2 = Decay constant for ^{239}Np ($= 3.41 \times 10^{-6} \text{ s}^{-1}$)
- F is units of (MeV/s) per (fission/s)

The value of R shall be supplied and justified by the user.

The decay power contributed by these heavy elements $P_{\text{dHE}}(t_\alpha, T_\alpha)$ for the time interval α shall then be calculated from

$$P_{\text{dHE}}(t, T) = \frac{P_\alpha}{Q} [F_{239\text{U}}(t_\alpha, T_\alpha) + F_{239\text{Np}}(t_\alpha, T_\alpha)] \quad (15)$$

where P_{α} shall be taken as the average reactor power during time interval α and Q is the effective energy release per fission evaluated for the reactor composition at the time of shutdown. $P_{dHE}(t_{\alpha}, T_{\alpha})$ shall be added to the fission product decay power for the time interval α in Eq.(3).

2.4 Reference Irradiation Mode

The program considers two irradiation histories, one is the reference irradiation mode and the other is the specified irradiation mode, and compares the results for the two modes. For the reference irradiation mode the decay power of fission products is calculated by using the data of ANS 5.1 standard for ^{235}U thermal or by interpolating the summation calculation results. The uncertainty of decay power of fission products and the correction factors for neutron capture in fission products are not considered in the calculation for the reference irradiation mode. The decay power of ^{239}U and ^{239}Np is considered in the calculation.

3. INPUT AND OUTPUT FORMATS

Input and output data for HEAT5G are described in the present section. The input data are divided into two parts. The first part gives the common decay power data for the calculation such as neutron capture correction factors, ANS 5.1 data and the summation calculation results for fission product decay power. The second part gives irradiation histories for the reference and the specified irradiation modes.

3.1 Input Data

1. (ICC(I), I = 1, 3) (3I3)

ICC(I) : Neutron capture effect data point numbers

ICC(1) : Data point number for irradiation times

ICC(2) : Data point number for neutron fluxes

ICC(3) : Data point number for cooling times

2. (FTT(K,J), K = 1, JJ) (6E12.5)

FTT(K,1) : Irradiation time points for neutron capture effect data

FTT(K,2) : Neutron fluxes

FTT(K,3) : Cooling times

3. (RAT(K,J,I), K = 1, KK) (6E12.5)

RAT : Decay power ratio with and without consideration of neutron capture effect

K : Suffix for cooling time

J : Suffix for neutron flux

I : Suffix for irradiation time

DO 22 I = 1, ICC(1)

DO 22 J = 1, ICC(2)

22 READ (5, 105) (RAT(K,J,I), K = 1, ICC(3))

4. (A(I), R(I), I = 1, 23) (2E12.5)

A(I) : α_i of ^{235}U (Table 1, ANS 5.1)⁽⁸⁾

R(I) : λ_i of ^{235}U (Table 1, ANS 5.1)

5. (B(I), U(I), I = 1, 23) (2E12.5)

B(I) : α_i of ^{238}U (Table 1, ANS 5.1)

U(I) : λ_i of ^{238}U (Table 1, ANS 5.1)

6. (C(I), V(I), I = 1, 23) (2E12.5)

C(I) : α_i of ^{239}Pu (Table 1, ANS 5.1)

V(I) : λ_i of ^{239}Pu (Table 1, ANS 5.1)

7. ITS, UTS (I3, A3)

ITS : No. of cooling times after infinite irradiation

UTS : Unit of cooling time

= bbS second

= bbb second

= bbM minute

= bbH hour

= bbD day

= bbY year

"b" means blank column

8. (T(I), I = 1, ITS) (6E12.5)

(P(I), I = 1, ITS) (6E12.5)

I(I) : Cooling time

P(I) : Decay power (MeV/s) of FP after infinite irradiation at
constant rate of 1 fission/s

9. IOPT, ICASE (2I3)

IOPT = 0 Calculate decay power of FP and actinides

= 1 Calculate decay power of FP

= 2 Calculate decay power of actinides

ICASE : No. of calculation cases

10. CR(E12.5)

Unnecessary when IOPT is equal to 1

$$CR = \Sigma_c / \Sigma_f \quad (R \text{ in Section 2.3})$$

= Atoms of ^{239}U produced per fission.

11. KA, KB (2I3)

KA = 0 Use revised ANS 5.1 data of FP decay power for the reference irradiation mode

= 1 Use Tasaka data of FP decay power for the reference irradiation mode

KB = 0 Use revised ANS 5.1 data of FP decay power for the specified irradiation mode

= 1 Use Tasaka data of FP decay power for the specified irradiation mode

12. ITC, ITU (I3, A3)

ITC : No. of cooling times

ITU : Unit of cooling times (UTS of Item 7)

13. (TC(I), I = 1, ITC) (6E12.5)

TC : Cooling times after the referencial or the specified irradiation mode

14. ITA, UTA (I3, A3)

ITA : No. of time steps for the reference irradiation

UTA : Unit of time (UTS of Item 7)

15. (TA(I), PA(I), I = 1, ITA) (6E12.5)

TA(I) : Time period of I-th time step in unit UTA

PA(I) : Fission rate of I-th time step (fission/s)

16. ITB, UTB (I3, A3)

17. (TB(I), PB(I), I = 1, ITB) (6E12.5)

Items (16) and (17) for the specified irradiation mode correspond to

Items (14) and (15) of the reference irradiation mode, respectively.

18. (FB(I), I = 1, ITB) (6E12.5)

FB(I) : Thermal neutron flux ($n/cm^2 \cdot s$) for the I-th irradiation
time step

19. ((PH(I,J), I = 1, 3), J = 1, ITB) (3E12.5)

PH(1,J) : Fission fraction of ^{235}U for the J-th irradiation
time step

PH(2,J) : Same of ^{238}U

PH(3,J) : Same of ^{239}Pu

Items (16) through (19) are repeated for ICASE times.

3.2 Output Data

1. Input data listing

2. Case No.

3. (TC(I), HA(I), HB(I), SIG(I), HBS(I), R, DPAC/HB(I), DPFPN/DDFP,
I = 1, ITC)

TC(I) : Cooling time

HA(I) : Decay power for the reference irradiation mode

HB(I) : Decay power for the specified irradiation mode

SIG(I) : Standard deviation of FP decay power for the specified
irradiation mode

HBS(I) : Decay power for the specified irradiation mode added 1
standard deviation for FP decay power

R : Ratio of decay power for the specified irradiation
mode to that of the reference irradiation mode,
HB(I)/HA(I)

DPAC/HB(I) : Contribution of actinide decay power to total decay
power for the specified irradiation mode

DPFPN/DPFP : Neutron capture effect of FP to FP decay power for the specified irradiation mode

4. Irradiation history of the reference irradiation
5. Irradiation history of the specified irradiation

4. SAMPLE CALCULATION

Input and output data for the sample calculation of HEAT5G are shown in Appendix 2 and 3, respectively. The decay power of ^{239}U and ^{239}Np is calculated with a conversion ratio R of 0.59, which defines atoms of ^{239}U produced per fission. The revised ANS 5.1 standard is used for the calculation of decay power of fission products. The reference irradiation mode is a one-year irradiation with a constant fission rate of 1 fission/s.

The specified irradiation mode for the first case is a one-year irradiation with ^{235}U thermal fission rate of 1 fission/s and the thermal neutron flux of 1×10^{14} n/(cm²·s) for neutron capture correction in fission products. The second and the third cases represent the specified irradiation modes of 20 hour irradiation and a complicated irradiation before the LOFT (Loss-of-Fluid Test) L2-3⁽¹⁵⁾ experiment, respectively. Thermal neutron flux for these cases is 3.9×10^{13} n/(cm²·s) and fission fractions for ^{235}U thermal, ^{238}U fast, and ^{239}Pu thermal are 0.938, 0.060, and 0.002, respectively.

DPFPN/DPFP : Neutron capture effect of FP to FP decay power for the specified irradiation mode

4. Irradiation history of the reference irradiation
5. Irradiation history of the specified irradiation

4. SAMPLE CALCULATION

Input and output data for the sample calculation of HEAT5G are shown in Appendix 2 and 3, respectively. The decay power of ^{239}U and ^{239}Np is calculated with a conversion ratio R of 0.59, which defines atoms of ^{239}U produced per fission. The revised ANS 5.1 standard is used for the calculation of decay power of fission products. The reference irradiation mode is a one-year irradiation with a constant fission rate of 1 fission/s.

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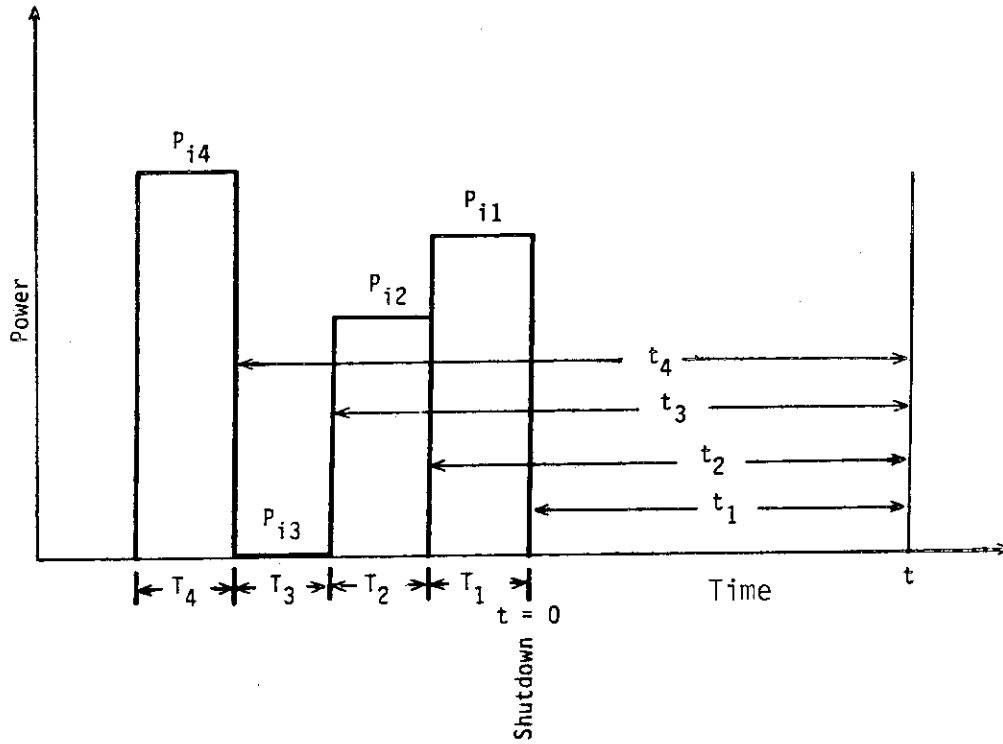


Fig.1 Histogram Presentation of Irradiation History

Table 1 Exponential Parameters for Fission Products Decay Power Functions of 1979 ANS 5.1 Standard (Ref.(8))

²³⁵ U thermal		²³⁸ U fast		²³⁹ Pu thermal	
α	λ	α	λ	α	λ
6.5057E - 01*	2.2138E + 01	1.2311E + 00	3.2881E + 00	2.0830E - 01	1.0020E + 01
5.1264E - 01	5.1587E - 01	1.1486E + 00	9.3805E - 01	3.8530E - 01	6.4330E - 01
2.4384E - 01	1.9594E - 01	7.0701E - 01	3.7073E - 01	2.2130E - 01	2.1860E - 01
1.3850E - 01	1.0314E - 01	2.5209E - 01	1.1118E - 01	9.4600E - 02	1.0040E - 01
5.5440E - 02	3.3656E - 02	7.1870E - 02	3.6143E - 02	3.5310E - 02	3.7280E - 02
2.2225E - 02	1.1681E - 02	2.8291E - 02	1.3272E - 02	2.2920E - 02	1.4350E - 02
3.3088E - 03	3.5870E - 03	6.8382E - 03	5.0133E - 03	3.9460E - 03	4.5490E - 03
9.3015E - 04	1.3930E - 03	1.2322E - 03	1.3655E - 03	1.3170E - 03	1.3280E - 03
8.0943E - 04	6.2630E - 04	6.8409E - 04	5.5158E - 04	7.0520E - 04	5.3560E - 04
1.9567E - 04	1.8906E - 04	1.6975E - 04	1.7873E - 04	1.4320E - 04	1.7300E - 04
3.2535E - 05	5.4988E - 05	2.4182E - 05	4.9032E - 05	1.7650E - 05	4.8810E - 05
7.5595E - 06	2.0958E - 05	6.6356E - 06	1.7058E - 05	7.3470E - 06	2.0060E - 05
2.5232E - 06	1.0010E - 05	1.0075E - 06	7.0465E - 06	1.7470E - 06	8.3190E - 06
4.9948E - 07	2.5438E - 06	4.9894E - 07	2.3190E - 06	5.4810E - 07	2.3580E - 06
1.8531E - 07	6.6361E - 07	1.6352E - 07	6.4480E - 07	1.6710E - 07	6.4500E - 07
2.6608E - 08	1.2290E - 07	2.3355E - 08	1.2649E - 07	2.1120E - 08	1.2780E - 07
2.2398E - 09	2.7213E - 08	2.8094E - 09	2.5548E - 08	2.9960E - 09	2.4660E - 08
8.1641E - 12	4.3714E - 09	3.6236E - 11	8.4782E - 09	5.1070E - 11	9.3780E - 09
8.7797E - 11	7.5780E - 10	6.4577E - 11	7.5130E - 10	5.7300E - 11	7.4500E - 10
2.5131E - 14	2.4786E - 10	4.4963E - 14	2.4188E - 10	4.1380E - 14	2.4260E - 10
3.2176E - 16	2.2384E - 13	3.6654E - 16	2.2739E - 13	1.0880E - 15	2.2100E - 13
4.5038E - 17	2.4600E - 14	5.6293E - 17	9.0536E - 14	2.4540E - 17	2.6400E - 14
7.4791E - 17	1.5699E - 14	7.1602E - 17	5.6098E - 15	7.5570E - 17	1.3800E - 14

* Read as 6.5057 × 10⁻¹, etc.

Table 2 Decay Power of fission Products after Irradiation of 10^{13} s
 Calculated by Summation Calculation

TC(SEC)	TOTAL DECAY POWER			BETA DECAY POWER			GAMMA DECAY POWER		
	U235T	PU239T	U238F	U235T	PU239T	U238F	U235T	PU239T	U238F
1.0000000E+00	1.2771111E+01	9.0000000E+00	1.1111111E+01	8.0000000E+00	5.0000000E+00	4.0000000E+00	7.0000000E+00	4.5000000E+00	3.5000000E+00
1.0000000E+01	1.1771111E+01	8.0000000E+00	1.0111111E+01	7.0000000E+00	4.0000000E+00	3.0000000E+00	6.0000000E+00	3.5000000E+00	2.5000000E+00
1.0000000E+02	1.0771111E+01	7.0000000E+00	9.1111111E+00	6.0000000E+00	3.0000000E+00	2.0000000E+00	5.0000000E+00	2.5000000E+00	1.5000000E+00
1.0000000E+03	1.0371111E+01	6.0000000E+00	8.1111111E+00	5.0000000E+00	2.0000000E+00	1.0000000E+00	4.0000000E+00	1.5000000E+00	0.5000000E+00
1.0000000E+04	1.0271111E+01	5.0000000E+00	7.1111111E+00	4.0000000E+00	1.0000000E+00	0.0000000E+00	3.0000000E+00	0.5000000E+00	0.0000000E+00
1.0000000E+05	1.0237111E+01	4.6666667E+00	6.7777778E+00	3.6666667E+00	0.6666667E+00	0.0000000E+00	2.6666667E+00	0.3333333E+00	0.0000000E+00
1.0000000E+06	1.0233711E+01	4.5666667E+00	6.6777778E+00	3.5666667E+00	0.5666667E+00	0.0000000E+00	2.5666667E+00	0.2333333E+00	0.0000000E+00
1.0000000E+07	1.0233371E+01	4.5333333E+00	6.6444444E+00	3.5333333E+00	0.5333333E+00	0.0000000E+00	2.5333333E+00	0.2000000E+00	0.0000000E+00
1.0000000E+08	1.0233337E+01	4.5300000E+00	6.6400000E+00	3.5300000E+00	0.5300000E+00	0.0000000E+00	2.5300000E+00	0.1966667E+00	0.0000000E+00
1.0000000E+09	1.0233333E+01	4.5300000E+00	6.6400000E+00	3.5300000E+00	0.5300000E+00	0.0000000E+00	2.5300000E+00	0.1966667E+00	0.0000000E+00
1.0000000E+10	1.0233333E+01	4.5300000E+00	6.6400000E+00	3.5300000E+00	0.5300000E+00	0.0000000E+00	2.5300000E+00	0.1966667E+00	0.0000000E+00

Table 3 One Sigma Uncertainty for Irradiation of 10^{13} s (Ref.(8))

Time After Shutdown (s)	One Sigma Uncertainty $\Delta F(t, \infty)$					
	^{235}U		^{238}U		^{239}Pu	
	(MeV/fission)	(%)	(MeV/fission)	(%)	(MeV/fission)	(%)
1.0000E+00	0.040E+01	3.3	0.176E+01	12.	0.058E+01	5.6
1.5000E+00	0.032E+01	2.7	0.164E+01	12.	0.048E+01	4.8
2.0000E+00	0.028E+01	2.4	0.154E+01	12.	0.441E+00	4.5
4.0000E+00	0.023E+01	2.2	0.130E+01	11.	0.396E+00	4.3
6.0000E+00	0.021E+01	2.1	0.115E+01	10.	0.374E+00	4.3
8.0000E+00	0.198E+00	2.0	0.105E+01	9.9	0.359E+00	4.2
1.0000E+01	0.187E+00	2.0	0.098E+01	9.5	0.347E+00	4.2
1.5000E+01	0.170E+00	1.9	0.855E+00	9.0	0.326E+00	4.2
2.0000E+01	0.159E+00	1.9	0.758E+00	8.4	0.311E+00	4.2
4.0000E+01	0.137E+00	1.8	0.560E+00	7.2	0.279E+00	4.2
6.0000E+01	0.125E+00	1.8	0.463E+00	6.6	0.261E+00	4.2
8.0000E+01	0.118E+00	1.8	0.405E+00	6.2	0.248E+00	4.2
1.0000E+02	0.112E+00	1.8	0.367E+00	5.9	0.239E+00	4.2
1.5000E+02	0.103E+00	1.8	0.317E+00	5.6	0.223E+00	4.2
2.0000E+02	0.097E+00	1.8	0.281E+00	5.4	0.211E+00	4.2
4.0000E+02	0.083E+00	1.8	0.229E+00	5.1	0.187E+00	4.3
6.0000E+02	0.076E+00	1.8	0.205E+00	5.0	0.173E+00	4.3
8.0000E+02	0.071E+00	1.8	0.189E+00	5.0	0.163E+00	4.4
1.0000E+03	0.067E+00	1.8	0.177E+00	4.9	0.155E+00	4.4
1.5000E+03	0.060E+00	1.8	0.157E+00	4.9	0.140E+00	4.5
2.0000E+03	0.055E+00	1.8	0.142E+00	4.8	0.129E+00	4.5
4.0000E+03	0.045E+00	1.8	0.111E+00	4.7	0.106E+00	4.7
6.0000E+03	0.039E+00	1.7	0.095E+00	4.6	0.095E+00	4.7
8.0000E+03	0.036E+00	1.7	0.085E+00	4.5	0.088E+00	4.8
1.0000E+04	0.033E+00	1.7	0.078E+00	4.4	0.083E+00	4.8
1.5000E+04	0.030E+00	1.8	0.068E+00	4.3	0.074E+00	4.8
2.0000E+04	0.027E+00	1.8	0.061E+00	4.2	0.068E+00	4.8
4.0000E+04	0.023E+00	1.9	0.049E+00	4.1	0.058E+00	4.8
6.0000E+04	0.021E+00	1.9	0.043E+00	4.0	0.053E+00	4.9
8.0000E+04	0.020E+00	2.0	0.392E-01	3.9	0.049E+00	4.9
1.0000E+05	0.194E-01	2.0	0.366E-01	3.9	0.471E-01	5.0
1.5000E+05	0.175E-01	2.0	0.327E-01	3.9	0.424E-01	5.0
2.0000E+05	0.163E-01	2.0	0.303E-01	3.8	0.395E-01	5.0
4.0000E+05	0.140E-01	2.0	0.258E-01	3.9	0.332E-01	5.0
6.0000E+05	0.127E-01	2.0	0.233E-01	3.9	0.297E-01	5.0
8.0000E+05	0.117E-01	2.0	0.216E-01	3.9	0.273E-01	5.0
1.0000E+06	0.110E-01	2.0	0.204E-01	3.9	0.255E-01	5.0
1.5000E+06	0.097E-01	2.0	0.180E-01	4.0	0.223E-01	5.0
2.0000E+06	0.089E-01	2.0	0.165E-01	4.0	0.202E-01	5.0
4.0000E+06	0.069E-01	2.0	0.132E-01	4.1	0.158E-01	5.0
6.0000E+06	0.060E-01	2.0	0.117E-01	4.2	0.137E-01	5.0
8.0000E+06	0.054E-01	2.0	0.107E-01	4.3	0.124E-01	5.0
1.0000E+07	0.049E-01	2.0	0.101E-01	4.4	0.114E-01	5.0
1.5000E+07	0.042E-01	2.0	0.086E-01	4.4	0.097E-01	5.0
2.0000E+07	0.037E-01	2.0	0.076E-01	4.5	0.086E-01	5.0
4.0000E+07	0.029E-01	2.0	0.060E-01	4.6	0.065E-01	5.0
6.0000E+07	0.026E-01	2.0	0.053E-01	4.7	0.055E-01	5.0
8.0000E+07	0.024E-01	2.0	0.049E-01	4.9	0.487E-02	5.0
1.0000E+08	0.023E-01	2.0	0.464E-02	5.0	0.447E-02	5.0
1.5000E+08	0.022E-01	2.0	0.415E-02	5.0	0.393E-02	5.0
2.0000E+08	0.021E-01	2.0	0.391E-02	5.0	0.367E-02	5.0
4.0000E+08	0.177E-02	2.0	0.332E-02	5.0	0.314E-02	5.0
6.0000E+08	0.152E-02	2.0	0.287E-02	5.0	0.273E-02	5.0
8.0000E+08	0.131E-02	2.0	0.249E-02	5.0	0.239E-02	5.0
1.0000E+09	0.114E-02	2.0	0.216E-02	5.0	0.210E-02	5.0

Table 4 Neutron Capture Effect in Fission Products on Total Decay Power after Thermal Neutron Irradiation of ²³⁵U for 1 Year

TC(SEC)	PHI= 1.0E+12 (2)	PHI= 1.0E+13	PHI= 2.0E+13	PHI= 5.0E+13	PHI= 1.0E+14	PHI= 1.0E+15
0.0	0.9998 (3)	0.9997	1.0001	1.0020	1.0048	1.0231
1.0E+00	0.9999	0.9997	1.0001	1.0022	1.0052	1.0249
2.0E+00	0.9998	0.9995	1.0001	1.0021	1.0053	1.0257
5.0E+00	0.9998	0.9995	1.0000	1.0022	1.0055	1.0272
1.0E+01	0.9998	0.9994	0.9999	1.0021	1.0055	1.0280
2.0E+01	0.9998	0.9992	0.9996	1.0018	1.0052	1.0281
5.0E+01	0.9997	0.9988	0.9991	1.0011	1.0043	1.0274
1.0E+02	0.9996	0.9985	0.9986	1.0005	1.0038	1.0282
2.0E+02	0.9996	0.9981	0.9982	1.0002	1.0037	1.0311
5.0E+02	0.9995	0.9977	0.9978	1.0001	1.0043	1.0368
1.0E+03	0.9994	0.9973	0.9975	1.0002	1.0050	1.0423
2.0E+03	0.9993	0.9969	0.9971	1.0004	1.0061	1.0498
5.0E+03	0.9991	0.9962	0.9966	1.0010	1.0086	1.0640
1.0E+04	0.9990	0.9962	0.9969	1.0027	1.0120	1.0784
2.0E+04	0.9991	0.9971	0.9986	1.0062	1.0180	1.0957
5.0E+04	0.9997	1.0010	1.0047	1.0162	1.0319	1.1228
1.0E+05	1.0005	1.0058	1.0117	1.0268	1.0457	1.1417
2.0E+05	1.0010	1.0090	1.0165	1.0342	1.0553	1.1474
5.0E+05	1.0011	1.0100	1.0180	1.0368	1.0593	1.1400
1.0E+06	1.0011	1.0101	1.0183	1.0381	1.0620	1.1387
2.0E+06	1.0011	1.0102	1.0188	1.0399	1.0653	1.1355
5.0E+06	1.0011	1.0101	1.0190	1.0409	1.0664	1.1139
1.0E+07	1.0010	1.0092	1.0175	1.0387	1.0641	1.1010
2.0E+07	1.0011	1.0104	1.0203	1.0468	1.0817	1.1267
5.0E+07	1.0021	1.0207	1.0408	1.0958	1.1702	1.2660
1.0E+08	1.0033	1.0330	1.0650	1.1533	1.2717	1.4242
2.0E+08	1.0027	1.0266	1.0529	1.1256	1.2204	1.3221
5.0E+08	1.0003	1.0036	1.0076	1.0187	1.0304	1.0167
1.0E+09	1.0000	1.0008	1.0018	1.0049	1.0075	0.9948
1.0E+10	0.9940	0.9737	0.9689	0.9655	0.9636	0.9502
1.0E+11	0.9953	0.9705	0.9557	0.9273	0.8921	0.6015
1.0E+12	0.9948	0.9677	0.9518	0.9220	0.8856	0.5884
1.0E+13	0.9882	0.9299	0.9005	0.8561	0.8117	0.5054

(1) Cooling time after irradiation.

(2) Thermal neutron flux below 0.5 eV.

(3) Decay power ratio with and without consideration of neutron capture effect in fission products.

Table 5 Neutron Capture Effect in Fission Products on Total Decay Power after Thermal Neutron Irradiation of ²³⁵U for 2 Years

TC(SEC) ⁽¹⁾	PHI= 1.0E+12 ⁽²⁾	PHI= 1.0E+13	PHI= 2.0E+13	PHI= 5.0E+13	PHI= 1.0E+14	PHI= 1.0E+15
0.0	0.9999 ⁽³⁾	1.0006	1.0019	1.0054	1.0096	1.0332
1.0E+00	1.0000	1.0007	1.0020	1.0058	1.0103	1.0359
2.0E+00	0.9999	1.0006	1.0020	1.0059	1.0106	1.0373
5.0E+00	1.0000	1.0007	1.0022	1.0063	1.0112	1.0398
1.0E+01	0.9999	1.0007	1.0021	1.0063	1.0114	1.0416
2.0E+01	0.9999	1.0005	1.0019	1.0061	1.0112	1.0430
5.0E+01	0.9999	1.0002	1.0014	1.0055	1.0103	1.0445
1.0E+02	0.9998	0.9999	1.0011	1.0051	1.0100	1.0477
2.0E+02	0.9997	0.9997	1.0009	1.0052	1.0106	1.0534
5.0E+02	0.9997	0.9996	1.0010	1.0061	1.0106	1.0639
1.0E+03	0.9996	0.9995	1.0012	1.0072	1.0126	1.0739
2.0E+03	0.9996	0.9995	1.0016	1.0088	1.0178	1.0976
5.0E+03	0.9996	0.9997	1.0026	1.0123	1.0241	1.1135
1.0E+04	0.9996	1.0005	1.0043	1.0165	1.0312	1.1387
2.0E+04	0.9998	1.0024	1.0077	1.0233	1.0413	1.1680
5.0E+04	1.0006	1.0078	1.0163	1.0378	1.0612	1.2103
1.0E+05	1.0015	1.0136	1.0252	1.0518	1.0791	1.2366
2.0E+05	1.0021	1.0177	1.0314	1.0617	1.0914	1.2414
5.0E+05	1.0023	1.0192	1.0339	1.0664	1.0976	1.2231
1.0E+06	1.0024	1.0198	1.0351	1.0695	1.1025	1.2111
2.0E+06	1.0024	1.0205	1.0368	1.0732	1.1080	1.1881
5.0E+06	1.0024	1.0214	1.0390	1.0775	1.1135	1.1270
1.0E+07	1.0024	1.0215	1.0402	1.0824	1.1242	1.0943
2.0E+07	1.0028	1.0273	1.0521	1.1122	1.1760	1.0993
5.0E+07	1.0052	1.0505	1.0971	1.2115	1.3344	1.1808
1.0E+08	1.0074	1.0726	1.1400	1.3042	1.4777	1.2645
2.0E+08	1.0052	1.0516	1.1003	1.2156	1.3294	1.1689
5.0E+08	1.0007	1.0075	1.0152	1.0301	1.0366	0.9965
1.0E+09	1.0001	1.0019	1.0041	1.0076	1.0074	0.9851
1.0E+10	0.9894	0.9688	0.9659	0.9632	0.9608	0.9406
1.0E+11	0.9946	0.9632	0.9415	0.8949	0.8353	0.5004
1.0E+12	0.9940	0.9602	0.9373	0.8887	0.8274	0.4847
1.0E+13	0.9873	0.9217	0.8848	0.8206	0.7511	0.3931

(1) Cooling time after irradiation.

(2) Thermal neutron flux below 0.5 eV.

(3) Decay power ratio with and without consideration of neutron capture effect in fission products.

Table 6 Neutron Capture Effect in Fission Products on Total Decay Power after Thermal Neutron Irradiation of ²³⁵U for 5 Years

TC(SEC) ⁽¹⁾	PHI= 1.0E+12 ⁽²⁾	PHI= 1.0E+13	PHI= 2.0E+13	PHI= 5.0E+13	PHI= 1.0E+14	PHI= 1.0E+15
0.0	1.0003	1.0032	1.0063	1.0124	1.0181	1.0490
1.0E+00	1.0003	1.0035	1.0067	1.0134	1.0194	1.0530
2.0E+00	1.0004	1.0036	1.0070	1.0138	1.0200	1.0552
5.0E+00	1.0003	1.0038	1.0073	1.0145	1.0212	1.0594
1.0E+01	1.0003	1.0039	1.0075	1.0150	1.0218	1.0632
2.0E+01	1.0003	1.0038	1.0075	1.0150	1.0219	1.0668
5.0E+01	1.0003	1.0035	1.0071	1.0145	1.0215	1.0719
1.0E+02	1.0002	1.0034	1.0070	1.0147	1.0222	1.0785
2.0E+02	1.0003	1.0035	1.0074	1.0161	1.0245	1.0888
5.0E+02	1.0003	1.0041	1.0089	1.0193	1.0294	1.1065
1.0E+03	1.0003	1.0049	1.0104	1.0226	1.0345	1.1237
2.0E+03	1.0004	1.0060	1.0127	1.0273	1.0415	1.1470
5.0E+03	1.0006	1.0083	1.0172	1.0366	1.0551	1.1904
1.0E+04	1.0009	1.0110	1.0224	1.0466	1.0693	1.2319
2.0E+04	1.0014	1.0153	1.0299	1.0600	1.0875	1.2790
5.0E+04	1.0027	1.0246	1.0449	1.0845	1.1186	1.3435
1.0E+05	1.0040	1.0332	1.0586	1.1057	1.1437	1.3799
2.0E+05	1.0049	1.0397	1.0688	1.1210	1.1600	1.3821
5.0E+05	1.0054	1.0434	1.0752	1.1312	1.1689	1.3461
1.0E+06	1.0057	1.0462	1.0804	1.1403	1.1787	1.3206
2.0E+06	1.0060	1.0503	1.0875	1.1523	1.1914	1.2759
5.0E+06	1.0069	1.0584	1.1013	1.1750	1.2142	1.1661
1.0E+07	1.0077	1.0689	1.1210	1.2124	1.2585	1.0976
2.0E+07	1.0106	1.0970	1.1730	1.3093	1.3768	1.0673
5.0E+07	1.0173	1.1592	1.2843	1.5078	1.6170	1.0918
1.0E+08	1.0199	1.1849	1.3290	1.5802	1.6998	1.1045
2.0E+08	1.0114	1.1076	1.1889	1.3186	1.3734	1.0329
5.0E+08	1.0017	1.0176	1.0286	1.0344	1.0293	0.9645
1.0E+09	1.0004	1.0050	1.0077	1.0066	1.0019	0.9607
1.0E+10	0.9801	0.9646	0.9624	0.9589	0.9547	0.9177
1.0E+11	0.9923	0.9420	0.9019	0.8127	0.7118	0.4137
1.0E+12	0.9917	0.9385	0.8967	0.8046	0.7011	0.3946
1.0E+13	0.9848	0.8981	0.8412	0.7323	0.6214	0.2724

- (1) Cooling time after irradiation.
- (2) Thermal neutron flux below 0.5 eV.
- (3) Decay power ratio with and without consideration of neutron capture effect in fission products.

Table 7 Neutron Capture Effect in Fission Products on Beta and Gamma Decay Powers after Thermal Neutron Irradiation of ²³⁵U for 1 Year

TC (SEC)	PHI= 1.0E+12 (2)		PHI= 1.0E+13		PHI= 2.0E+13		PHI= 5.0E+13		PHI= 1.0E+14		PHI= 1.0E+15	
	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA
0.0	0.9998	0.9999	0.9996	0.9997	1.0001	1.0001	1.0023	1.0016	1.0057	1.0039	1.0250	1.0212
1.0E+00	0.9998	0.9999	0.9995	0.9997	1.0001	1.0001	1.0024	1.0017	1.0061	1.0042	1.0267	1.0229
2.0E+00	0.9998	0.9999	0.9995	0.9997	1.0000	1.0001	1.0025	1.0018	1.0062	1.0044	1.0275	1.0240
5.0E+00	0.9998	0.9999	0.9995	0.9996	0.9999	1.0001	1.0024	1.0019	1.0063	1.0047	1.0284	1.0259
1.0E+01	0.9997	0.9998	0.9991	0.9996	0.9996	1.0001	1.0021	1.0021	1.0060	1.0051	1.0281	1.0278
2.0E+01	0.9997	0.9998	0.9988	0.9996	0.9991	1.0001	1.0013	1.0022	1.0049	1.0055	1.0258	1.0302
5.0E+01	0.9996	0.9998	0.9980	0.9995	0.9980	1.0001	0.9995	1.0025	1.0022	1.0062	1.0194	1.0343
1.0E+02	0.9995	0.9998	0.9973	0.9994	0.9970	1.0001	0.9979	1.0028	0.9999	1.0070	1.0157	1.0389
2.0E+02	0.9994	0.9997	0.9967	0.9994	0.9961	1.0001	0.9966	1.0032	0.9985	1.0081	1.0149	1.0447
5.0E+02	0.9992	0.9997	0.9959	0.9992	0.9951	1.0001	0.9956	1.0039	0.9976	1.0098	1.0164	1.0537
1.0E+03	0.9991	0.9996	0.9952	0.9991	0.9942	1.0002	0.9948	1.0046	0.9971	1.0114	1.0179	1.0620
2.0E+03	0.9988	0.9996	0.9941	0.9990	0.9930	1.0002	0.9937	1.0056	0.9964	1.0136	1.0195	1.0734
5.0E+03	0.9986	0.9996	0.9928	0.9990	0.9914	1.0009	0.9923	1.0080	0.9957	1.0188	1.0225	1.0970
1.0E+04	0.9984	0.9995	0.9922	0.9994	0.9908	1.0019	0.9922	1.0113	0.9964	1.0250	1.0263	1.1214
2.0E+04	0.9985	0.9997	0.9927	1.0007	0.9917	1.0044	0.9941	1.0165	0.9993	1.0336	1.0321	1.1488
5.0E+04	0.9990	1.0003	0.9963	1.0047	0.9970	1.0107	1.0021	1.0272	1.0095	1.0491	1.0442	1.1832
1.0E+05	0.9999	1.0009	1.0014	1.0089	1.0042	1.0170	1.0120	1.0374	1.0212	1.0631	1.0516	1.2059
2.0E+05	1.0005	1.0014	1.0047	1.0121	1.0087	1.0219	1.0177	1.0455	1.0273	1.0745	1.0458	1.2175
5.0E+05	1.0005	1.0016	1.0044	1.0140	1.0078	1.0252	1.0153	1.0522	1.0233	1.0852	1.0275	1.2206
1.0E+06	1.0003	1.0018	1.0032	1.0154	1.0057	1.0281	1.0114	1.0587	1.0182	1.0961	1.0205	1.2306
2.0E+06	1.0002	1.0019	1.0021	1.0173	1.0039	1.0318	1.0083	1.0673	1.0140	1.1099	1.0178	1.2378
5.0E+06	1.0002	1.0020	1.0015	1.0192	1.0028	1.0361	1.0061	1.0775	1.0102	1.1253	1.0117	1.2210
1.0E+07	1.0001	1.0020	1.0010	1.0196	1.0020	1.0375	1.0044	1.0827	1.0074	1.1371	1.0047	1.2246
2.0E+07	1.0001	1.0033	1.0006	1.0322	1.0013	1.0627	1.0033	1.1445	1.0060	1.2517	0.9987	1.4142
5.0E+07	1.0001	1.0174	1.0008	1.1704	1.0018	1.3341	1.0049	1.7807	1.0095	2.3805	1.0007	3.2627
1.0E+08	1.0001	1.0185	1.0014	1.1822	1.0030	1.3578	1.0084	1.8373	1.0165	2.4763	1.0099	3.3798
2.0E+08	1.0001	1.0088	1.0010	1.0865	1.0025	1.1707	1.0077	1.4012	1.0152	1.7000	1.0045	2.0648
5.0E+08	1.0000	1.0011	1.0001	1.0108	1.0005	1.0220	1.0020	1.0530	1.0032	1.0858	0.9895	1.0722
1.0E+09	0.9999	1.0003	0.9998	1.0028	0.9999	1.0059	1.0003	1.0142	1.0005	1.0217	0.9893	1.0060
1.0E+10	0.9905	0.9997	0.9579	0.9986	0.9502	0.9984	0.9447	0.9981	0.9417	0.9979	0.9218	0.9949
1.0E+11	0.9941	1.0000	0.9627	0.9997	0.9440	0.9994	0.9082	0.9989	0.8638	0.9980	0.4992	0.9844
1.0E+12	0.9936	0.9999	0.9597	0.9996	0.9399	0.9994	0.9028	0.9977	0.8575	0.9977	0.4899	0.9817
1.0E+13	0.9663	0.9998	0.9188	0.9987	0.8847	0.9977	0.8334	0.9955	0.7824	0.9921	0.4353	0.9371

- (1) Cooling time after irradiation.
- (2) Thermal neutron flux below 0.5 eV.
- (3) Decay power ratio with and without consideration of neutron capture effect in fission products.

Table 8 Neutron Capture Effect in Fission Products on Beta and Gamma Decay Powers after Thermal Neutron Irradiation of ²³⁵U for 2 Years

TC (SEC)	PHI= 1.0E+12 ⁽²⁾		PHI= 1.0E+13		PHI= 2.0E+13		PHI= 5.0E+13		PHI= 1.0E+14		PHI= 1.0E+15	
	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA
0.0	1.0000	1.0000 ⁽³⁾	1.0007	1.0007	1.0020	1.0018	1.0060	1.0048	1.0107	1.0085	1.0305	1.0361
1.0E+00	0.9999	1.0000	1.0007	1.0007	1.0021	1.0019	1.0063	1.0052	1.0114	1.0092	1.0327	1.0391
2.0E+00	0.9999	1.0000	1.0007	1.0008	1.0022	1.0020	1.0065	1.0055	1.0117	1.0096	1.0337	1.0408
5.0E+00	0.9999	1.0000	1.0006	1.0008	1.0021	1.0022	1.0066	1.0059	1.0120	1.0103	1.0352	1.0442
1.0E+01	0.9999	1.0000	1.0004	1.0009	1.0019	1.0023	1.0063	1.0063	1.0117	1.0111	1.0354	1.0476
2.0E+01	0.9998	1.0000	1.0000	1.0010	1.0013	1.0025	1.0054	1.0069	1.0102	1.0120	1.0335	1.0517
5.0E+01	0.9997	1.0000	0.9991	1.0011	0.9993	1.0029	1.0027	1.0078	1.0064	1.0137	1.0278	1.0593
1.0E+02	0.9996	1.0000	0.9983	1.0012	0.9986	1.0032	1.0006	1.0089	1.0035	1.0155	1.0248	1.0673
2.0E+02	0.9995	1.0000	0.9976	1.0014	0.9976	1.0037	0.9993	1.0102	1.0020	1.0179	1.0252	1.0775
5.0E+02	0.9993	1.0000	0.9969	1.0017	0.9968	1.0045	0.9987	1.0124	1.0019	1.0216	1.0289	1.0931
1.0E+03	0.9992	1.0000	0.9963	1.0021	0.9962	1.0053	0.9985	1.0144	1.0021	1.0251	1.0326	1.1075
2.0E+03	0.9990	1.0000	0.9957	1.0025	0.9955	1.0064	0.9982	1.0172	1.0025	1.0300	1.0373	1.1276
5.0E+03	0.9988	1.0001	0.9948	1.0036	0.9947	1.0069	0.9982	1.0235	1.0037	1.0405	1.0450	1.1686
1.0E+04	0.9987	1.0003	0.9947	1.0054	0.9949	1.0123	0.9993	1.0310	1.0059	1.0525	1.0526	1.2114
2.0E+04	0.9986	1.0006	0.9956	1.0082	0.9965	1.0173	1.0025	1.0411	1.0105	1.0678	1.0620	1.2591
5.0E+04	0.9995	1.0014	0.9959	1.0141	1.0030	1.0270	1.0125	1.0581	1.0231	1.0916	1.0775	1.3164
1.0E+05	1.0004	1.0023	1.0053	1.0199	1.0107	1.0360	1.0233	1.0733	1.0355	1.1117	1.0826	1.3521
2.0E+05	1.0009	1.0029	1.0084	1.0245	1.0150	1.0435	1.0286	1.0861	1.0407	1.1287	1.0688	1.3686
5.0E+05	1.0009	1.0034	1.0074	1.0284	1.0129	1.0502	1.0246	1.0989	1.0347	1.1464	1.0398	1.3656
1.0E+06	1.0007	1.0038	1.0058	1.0320	1.0096	1.0568	1.0193	1.1124	1.0283	1.1658	1.0282	1.3676
2.0E+06	1.0005	1.0043	1.0035	1.0368	1.0069	1.0660	1.0147	1.1304	1.0226	1.1915	1.0209	1.3515
5.0E+06	1.0003	1.0049	1.0028	1.0442	1.0052	1.0806	1.0107	1.1594	1.0162	1.2330	1.0069	1.2745
1.0E+07	1.0002	1.0056	1.0021	1.0521	1.0040	1.0968	1.0086	1.1982	1.0131	1.2987	0.9945	1.2508
2.0E+07	1.0002	1.0103	1.0018	1.0988	1.0036	1.1881	1.0084	1.4030	1.0137	1.6314	0.9833	1.4244
5.0E+07	1.0002	1.0396	1.0026	1.3816	1.0054	1.7312	1.0131	2.5834	1.0218	3.4970	0.9790	2.5766
1.0E+08	1.0003	1.0365	1.0039	1.3534	1.0083	1.6782	1.0205	2.4641	1.0339	3.2918	0.9796	2.4285
2.0E+08	1.0002	1.0167	1.0028	1.1625	1.0066	1.3132	1.0163	1.6687	1.0252	2.0205	0.9751	1.6093
5.0E+08	1.0000	1.0021	1.0006	1.0216	1.0016	1.0427	1.0034	1.0843	1.0029	1.1052	0.9768	1.0365
1.0E+09	0.9999	1.0006	0.9999	1.0059	1.0002	1.0117	1.0005	1.0218	0.9995	1.0229	0.9782	0.9988
1.0E+10	0.9999	0.9994	0.9950	0.9983	0.9455	0.9982	0.9412	0.9979	0.9375	0.9975	0.9082	0.9917
1.0E+11	0.9993	0.9999	0.9535	0.9994	0.9261	0.9991	0.8673	0.9980	0.7923	0.9964	0.3745	0.9713
1.0E+12	0.9926	0.9999	0.9504	0.9994	0.9218	0.9990	0.8614	0.9978	0.7853	0.9958	0.3640	0.9665
1.0E+13	0.9653	0.9997	0.9093	0.9980	0.8666	0.9964	0.7928	0.9922	0.7130	0.9855	0.3133	0.6846

(1) Cooling time after irradiation.

(2) Thermal neutron flux below 0.5 eV.

(3) Decay power ratio with and without consideration of neutron capture effect in fission products.

Table 9 Neutron Capture Effect in Fission Products on Beta and Gamma Decay Powers after Thermal Neutron Irradiation of ²³⁵U for 5 Years

TC (SEC)	PHI= 1.0E+12 (1)		PHI= 1.0E+13 (2)		PHI= 2.0E+13		PHI= 5.0E+13		PHI= 1.0E+14		PHI= 1.0E+15	
	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA	BETA	GAMMA
0.0	1.0003	1.0003	1.0033	1.0033	1.0064	1.0062	1.0126	1.0122	1.0182	1.0178	1.0397	1.0586
1.0E+00	1.0003	1.0004	1.0035	1.0035	1.0068	1.0067	1.0134	1.0132	1.0194	1.0193	1.0427	1.0635
2.0E+00	1.0003	1.0004	1.0036	1.0037	1.0070	1.0070	1.0138	1.0138	1.0199	1.0202	1.0443	1.0663
5.0E+00	1.0003	1.0004	1.0037	1.0040	1.0071	1.0076	1.0142	1.0150	1.0205	1.0218	1.0468	1.0719
1.0E+01	1.0003	1.0004	1.0035	1.0043	1.0069	1.0081	1.0139	1.0161	1.0201	1.0235	1.0481	1.0775
2.0E+01	1.0002	1.0005	1.0030	1.0046	1.0061	1.0088	1.0124	1.0175	1.0181	1.0255	1.0474	1.0946
5.0E+01	1.0000	1.0005	1.0015	1.0053	1.0037	1.0101	1.0084	1.0200	1.0128	1.0291	1.0432	1.0972
1.0E+02	0.9998	1.0006	1.0002	1.0060	1.0018	1.0115	1.0055	1.0227	1.0095	1.0331	1.0415	1.1106
2.0E+02	0.9997	1.0007	0.9997	1.0070	1.0006	1.0133	1.0043	1.0262	1.0085	1.0382	1.0437	1.1273
5.0E+02	0.9996	1.0008	0.9990	1.0084	1.0004	1.0160	1.0046	1.0316	1.0097	1.0461	1.0512	1.1531
1.0E+03	0.9995	1.0010	0.9988	1.0097	1.0004	1.0186	1.0054	1.0367	1.0113	1.0534	1.0589	1.1767
2.0E+03	0.9994	1.0012	0.9987	1.0118	1.0006	1.0224	1.0066	1.0439	1.0137	1.0638	1.0688	1.2097
5.0E+03	0.9994	1.0017	0.9988	1.0161	1.0014	1.0303	1.0092	1.0592	1.0180	1.0855	1.0850	1.2767
1.0E+04	0.9994	1.0023	0.9994	1.0211	1.0028	1.0393	1.0123	1.0760	1.0228	1.1093	1.0988	1.3465
2.0E+04	0.9996	1.0031	1.0012	1.0278	1.0059	1.0510	1.0178	1.0971	1.0302	1.1380	1.1145	1.4239
5.0E+04	1.0004	1.0046	1.0070	1.0390	1.0148	1.0697	1.0313	1.1283	1.0463	1.1782	1.1368	1.5140
1.0E+05	1.0014	1.0060	1.0131	1.0491	1.0237	1.0860	1.0435	1.1544	1.0592	1.2098	1.1400	1.5676
2.0E+05	1.0019	1.0072	1.0161	1.0575	1.0279	1.1005	1.0482	1.1776	1.0617	1.2362	1.1152	1.5892
5.0E+05	1.0017	1.0085	1.0139	1.0678	1.0243	1.1174	1.0420	1.2050	1.0516	1.2660	1.0691	1.5754
1.0E+06	1.0014	1.0096	1.0110	1.0786	1.0199	1.1361	1.0356	1.2367	1.0438	1.3027	1.0496	1.5700
2.0E+06	1.0010	1.0115	1.0086	1.0947	1.0160	1.1636	1.0297	1.2829	1.0369	1.3558	1.0349	1.5326
5.0E+06	1.0008	1.0150	1.0074	1.1284	1.0134	1.2218	1.0241	1.3816	1.0292	1.4676	1.0081	1.3825
1.0E+07	1.0007	1.0202	1.0072	1.1788	1.0130	1.3131	1.0235	1.5487	1.0278	1.6692	0.9852	1.2977
2.0E+07	1.0008	1.0405	1.0081	1.3678	1.0151	1.6538	1.0277	2.1667	1.0324	2.4250	0.9640	1.3819
5.0E+07	1.0011	1.1010	1.0117	1.9233	1.0219	2.6438	1.0403	3.9304	1.0470	4.5700	0.9497	1.6275
1.0E+08	1.0013	1.0788	1.0148	1.7233	1.0277	2.2830	1.0498	3.2600	1.0573	3.7345	0.9402	1.6245
2.0E+08	1.0006	1.0346	1.0096	1.3208	1.0177	1.5618	1.0285	1.9502	1.0293	2.1224	0.9362	1.2435
5.0E+08	1.0001	1.0050	1.0024	1.0486	1.0039	1.0787	1.0026	1.0989	0.9984	1.0920	0.9455	1.0030
1.0E+09	0.9998	1.0015	1.0004	1.0142	1.0006	1.0219	0.9989	1.0218	0.9956	1.0145	0.9474	0.9870
1.0E+10	0.9682	0.9990	0.9434	0.9981	0.9399	0.9979	0.9344	0.9973	0.9282	0.9965	0.8767	0.9823
1.0E+11	0.9503	0.9999	0.9268	0.9990	0.8762	0.9981	0.7638	0.9956	0.6370	0.9917	0.2724	0.9424
1.0E+12	0.9898	0.9999	0.9234	0.9988	0.8713	0.9978	0.7569	0.9949	0.6287	0.9903	0.2598	0.9326
1.0E+13	0.9824	0.9995	0.8822	0.9960	0.8166	0.9924	0.6917	0.9823	0.5654	0.9665	0.1918	0.7685

- (1) Cooling time after irradiation.
- (2) Thermal neutron flux below 0.5 eV.
- (3) Decay power ratio with and without consideration of neutron capture effect in fission products.

Appendix 1 FORTRAN List of HEAT5G Program

FACOM OSIV/F4 FORTRAN IV (HE) V04L15 DATE 80.06.17 TIME 11.44.40

PAGE 1

```
SPECIFIED OPTIONS: NQNAME,FLAG(I),SOURCE,COMNF,SYNAME,GO,IMP,NOITATIS
C.....
C* HEAT5G PROGRAM 1980/06/01
C*
C*.....
C DIMENSION AREA
C
C DIMENSION ICS(3),TTI(5),FTI(40+3),JCC(3),RAI(40+3),D13,FP(100)
C DIMENSION TA(100),TE(100),PA(100),PB(100),TC(100),TD(100),TI(100)
C 1 HA(100),S(100),LS(100),AA(100),T9(100)
C 2 JCC(100),A(23),R(23),TD(57),AC(57),SIG(100)
C 3 HBS(100),ZQ(57),PD(57),R(23),UC(23),C(23),V(23),PH(2,100)
C
C DATA AREA
C
C DATA (D(I),I=1,57)/0.00,1.00,1.50,2.00,4.00,6.00,8.00,10.0
C 1 15.0,20.0,30.0,40.0,50.0,60.0,70.0,80.0,100.0,150.0,200.0,300.0,400.0,600.0
C 2 800.0,1000.0,1500.0,2000.0,3000.0,4000.0,6000.0,8000.0,10000.0,15000.0
C 3 2.0E+4,4.0E+4,6.0E+4,8.0E+4,1.0E+5,1.5E+5,2.0E+5,4.0E+5
C 4 6.0E+5,8.0E+5,1.0E+6,1.5E+6,2.0E+6,4.0E+6,6.0E+6,8.0E+6
C 5 1.0E+7,1.5E+7,2.0E+7,4.0E+7,6.0E+7,8.0E+7,1.0E+8,1.5E+8
C 6 2.0E+8,4.0E+8,6.0E+8,8.0E+8,1.0E+9,1.0E+10/
C DATA (R(I),I=1,57)/4.50,3.25,2.67,2.40,2.12,1.85,2.01,1.67
C 1 1.91,1.65,1.64,1.62,1.62,1.61,1.61,1.61,1.61,1.78,1.78,1.78,1.77
C 2 1.77,1.78,1.79,1.79,1.79,1.79,1.76,1.73,1.78,1.78,1.82,1.82
C 3 1.84,2.00,2.00,2.00,2.01,2.01,1.99,2.00,1.99,2.01,2.00
C 4 2.01,2.02,1.99,2.02,2.00,1.99,1.99,1.96,1.97,2.03,2.04
C 5 2.00,2.00,1.99,2.01,2.01/
C DATA (Q(I),I=1,57)/07.30,5.65,4.79,4.49,4.30,4.23,4.21
C 1 4.18,4.16,4.16,4.17,4.18,4.20,4.24,4.24,4.29,4.33,4.38
C 2 4.42,4.48,4.48,4.49,4.57,4.67,4.74,4.84,4.94,4.97,4.00
C 3 3.94,3.90,3.87,3.86,3.87,3.88,2.91,3.95,3.96,4.00,4.09
C 4 4.20,4.26,4.40,4.43,4.43,4.62,4.76,4.90,5.00,5.00,5.00
C 5 5.00,5.00,5.00,5.00,5.00/
C DATA (PD(I),I=1,57)/07.30,5.65,4.79,4.49,4.30,4.23,4.21
C 1 4.18,4.16,4.16,4.17,4.18,4.20,4.24,4.24,4.29,4.33,4.38
C 2 4.41,4.43,4.52,4.66,4.75,4.79,4.81,4.78,4.73,4.82,4.90
C 3 4.90,5.00,5.00,5.00,5.00,5.00,5.00,5.00,5.00,5.00,5.00
C 4 5.00,5.00,5.00,5.00,5.00,5.00,5.00,5.00,5.00,5.00,5.00
C 5 5.00,5.00,5.00,5.00,5.00/
C
C INTEGER UTS,UTC,UTA,UTB
C
C FORMAT AREA
C
C 100 FORMAT(24I3)
C 105 FORMAT(6E12.5)
C 110 FORMAT(13A3)
C 111 FORMAT(10X,13,A3)
C 115 FORMAT(2E12.5)
C 120 FORMAT(3E12.5)
C 200 FORMAT(1H1,10X,12H TC(N) ,12H HA(N) ,12H HB(N)
C 1 12H SIG(N) ,12H HBS(N)
C 2 12H R=H/HA
C 3 12H UPAC/H3(N) ,12H DPERN/DFFP )
C
C 1000010 H5G00010
C 1000020 H5G00020
C 1000030 H5G00030
C 1000040 H5G00040
C 1000050 H5G00050
C 1000060 H5G00060
C 1000070 H5G00070
C 1000080 H5G00080
C 1000090 H5G00090
C 1000100 H5G00100
C 1000110 H5G00110
C 1000120 H5G00120
C 1000130 H5G00130
C 1000140 H5G00140
C 1000150 H5G00150
C 1000160 H5G00160
C 1000170 H5G00170
C 1000180 H5G00180
C 1000190 H5G00190
C 1000200 H5G00200
C 1000210 H5G00210
C 1000220 H5G00220
C 1000230 H5G00230
C 1000240 H5G00240
C 1000250 H5G00250
C 1000260 H5G00260
C 1000270 H5G00270
C 1000280 H5G00280
C 1000290 H5G00290
C 1000300 H5G00300
C 1000310 H5G00310
C 1000320 H5G00320
C 1000330 H5G00330
C 1000340 H5G00340
C 1000350 H5G00350
C 1000360 H5G00360
C 1000370 H5G00370
C 1000380 H5G00380
C 1000390 H5G00390
C 1000400 H5G00400
C 1000410 H5G00410
C 1000420 H5G00420
C 1000430 H5G00430
C 1000440 H5G00440
C 1000450 H5G00450
C 1000460 H5G00460
C 1000470 H5G00470
C 1000480 H5G00480
C 1000490 H5G00490
C 1000500 H5G00500
C 1000510 H5G00510
C 1000520 H5G00520
C 1000530 H5G00530
C 1000540 H5G00540
C 1000550 H5G00550
C 1000560 H5G00560
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FACOM OSIV/F4 FORTRAN IV (HE) V04L15 MAIN DATE 80.06.17 TIME 11.44.40

PAGE 2

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205 FORMAT(5X,13,2X,8(1PE12.5)) H5G00570
210 FORMAT(1H0) H5G00580
215 FORMAT(16(5X,1PE12.5)) H5G00590
220 FORMAT(1H0,10X, 32H(TA(I),PA(I),I=1,17A),TIME UNIT= A3) H5G00600
225 FORMAT(1H0,10X, 32H(TB(I),PB(I),I=1,17B),TIME UNIT= A3) H5G00610
230 FORMAT(11X,40( ,A3,1H),3X,12H (MEV/SEC) ,12H (MEV/SEC) , H5G00620
1 12H (PERCENT) ,12H (MEV/SEC) ) H5G00630
235 FORMAT(3(5X,1PE12.5)) H5G00640
101 FORMAT(10X,24I3) H5G00650
106 FORMAT(16(5X,1PE12.5)) H5G00660
116 FORMAT(2(5X,1PE12.5)) H5G00670
250 FORMAT(1H1,5X,10H***** CASE,I6,6H ***** H5G00680
C READ AND WRITE THE INITIAL VALUES H5G00700
C READ(5,100) (ICG(I),I=1,3) H5G00710
C WRITE(6,101) (ICG(I),I=1,3) H5G00720
C DO 11 J=1,3 H5G00730
C JJ=ICG(J) H5G00740
C READ(5,105) (FTT(K,J),K=1,JJ) H5G00750
C WRITE(6,106) (FTT(K,J),K=1,JJ) H5G00760
C 11 CONTINUE H5G00770
C ICG(1):TR DATA POINTS FOR IRRADIATION TIMES H5G00780
C ICG(2):PHI DATA POINTS FOR NEUTRON FLUXES H5G00790
C ICG(3):TC DATA POINTS FOR COOLING TIMES H5G00800
C IJ=ICG(I) H5G00810
C JJ=ICG(J) H5G00820
C KK=ICG(K) H5G00830
C DO 22 I=1,IJ H5G00840
C DO 22 J=1,JJ H5G00850
C READ(5,105) (RAT(K,J,I),K=1,KK) H5G00860
C WRITE(6,106) (RAT(K,J,I),K=1,KK) H5G00870
C 22 CONTINUE H5G00880
C READ(5,115) (A(I),R(I),I=1,23) H5G00890
C WRITE(6,116) (A(I),R(I),I=1,23) H5G00900
C READ(5,115) (B(I),U(I),I=1,23) H5G00910
C WRITE(6,116) (B(I),U(I),I=1,23) H5G00920
C READ(5,115) (C(I),V(I),I=1,23) H5G00930
C WRITE(6,116) (C(I),V(I),I=1,23) H5G00940
C READ(5,110) ITS,UTS H5G00950
C WRITE(6,111) (ITS,UTS) H5G00960
C READ(5,105) (T(I),I=1,ITS) H5G00970
C WRITE(6,106) (T(I),I=1,ITS) H5G00980
C READ(5,105) (P(I),I=1,ITS) H5G00990
C WRITE(6,106) (P(I),I=1,ITS) H5G01000
C DO 600 I=1,ITS H5G01010
C TSS(I)=T(I) H5G01020
C IF(UTS.EQ.3H S) GO TO 600 H5G01030
C IF(UTS.EQ.3H ) GO TO 600 H5G01040
C IF(UTS.EQ.3H M) T(I)=T(I) *60.0 H5G01050
C IF(UTS.EQ.3H H) T(I)=T(I) *3600.0 H5G01060
C IF(UTS.EQ.3H D) T(I)=T(I) *8.64E+4 H5G01070
C IF(UTS.EQ.3H Y) T(I)=T(I) *3.1536E+7 H5G01080
C 600 CONTINUE H5G01090
C 1000100 H5G01100
C 1000110 H5G01110
C 1000120 H5G01120
C 1000130 H5G01130
C 1000140 H5G01140
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ISN 00062      C      READ(5,100) ICPT,ICASE
ISN 00063      WRITE(6,101) ICPT,ICASE
ISN 00064      IF(ICPT.NE.1) READ(5,105) CR
ISN 00065      WRITE(6,106) CR
ISN 00066      READ(5,100) KA,KB
ISN 00067      WRITE(6,101) KA,KB
ISN 00068      READ(5,110) ITC,UTC
ISN 00069      WRITE(6,111) ITC,UTC
ISN 00070      READ(5,105) (TC(I),I=1,ITC)
ISN 00071      WRITE(6,106) (TC(I),I=1,ITC)
ISN 00072      DO 610 I=1,ITC
ISN 00073      TC(I)=TC(I)
ISN 00074      IF(UTC.EQ.3H S) GO TO 610
ISN 00075      IF(UTC.EQ.3H ) GO TO 610
ISN 00076      IF(UTC.EQ.3H M) TC(I)=TC(I)*60.0
ISN 00077      IF(UTC.EQ.3H H) TC(I)=TC(I)*3600.0
ISN 00078      IF(UTC.EQ.3H D) TC(I)=TC(I)*8.64E+4
ISN 00079      IF(UTC.EQ.3H Y) TC(I)=TC(I)*3.1536E+7
ISN 00080      610 CONTINUE

ISN 00081      C      READ(5,110) ITA,UTA
ISN 00082      WRITE(6,111) ITA,UTA
ISN 00083      READ(5,105) (TA(I),I=1,ITA)
ISN 00084      WRITE(6,106) (TA(I),I=1,ITA)
ISN 00085      DO 620 I=1,ITA
ISN 00086      TAA(I)=TA(I)
ISN 00087      IF(UTA.EQ.3H S) GO TO 620
ISN 00088      IF(UTA.EQ.3H M) TA(I)=TA(I)*60.0
ISN 00089      IF(UTA.EQ.3H H) TA(I)=TA(I)*3600.0
ISN 00090      IF(UTA.EQ.3H D) TA(I)=TA(I)*8.64E+4
ISN 00091      IF(UTA.EQ.3H Y) TA(I)=TA(I)*3.1536E+7
ISN 00092      620 CONTINUE

ISN 00094      C      DO 2000 JCASE=1,ICASE

ISN 00095      C      WRITE(6,250) JCASE
C
C
C
C
ISN 00096      READ(5,110) ITB,UTB
ISN 00097      WRITE(6,111) ITB,UTB
ISN 00098      READ(5,105) (TB(I),I=1,ITB)
ISN 00099      WRITE(6,106) (TB(I),I=1,ITB)
ISN 00100      READ(5,105) (FB(I),I=1,ITB)
ISN 00101      WRITE(6,106) (FB(I),I=1,ITB)
ISN 00102      READ(5,120) ((PH(I,J),I=1,3),J=1,ITB)
ISN 00103      WRITE(6,235) ((PH(I,J),I=1,3),J=1,ITB)
ISN 00104      DO 630 I=1,ITB
ISN 00105      TB(I)=TB(I)
ISN 00106      IF(UTB.EQ.3H S) GO TO 630
ISN 00107      IF(UTB.EQ.3H M) TB(I)=TB(I)*60.0
ISN 00108      IF(UTB.EQ.3H H) TB(I)=TB(I)*3600.0
ISN 00109      IF(UTB.EQ.3H D) TB(I)=TB(I)*8.64E+4
ISN 00110      IF(UTB.EQ.3H Y) TB(I)=TB(I)*3.1536E+7
ISN 00111

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H5G01150
H5G01160
H5G01170
H5G01180
H5G01190
H5G01200
H5G01210
H5G01220
H5G01230
H5G01240
H5G01250
H5G01260
H5G01270
H5G01280
H5G01290
H5G01300
H5G01310
H5G01320
H5G01330
H5G01340
H5G01350
H5G01360
H5G01370
H5G01380
H5G01390
H5G01400
H5G01410
H5G01420
H5G01430
H5G01440
H5G01450
H5G01460
H5G01470
H5G01480
H5G01490
H5G01500
H5G01510
H5G01520
H5G01530
H5G01540
H5G01550
H5G01560
H5G01570
H5G01580
H5G01590
H5G01600
H5G01610
H5G01620
H5G01630
H5G01640
H5G01650
H5G01660
H5G01670
H5G01680
H5G01690
H5G01700
H5G01710
H5G01720

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ISN 00112      630 CONTINUE
ISN 00113      C      A1=0.474
ISN 00114      A2=0.419
ISN 00115      R1=4.91E-4
ISN 00116      A2=3.41E-6
ISN 00117      CDS1=0.01.0
ISN 00118      EF1=199.9
ISN 00119      EF2=201.0
ISN 00120      EF3=208.6
ISN 00121      DEF1=1.3
ISN 00122      DEF2=1.7
ISN 00123      DEF3=1.3
ISN 00124      JMAX=57

ISN 00125      C      WRITE(6,200)
ISN 00126      WRITE(6,230) UTC
C
C
C      DO LOOP FOR COOLING TIME
C
ISN 00127      DO 1000 N=1,ITC
ISN 00128      HAIN=0.0
ISN 00129      HBFN=0.0
ISN 00130      SIG(N)=0.0
C
C
C      DO LOOP FOR REFERENCE IRRADIATION HISTORY
C
ISN 00131      DO 300 M=1,ITA
ISN 00132      M1=M+1
ISN 00133      IF(PA(M).EQ.0.0) GO TO 300
ISN 00134      T1=0.0
ISN 00135      IF(M1.GT.ITA) GO TO 311
ISN 00136      DO 310 L=M+1,ITA
ISN 00137      310 T1=T1+TA(L)
ISN 00138      311 CONTINUE
ISN 00139      T1=T1+TC(N)
ISN 00140      T2=T1+TA(M1-1)
ISN 00141      IF(IDPT.EQ.1) GO TO 700

ISN 00142      C      CALCULATION OF DECAY POWER OF U-239 AND NP-239
ISN 00143      C
ISN 00144      X1=R1*(T2-T1)
ISN 00145      X2=R2*(T2-T1)
ISN 00146      EXP1=0.0
ISN 00147      EXP2=0.0
ISN 00148      IF(X1.LE.300.0) EXP1=EXP1-X1
ISN 00149      IF(X2.LE.300.0) EXP2=EXP2-X2
ISN 00150      X1=R1*T1
ISN 00151      X2=R2*T1
ISN 00152      E1=0.0
ISN 00153      E2=0.0
ISN 00154      IF(X1.LE.300.0) E1=EXP1-X1
ISN 00155      IF(X2.LE.300.0) E2=EXP2-X2
ISN 00156      P29 =A1*CR*CONST*(1.0-EXP1)*E1
ISN 00157      P39 =A2*CR*CONST*(R2/(R1-R2))*(1.0-EXP1)*E2
ISN 00158      P239=P29+P39

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H5G01730
H5G01740
H5G01750
H5G01760
H5G01770
H5G01780
H5G01790
H5G01800
H5G01810
H5G01820
H5G01830
H5G01840
H5G01850
H5G01860
H5G01870
H5G01880
H5G01890
H5G01900
H5G01910
H5G01920
H5G01930
H5G01940
H5G01950
H5G01960
H5G01970
H5G01980
H5G01990
H5G02000
H5G02010
H5G02020
H5G02030
H5G02040
H5G02050
H5G02060
H5G02070
H5G02080
H5G02090
H5G02100
H5G02110
H5G02120
H5G02130
H5G02140
H5G02150
H5G02160
H5G02170
H5G02180
H5G02190
H5G02200
H5G02210
H5G02220
H5G02230
H5G02240
H5G02250
H5G02260
H5G02270
H5G02280
H5G02290
H5G02300

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ISN 00157      HAIN=HA(N)+P239*PA(M)
ISN 00158      IF(IQPT.EQ.2) GO TO 300
ISN 00159      700 CONTINUE
C
C
C      CALCULATION OF DECAY POWER OF FISSION PRODUCTS
ISN 00160      IF(KA.NE.0) GO TO 602
C
C
C      FP DECAY POWER BASED UPON ANS 5.1 (SEPTEMBER 1978)
ISN 00161      FNNN=0.0
ISN 00162      DO 601 I=1,23
ISN 00163      X1=TI*(R(I)
ISN 00164      X2=(T2-TI)*R(I)
ISN 00165      Y1=0.0
ISN 00166      Y2=0.0
ISN 00167      IF(X1.LE.300.0) Y1=EXP(-X1)
ISN 00168      IF(X2.LE.300.0) Y2=EXP(-X2)
ISN 00169      IF(X2.EQ.0.0) FNNN=FNNN+A(I)*Y1
ISN 00170      IF(X2.NE.0.0)
      *FNNN=FNNN+A(I)/X(I)*Y1*(1.0-Y2)
ISN 00171      601 CONTINUE
ISN 00172      HAIN=HA(N)+FNNN*PA(M)
ISN 00173      GO TO 300
ISN 00174      603 CONTINUE
C
C
C      FP DECAY POWER CALCULATION BY INTERPOLATION OF INPUT TABLE
ISN 00175      DO 320 K=1,2
ISN 00176      TI=TI
ISN 00177      IF(K.EQ.2) TI=T2
ISN 00178      DO 330 J=1,ITS
ISN 00179      JM=J
ISN 00180      IF(TI.LE.T(J)) GO TO 340
ISN 00181      330 CONTINUE
ISN 00182      340 JJ=JM
ISN 00183      IF(JJ.LE.1) JJ=2
ISN 00184      H1=P(JJ-1)
ISN 00185      H2=P(JJ)
ISN 00186      X1=TI*(JJ-1)
ISN 00187      X2=TI*(JJ)
ISN 00188      XX=TI
ISN 00189      H1=ALOG(H1)
ISN 00190      H2=ALOG(H2)
ISN 00191      IF(X1.EQ.0.0) GO TO 321
ISN 00192      IF(X2.EQ.0.0) GO TO 321
ISN 00193      X1=ALOG(X1)
ISN 00194      X2=ALOG(X2)
ISN 00195      XX=ALOG(TT)
ISN 00196      321 CONTINUE
ISN 00197      Y1=H1*(H2-H1)*(XX-X1)/(X2-X1)
ISN 00198      Y1=EXP(Y1)
ISN 00199      IF(K.EQ.1) W1=Y1
ISN 00200      IF(K.EQ.2) W2=Y1
ISN 00201      320 CONTINUE
ISN 00202      HAIN=HA(N)+(W1-W2)*PA(M)
ISN 00203      300 CONTINUE
C

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H5G02310
H5G02320
H5G02330
H5G02340
H5G02350
H5G02360
H5G02370
H5G02380
H5G02390
H5G02400
H5G02410
H5G02420
H5G02430
H5G02440
H5G02450
H5G02460
H5G02470
H5G02480
H5G02490
H5G02500
H5G02510
H5G02520
H5G02530
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H5G02560
H5G02570
H5G02580
H5G02590
H5G02600
H5G02610
H5G02620
H5G02630
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H5G02670
H5G02680
H5G02690
H5G02700
H5G02710
H5G02720
H5G02730
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H5G02750
H5G02760
H5G02770
H5G02780
H5G02790
H5G02800
H5G02810
H5G02820
H5G02830
H5G02840
H5G02850
H5G02860
H5G02870
H5G02880

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C
C      DECAY POWER CALCULATION FOR SPECIFIED IRRADIATION HISTORY
ISN 00204      DRD1=0.0
ISN 00205      DRD2=0.0
ISN 00206      DRD3=0.0
ISN 00207      F1=0.0
ISN 00208      F2=0.0
ISN 00209      F3=0.0
C
C
C      DPAC=0.0
ISN 00210      DPFN=0.0
ISN 00211      DPFN=0.0
ISN 00212      DPFN=0.0
C
C
C      DO 400 M=1,ITB
ISN 00213      AC=PHI1,M)
ISN 00214      AD=PHI2,M)
ISN 00215      AE=PHI3,M)
ISN 00216      M1=M+1
ISN 00217      IF(PB(M).EQ.0.0) GO TO 400
ISN 00218      TI=0.0
ISN 00219      IF(M1.GT.ITB) GO TO 411
ISN 00220      DO 410 L=M1,ITB
ISN 00221      410 TI=TI+TB(L)
ISN 00222      411 CONTINUE
ISN 00223      T1=TI*G(M)
ISN 00224      T2=TI+TB(M1-1)
ISN 00225      IF(IQPT.EQ.1) GO TO 705
ISN 00226      C
C
C      CALCULATION OF DECAY POWER OF U-239 AND NP-239
ISN 00227      X1=R1*(T2-T1)
ISN 00228      X2=R2*(T2-T1)
ISN 00229      EXP1=0.0
ISN 00230      EXP2=0.0
ISN 00231      IF(X1.LE.300.0) EXP1=EXP(-X1)
ISN 00232      IF(X2.LE.300.0) EXP2=EXP(-X2)
ISN 00233      X1=R1*T1
ISN 00234      X2=R2*T1
ISN 00235      E1=0.0
ISN 00236      E2=0.0
ISN 00237      IF(X1.LE.300.0) E1=EXP(-X1)
ISN 00238      IF(X2.LE.300.0) E2=EXP(-X2)
ISN 00239      P29 =A1+CR*CONST*(1.0-EXP1)*E1
ISN 00240      P39 =A2+CR*CONST*( R2/(R1-R2)*(1.0-EXP1)*(E2-E1)
      + (1.0-EXP2)*E2
      +R2/(R1-R2)*(EXP1-EXP2)*E2
ISN 00241      P239=P29+P39
ISN 00242      DPAC=DPAC+P239*PE(M)
ISN 00243      IF(IQPT.EQ.2) GO TO 400
C
C
C      CALCULATION OF DECAY POWER OF FISSION PRODUCTS
ISN 00244      705 CONTINUE
ISN 00245      IF(KB.NE.0) GO TO 604
C
C
C      FP DECAY POWER BASED UPON ANS 5.1 (SEPTEMBER 1978)
ISN 00246      FNNN=0.0

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H5G02890
H5G02900
H5G02910
H5G02920
H5G02930
H5G02940
H5G02950
H5G02960
H5G02970
H5G02980
H5G02990
H5G03000
H5G03010
H5G03020
H5G03030
H5G03040
H5G03050
H5G03060
H5G03070
H5G03080
H5G03090
H5G03100
H5G03110
H5G03120
H5G03130
H5G03140
H5G03150
H5G03160
H5G03170
H5G03180
H5G03190
H5G03200
H5G03210
H5G03220
H5G03230
H5G03240
H5G03250
H5G03260
H5G03270
H5G03280
H5G03290
H5G03300
H5G03310
H5G03320
H5G03330
H5G03340
H5G03350
H5G03360
H5G03370
H5G03380
H5G03390
H5G03400
H5G03410
H5G03420
H5G03430
H5G03440
H5G03450
H5G03460

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ISN 00247      SUM1=0.0
ISN 00248      SUM2=0.0
ISN 00249      SUM3=0.0
ISN 00250      SUM4=0.0
ISN 00251      SUM5=0.0
ISN 00252      SUM6=0.0
ISN 00253      C
C              DO 602 I1=1,2
C              C
C              I1=1 : U=235(TH)
C              I1=2 : U=239(FAST)
C              I1=3 : PU=239(TH)
C              C
ISN 00254      DO 602 I1=1,23
ISN 00255      GO TO (450,500,550),I1
ISN 00256      450 CONTINUE
ISN 00257      AS=AC*PB(M)
ISN 00258      X1=T1*R(I1)
ISN 00259      X2=(T2-T1)*A(I1)
ISN 00260      Y1=0.0
ISN 00261      Y2=0.0
ISN 00262      IF(X1.LE.300.0) Y1=EXP(-X1)
ISN 00263      IF(X2.LE.300.0) Y2=EXP(-X2)
ISN 00264      IF(X2.EQ.0.0) FNNN=FNNN+A(I1)*Y1
ISN 00265      IF(X2.NE.0.0)
*FNNN=FNNN+A(I1)/A(I1)*Y1*(1.0-Y2)
ISN 00266      SUM1=SUM1+A(I1)/R(I1)*Y1
ISN 00267      SUM2=SUM2+A(I1)/A(I1)*Y1*Y2
ISN 00268      GO TO 602
ISN 00269      500 CONTINUE
ISN 00270      AS=AS*PB(M)
ISN 00271      X1=T1*U(I1)
ISN 00272      X2=(T2-T1)*J(I1)
ISN 00273      Y1=0.0
ISN 00274      Y2=0.0
ISN 00275      IF(X1.LE.300.0) Y1=EXP(-X1)
ISN 00276      IF(X2.LE.300.0) Y2=EXP(-X2)
ISN 00277      IF(X2.EQ.0.0) FNNN=FNNN+B(I1)*Y1
ISN 00278      IF(X2.NE.0.0)
*FNNN=FNNN+B(I1)/U(I1)*Y1*(1.0-Y2)
ISN 00279      SUM3=SUM3+B(I1)/U(I1)*Y1
ISN 00280      SUM4=SUM4+B(I1)/U(I1)*Y1*Y2
ISN 00281      GO TO 602
ISN 00282      550 CONTINUE
ISN 00283      AS=AS*PB(M)
ISN 00284      X1=T1*V(I1)
ISN 00285      X2=(T2-T1)*W(I1)
ISN 00286      Y1=0.0
ISN 00287      Y2=0.0
ISN 00288      IF(X1.LE.300.0) Y1=EXP(-X1)
ISN 00289      IF(X2.LE.300.0) Y2=EXP(-X2)
ISN 00290      IF(X2.EQ.0.0) FNNN=FNNN+C(I1)*Y1
ISN 00291      IF(X2.NE.0.0)
*FNNN=FNNN+C(I1)/V(I1)*Y1*(1.0-Y2)
ISN 00292      SUM5=SUM5+C(I1)/V(I1)*Y1
ISN 00293      SUM6=SUM6+C(I1)/V(I1)*Y1*Y2
ISN 00294      602 CONTINUE
ISN 00295      IF(I1.EQ.1) F1= FNNN*AS

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H5G03470
H5G03480
H5G03490
H5G03500
H5G03510
H5G03520
H5G03530
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H5G03570
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H5G03600
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H5G03940
H5G03950
H5G03960
H5G03970
H5G03980
H5G03990
H5G04000
H5G04010
H5G04020
H5G04030
H5G04040

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ISN 00296      IF(I1.EQ.2) F2= (FNNN-FM1)*AB
ISN 00297      IF(I1.EQ.3) F3= (FNNN-FM1)*AB
ISN 00298      FM1=FNNN
ISN 00299      1602 CONTINUE
ISN 00300      HBFPM=F1+F2+F3
ISN 00301      GO TO 605
ISN 00302      604 CONTINUE
C
C              PP DECAY POWER CALCULATION BY INTERPOLATION OF INPUT TABLE
C              C
ISN 00303      DO 1420 K=1,2
ISN 00304      IT=I1
ISN 00305      IF(K.EQ.2) IT=T2
ISN 00306      DO 1430 J=1,ITS
ISN 00307      JM=J
ISN 00308      IF (IT.LE.T(J)) GO TO 1440
ISN 00309      1430 CONTINUE
ISN 00310      1440 JJ=JM
ISN 00311      IF (JJ.LE.1) JJ=2
ISN 00312      H1=PI(JJ-1)
ISN 00313      H2=PI(JJ)
ISN 00314      X1=T1(JJ-1)
ISN 00315      X2=T1(JJ)
ISN 00316      XX=IT
ISN 00317      H1=ALOG(H1)
ISN 00318      H2=ALOG(H2)
ISN 00319      IF (X1.EQ.0.0) GO TO 1421
ISN 00320      IF (XX.EQ.0.0) GO TO 1421
ISN 00321      X1=ALOG(X1)
ISN 00322      X2=ALOG(X2)
ISN 00323      XX=ALOG(IT)
ISN 00324      1421 CONTINUE
ISN 00325      Y1=H1*(H2-H1)+(XX-X1)/(X2-X1)
ISN 00326      Y1=EXP(Y1)
ISN 00327      IF (K.EQ.1) W1=Y1
ISN 00328      IF (K.EQ.2) W2=Y1
ISN 00329      1420 CONTINUE
ISN 00330      FR=1.0
ISN 00331      HBFPM=(W1-W2)*PB(M)*FR
ISN 00332      605 CONTINUE
ISN 00333      DPFPP=DPFP+HBFPM
C
C              CALCULATION OF STANDARD DEVIATION OF PP DECAY POWER
C              C
ISN 00334      DO 1353 I1=1,3
ISN 00335      DO 353 L=1,2
ISN 00336      GO TO (360,370,380),I1
ISN 00337      360 CONTINUE
ISN 00338      TT=I1
ISN 00339      IF(L.EQ.2) TT=T2
ISN 00340      DO 350 J=1,JMAX
ISN 00341      JM=J
ISN 00342      IF(TT.LE.T(J)) GO TO 351
ISN 00343      350 CONTINUE
ISN 00344      351 CONTINUE
ISN 00345      IF(JM.LE.1) JM=2
ISN 00346      H1=RD(JM-1)
ISN 00347      H2=RD(JM)

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H5G04050
H5G04060
H5G04070
H5G04080
H5G04090
H5G04100
H5G04110
H5G04120
H5G04130
H5G04140
H5G04150
H5G04160
H5G04170
H5G04180
H5G04190
H5G04200
H5G04210
H5G04220
H5G04230
H5G04240
H5G04250
H5G04260
H5G04270
H5G04280
H5G04290
H5G04300
H5G04310
H5G04320
H5G04330
H5G04340
H5G04350
H5G04360
H5G04370
H5G04380
H5G04390
H5G04400
H5G04410
H5G04420
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H5G04520
H5G04530
H5G04540
H5G04550
H5G04560
H5G04570
H5G04580
H5G04590
H5G04600
H5G04610
H5G04620

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ISN 00348 X1=TD(JM-1)
ISN 00349 X2=TD(JM)
ISN 00350 XX=TT
ISN 00351 IF(X1.EQ.0.0) GO TO 352
ISN 00352 IF(XX.EQ.0.0) GO TO 352
ISN 00353 X1=ALOG(X1)
ISN 00354 X2=ALOG(X2)
ISN 00355 XX=ALOG(XX)
ISN 00356 352 CONTINUE
ISN 00357 QDT=H1*(H2-H1)*(XX-X1)/(X2-X1)
ISN 00358 QDT=QDT+C.01
ISN 00359 IF(L.EQ.1) QD1=QD1+SUM1*AC
ISN 00360 IF(L.EQ.2) QD2=QD2+SUM2*AC
ISN 00361 GO TO 353
ISN 00362 370 CONTINUE
ISN 00363 TT=TT
ISN 00364 IF(L.EQ.2) TT=TT
ISN 00365 QD 355 J=1,JMAX
ISN 00366 JM=J
ISN 00367 IF(TT.LE.TD(J)) GO TO 357
ISN 00368 355 CONTINUE
ISN 00369 357 CONTINUE
ISN 00370 IF(JM.LE.1) JM=2
ISN 00371 H1=QD(JM-1)
ISN 00372 H2=QD(JM)
ISN 00373 X1=TD(JM-1)
ISN 00374 X2=TD(JM)
ISN 00375 XX=TT
ISN 00376 IF(X1.EQ.0.0) GO TO 362
ISN 00377 IF(XX.EQ.0.0) GO TO 362
ISN 00378 X1=ALOG(X1)
ISN 00379 X2=ALOG(X2)
ISN 00380 XX=ALOG(XX)
ISN 00381 362 CONTINUE
ISN 00382 QDT=H1*(H2-H1)*(XX-X1)/(X2-X1)
ISN 00383 QDT=QDT+C.01
ISN 00384 IF(L.EQ.1) QD1=QD1+SUM3*AD
ISN 00385 IF(L.EQ.2) QD2=QD2+SUM4*AD
ISN 00386 GO TO 353
ISN 00387 380 CONTINUE
ISN 00388 TT=TT
ISN 00389 IF(L.EQ.2) TT=TT
ISN 00390 QD 356 J=1,JMAX
ISN 00391 JM=J
ISN 00392 IF(TT.LE.TD(J)) GO TO 358
ISN 00393 356 CONTINUE
ISN 00394 358 CONTINUE
ISN 00395 IF(JM.LE.1) JM=2
ISN 00396 H1=QD(JM-1)
ISN 00397 H2=QD(JM)
ISN 00398 X1=TD(JM-1)
ISN 00399 X2=TD(JM)
ISN 00400 XX=TT
ISN 00401 IF(X1.EQ.0.0) GO TO 372
ISN 00402 IF(XX.EQ.0.0) GO TO 372
ISN 00403 X1=ALOG(X1)
ISN 00404 X2=ALOG(X2)
ISN 00405 XX=ALOG(XX)

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H5G04630
H5G04640
H5G04650
H5G04660
H5G04670
H5G04680
H5G04690
H5G04700
H5G04710
H5G04720
H5G04730
H5G04740
H5G04750
H5G04760
H5G04770
H5G04780
H5G04790
H5G04800
H5G04810
H5G04820
H5G04830
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H5G04880
H5G04890
H5G04900
H5G04910
H5G04920
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H5G04960
H5G04970
H5G04980
H5G04990
H5G05000
H5G05010
H5G05020
H5G05030
H5G05040
H5G05050
H5G05060
H5G05070
H5G05080
H5G05090
H5G05100
H5G05110
H5G05120
H5G05130
H5G05140
H5G05150
H5G05160
H5G05170
H5G05180
H5G05190
H5G05200

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ISN 00406 372 CONTINUE
ISN 00407 PDT=H1*(H2-H1)*(XX-X1)/(X2-X1)
ISN 00408 PDT=PDT+C.01
ISN 00409 IF(L.EQ.1) PD1=PDT+SUM5*AE
ISN 00410 IF(L.EQ.2) PD2=PDT+SUM6*AE
ISN 00411 353 CONTINUE
ISN 00412 1353 CONTINUE
ISN 00413 DRD1=DRD1+(QD1-QD2)*PB(M)
ISN 00414 DRD2=DRD2+(QD1-QD2)*PB(M)
ISN 00415 DRD3=DRD3+(PD1-PD2)*PB(M)
ISN 00416 C
ISN 00417 400 CONTINUE
ISN 00418 C
ISN 00419 C
ISN 00420 C
ISN 00421 C
ISN 00422 C
ISN 00423 C
ISN 00424 C
ISN 00425 C
ISN 00426 DO 4 JJJ=1,3
ISN 00427 K=JCC(JJJ)
ISN 00428 DO 2 KKK=1,K
ISN 00429 IF (TTT(JJJ).LT.FTT(KKK,JJJ)) GOTO 3
ISN 00430 2 CONTINUE
ISN 00431 JCC(JJJ)=K
ISN 00432 GO TO 4.
ISN 00433 3 CONTINUE
ISN 00434 JCC(JJJ)=KKK
ISN 00435 4 CONTINUE
ISN 00436 K1=JCC(1)
ISN 00437 K2=JCC(2)
ISN 00438 K3=JCC(3)
ISN 00439 C
ISN 00440 IF(K1.GT.1) TTT(1)=TTT(1)-FTT(K1-1,1)
ISN 00441 IF(K2.GT.1) TTT(2)=TTT(2)-FTT(K2-1,2)
ISN 00442 IF(K3.GT.1) TTT(3)=TTT(3)-FTT(K3-1,3)
ISN 00443 C
ISN 00444 D(1)=FTT(K1,1)
ISN 00445 D(2)=FTT(K2,2)
ISN 00446 D(3)=FTT(K3,3)
ISN 00447 C
ISN 00448 IF(K1.GT.1) D(1)=FTT(K1,1)-FTT(K1-1,1)
ISN 00449 IF(K2.GT.1) D(2)=FTT(K2,2)-FTT(K2-1,2)
ISN 00450 IF(K3.GT.1) D(3)=FTT(K3,3)-FTT(K3-1,3)
ISN 00448 C
ISN 00449 MMH=JCC(3)
ISN 00450 IF (T1.GT.FTT(MMH,3)) TTT(3)=D(2)
ISN 00450 RRI = 1.0

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H5G05210
H5G05220
H5G05230
H5G05240
H5G05250
H5G05260
H5G05270
H5G05280
H5G05290
H5G05300
H5G05310
H5G05320
H5G05330
H5G05340
H5G05350
H5G05360
H5G05370
H5G05380
H5G05390
H5G05400
H5G05410
H5G05420
H5G05430
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H5G05450
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H5G05490
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H5G05670
H5G05680
H5G05690
H5G05700
H5G05710
H5G05720
H5G05730
H5G05740
H5G05750
H5G05760
H5G05770
H5G05780

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ISN 00451      RR2 = 1.0      H5G057V0
ISN 00452      RR3 = 1.0      H5G05800
ISN 00453      RR4 = 1.0      H5G0581C
ISN 00454      RR5 = 1.0C     H5G05820
ISN 00455      RR6 = 1.0      H5G05830
ISN 00456      RR7 = 1.0      H5G05840
ISN 00457      RR8 = RAT(K3,K2,K1) H5G05850
C              H5G05860
ISN 00458      IF (K1.GT.1.AND.K2.GT.1.AND.K3.GT.1) GO TO 7C H5G05870
ISN 00459      IF (K1.GT.1.AND.K2.GT.1.AND.K3.LE.1) GO TO 6C H5G05880
ISN 00460      IF (K1.GT.1.AND.K2.LE.1.AND.K3.GT.1) GO TO 5C H5G05890
ISN 00461      IF (K1.GT.1.AND.K2.LE.1.AND.K3.LE.1) GO TO 4C H5G05900
ISN 00462      IF (K1.LE.1.AND.K2.GT.1.AND.K3.GT.1) GO TO 3C H5G05910
ISN 00463      IF (K1.LE.1.AND.K2.GT.1.AND.K3.LE.1) GO TO 2C H5G05920
ISN 00464      IF (K1.LE.1.AND.K2.LE.1.AND.K3.GT.1) GO TO 1C H5G05930
C              H5G05940
ISN 00465      GO TO 80      H5G05950
C              H5G05960
ISN 00466      10 CONTINUE  H5G05970
ISN 00467      RR4=RAT(K3-1,K2,K1) H5G05980
ISN 00468      GO TO 8C      H5G05990
C              H5G06000
ISN 00469      20 CONTINUE  H5G06010
ISN 00470      RR6=RAT(K3,K2-1,K1) H5G06020
ISN 00471      GO TO 80      H5G06030
C              H5G06040
ISN 00472      30 CONTINUE  H5G06050
ISN 00473      RR2=RAT(K3-1,K2-1,K1) H5G06060
ISN 00474      RR4=RAT(K3-1,K2,K1) H5G06070
ISN 00475      RR6=RAT(K3,K2-1,K1) H5G06080
ISN 00476      GO TO 80      H5G06090
C              H5G06100
ISN 00477      40 CONTINUE  H5G06110
ISN 00478      RR7=RAT(K3,K2,K1-1) H5G06120
ISN 00479      GO TO 80      H5G06130
C              H5G06140
ISN 00480      50 CONTINUE  H5G06150
ISN 00481      RR3=RAT(K3-1,K2,K1-1) H5G06160
ISN 00482      RR4=RAT(K3-1,K2,K1) H5G06170
ISN 00483      RR7=RAT(K3,K2,K1-1) H5G06180
ISN 00484      GO TO 80      H5G06190
C              H5G06200
ISN 00485      60 CONTINUE  H5G06210
ISN 00486      RR5=RAT(K3,K2-1,K1-1) H5G06220
ISN 00487      RR6=RAT(K3,K2-1,K1) H5G06230
ISN 00488      RR7=RAT(K3,K2,K1-1) H5G06240
ISN 00489      GO TO 80      H5G06250
C              H5G06260
ISN 00490      70 CONTINUE  H5G06270
ISN 00491      RR1=RAT(K3-1,K2-1,K1-1) H5G06280
ISN 00492      RR2=RAT(K3-1,K2-1,K1) H5G06290
ISN 00493      RR3=RAT(K3-1,K2,K1-1) H5G06300
ISN 00494      RR4=RAT(K3-1,K2,K1) H5G06310
ISN 00495      RR5=RAT(K3,K2-1,K1-1) H5G06320
ISN 00496      RR6=RAT(K3,K2-1,K1) H5G06330
ISN 00497      RR7=RAT(K3,K2,K1-1) H5G06340
C              H5G06350
ISN 00498      80 CONTINUE  H5G06360
    
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ISN 00499      C          H5G06370
ISN 00500      DO 90 LLL=1,3 H5G06380
ISN 00501      RR1=((RR2-RR1)/D(LLL))*TTT(LLL)*RR1 H5G06390
ISN 00502      IF (LLL.EQ.3) GO TO 90 H5G06400
ISN 00503      RR2=((RR4-RR3)/D(LLL))*TTT(LLL)*RR3 H5G06410
ISN 00504      IF (LLL.EQ.2) GO TO 90 H5G06420
ISN 00505      RR3=((RR6-RR5)/D(LLL))*TTT(LLL)*RR5 H5G06430
ISN 00506      RR4=((RR8-RR7)/D(LLL))*TTT(LLL)*RR7 H5G06440
C              H5G06450
ISN 00507      90 CONTINUE H5G06460
C              H5G06470
C              H5G06480
C              H5G06490
ISN 00508      SDP1=(DEF1/EF1*F1)**2*DRD1**2 H5G06500
ISN 00509      SDP1=SDP1**0.5 H5G06510
ISN 00510      SDP2=(DEF2/EF2*F2)**2*JAD2**2 H5G06520
ISN 00511      SDP2=SDP2**0.5 H5G06530
ISN 00512      SDP3=(DEF3/EF3*F3)**2*JAD3**2 H5G06540
ISN 00513      SDP3=SDP3**0.5 H5G06550
ISN 00514      SIG(N)=(SDP1+SDP2+SDP3)/HBFPN*100.0 H5G06560
ISN 00515      HBFPN=UPAC*DPPFN H5G06570
ISN 00516      HBS(N)=DPPFN*1.0*(0.01*SIG(N))*{(DPPFN-DPPF)*DPAC H5G06580
ISN 00517      S(N)=HBFPN/HA(N) H5G06590
ISN 00518      RATI01=DPAC/HBFPN H5G06600
ISN 00519      RATI02=DPPFN/DPPF H5G06610
ISN 00520      WRITE(6,205)N,TCC(N),HA(N),HBFPN,SIG(N),HBS(N),S(N),RATI01,RATI02 H5G06620
ISN 00521      1000 CONTINUE H5G06630
ISN 00522      WRITE(6,210) H5G06640
ISN 00523      WRITE(6,220) UTA H5G06650
ISN 00524      WRITE(6,215) ITAA(I),PA(I),I=1,ITA H5G06660
ISN 00525      WRITE(6,225) UTB H5G06670
ISN 00526      WRITE(6,215) ITBB(I),PB(I),I=1,ITB H5G06680
ISN 00527      2000 CONTINUE H5G06690
ISN 00528      STOP H5G06700
ISN 00529      END H5G06710
    
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Appendix 2 Input Data for Sample Calculation

TIME 18.08.38 LIB=J2035.HEATDATA.DATA MOD=SAMPLE01 PAGE 3

NO.1	MODULE NAME	SAMPLE01	BLOCKS	9	80.06.30	TIME	21.12.17
		LEVEL	2				
3	6	33					00000100
3.15360E+07	6.30720E+07	1.57680E+08	5.00000E+12	1.00000E+14	1.00000E+16	1.00000E+18	00000200
0.100000E+13	1.00000E+12	2.00000E+11	5.00000E+10	1.00000E+09	2.00000E+08	3.00000E+07	00000300
0.000000E+00	1.00000E+00	2.00000E+00	5.00000E+00	1.00000E+00	2.00000E+00	3.00000E+00	00000400
5.000000E+01	1.00000E+02	2.00000E+03	5.00000E+04	1.00000E+05	2.00000E+06	3.00000E+07	00000500
5.000000E+02	1.00000E+04	2.00000E+08	5.00000E+12	1.00000E+16	2.00000E+20	3.00000E+24	00000600
5.000000E+05	1.00000E+06	2.00000E+08	5.00000E+08	1.00000E+08	2.00000E+08	3.00000E+08	00000700
5.000000E+07	1.00000E+06	2.00000E+08	5.00000E+08	1.00000E+08	2.00000E+08	3.00000E+08	00000800
1.000000E+11	1.00000E+12	1.00000E+13	1.00000E+14	1.00000E+15	1.00000E+16	1.00000E+17	00000900
9.99841E-01	9.99912E-01	9.99818E-01	9.99919E-01	9.99791E-01	9.99794E-01	9.99797E-01	00001000
9.99695E-01	9.99521E-01	9.99571E-01	9.99453E-01	9.99257E-01	9.99269E-01	9.99281E-01	00001100
9.99093E-01	9.99031E-01	9.99128E-01	9.99707E-01	1.00048E+00	1.00103E+00	1.00158E+00	00001200
1.00115E+00	1.00114E+00	1.00111E+00	1.00107E+00	1.00096E+00	1.00085E+00	1.00074E+00	00001300
1.00026E+00	1.00034E+00	1.00027E+00	1.00033E+00	1.00000E+00	9.99927E-01	9.99854E-01	00001400
9.95202E-01	9.94819E-01	9.94917E-01	9.94898E-01	9.94977E-01	9.94918E-01	9.94859E-01	00001500
9.99882E-01	9.99652E-01	9.99545E-01	9.99499E-01	9.99372E-01	9.99318E-01	9.99264E-01	00001600
9.98105E-01	9.97455E-01	9.96129E-01	9.97694E-01	9.97315E-01	9.97483E-01	9.97651E-01	00001700
9.96237E-01	9.96180E-01	9.97055E-01	1.00098E+00	1.00078E+00	1.00058E+00	1.00038E+00	00001800
1.00097E+00	1.01006E+00	1.01020E+00	1.01009E+00	1.00916E+00	1.01038E+00	1.01050E+00	00001900
1.02071E+00	1.03000E+00	1.02659E+00	1.03058E+00	1.03079E+00	9.97696E-01	9.97696E-01	00002000
9.70478E-01	9.67715E-01	9.62929E-01	9.99980E-01	9.99875E-01	9.99819E-01	9.99763E-01	00002100
1.00008E+00	1.00009E+00	1.00009E+00	1.00009E+00	1.00014E+00	1.00020E+00	1.00025E+00	00002200
9.99100E-01	9.98647E-01	9.98246E-01	9.97812E-01	9.97463E-01	9.97078E-01	9.96729E-01	00002300
9.99645E-01	9.99635E-01	1.00049E+00	1.01169E+00	1.01651E+00	1.02133E+00	1.02615E+00	00002400
1.01796E+00	1.01810E+00	1.01881E+00	1.01904E+00	1.01750E+00	1.02026E+00	1.02302E+00	00002500
1.04075E+00	1.06050E+00	1.05289E+00	1.00759E+00	1.00183E+00	9.68948E-01	9.68948E-01	00002600
9.56848E-01	9.51798E-01	9.00540E-01	1.00210E+00	1.00207E+00	1.00180E+00	1.00160E+00	00002700
1.00198E+00	1.00217E+00	1.00210E+00	1.00216E+00	1.00207E+00	1.00180E+00	1.00160E+00	00002800
1.00109E+00	1.00052E+00	1.00021E+00	1.00014E+00	1.00020E+00	1.00025E+00	1.00030E+00	00002900
1.00104E+00	1.00268E+00	1.00665E+00	1.01622E+00	1.02828E+00	1.04186E+00	1.05544E+00	00003000
1.00380E+00	1.03080E+00	1.02997E+00	1.04094E+00	1.03872E+00	1.04678E+00	1.05474E+00	00003100
1.00958E+00	1.15333E+00	1.12559E+00	1.01875E+00	1.00493E+00	9.65848E-01	9.65848E-01	00003200
9.27329E-01	9.22029E-01	8.56104E-01	1.00554E+00	1.00551E+00	1.00521E+00	1.00501E+00	00003300
1.00485E+00	1.00520E+00	1.00528E+00	1.00554E+00	1.00551E+00	1.00521E+00	1.00501E+00	00003400
1.00433E+00	1.00375E+00	1.00368E+00	1.00425E+00	1.00498E+00	1.00610E+00	1.00722E+00	00003500
1.00881E+00	1.01202E+00	1.01803E+00	1.02186E+00	1.02456E+00	1.02726E+00	1.03000E+00	00003600
1.00934E+00	1.00820E+00	1.00530E+00	1.00643E+00	1.00641E+00	1.00614E+00	1.00592E+00	00003700
1.10725E+00	1.27172E+00	1.22037E+00	1.02040E+00	1.00755E+00	9.63559E-01	9.63559E-01	00003800
8.92076E-01	8.65877E-01	8.11739E-01	1.02313E+00	1.02487E+00	1.02569E+00	1.02720E+00	00003900
1.02313E+00	1.02487E+00	1.02569E+00	1.02720E+00	1.02798E+00	1.02866E+00	1.02934E+00	00004000
1.02737E+00	1.02819E+00	1.03106E+00	1.03680E+00	1.04232E+00	1.04900E+00	1.05568E+00	00004100
1.06402E+00	1.07840E+00	1.09566E+00	1.12284E+00	1.14173E+00	1.16173E+00	1.18173E+00	00004200
1.13996E+00	1.12874E+00	1.13550E+00	1.11394E+00	1.10105E+00	1.12670E+00	1.15235E+00	00004300
1.26596E+00	1.42422E+00	1.32215E+00	1.01669E+00	9.94834E-01	9.50151E-01	9.00044E-01	00004400
6.01526E-01	9.68409E-01	5.05412E-01	9.99909E-01	9.99970E-01	9.99945E-01	9.99914E-01	00004500
9.99921E-01	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	00004600
9.99655E-01	9.99800E-01	9.99746E-01	9.99693E-01	9.99639E-01	9.99597E-01	9.99555E-01	00004700
9.99578E-01	9.99607E-01	9.99789E-01	1.00037E+00	1.00146E+00	1.00255E+00	1.00364E+00	00004800
1.00231E+00	1.00235E+00	1.00237E+00	1.00237E+00	1.00236E+00	1.00232E+00	1.00228E+00	00004900
1.00518E+00	1.00745E+00	1.00521E+00	1.00069E+00	1.00012E+00	9.89760E-01	9.89760E-01	00005000
9.94569E-01	9.94050E-01	9.87300E-01	1.00064E+00	1.00066E+00	1.00051E+00	1.00047E+00	00005100
1.00063E+00	1.00069E+00	1.00064E+00	1.00067E+00	1.00066E+00	1.00051E+00	1.00047E+00	00005200

PACKOM OSIV/F4 GEN V02L08E DATE 80.07.02 TIME 18.08.38 LIB=J2035.HEATDATA.DATA MOD=SAMPLE01 PAGE 4

NO.1	MODULE NAME	SAMPLE01	BLOCKS	9	80.06.30	TIME	21.12.17
		LEVEL	2				
1.00016E+00	9.99867E-01	9.99651E-01	9.99551E-01	9.99500E-01	9.99496E-01	9.99492E-01	00005300
9.99731E-01	1.00051E+00	1.00240E+00	1.00781E+00	1.01365E+00	1.01772E+00	1.02179E+00	00005400
1.01922E+00	1.01976E+00	1.02046E+00	1.02140E+00	1.02154E+00	1.02729E+00	1.03305E+00	00005500
1.05046E+00	1.07261E+00	1.05160E+00	1.00752E+00	1.00189E+00	9.68255E-01	9.68255E-01	00005600
9.63101E-01	9.60188E-01	9.21708E-01	1.00217E+00	1.00211E+00	1.00192E+00	1.00172E+00	00005700
1.00190E+00	1.00199E+00	1.00200E+00	1.00099E+00	1.00122E+00	1.00158E+00	1.00194E+00	00005800
1.00143E+00	1.00103E+00	1.00089E+00	1.00099E+00	1.00218E+00	1.00313E+00	1.00408E+00	00005900
1.00260E+00	1.00422E+00	1.00768E+00	1.01629E+00	1.02518E+00	1.03137E+00	1.03756E+00	00006000
1.03389E+00	1.03511E+00	1.03680E+00	1.03901E+00	1.04020E+00	1.04212E+00	1.04404E+00	00006100
1.09705E+00	1.14002E+00	1.10028E+00	1.01520E+00	1.00406E+00	9.65939E-01	9.65939E-01	00006200
9.41506E-01	9.37251E-01	8.64780E-01	1.00627E+00	1.00633E+00	1.00614E+00	1.00594E+00	00006300
1.00539E+00	1.00579E+00	1.00591E+00	1.00627E+00	1.00633E+00	1.00614E+00	1.00594E+00	00006400
1.00545E+00	1.00506E+00	1.00520E+00	1.00614E+00	1.00722E+00	1.00800E+00	1.00878E+00	00006500
1.01228E+00	1.01691E+00	1.02324E+00	1.03782E+00	1.05184E+00	1.06170E+00	1.07156E+00	00006600
1.06642E+00	1.06945E+00	1.07321E+00	1.07749E+00	1.08243E+00	1.11212E+00	1.14181E+00	00006700
1.21145E+00	1.30423E+00	1.21562E+00	1.00009E+00	1.00764E+00	9.63180E-01	9.63180E-01	00006800
8.94857E-01	8.88693E-01	8.20616E-01	1.00627E+00	1.00633E+00	1.00614E+00	1.00594E+00	00006900
1.00960E+00	1.01029E+00	1.01036E+00	1.01117E+00	1.01317E+00	1.01116E+00	1.01096E+00	00007000
1.01029E+00	1.00999E+00	1.01060E+00	1.01261E+00	1.01477E+00	1.01783E+00	1.02089E+00	00007100
1.02410E+00	1.03117E+00	1.04130E+00	1.06115E+00	1.07970E+00	1.09137E+00	1.10304E+00	00007200
1.09757E+00	1.10247E+00	1.10802E+00	1.11350E+00	1.12424E+00	1.17805E+00	1.23186E+00	00007300
1.33437E+00	1.47772E+00	1.32938E+00	1.03659E+00	1.00738E+00	9.60812E-01	9.60812E-01	00007400
8.35330E-01	8.27446E-01	7.51097E-01	1.03726E+00	1.03978E+00	1.04165E+00	1.04304E+00	00007500
1.03324E+00	1.03587E+00	1.03726E+00	1.03978E+00	1.04165E+00	1.04304E+00	1.04443E+00	00007600
1.04455E+00	1.04765E+00	1.05343E+00	1.06387E+00	1.07294E+00	1.08763E+00	1.10232E+00	00007700
1.11349E+00	1.13873E+00	1.16802E+00	1.21033E+00	1.23658E+00	1.24140E+00	1.24622E+00	00007800
1.22314E+00	1.21144E+00	1.18811E+00	1.12705E+00	1.09426E+00	1.09930E+00	1.10434E+00	00007900
1.18080E+00	1.26452E+00	1.16892E+00	9.96462E-01	9.95082E-01	9.40602E-01	9.40602E-01	00008000
5.00338E-01	4.84702E-01	3.93145E-01	1.00030E+00	1.00035E+00	1.00034E+00	1.00032E+00	00008100
1.00032E+00	1.00035E+00	1.00036E+00	1.00028E+00	1.00033E+00	1.00038E+00	1.00043E+00	00008200
1.00029E+00	1.00025E+00	1.00025E+00	1.00028E+00	1.00033E+00	1.00038E+00	1.00043E+00	00008300
1.00062E+00	1.00089E+00	1.00139E+00	1.00271E+00	1.00399E+00	1.00492E+00	1.00585E+00	00008400
1.00539E+00	1.00568E+00	1.00603E+00	1.00679E+00	1.00770E+00	1.01061E+00	1.01352E+00	00008500
1.01725E+00	1.01992E+00	1.01137E+00	1.00172E+00	1.00040E+00	9.80131E-01	9.80131E-01	00008600
9.92270E-01	9.91741E-01	9.84759E-01	1.00390E+00	1.00390E+00	1.00365E+00	1.00345E+00	00008700
1.00325E+00	1.00354E+00	1.00363E+00	1.00379E+00	1.00390E+00	1.00365E+00	1.00345E+00	00008800
1.00253E+00	1.00336E+00	1.00346E+00	1.00444E+00	1.00484E+00	1.00524E+00	1.00564E+00	00008900
1.00825E+00	1.01104E+00	1.01534E+00	1.02455E+00	1.03324E+00	1.03945E+00	1.04566E+00	00009000
1.04337E+00	1.04619E+00	1.05027E+00	1.05845E+00	1.06889E+00	1.09705E+00	1.12521E+00	00009100
1.15918E+00	1.19486E+00	1.10756E+00	1.01765E+00	1.00498E+00	9.64609E-01	9.64609E-01	00009200
9.42023E-01	9.38509E-01	8.98111E-01	1.00627E+00	1.00633E+00	1.00614E+00	1.00	

1.61696E+00	1.69983E+00	1.27241E+00	1.02927E+00	1.00190E+00	5.54734E-01	000011000
7.11849E-01	7.01149E-01	6.21425E-01				00011100
1.04902E+00	1.05298E+00	1.05522E+00	1.05938E+00	1.16216E+00	1.06677E+00	0000011200
1.07186E+00	1.07853E+00	1.08077E+00	1.12652E+00	1.12265E+00	1.14495E+00	0000011300
1.19038E+00	1.23101E+00	1.27904E+00	1.24348E+00	1.27990E+00	1.28210E+00	0000011400
1.34606E+00	1.32061E+00	1.27592E+00	1.16612E+00	1.06764E+00	1.06734E+00	0000011500
1.09176E+00	1.10450E+00	1.03290E+00	9.64466E-01	9.64677E-01	9.37720E-01	0000011600
4.13735E-01	3.94639E-01	2.72392E-01				00011700
6.5057-01	2.2138+01					00011800
5.1264-01	5.1587-01					00011900
2.4384-01	1.9594-01					00012000
1.3850-01	1.0214-01					00012100
5.5440-02	3.2656-02					00012200
2.2225-02	1.1681-02					00012300
3.3088-03	2.5870-02					00012400
9.3015-04	1.2920-03					00012500
8.0943-04	6.2630-04					00012600
1.9567-04	1.8906-04					00012700
3.2525-05	5.4986-05					00012800
7.5995-06	2.9293-05					00012900
2.5232-06	1.0010-05					00013000
4.9948-07	2.5438-06					00013100
1.8531-07	6.6361-07					00013200
2.6608-08	1.2290-07					00013300
2.2398-09	2.7213-08					00013400
8.1641-12	4.3714-09					00013500
8.7797-11	7.5782-10					00013600
2.5121-14	2.4786-10					00013700
3.2176-16	2.2384-13					00013800
4.5038-17	2.4600-14					00013900
7.4791-17	1.5699-14					00014000
1.2311+00	3.2881+00					00014100
1.1486+00	9.3805+01					00014200
7.0701+01	3.7073+01					00014300
2.5209+01	1.1118+01					00014400
7.1870+02	1.6143+02					00014500
2.8291+02	1.3272+02					00014600
6.8382+03	5.0123+03					00014700
1.2322+03	1.3655+03					00014800
6.8409+04	5.5158+04					00014900
1.6975+04	1.7873+04					00015000
2.4182+05	4.9032+05					00015100
6.6356+06	1.7058+05					00015200
1.0075+06	7.0465+06					00015300
4.9894+07	2.3190+06					00015400
1.6352+07	6.4480+07					00015500
2.3355+08	1.2649+07					00015600
2.8094+09	2.5548+08					00015700
3.6236+11	8.4782+09					00015800
6.4571+14	7.5130+10					00015900
4.4963+14	2.4182+10					00016000
3.6654+16	2.2729+12					00016100
5.6293+17	9.0536+14					00016200
7.1602+17	5.6098+15					00016300
2.083+01	1.002+01					00016400
3.852+01	6.433+01					00016500
2.213+01	2.186+01					00016600

9.460-02	1.004-01					00016700
3.531-02	3.728-02					00016800
2.292-02	1.425-02					00016900
3.946-03	4.549-03					00017000
1.317-03	1.328-03					00017100
7.052-04	5.356-04					00017200
1.430-04	1.730-04					00017300
1.765-05	4.881-05					00017400
7.347-06	2.006-05					00017500
1.747-06	8.319-06					00017600
5.481-07	2.258-06					00017700
1.671-07	6.450-07					00017800
2.112-08	1.278-07					00017900
2.996-09	2.466-08					00018000
5.197-11	9.378-09					00018100
5.730-11	7.450-10					00018200
4.138-14	2.426-10					00018300
1.088-15	2.210-13					00018400
2.454-17	2.640-14					00018500
7.557-17	1.360-14					00018600
78						00018700
0.0+0	1.0+0	1.5+0	2.0+0	3.0+0	4.0+0	00018800
5.0+0	6.0+0	8.0+0	1.0+1	1.5+1	2.0+1	00018900
3.0+1	4.0+1	5.0+1	6.0+1	8.0+1	1.0+2	00019000
1.5+2	2.0+2	3.0+2	4.0+2	5.0+2	6.0+2	00019100
8.0+2	1.0+3	1.5+3	2.0+3	3.0+3	4.0+3	00019200
5.0+3	6.0+3	8.0+3	1.0+4	1.5+4	2.0+4	00019300
3.0+4	4.0+4	5.0+4	6.0+4	8.0+4	1.0+5	00019400
1.5+5	2.0+5	3.0+5	4.0+5	5.0+5	6.0+5	00019500
8.0+5	1.0+6	1.5+6	2.0+6	3.0+6	4.0+6	00019600
5.0+6	6.0+6	8.0+6	1.0+7	1.5+7	2.0+7	00019700
3.0+7	4.0+7	5.0+7	6.0+7	8.0+7	1.0+8	00019800
1.5+8	2.0+8	3.0+8	4.0+8	5.0+8	6.0+8	00019900
8.0+8	1.0+9	1.0+10	1.0+11	1.0+12	1.0+13	00020000
1.27400E+01	1.17000E+01	1.13900E+01	1.11300E+01	1.07200E+01	1.04000E+01	00020100
1.01300E+01	9.90000E+00	9.52700E+00	9.23000E+00	8.88100E+00	8.28900E+00	00020200
7.75900E+00	7.34900E+00	7.04600E+00	6.79900E+00	6.41400E+00	6.12300E+00	00020300
5.82000E+00	5.28800E+00	4.58000E+00	4.57400E+00	4.26300E+00	4.19500E+00	00020400
3.93300E+00	3.73200E+00	3.26600E+00	3.10800E+00	2.75900E+00	2.52800E+00	00020500
2.36200E+00	2.23400E+00	2.04500E+00	1.91000E+00	1.68900E+00	1.54900E+00	00020600
1.97300E+00	1.26100E+00	1.18000E+00	1.11800E+00	1.02900E+00	9.67900E+00	00020700
8.71700E-01	8.13800E-01	7.42900E-01	6.96600E-01	6.61300E-01	6.22200E-01	00020800
5.86200E-01	5.50300E-01	4.85900E-01	4.41600E-01	3.82600E-01	3.44300E-01	00020900
3.17200E-01	2.96500E-01	2.66100E-01	2.43800E-01	2.06300E-01	1.82500E-01	00021000
1.58300E-01	1.45800E-01	1.27500E-01	1.31400E-01	1.22900E-01	1.17400E-01	00021100
1.09300E-01	1.04400E-01	9.67200E-02	9.00000E-02	8.35300E-02	7.81300E-02	00021200
6.79700E-02	5.92500E-02	5.64300E-02	5.51400E-02	4.97300E-02	2.11500E-02	00021300
0 3						00021400
0.59						00021500
0 0						00021600
29 5						00021700
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5.00000E+01	1.00000E+02	2.00000E+02	3.00000E+02	4.00000E+02	5.00000E+02	00021900
5.00000E+03	1.00000E+04	2.00000E+04	3.00000E+04	4.00000E+04	5.00000E+04	00022000
5.00000E+05	1.00000E+06	2.00000E+06	3.00000E+06	4.00000E+06	5.00000E+06	00022100
5.00000E+07	1.00000E+08	2.00000E+08	3.00000E+08	4.00000E+08	5.00000E+08	00022200
1 Y						00022300

PACOM DSIV/F4 DEM Y02L06E DATE 80.07.02 TIME 18.04.38 LIB=J2035.HEATDATA.DATA

MOD=SAMPLED1

PAGE 7

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1 H 00022900
2.00000E+01 1.00000E+00 00023000
3.90000E+12 00023100
0.93800E+00 0.06000E+00 0.00200E+00 00023200
15 H 00023300
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5.00 0.6139 1.22 0.6221 5.88 0.7640 00023500
5.88 0.645E 5.88 0.9277 5.27 1.0095 00023600
4.95 0.9959 4.95 0.9886 3.80 0.9209 00023700
2.48 0.9277 1.16 0.9618 2.11 1.0 00023800
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3.90000E+12 3.90000E+12 3.90000E+12 3.90000E+12 3.90000E+12 3.90000E+12 00024000
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78

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8.00000E+02	1.00000E+03	1.50000E+03	2.00000E+03	3.00000E+03	4.00000E+03
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3.00000E+07	4.00000E+07	5.00000E+07	6.00000E+07	8.00000E+07	1.00000E+08
1.50000E+08	2.00000E+08	3.00000E+08	4.00000E+08	5.00000E+08	6.00000E+08
8.00000E+08	1.00000E+09	1.50000E+09	2.00000E+09	3.00000E+09	4.00000E+09
1.27400E+01	1.17000E+01	1.13900E+01	1.11300E+01	1.00000E+12	1.00000E+13
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7.73900E+00	7.34900E+00	7.04600E+00	6.79900E+00	6.41400E+00	6.12300E+00
5.62000E+00	5.28600E+00	4.85200E+00	4.57400E+00	4.36300E+00	4.19500E+00
3.93000E+00	2.78200E+00	3.36600E+00	2.10800E+00	2.75900E+00	2.52800E+00
2.36200E+00	2.23400E+00	2.04500E+00	1.91000E+00	1.68800E+00	1.54900E+00
1.37300E+00	1.28100E+00	1.12800E+00	1.11300E+00	1.02900E+00	9.67900E-01
8.71700E-01	8.12500E-01	7.42900E-01	6.56600E-01	6.61300E-01	6.32300E-01
5.86200E-01	5.50300E-01	4.85900E-01	4.41600E-01	3.82600E-01	3.44300E-01
3.17200E-01	2.76500E-01	2.66100E-01	2.43200E-01	2.06300E-01	1.83500E-01
1.58600E-01	1.40500E-01	1.37500E-01	1.31400E-01	1.22900E-01	1.17400E-01
1.09300E-01	1.04400E-01	9.67200E-02	9.00000E-02	6.38300E-02	7.81300E-02
6.79700E-02	5.92500E-02	5.64200E-02	5.51400E-02	4.97300E-02	2.11500E-03
0 3					
5.90000E-01					
0 0					
29 5					
0.0	1.00000E+00	2.00000E+00	5.00000E+00	1.00000E+01	2.00000E+01
5.00000E+01	1.00000E+02	2.00000E+02	5.00000E+02	1.00000E+03	2.00000E+03
5.00000E+03	1.00000E+04	2.00000E+04	5.00000E+04	1.00000E+05	2.00000E+05
5.00000E+05	1.00000E+06	2.00000E+06	5.00000E+06	1.00000E+07	2.00000E+07
5.00000E+07	1.00000E+08	2.00000E+08	5.00000E+08	1.00000E+09	
1.00000E+00	1.00000E+00				

****.CASE 1 ****
1 Y
1.00000E+00 1.00000E+00
1.00000E+14 0.0
1.00000E+00 0.0

JAERI-M 8998

	TC(N)	HA(N)	HB(N)	SIG(N)	HBS(N)	R=HB/HA	CPAC/HB(N)	DRFPN/DRFP
	(S)	(MEV/SEC)	(MEV/SEC)	(PERCENT)	(MEV/SEC)			
1	0.0	1.35472E+01	1.36103E+01	4.57767E+00	1.42063E+01	1.00466E+00	3.87111E-02	1.00485E+00
2	1.00000E+00	1.26822E+01	1.27454E+01	3.23086E+00	1.21503E+01	1.00498E+00	4.13272E-02	1.00520E+00
3	2.00000E+00	1.20624E+01	1.21232E+01	2.49207E+00	1.24108E+01	1.00505E+00	4.34365E-02	1.00526E+00
4	5.00000E+00	1.08911E+01	1.09485E+01	2.18202E+00	1.11746E+01	1.00527E+00	4.80601E-02	1.00554E+00
5	1.00000E+01	9.65825E+00	9.71395E+00	1.07413E+00	1.01075E+01	1.00525E+00	5.30061E-02	1.00551E+00
6	2.00000E+01	8.23538E+00	8.26625E+00	9.93721E+00	9.93116E+00	1.00490E+00	5.91160E-02	1.00521E+00
7	5.00000E+01	7.50687E+00	7.53712E+00	1.93757E+00	7.67246E+00	1.00403E+00	6.90335E-02	1.00375E+00
8	1.00000E+02	6.55495E+00	6.57764E+00	1.91655E+00	6.69355E+00	1.00346E+00	7.80626E-02	1.00375E+00
9	2.00000E+02	5.71279E+00	5.73197E+00	1.91791E+00	5.63193E+00	1.00236E+00	8.73530E-02	1.00368E+00
10	5.00000E+02	4.76524E+00	4.78251E+00	1.68751E+00	4.86466E+00	1.00383E+00	9.74062E-02	1.00425E+00
11	1.00000E+03	4.05718E+00	4.07530E+00	1.87034E+00	4.14358E+00	1.00447E+00	1.02616E-01	1.00498E+00
12	2.00000E+03	3.22124E+00	3.24942E+00	1.85451E+00	3.40468E+00	1.00546E+00	1.04899E-01	1.00549E+00
13	5.00000E+02	2.44762E+00	2.47921E+00	1.86273E+00	2.55641E+00	1.00376E+00	1.07642E-01	1.00861E+00
14	1.00000E+04	1.99427E+00	2.01134E+00	1.82537E+00	2.04731E+00	1.01056E+00	1.20396E-01	1.01203E+00
15	2.00000E+04	1.62073E+00	1.64727E+00	1.84029E+00	1.67127E+00	1.01544E+00	1.41301E-01	1.01603E+00
16	5.00000E+04	1.23121E+00	1.26175E+00	1.94771E+00	1.28364E+00	1.02643E+00	1.66136E-01	1.03186E+00
17	1.00000E+05	9.89675E-01	1.02885E+00	2.10433E+00	1.04390E+00	1.03751E+00	1.72291E-01	1.04568E+00
18	2.00000E+05	7.84964E-01	8.21204E-01	2.10463E+00	8.38256E-01	1.04640E+00	1.53235E-01	1.05286E+00
19	5.00000E+05	5.51501E-01	5.81246E-01	2.11768E+00	5.92267E-01	1.05447E+00	7.78131E-02	1.05934E+00
20	1.00000E+06	4.04019E-01	4.22534E-01	2.10375E+00	4.38909E-01	1.06077E+00	1.81594E-02	1.06203E+00
21	2.00000E+06	2.85925E-01	3.06095E-01	2.12174E+00	3.14226E-01	1.06524E+00	8.82104E-04	1.06338E+00
22	5.00000E+06	1.69139E-01	1.80275E-01	2.12071E+00	1.83962E-01	1.06543E+00	5.43502E-05	1.06438E+00
23	1.00000E+07	1.01462E-01	1.07971E-01	2.09256E+00	1.10095E-01	1.06615E+00	3.57560E-18	1.06415E+00
24	2.00000E+07	4.85790E-02	5.25498E-02	2.12027E+00	5.35849E-02	1.06174E+00	1.13930E-29	1.08174E+00
25	5.00000E+07	1.54443E-02	1.60737E-02	2.12115E+00	1.64325E-02	1.17025E+00	1.23546E-77	1.17025E+00
26	1.00000E+08	5.81270E-03	7.39218E-03	1.32927E+00	7.46539E-03	1.27172E+00	0.0	1.27172E+00
27	2.00000E+08	2.65749E-03	2.84312E-03	2.46845E+00	3.20882E-03	1.22037E+00	0.0	1.22037E+00
28	5.00000E+08	1.40086E-03	1.49086E-03	2.10301E+00	1.99862E-03	1.03040E+00	0.0	1.03040E+00
29	1.00000E+09	1.28599E-03	1.29579E-03	2.11255E+00	1.32255E-03	1.00755E+00	0.0	1.00755E+00

(TA(I),PA(I),I=1,1TA),TIME UNIT= Y
1.00000E+00 1.00000E+00

(TB(I),PB(I),I=1,1TB),TIME UNIT= Y
1.00000E+00 1.00000E+00

***** CASE 2 *****
1
2.00000E+01 1.00000E+00
3.90000E+13
9.38000E-01 6.00000E-02 2.00000E-03

	TC(N)	HA(N)	HB(N)	SIG(N)	HBS(N)	R=HB/HA	CPAC/HB(N)	DRFPN/DRFP
	(S)	(MEV/SEC)	(MEV/SEC)	(PERCENT)	(MEV/SEC)			
1	0.0	1.35472E+01	1.26822E+01	5.41062E+00	1.32951E+01	9.22276E-01	2.52971E-02	1.00000E+00
2	1.00000E+00	1.26822E+01	1.16945E+01	4.11231E+00	1.21619E+01	9.22121E-01	2.83684E-02	1.00000E+00
3	2.00000E+00	1.20624E+01	1.10504E+01	3.20987E+00	1.13940E+01	9.15101E-01	3.00307E-02	1.00000E+00
4	5.00000E+00	1.08911E+01	9.35492E+00	2.79628E+00	1.01820E+01	9.04782E-01	3.36538E-02	1.00000E+00
5	1.00000E+01	9.65825E+00	8.61194E+00	2.61531E+00	9.03374E+00	8.93477E-01	3.75357E-02	1.00000E+00
6	2.00000E+01	8.23538E+00	7.75835E+00	2.44213E+00	7.93977E+00	8.79330E-01	4.24582E-02	1.00000E+00
7	5.00000E+01	7.50687E+00	6.42281E+00	2.27066E+00	6.56127E+00	8.55591E-01	5.06594E-02	1.00000E+00
8	1.00000E+02	6.55495E+00	5.45937E+00	2.17332E+00	5.57119E+00	8.32657E-01	5.83932E-02	9.99999E-01
9	2.00000E+02	5.71279E+00	4.60407E+00	2.12956E+00	4.70070E+00	8.06798E-01	6.64110E-02	9.99999E-01
10	5.00000E+02	4.76524E+00	3.65518E+00	2.06840E+00	3.72814E+00	7.67676E-01	7.42281E-02	9.99999E-01
11	1.00000E+03	4.05718E+00	2.95327E+00	2.03195E+00	3.00883E+00	7.27912E-01	7.58845E-02	9.99997E-01
12	2.00000E+03	3.22124E+00	2.25290E+00	1.98773E+00	2.27414E+00	6.70291E-01	7.07278E-02	9.99997E-01
13	5.00000E+03	2.47626E+00	1.93277E+00	1.95162E+00	1.41844E+00	5.62447E-01	5.53879E-02	9.99997E-01
14	1.00000E+04	1.99427E+00	9.32667E-01	1.80426E+00	9.49735E-01	4.68275E-01	5.82610E-02	1.00000E+00
15	2.00000E+04	1.62073E+00	6.00728E-01	1.67391E+00	6.09936E-01	3.70661E-01	8.42924E-02	1.00001E+00
16	5.00000E+04	1.23121E+00	3.02478E-01	1.67832E+00	3.06767E-01	2.45675E-01	1.51083E-01	1.00003E+00
17	1.00000E+05	9.89675E-01	1.62541E-01	2.23632E+00	1.65314E-01	1.64237E-01	2.27082E-01	1.00005E+00
18	2.00000E+05	7.84964E-01	8.23979E-02	2.15492E+00	8.35829E-02	1.04970E-01	3.32545E-01	1.00006E+00
19	5.00000E+05	5.51501E-01	3.12009E-02	2.22645E+00	3.17786E-02	5.67553E-02	3.14722E-01	1.00030E+00
20	1.00000E+06	4.04019E-01	1.29315E-02	2.29427E+00	1.31271E-02	3.20023E-02	1.26472E-01	1.00007E+00
21	2.00000E+06	2.85925E-01	5.34883E-03	2.24616E+00	5.46766E-03	1.84936E-02	1.10614E-02	1.00007E+00
22	5.00000E+06	1.69139E-01	1.64284E-03	2.12120E+00	1.57863E-03	5.71689E-02	1.29631E-06	1.00007E+00
23	1.00000E+07	1.01462E-01	7.01558E-04	2.05277E+00	7.15965E-04	6.91450E-03	1.19799E-13	1.00007E+00
24	2.00000E+07	4.85790E-02	2.62436E-04	2.24559E+00	2.69251E-04	5.42283E-02	4.94764E-28	1.00006E+00
25	5.00000E+07	1.54443E-02	5.28386E-05	2.22992E+00	5.40166E-05	3.42123E-02	9.20032E-72	1.00017E+00
26	1.00000E+08	5.81270E-03	1.71289E-05	1.64352E+00	1.30104E-05	2.94681E-02	0.0	1.00027E+00
27	2.00000E+08	2.65749E-03	6.33579E-06	2.44249E+00	6.50735E-06	2.38563E-02	0.0	1.00022E+00
28	5.00000E+08	1.40086E-03	4.22118E-06	2.24919E+00	4.41637E-06	2.21328E-02	0.0	1.00003E+00
29	1.00000E+09	1.28599E-03	2.92194E-06	2.23067E+00	2.48713E-06	2.27214E-02	0.0	1.00001E+00

(TA(I),PA(I),I=1,1TA),TIME UNIT= Y
1.00000E+00 1.00000E+00

(TB(I),PB(I),I=1,1TB),TIME UNIT= H
2.00000E+01 1.00000E+00

***** CASE 3 *****

1.106000E+01	2.046300E-01	5.500000E+00	4.093000E-01	5.000000E+00	4.775000E-01
5.000000E+00	6.139300E-01	1.320000E+00	6.821000E-01	5.880000E+00	7.640000E-01
5.880000E+00	6.458300E-01	5.880000E+00	9.277000E-01	5.270000E+00	1.009500E+00
4.950000E+00	9.959300E-01	4.950000E+00	9.586000E-01	3.800000E+00	9.209000E-01
3.480000E+00	9.277000E-01	1.160000E+00	9.616000E-01	2.110000E+00	1.000000E+00
3.900000E+13	3.900000E+13	3.900000E+13	3.900000E+13	3.900000E+13	3.900000E+13
3.900000E+13	3.900000E+13	3.900000E+13	3.900000E+13	3.900000E+13	3.900000E+13
9.380000E-01	2.900000E+13	2.900000E+13	2.900000E+13	2.900000E+13	2.900000E+13
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02
9.380000E-01	6.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02	2.000000E-02

	TC(N)	HA(N)	HB(N)	SIG(N)	HBS(N)	R=HB/HA	LPAC/HB(N)	EPFP/OPFP
	(S)	(MEV/SEC)	(MEV/SEC)	(PERCENT)	(MEV/SEC)			
1	0.0	1.25472E+01	1.26520E+01	5.91273E+00	1.35666E+01	9.46687E-01	3.03755E-02	1.00001E+00
2	1.00000E+00	1.26822E+01	1.15168E+01	4.53074E+00	1.24391E+01	9.29648E-01	3.27511E-02	1.00001E+00
3	2.00000E+00	1.20624E+01	1.12727E+01	3.55227E+00	1.16593E+01	9.24528E-01	3.46104E-02	1.00001E+00
4	5.00000E+00	1.05911E+01	1.00763E+01	3.14247E+00	1.03507E+01	9.25191E-01	3.66792E-02	1.00001E+00
5	1.00000E+01	9.86252E+00	9.03422E+00	2.95084E+00	9.29191E+00	9.18015E-01	4.30654E-02	1.00001E+00
6	2.00000E+01	8.82302E+00	7.98061E+00	2.83871E+00	8.19615E+00	9.04522E-01	4.85838E-02	1.00001E+00
7	5.00000E+01	7.50667E+00	6.64505E+00	2.72535E+00	6.51535E+00	8.65400E-01	5.77379E-02	1.00000E+00
8	1.00000E+02	6.55499E+00	5.68189E+00	2.72173E+00	5.82206E+00	8.66722E-01	6.62683E-02	9.99998E-01
9	2.00000E+02	5.71679E+00	4.82150E+00	2.79574E+00	4.95639E+00	8.45724E-01	7.26175E-02	9.99995E-01
10	1.00000E+02	4.76224E+00	3.88093E+00	2.93704E+00	3.58522E+00	8.14423E-01	8.49791E-02	9.99994E-01
11	1.00000E+02	4.05718E+00	3.17647E+00	3.15991E+00	3.26792E+00	7.82924E-01	8.86783E-02	9.99993E-01
12	2.00000E+03	2.33124E+00	2.45658E+00	3.54159E+00	2.52593E+00	7.37436E-01	8.79304E-02	9.99993E-01
13	5.00000E+03	2.47626E+00	1.61582E+00	4.68654E+00	1.68523E+00	6.82524E-01	6.33706E-02	9.99994E-01
14	1.00000E+04	1.99427E+00	1.15230E+00	5.94785E+00	1.21423E+00	5.77603E-01	9.63684E-02	1.00000E+00
15	2.00000E+04	1.92070E+00	8.05888E-01	6.29400E+00	8.63994E-01	4.97248E-01	1.30736E-01	1.00003E+00
16	5.00000E+04	1.23121E+00	4.70204E-01	1.37632E+01	5.21825E-01	3.81903E-01	2.02253E-01	1.00010E+00
17	1.00000E+05	8.89675E-01	2.86620E-01	2.37552E+01	3.28124E-01	3.61631E-01	2.77647E-01	1.00017E+00
18	2.00000E+05	7.84964E-01	1.65711E-01	3.19125E+01	2.20369E-01	2.11107E-01	3.44101E-01	1.00022E+00
19	5.00000E+05	5.51536E-01	6.98231E-02	4.57401E+01	9.23998E-02	1.26632E-01	2.92537E-01	1.00024E+00
20	1.00000E+06	4.04079E-01	3.03962E-02	4.81533E+01	4.32360E-02	7.92233E-02	1.22591E-01	1.00025E+00
21	2.00000E+06	2.89226E-01	1.31132E-02	4.90665E+01	1.94999E-02	4.59668E-02	9.36317E-03	1.00026E+00
22	5.00000E+06	1.89139E-01	4.11411E-03	4.75823E+01	6.07152E-03	3.43243E-02	1.07947E-04	1.00027E+00
23	1.00000E+07	1.01462E-01	1.77284E-03	4.62646E+01	2.59431E-03	1.74710E-02	9.86628E-06	1.00025E+00
24	2.00000E+07	4.85763E-02	6.66742E-04	5.14046E+01	1.00938E-03	1.37249E-02	4.06593E-08	1.00020E+00
25	5.00000E+07	1.54443E-02	1.34237E-04	5.13134E+01	2.03077E-04	6.69169E-03	7.53207E-02	1.00026E+00
26	1.00000E+08	5.81270E-03	4.35694E-05	3.62369E+01	5.93290E-05	7.49555E-03	0.0	1.00099E+00
27	2.00000E+08	2.65749E-03	1.61410E-05	6.13714E+01	2.61195E-05	6.07378E-03	0.0	1.00081E+00
28	5.00000E+08	1.90065E-03	1.09243E-05	5.36421E+01	1.07637E-05	5.74705E-03	0.0	1.00012E+00
29	1.00000E+09	1.28599E-03	7.36652E-06	5.24746E+01	1.12625E-05	5.74384E-03	0.0	1.00003E+00

(TA(I),PA(I),I=1,1TA),TIME UNIT= Y
1.00000E+00

(TB(I),PB(I),I=1,1TB),TIME UNIT= H

1.106000E+01	2.046300E-01	5.500000E+00	4.093000E-01	5.000000E+00	4.775000E-01
5.000000E+00	6.139300E-01	1.320000E+00	6.821000E-01	5.880000E+00	7.640000E-01
5.880000E+00	6.458300E-01	5.880000E+00	9.277000E-01	5.270000E+00	1.009500E+00
4.950000E+00	9.959300E-01	4.950000E+00	9.586000E-01	3.800000E+00	9.209000E-01
3.480000E+00	9.277000E-01	1.160000E+00	9.616000E-01	2.110000E+00	1.000000E+00