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NEWIGL - A TWO-GROUP TIME-DEPENDENT
ONE-DIMENSIONAL NEUTRON DIFFUSION
THEORY CODE

Battelle

Pacific Northwest Laboratories
Richland, Washington 99352

MAY 1974

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by

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United Nuclear Industries, Inc.

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C. M. Heeb, W. W. Porath and H. Toffer

COMPUTER CODE ABSTRACT

1. Program Identification: NEWIGL is the generic name of two similar improvements on the WIGL2 code. One version called BNWIGL is designed for the UNIVAC 1108. The other version called UNIWIGL is operable on the CDC 6600.
2. Description of Problem or Function: NEWIGL solves the one-dimensional two-energy group time-dependent diffusion theory equation with thermal feedback as does WIGL2. However, a stand-alone one-dimensional steady state diffusion theory code has been added at the front end to perform critical searches and to calculate initial direct and adjoint fluxes. The code will solve problems in slab, cylindrical and spherical geometries with up to six delayed neutron groups. Thermal feedback is introduced through the solution of the non-boiling heat transfer equations. Transients can be initiated either from changes in the thermal hydraulic parameters or by simulated control rod movement in either of the two independent pseudo rod models. Effects of two and three dimensions can be simulated through the use of interpolation tables for control rod worths and Doppler weighting factors.
3. Method of Solution: The numerical techniques used for solving the time-dependent diffusion theory equation are the same as in WIGL2. Principal improvements to these have been through the introduction of Doppler weighting factors and control rod worth functions which allow

nonlinear changes in control region cross sections as functions of rod position. Values of the Doppler weighting factors and rod worth functions are entered in tabular form. Lagrangian interpolation is used to arrive at intermediate values of the argument required during execution.

4. Related Material: The NEWIGL programs are entirely independent of auxiliary programs. All required nuclear parameters are supplied by the input.
5. Restrictions: The CDC 6600 version central memory size is within 57000 locations. The UNIVAC 1108 version is within 63000 locations. Storage is dynamically allocated by the code. The user is free to establish his own trade-offs between spatial detail, numbers of materials, and delayed neutron groups.
6. Computers: CDC 6600 and UNIVAC 1108.
7. Running Time: A CDC 6600 version problem with 111 mesh points, 6 delayed neutron groups and 13 materials took 0.83 seconds per time step. A UNIVAC 1108 version problem with 141 space points, 6 delayed neutron groups and 4 materials took 1.17 seconds per time step.
8. Programming Languages: Both versions are essentially one hundred percent FORTRAN IV except for installation-dependent timing routines.
9. Operating System: The CDC 6600 version is operable on the SCOPE 3.5 operating system. The UNIVAC 1108 version is operable on the UCC modified EXEC II operating systems (12.0 to 13.0, levels cope versions 3.7 to 3.9).

10. Machine Requirements: The CDC version requires 57000 central memory locations plus the normal complement of disc storage devices. The 1108 version requires 63000 core memory locations plus the normal user scratch drum storage. Required peripheral storage is allocated by both versions during execution.
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12. References:

A. F. Henry and A. V. Vola, "WIGL2 - A Program for the Space-Time Diffusion Equations Accounting for Temperature Xenon, and Control Feedbacks," WAPD-TM-532, October 1965.

J. R. Lilley, "Computer Code HFN-Multigroup, Multiregion Neutron Diffusion Theory in One Space Dimensions," HW-71545, November 17, 1961.

L. J. Agee, "WIGL2, A Self-Initializing Version," DUN-7538, February 5, 1971.
13. Material Available: Source decks and sample problem for both UNIVAC 1108 and CDC 6600 machines. A reference report is also available.

TABLE OF CONTENTSPage No.

COMPUTER CODE ABSTRACT	iii
I. INTRODUCTION	1
II. INPUT-OUTPUT MODIFICATIONS	4
III. THE TRIP ROD DESCRIPTION	7
IV. DOPPLER WEIGHTING FACTORS	13
V. ROD WORTH TABLES	14
VI. PROGRAM INPUT INSTRUCTIONS	15
REFERENCES	46
ACKNOWLEDGEMENT.	47
APPENDIX A	A-1
APPENDIX B	B-1
APPENDIX C	C-1
APPENDIX D	D-1

NEWIGL - A TWO-GROUP TIME-DEPENDENT
ONE-DIMENSIONAL NEUTRON DIFFUSION THEORY CODE

I. INTRODUCTION

NEWIGL is an enhanced version of the original WIGL2 code written by A. F. Henry and A. V. Vota.⁽¹⁾ The time-dependent, two energy group diffusion theory subroutines have been retained without major modification. A steady-state diffusion theory code HFN⁽²⁾ has been added to the original WIGL2 subroutines. This permits the user to perform critical searches on a specified input parameter. The direct and adjoint fluxes from such a search are then passed on to the time-dependent calculation, thereby ensuring that each transient calculation starts as close to exact critical as is specified by the user. In addition, modifications have been made to the pseudo-rod terms to allow a more realistic representation of two and three dimensional effects in the single space dimension of the WIGL2 code. Finally, the input has been restructured into a psuedo namelist format.⁽³⁾

The NEWIGL code name is a generic term for the two versions of the code which are available for the CDC 6600 and UNIVAC 1108 computers. The CDC version is called UNIWIGL and the UNIVAC version is called BNWIGL. The two versions are identical except for the following features.

1. BNWIGL contains a provision for Doppler weighting factors not contained in UNIWIGL.

2. BNWIGL has the ability to decrease the time step after a user-selected reactivity limit is reached. This does not exist in UNIWIGL.
3. UNIWIGL produces printer plots of fluxes, adjoint fluxes, and normalized power distribution for each spatial mesh point at various time steps. BNWIGL does not.
4. BNWIGL calculates the time integral of the power to produce a final deposited enthalpy edit. UNIWIGL does not contain this edit.
5. UNIWIGL thermal hydraulic section has been modified to allow for separate moderator and coolant regions.

With these improvements, the code can treat slab, cylindrical and spherical geometries. It includes nonboiling heat transfer, xenon feedback, as well as fuel and coolant temperature feedback. Transients may be excited by prescribed changes in inlet coolant temperature, coolant flow rate or rod position. In addition, control rod worth functions can be input for each of two independent psuedo rod banks.

The basic theory is described in Appendix A which is reproduced from the original WIGL2 report (WAPD-TM-532). Appendix B gives a complete description of HFN, the steady-state diffusion theory code which precedes the transient portion of a calculation. The bulk of the following text describes the input required by NEWIGL with notes where the CDC and UNIVAC versions differ. A complete narrative of the special capabilities of NEWIGL is also included.

SPECIAL FEATURES

One of the major difficulties involved in using WIGL2 was that it required a balanced set of initial conditions. If the program input does not meet this requirement, WIGL2 will appear to have experienced a perturbation, the size of which is of the order of the accuracy of the input, and the variables of interest (fluxes, temperature, etc.) will begin to change with time, i.e., experience a drift.

The problem of the drift has been eliminated by using the program HFN (HW-71545) as an input subroutine. HFN does a critical search adjusting one of the few-group parameters so the reactor is "just critical" and returns the flux shape. The flux shape is used (with the heat transfer parameters) to determine the fuel and coolant temperature in each of the thermal hydraulic regions. The flux shape is also used to determine the xenon, iodine, and precursor distribution.

To make the program more usable, a second rod bank was added which will trip when a scram signal is generated. The output has also been modified to give the user more control over the amount of output printed.

Special modifications were made to UNIWIGL to allow proper coolant volume calculations for graphite moderated water cooled reactors.⁽⁴⁾

II. INPUT-OUTPUT MODIFICATIONS

To obtain an exactly critical start, the HFN code (HW-71545) was overlaid with the WIGL2 code as an input subprogram. The HFN code performs a one-dimensional, steady-state diffusion theory calculation using the interpreted WIGL2 input data and returns the steady-state, normalized two-group flux profile. The steady-state condition is obtained by modifying either the absorption cross section or neutrons per fission inputted into the first WIGL2 region to obtain a "just critical" reactor. (Because of this, the input cross sections of Region One will be altered by the code before any WIGL2 calculation is performed.)

The HFN program is also used to obtain both the steady-state adjoint flux distribution used to calculate the reactivity, and the $\Delta\Sigma_{a2}$ associated with a Δk (see \$ROD Card Section).

Once the initial flux distribution is known, the precursor concentration for the steady state is solved, i.e.:

$$C_g = 1/\lambda_g [\beta_g (\nu\Sigma_{f1} \phi_1 + \nu\Sigma_{f2} \phi_2)] \quad (2.1)$$

where

$g = 1, 2, \dots$ number of delayed groups.

(Note the spatial dependency of Equation 2.1 has been ignored for simplicity.)

Likewise the initial xenon and iodine concentration is obtained from:

$$I_k = \left(\frac{\gamma_{I,k}}{\lambda_I} \right) \frac{\int_K (\Sigma_{f1}\phi_1 + \Sigma_{f2}\phi_2) dV}{\int_K dV} \quad (2.2)$$

$$x_K = 1.0358 \lambda_{IK} / \left[\sigma_{x,k} \frac{\int_K \phi_2 dV}{\int dV} - \lambda_x \right] \quad (2.3)$$

Where K is a spatially dependent thermal hydraulic region. The normalized fluxes are related to an input power level, thus the thermal hydraulic equations can be used to determine the steady-state fuel and coolant temperature distribution. With $\bar{T}_{fK}$ and $\bar{T}_{cK}$ as unknowns, the equations are:

$$\bar{T}_{cK} = T_b + (q V_f)_k / (2W_r C_c) \quad (2.4)$$

$$\bar{T}_{fK} = \bar{T}_{cK} + (1 - r) q \left[\frac{V_f}{V_c} \right] \left[\frac{1}{A_H D} + \frac{1}{A_H h_o (w/w_o)^{0.8}} \right] \quad (2.5)$$

with the parameters being defined on page 20 of Appendix A. (Note that care must be taken in obtaining average thermal hydraulic parameters as $q = \int f(x) dV$ where V refers to the active volume of the core, i.e., $dV = \text{height} \times \text{width} \times dX$.)

The output edit was modified to give the user more control over the amount of output printed during any time zone. The necessary input and corresponding output is described in detail in the \$TIME Card Section. (It should be noted that the only program change made was to limit the amount and arrange the order of output, hence all parameters are calculated regardless of the output requested.)

One additional edit feature was added to the program which prints the different combination of flux-adjoint integrals used in calculating the reactivity. That is for two-group diffusion theory:

$$\rho^j = \rho(t) = \frac{1}{Q} \sum_{n=1}^6 \sum_{k=1}^{NTHREG} AFI_{n,k} \quad (2.6)$$

Where for time step j:

$$AFI_{1,k} = VD_1^j \int_K \phi_1^* \nabla \phi^j dV \quad (2.7)$$

$$AFI_{2,k} = (\nu \Sigma_f^j - \Sigma_1^j) \int_K \phi_1^* \phi_1^j dV \quad (2.8)$$

$$AFI_{3,k} = \nu \Sigma_{f2}^j \int_K \phi_1^* \phi_2^j dV \quad (2.9)$$

$$AFI_{4,k} = \nabla D_2^j \int_K \phi_2^* \nabla \phi_2^j dV \quad (2.10)$$

$$AFI_{5,k} = - \Sigma_2^j \int_K \phi_2^* \phi_2^j dV \quad (2.11)$$

$$AFI_{6,k} = \Sigma_{r1}^j \int_K \phi_2^* \phi_1^j dV \quad (2.12)$$

$$Q^j = \int_{\text{core}} \phi_1^* (\nu \Sigma_{f1}^j \phi_1^j + \nu \Sigma_{f2}^1 \phi_2^j) dV \quad (2.13)$$

The two-group diffusion parameters can be taken out of the integral as they must be constant over a given thermal hydraulic region K. This output assists the user calculating reactivity associated with changes in core regions if desired.

III. THE TRIP ROD DESCRIPTION

The original WIGL2 program contained provisions for control rod motion which could be initiated at any desired time. While this option is extremely useful, there was no provision made to initiate the control rod motion if certain parameters were exceeded. In numerous safety analyses, the main concern is how fast the safety system observes an excursion and how long after detection does the excursion continue before the safety or "scram" rods terminate the excursions.

To simplify this type of analysis, a second independent rod bank was added to the WIGL2 code. This rod bank can be considered to be perpendicular to the direction in which the flux is calculated, and the control parameters $\Delta D_{i,k}$, $\Delta \Sigma a_{i,k}$, $\Delta v \Sigma f_{i,k}$, and $\Delta \Sigma r_{i,k}$ for group i and material k are the changes associated with the insertion of a full rod of length HIGH2. (Note parallel motion can be mocked by correctly defining either WD_k or $V2_k$ below.) The change relating the rod motion to the time-dependent cross section is:

$$\Sigma_{i,k}(t) = \Sigma_{i,k}^* + RT(f2_k(t)) \quad (3.1)$$

where

$$f2_k(t) = U(t - t_s)[WD_k + (t - t_s) V2_k] / \text{HIGH2} \quad (3.2)$$

$RT(f2_k(t))$ = the input rod table value at $f2_k(t)$

$$t_s = t_t + t_{dk}$$

HIGH2 = total length of rod

t_t = time of trip

WD_k = initial withdrawal distance (input)

t_{dk} = delay time (input)

$V2_k$ = velocity of rod (input)

$$U(x-a) = \begin{cases} 0 & x > a \\ 1 & x < a \end{cases}$$

with the further restriction that $0 \leq f2_k(t) \leq 1$.

Trip Description

The time of trip (t_t) is the time when certain parameters exceed limits which are specified in input data. The parameters tested and the equations used to describe the behavior of these parameters are discussed in the following section. There are eight trip tests that can be performed, which are:

- 1) Nodal temperature trip.
- 2) Average temperature trip.
- 3) Temperature rate trip.
- 4) Power from coolant temperature trip.
- 5) Nuclear rate trip.
- 6) Indicated or weighted flux trip.
- 7) Maximum period trip.
- 8) Trip at specified time.

The differential equations defining the relationship between the actual and detector indicated quantities are all of the form:

$$dx/dt = ax(t) + y(t) \quad (3.3)$$

If $y(t)$ is assumed constant [$y(t) = y_0$] over the time step in question ($\Delta t = t - t_0$), then:

$$x(t) = x(t_0) e^{a\Delta t} + (y_0/a)(e^{a\Delta t} - 1) \quad (3.4)$$

This solution is used for all trip tests discussed in this section.

Scram Signal Generation

Section VI of WAPD-TM-532 discusses the equations used to determine the coolant temperature at the downstream end of the fuel charge. To perform the tripping function, however, it is necessary to know the coolant temperature at the position of the temperature detector. This is obtained by assuming that the temperature at the detector, T_{oi} , is given by:

$$\frac{dT_{Di}}{dt} = \frac{1}{\tau_6} (T_{oi} - T_{Di}) ; \quad (3.5)$$

or in other words, a coolant flow lag where τ_0 is the lag time. The indicated temperature, T_{Ii} , is assumed to lag T_{Di} because of the finite heating time of the temperature detector, and so T_{Ii} is obtained from T_{Di} by

$$\frac{dT_{Ii}}{dt} = \frac{1}{\tau_0} (T_{Di} - T_{Ii}) \quad , \quad (3.6)$$

where τ_0 is the time constant of the detector.

The value for T_{Di} obtained from Equation 3.6 is compared, during a transient, with the input limit (T^4_{MAX}) for T_{Di} . If this limit is exceeded, a scram signal is generated. The calculated value for T_{Di} can also be determined for each node in a specified set of nodes, and/or as a weighted average of any specified combination of nodes. The weighted average value for T_D is determined from the individual values for T_{Di} and averaged according to input weighting factors, that is,

$$\bar{T}_4 = \frac{\sum_i T_{Di} W_{li}}{\sum_i W_{li}} \quad , \quad (3.7)$$

where the W_{li} are the input quantities. (The input limit for the average value is T^4_{BMAX} .)

Coolant Outlet Temperature Rate of Change

It is also possible for a scram signal to be generated if the rate of change of the indicated outlet temperature in any region (dT_{Di}/dt) exceeds a specified value, DT^4_{MAX} . There are no provisions in the program for computing the rate of change of the average outlet temperature, $\bar{T}_D$. Hence, during a transient, a scram signal will be generated only when the rate of change of T_{Di} in any region of the specified set of regions attains an outlet temperature rate of change which exceeds the input limit for $\frac{dT_{Di}}{dt}$.

Power Rate (Based on Coolant Outlet Temperature)

With the quantity $\bar{T}_D$ available, it is possible to describe the output of the thermal rate instrumentation, which consists of a differentiating circuit and an integrating circuit in series, and uses $\bar{T}_D$ as the input to the differentiating

circuit. The output of the differentiating circuit, V_1 , (and the input to the integrating circuit) is determined by solving the following differential equation,

$$\frac{dV_1}{dt} = \frac{1}{\tau_1} (\alpha \bar{T}_4 - V_1) , \quad (3.8)$$

where α is a scale factor obtained from

$$\alpha = \frac{N(0)}{\tau_1(T_D(0) - T_{ln})} \quad (3.9)$$

and τ_1 is the time constant of the differentiating circuit. The output of the integrating circuit is V_2 , and is obtained from

$$\frac{dV_2}{dt} = \frac{1}{\tau_2} (\alpha \bar{T}_D - V_1 - V_2) , \quad (3.10)$$

where τ_2 is the time constant of the integrating circuit. V_2 is thus the thermal rate as determined by the thermal rate instrumentation. Equations 3.8 and 3.10 are derived from the circuit equations discussed in HW-77221. A scram signal will be generated whenever the calculated value for V_2 exceeds the input limit (C2MAX) specified.

During any given transient, V_2 is calculated for any specified node, or any specified set of nodes depending on the value of WL_1 input, but not both. When an average value for V_2 is being calculated, the average value of $\bar{T}_D$ from Equation 3.7 is used to determine the input signal to the differentiating circuit equation.

Nuclear Rate

The nuclear rate instrumentation is similar to the thermal rate instrumentation except that $\bar{N}$ is used as the input quantity to the differentiating circuit equations. The output of the integrating circuit, V_4 , is obtained by solving the following equations:

$$\frac{dV_3}{dt} = \frac{1}{\tau_3^2} \bar{N} - \frac{1}{\tau_3} V_3, \text{ and} \quad (3.11)$$

$$\frac{dV_4}{dt} = \frac{\bar{N}}{\tau_3 \tau_4} - \frac{V_3}{\tau_4} - \frac{V_4}{\tau_4} \quad (3.12)$$

The above equations may be derived from the circuit equations as shown in HW-77221 and are discussed in more detail there.

It is possible to have a scram signal generated when the calculated value of V_4 exceeds the limit (FRMAX) specified in the input data. Also, V_4 is calculated for any specified node, or any specified set of nodes depending on the value of $W2_1$ input, but not both. When an average value of V_4 is being calculated, an average value of N is used in Equations 3.9 and 3.10. This is obtained from,

$$\bar{N} = \frac{\sum_i W2_i (\sum_{D1} \phi_{1i} + \sum_{D2} \phi_{2i})}{\sum_i W2_i}, \quad (3.13)$$

where the $W2_i$, $\sum_{D1}$, and $\sum_{D2}$ are input quantities.

Indicated Neutron Levels

A scram signal can be generated whenever the indicated neutron level exceeds a specified value (FIMAX). The indicated neutron level, N_f , is obtained by solving the differential equation:

$$\frac{dN_f}{dt} = \frac{1}{\tau_f} (\bar{N}^* - N_f), \quad (3.14)$$

where $\bar{N}$ is given by Equation 3.13, and τ_f is an instrument time constant.

FIMAX may be inputted either as a positive or negative number, and the trip will be performed only on the absolute value of FIMAX. The sign determines whether the flux summed over a thermal hydraulic region is tested or the flux summed over the whole reactor is tested. That is,

$$\overline{N}^* = \sum_{i=1}^{NPTS} W_{IJ} * (\Sigma_{D1} \phi_{1i} + \Sigma_{D2} \phi_{2i}) \quad (3.15)$$

Where J = identification number of the thermal hydraulic region containing point I

W_{IJ} are input

and $NPTS$ = number of special points in thermal hydraulic region if $FIMAX > 0.0$

$NPTS$ = number of special points over entire reactor if $FIMAX < 0.0$

Note that the quantity N^* is not divided by the sum of the weight functions. This is to allow trips with different weightings to be performed over the different thermal hydraulic regions.

Period

A scram signal can be generated whenever the e-folding time of the neutron level (period) in any node of a specified set of nodes becomes shorter than an inputted limit, $PMAX$.

$$P(t) = \Delta t / \ln \left[\text{abs} \left[(\Sigma_{D1} \phi_{1i} + \Sigma_{D2} \phi_{2i}) / (\Sigma_{D1} \phi'_{1i} + \Sigma_{D2} \phi'_{2i}) \right] \right] \quad (3.16)$$

where ϕ'_{gi} is the flux from the previous time step.

There has been no attempt to describe the period instrumentation in the program. It is possible, however, to cause the insertion of the safety system to be delayed for a specified increment of time after the generation of any scram signal (see discussion of trip rod). In this manner, it is often possible to approximate the delay caused by the period instrumentation.

Time

A scram signal can be generated at any specified time after the beginning of a run by inputting $ITRIP = -1$ and inputting the desired time of trip for $TROD2$ (see discussion of trip rod).

IV. DOPPLER WEIGHTING FACTORS

In using a one-dimensional code with fuel temperature feedback averaged values of the fuel temperature for the perpendicular direction not represented explicitly (i.e., the axial direction in a radial case, or the radial direction in an axial case) can often lead to large errors in the case of more severe transients. Doppler weighting factors are calculated by BNWIGL and a provision is made for their use in modifying the Doppler feedback. They are defined as follows:

$$DWF_i = \frac{\sum_i (\sqrt{T_i} - \sqrt{T^*}) v_i \phi_i^2}{(\overline{\sqrt{T} - \sqrt{T^*}}) \cdot \sum_i v_i \phi_i^2}, \quad (4.1)$$

where

ϕ_i = the total flux in the i th thermal hydraulic region

v_i = the volume of the region i

T = the fuel temperature of region i ($^{\circ}\text{R}$)

T^* = the reference temperature of the cross section set

$\overline{(\sqrt{T} - \sqrt{T^*})}$ = the region averaged value of this function

These Doppler weighting factors are averaged over all thermal hydraulic regions and input as functions of the fraction of deposited enthalpy, $DWF(H)$. The temperature dependence of the cross sections is then modified according to the following equation:

$$\Sigma(T) = a (\sqrt{T} - \sqrt{T^*}) DWF(H) + \Sigma^* \quad (4.2)$$

where a is a constant and Σ^* the value at T^* .

V. ROD WORTH TABLES

Both psuedo rod banks (\$RØD and \$T ROD) normally apply a change to the region cross sections in an exactly linear fashion based on the fraction inserted at a given time. Since most control rod worth curves are far from linear, a provision has been made to modify this linear behavior to better approximate a given rod worth curve. Thus the cross sections in a partially controlled region become

$$\Sigma = \Sigma^0 + RT(f) \Delta \Sigma, \quad (5.1)$$

where

Σ^0 = the uncontrolled cross-section value.

f = the fraction of the rod that is inserted

$RT(f)$ = the value of the input worth function at f

$\Delta \Sigma$ = the change from the controlled to the controlled cross section.

The value of function RT is input via tabular values. Up to 20 entries are possible. The code performs a Lagrangian interpolation on intermediate values.

VI. PROGRAM INPUT INSTRUCTIONS

To simplify the input and yet keep it in the most general form, a psuedo-name list input was developed. The main difference between the psuedo-name list and the actual name list is that no \$END card need be used. The program will recognize the following names.

<u>Type</u>	<u>Name</u>	<u>Used to Indicate</u>
1	__\$WIG	: WIGL2 Input Parameters
2	__\$TIT	: Title of Case
3	__\$TIME	: Time Description
4	__\$GEOM	: Geometry Description
5	__\$XSEC	: Cross Sections
6	__\$FLUX	: Flux Distribution
7	__\$ADJ	: Adjoint Flux Distribution
8	__\$DOP	: Change in Cross Sections with Sq. Root of Fuel Temperature
9	__\$COOL	: Change in Cross Sections with Coolant Density
10	__\$ROD	: Change in Cross Sections Due to Addition of Control Rod Bank #1
11	__\$TROD	: Same as \$ROD for Bank #2
12	__\$TRIP	: Parameters Associated with a Rod Trip
13	__\$THPR	: Thermal Hydraulic Parameters
14	__\$XEON	: Parameters Associated with Xenon
15	__\$SSTX	: Steady State Temperature and Xenon Distribution
16	__\$BETA	: Decay Parameters (re λ 's, β 's) 6E 12.6
17	__\$PREC	: Precursor Concentrations
18	__\$SOR	: External Source
19	__\$BUCK	: Traverse Buckling
20	__\$HFN	: Special HFN options for HFN cases set up by WIGL2
21	__\$RUN HFN	: Indicates cards following are input for a standard HFN run
22	__\$END	: End of HFN Case

***** Note "\$" in Column 2 *****

HFN INPUT INSTRUCTIONS

To make only an HFN run, prepare the input deck according to the HFN manual (HW-71545), and precede the deck with a card containing "RUN_HFN" in columns 1-7. It should be noted that the "RUN HFN" card need appear only once regardless of the number of stacked consecutive cases to be run. If both WIGL2 and HFN are to be run, the HFN input must be followed by a "\$END" card. Note that all the HFN cases will be run before the WIGL2 runs regardless of the order the cases are input.

WIGL2 CASE INPUT INSTRUCTIONS

The WIGL2 program will calculate some of the necessary input parameters if they are not supplied. The minimum input necessary for the first case is included under cards of types 1-5 (i.e., "\$WIG", "\$TIT", "\$TIME", "GEOM", and "XSEC"), and the only order required is that every WIGL2 case must have the "\$WIG" card as the first card of the case. The other card groups may be inputted in any order or omitted if not needed. Each UNIWIGL case must begin with a plot description card.

UNIWIGL Plot Card

Column 1 - "*" (4-8-11 punch)

Column 11 - The number of time steps between plots

Column 16 - Non-zero entry will cause the initial power profile
to be plotted

Column 21 - Non-zero entry will cause a plot of the normalized power
profile

Column 26 - Non-zero entry for two group flux plots

Column 31 - Non-zero entry for two group adjoint plots

The Repeat Option

Inevitably identical input parameters are used in consecutive regions. Normally this means that cards must be duplicated. To reduce the number of cards and hopefully the number of input errors, most of the WIGL2 input is identified by the "region" the parameter is associated with. (This may be a geometrical, thermal hydraulic, nuclear, or other previously specified region.) The card order must be such that the region numbers are in increasing order. If any number is omitted, the same data will be loaded for that region as input for the region with the next larger region number. If the input cards were:

<u>Data Field</u>	
<u>No. 1</u>	<u>Reg. No.</u>
1.0	3
2.0	4
3.0	11
0.0	12

And the variable $x(I)$, $I = 1, 2, 3, \dots, 12$ was being read from data field number 1, then $x(1)=x(2)=x(3)=1.0$; $x(4)=2.0$, $x(5), \dots, x(11)=3.0$ and $x(12)=0.0$.

Note the region numbers are in increasing order, and the last region number must appear even though the data are zeros.

Card Group "\$WIG"

The name WIG is a true name list which recognizes 43 names. Only a few of the entries must normally be inputted because usually not all options will be activated for any one case. Those entries preceded by an "*" must always be entered unless the option is to be zero (unless indicated otherwise in the Comment column).

Entry No.	Name List	Name in Equiv. Name (if any)	Description	Comment
1	PRES		System Water Pressure (14.7 psi $\leq$ press $\leq$ 2500 psi)	No input results in no temp. vs. density change in water
2	*V1		Reciprocal of Neutron Speed Gr 1 (sec/cm).	Must be greater than 0
3	*V2		Reciprocal of Neutron Speed Gr 2 (sec/cm)	Must be greater than 0
4	*NPTS	IN(1)	Number of Points	Includes the zero point
5	*NCMP	IN(2)	Number of Compositions	Must be same as number of X-SECT sets
6	*NREG	IN(3)	Number of Nuclear Regions	Must agree with _\$GEOM
7	*NTREG	IN(4)	Number of Thermal Hydraulic Regions	Must agree with _\$GEOM
8	*NLBDY	IN(5)	Left or Bottom Boundary Condition	Entry 8 and 9 must be either 0 or 1
9	*NRBDY	IN(6)	Right or Top Boundary Condition	0 implies $d\phi/dx=0$ at boundary 1 implies $\phi=0$ at boundary
10	*NTYPE	IN(7)	Prob Type	0=sphere; 1=axial; 2=radial
11	*NGEOM	IN(8)	Geometry Type	0=slab; 1=radial; 2=spherical
12	NBETA	IN(9)	Number of Delayed Groups	This must be 0, 1, or 6 If not inputted, assumed to be 6
13	NPUN		Punch Option	Input - 1 for punched cards for restart
14	NTSTP		Maximum Number of Time Steps Allowed	This is set to 500 by code unless inputted otherwise
15	NPRT		Reactivity Option	0= ρ will not be calculated -1= ρ will be calculated This is set to -1 unless inputted otherwise

Entry No.	Name in List	Equiv. Name (if any)	Description	Comment
16	TALTS		Time at which source begins to change with time (sec)	See Eqn. 34 - Appendix A
17	ALPHAS		Parameter for rate of change of source (sec^{-1})	See Eqn. 34 - Appendix A
18	TALTW		Time which flow begins to change (sec)	See Eqn. 38 - Appendix A
19	ALPHAOW		Parameter affecting rate of change of flow (sec^{-1})	See Eqn. 38 - Appendix A
20	TALTIN		Time at which inlet temperature begins to change (sec)	See Eqn. 40 - Appendix A
21	ALPHIN		Parameter affecting rate of inlet temp (sec^{-1})	See Eqn. 40 - Appendix A
22	TROD		Time at which rod position begins to change (sec) Applies to \$ROD rod	See Eqn. 50 - Appendix A
23	WZERO		Initial Flow Rate into Core (lbs/hr)	See Eqn. 38 - Appendix A
24	TIN		Core Inlet Temperature ($^{\circ}\text{F}$)	See Eqn. 40 - Appendix A
25	TOUT		Desired Coolant Outlet Temp ($^{\circ}\text{F}$)	See Eqn. 52, 59.a, 59.b - Appendix A
26	RZERO		Initial Rod Withdrawal (cm)	See Eqn. 50 - Appendix A
27	REDOT		Rate of Rod Bank Motion (cm/sec)	See Eqn. 50 - Appendix A
28	ALPHR1	} Parameters specifying response of control system		See Eqn. 52, 59.a, 59.b - Appendix A
29	ALPHR2			
30	ALPHR3			
31	ALPHR4			
32	PZERO		Desired Power in Megawatts	See Eqn. 53, 59.a, 59.b, 60 Appendix A This is also the power that HFN will normalize initial power to.
33	CSAREA		Cross Sectional Area of Core (cm^2)	Use with axial prob only. Must be input as HIGH*WIDE.
34**	NPASS		Number of Passes	NPAS=1 or 2. See next entry, if no input NPASS=1, NK1=NTREG
35**	NK1		Number of Thermal Hydraulic Regions in the First Pass	If NPASS=1, NK1 must equal to NTREG. If NPASS=2, NK1 must be <NTREG-1. In the latter case, the last T-H region (region NTREG) is the down pass region.

** Use only with radial cases in slab geometry.

Entry No.	Name in Name List	Equiv. Name (if any)	Description	Comment
36**	NRBEAR		Number of Rod Bearing Compositions	See Eqn. 58 - Appendix A
37**	HIGH		Core Height (cm)	This should be the length of the entire control rod Used in both radial and axial case.
38**	WIDE		Core Width (cm)	Wide = area of active zone of reactor/high Used in both radial and axial cases.
38**	WIDE		Core Width (cm)	Wide = area of active zone of reactor/high
39	NTIME		No. of Time Zones	This is found from \$TIME, no input needed
40	TIME		Initial Time	Set to zero unless for a restart case for which it must be input
41	HIGH2			Total length of control rods in Bank #2
42	ITRIP			- 1 No \$TRIP cards but use 2nd rod group. TROD2 is the scram time for 2nd rod group. = 1 indicates w1(1); I=1→NTREG will be input = 2 indicates w2(I); I=1→NPTS will be input = 4 indicates w4(I); I=1→NTREG will be input For input of more than one-sum numbers, i.e., 1+4=5 implies both w1 and w2 will be input
43+	RHφIN			Begin small time steps when reactivity +0.001 > RHφIN

** Use only with radial cases in slab geometry.

+ BNWIGL only.

Entry No.	Name in List	Equiv. Name (if any)	Description	Comment
44	IN(1)	NPTS		
	(2)	NCMP	These parameters are equivalent and either name can be used in the name list, hence both of the following cards are equivalent:	
	(3)	NREG		
	(4)	NTREG		
	(5)	NLBDY		
	(6)	NRBDG	<u>Col. 1</u> ↓ _ \$SWIG_ NPTS=5, NCMP=4, NREG=4, NTREG=4	
	(7)	NTYPE	or	
	(8)	NGEOM	<u>Col. 1</u> ↓	
	(9)	NBETA	_ \$SWIG_ IN=5, 3*4	
	IN(10)	NPUN		

The -\$TIT Card

The title card must have \$TIT in columns 2-5, and columns 1 and 6 must be blank. The rest of the card (columns 7-80) may have any identification the user cares to enter.

The -\$TIME Card

This card controls the size of the time step taken, the number of time steps in any time zone, the amount of output printed, and printout frequency. The subroutine which uses this input will recognize the following symbols and any number.

<u>Symbol</u>	<u>Action</u>
.	Any number group with "." is assumed to be the delt-time (in seconds) associated with that zone.
*	Number following this symbol is number of time steps in this zone - end of zone.
B	Print only a brief output. In UNIWIGL, this option deletes all plots.
F	Brief output + flux and region cross sections.
A	Same as "F" + adjoint integral.
P	Same as "A" + precursors distribution.

The print frequency is determined by the integer following the B, F, A, or P symbol. For example, assume four time zones were desired such that the time steps were 0.0001, 0.001, 0.01, and 0.1 seconds. Let time zone 1 run between 0.0 and 0.002 seconds; zone 2 between 0.002 and 0.01 seconds; zone 3 between 0.01 and 0.50 seconds; and zone 4 between 0.50 and 0.60 seconds. If a flux profile is desired, every four steps of zone 1 and 2, a brief printout after every step in zone 3, and the precursor distribution at the end of zone 4, the correct card would be:

Col. 1

↓

-\$TIME 0.0001 F4 *20 0.001 *8 B1 0.01 *49 P10 *10.

If more than one card is required, all 80 columns may be used on all following cards.

The \$GEOM Card

The geometry input subroutine will recognize the following symbols:

Symbol	Uses
.	Any number group containing a period will be assumed to be the distance between mesh points in centimeters.
*	An asterisk signifies the end of a region whose width will be the width of the last mesh spacing times the number following the asterisk.
N	Signifies nuclear region and is followed by a nuclear material number, indicating the order in which the cross sections were inputted.
T	Signifies the end of a thermal hydraulic region.

This method of input is best explained by a simple example. Consider the following reactor.

Let the desired mesh spacing be 5 cm in the reflector, 2 cm in the fuel region, and 2.5 cm in the fuel and rod region. The correct input for this reactor would be:

```
Col. 1
↓
$GEOM N1 5.0 *2 2.0 N2 *5 T3 N3 2.5 *2 T4 *2 N2 2.0*5 N1 5.0*2
```

It should be noted that each thermal hydraulic region must have only one nuclear composition in it, and the "T" need be used only when extra T-H regions are desired. For reference, there would be 3 composition, 5 nuclear, and 6 thermal hydraulic regions in the preceding example. The cross-section sets must be ordered so the reflector set is first, the fuel set second, and the fuel and rod set last. Also, two adjoining nuclear regions cannot use the same composition. The program will lump them together and not interpret remainder of \$GEOM CARD CORRECTLY. Note: If more than one card is required, all 80 columns of all following cards may be used.

The -\$XSEC Card Group

This card group contains the two-group diffusion theory parameters for the nuclear material at $t=0$. In the original report (WAPD-TM-532), these are indicated as:

- D_g^* : Reference diffusion constant for group g .
- Σ_{ag}^* : Reference absorption cross section for group g .
- Σ_{rg}^* : Reference removal cross section for group g .
(Note this removal scattering $\Sigma_s(1 \rightarrow 2)$ only.)
- ν_g^* : Average neutrons per fission in group g .
(Note in WAPD-532, this term is always associated with Σ_{fg}^* and is written $\nu \Sigma_{fg}^*$, where both the superscript and the subscript are understood to be the same as that on the Σ_f term.)
- Σ_{fg}^* : Reference fission cross section for group g .

There are two possible ways of inputting these parameters. The first is by including the three cards for each composition as shown on the following table. The second is to store the three-card group for each composition in the library and use the library read option in the program. (See page 4.27.)[†] Regardless of which method is used, the order of appearance of the cross section names is the determining factor in assigning the nuclear material number. The first set of cross sections are assigned Composition No. 1, the second set Composition No. 2, etc. If an HFN run is made to force the reactor critical, the cross section group first appearing will be the one perturbed. The value of Σ_{a2}^* will normally be the one changed. This would physically be the same as adding poison to represent a structural material or leakage in a true reactor system. If the value of ν_2^* is input negative, the value of $\nu \Sigma_{f2}$ will be changed to make the system critical. This is necessary with some cases where the one-dimensional approximation results in the system being very subcritical and corresponds to physically adding a source proportional to the thermal flux. To avoid ambiguity in thermal hydraulic feedback, it may be necessary to repeat the same material for different thermal hydraulic regions.

[†] Library read options are not available on UNIWIGL.

Name of Card Group Format: \$XSEC

(A card with the card group name must precede these cards.)
Repeat card 1-3 for each new nuclear material.

Column	1-6	6-12	12-80			
Format	Alpha-Number	Alpha-Number				
Card No. 1 of XSECT Group	ID for Composition		Any other identification - not used by WIGL			
Symbol						

Notes: 1. Order of appearance determines which material is identified as material 1, 2, . . . ; hence the order of appearance of these cards must correspond to nuclear material number used in \$GEOM.

-25-

Column	1-12	13-24	25-36	37-48	49-60	
Format	Decimal	Decimal	Decimal	Decimal	Decimal	
Cards 2 & 3 of XSECT Group	The number of neutrons per fission in Group I	Group I fission cross sections	Group I capture cross sections	Group I diffusion coefficients	Scattering from Group 1 into Group 2	
Symbol	NU(I)	SIGF(I)	SIGC(I)	D(I)	SIG(I)	

Notes: 1. Above input is in the form of macroscopic cross sections.
2. No entry of SIG(2) is needed on Card 3.
3. If NU(2) of MAT 2 is input as - NU(2), then HFN will do the critical search on ($\nu\Sigma_f$) of Group 2; otherwise the absorption cross section is used.
4. I=1 is fast group, Card No. 2; I=2 is thermal group, Card No. 3.

The -\$FLUX and -\$ADJ Card Groups

If either of these card groups are omitted, the HFN program will automatically be run and the values of flux or adjoints calculated for a critical ($k=1$) reactor. If either the flux or adjoints are inputted via cards, the format (E12.5,1X),E12.5,1X,E12.5,1X,E12.5,1X,E12.5,1X,E12.5 is used. The order of the flux or adjoint solution is Group 1, Pt 1 through all points, the Group 2, Pt 1 through all points. The Group 2 flux must start on a new card.

The -\$DOP Card Group

This card group contains the change in the cross sections with the square root of the fuel temperature ($\text{cm}^{-1}/^{\circ}\text{F}$) and the reference fuel temperature for each different composition (one card for composition). Symbolically, these are:

- (1) $\frac{\partial \Sigma_{a1}}{\partial T_f^{1/2}}$: Change in fast absorption cross section with the square root of fuel temperature ($\text{cm}^{-1}/^{\circ}\text{F}$).
- (2) $\frac{\partial v\Sigma_{f1}}{\partial T_f^{1/2}}$: Change in $v\Sigma_f$ of Group One with the square root of fuel temperature ($\text{cm}^{-1}/^{\circ}\text{F}$). (See Equation 33.)
- (3) $\frac{\partial \Sigma_{r(1 \rightarrow 2)}}{\partial T_f^{1/2}}$: Change in the scattering removal cross section with the square root of fuel temperature ($\text{cm}^{-1}/^{\circ}\text{F}$).
- (4) T_f^* : Reference fuel temperature $^{\circ}\text{F}$ of material n.

$$\text{Note: } \partial T_f^{1/2} \equiv \left(\sqrt{T_{f,k}^j + 459.72} - \sqrt{T_{f,n}^* + 459.72} \right)$$

where k is the T-H region involved.

The -\$DOP Card Group Format

Column	1-12	13-24	25-36	37-48	49-54
Format	Decimal	Decimal	Decimal	Decimal	Integer
Card No. 1 of -\$DOP Card Group	Change in Σ_a Group 1	Change in $v\Sigma_f$ Group 1	Change in $\Sigma_{r(1 \rightarrow 2)}$	Reference fuel temperature	Comp. number (repeat option)
Symbol	PTEMP(1)	PTEMP(2)	PTEMP(3)	REFT	N

The following cards apply only to XNWIGL

Column	1-6	7-12	13-18
Format	Integer	Integer	Integer
	Number of points in Doppler wtg factor table	Order of interpolation Defaults to 2 if MHO=0	Maximum deposited enthalpy
Symbol	MAVGH	MHO	MAXDE

Column	1-12	13-24	25-36	37-48	49-60	61-72
Format	Decimal	Decimal	Decimal	Decimal	Decimal	Decimal
fraction of average deposited enthalpy 0 to 1.0						
Symbol	AVGH(1)	AVGH(2)	AVGH(3)	AVGH(4)	AVGH(5)	AVGH(6)

Repeat until MAVGH values have been entered.

Column	1-12	13-24	25-36	37-48	49-60	61-72
Format	Decimal	Decimal	Decimal	Decimal	Decimal	Decimal
Doppler wtg factor from axial case						
Symbol	CDWF(1)	CDWF(2)	CDWF(3)	CDWF(4)	CDWF(5)	CDWF(6)

Repeat until MAVGH values have been entered.

The _\$COOL Card Group

This card group allows the change in the macroscopic cross section due to a change in coolant density and the reference ($t=0$) coolant density of the composition. One set is required for each different nuclear composition. Symbolically these are:

- (1) $\frac{\partial}{\partial \rho_c} \left(\frac{1}{D_g} \right)$: Change in $1/D$ for Group g with coolant density ($\text{cm}^{-1}/\#/ft^3$)
- (2) $\frac{\partial \Sigma_a}{\partial \rho_c}$: Change in Σ_a for Group g with coolant density ($\text{cm}^{-1}/\#/ft^3$)
- (3) $\frac{\partial v \Sigma_{fp}}{\partial \rho_c}$: Change in $v \Sigma_{fp}$ for Group g with coolant density ($\text{cm}^{-1}/\#/ft^3$)
- (4) $\frac{\partial \Sigma_r(1 \rightarrow 2)}{\partial \rho_e}$: Change in the $\Sigma_r(1 \rightarrow 2)$ with coolant density ($\text{cm}^{-1}/\#/ft^3$)
- (5) $P_{c,n}^*$: The reference density of the coolant in nuclear composition Number n (lbs/ft^3)

This card group can be inputted either via use of the library read option (see page 4.27) or by cards which use the format shown on the following page.

The \$COOL Card Group Format

Changes in macroscopic data with coolant density ($\text{cm}^{-1}/\#/ft^3$).

Column	1-12	13-24	25-36	37-48	49-54	
Format	Decimal	Decimal	Decimal	Decimal	Integer	
Card No. 1 of \$COOL Group	Change in $1/D_1$ Group 1	Change in Σ_a Group 1	Change in $v\Sigma_f$ Group 1	Change in $\Sigma_r(1 \rightarrow 2)$	Comp. Number (repeat optional)	
Symbol	PDEN(1)	PDEN(2)	PDEN(3)	PDEN(4)	N	

Column	1-12	13-24	25-36	37-48	49-54	
Format	Decimal	Decimal	Decimal	Decimal	Integer	
Card No. 2 of \$COOL Group	Change in $1/D_2$ Group 2	Change in Σ_a Group 2	Change in $v\Sigma_f$ Group 2	Reference coolant density	Comp. Number (repeat optional)	
Symbol	PDEN(5)	PDEN(6)	PDEN(7)	FEFDEN	N	

The _\$ROD Card Group

The parameters inputted via this card group are the changes in the macroscopic cross section of the first rod bank due to the addition of a full control rod of height "HIGH". There are two ways to input these parameters:

- 1) The change in all macroscopic data can be inputted directly using the format shown on the next page.
- 2)[†] The desired δK resulting from the insertion of a full rod into nuclear material "I" can be input via a name list which recognizes the symbol DR(I). This causes HFN to vary the thermal absorption cross section of that material until the desired δK is obtained and returns the corresponding $\delta \Sigma_{a2}$. This may be repeated for as many nuclear compositions as desired. For example, the card

_ \$ROD - DR(1) = 0.001, DR(3) = -.0002

would cause two independent HFN searches: One varying the Σ_{a2} of material, one until $k_{eff} = 0.999$. The value $\delta \Sigma_2^{(original)} - \Sigma_{a2}^{(search)}$ would be returned and stored in WIGL2. Likewise the second search would vary the Σ_{a2} of nuclear material three until a $k_{eff} = 1.002$ was obtained.

In the original WIGL2 report, these parameters are defined in WAPD-TM-532 as:

- 1) $\Delta(1/D_g)$: Change in $1/D$ for Group g due to the addition of a control rod.
- 2) $\Delta \Sigma_{ag}$: Change in Σ_a for Group g due to the addition of a control rod.
- 3) $\Delta v \Sigma_{fg}$: Change in $v \Sigma_f$ for Group g due to the addition of a control rod.
- 4) $\Delta \Sigma_r(1 \rightarrow 2)$: Change in $\Sigma_r(1 \rightarrow 2)$ due to the addition of a control rod.

Note that each of the above parameters must be inputted for each nuclear composition if inputted via Method 1.

[†] This is a little used option. The user should beware.

The \$ROD Card Group Format

Changes in cross section due to addition of entire control rod of length "HIGH" - Rod Bank No. 1.

Note: One card is required for each different rod material in reactor and last value of n = NCMP of \$WIG.

Column	1-12	13-24	25-36	37-48	49-54	
Format	Decimal	Decimal	Decimal	Decimal	Integer	
Card No. 1 of \$ROD Group	Change in $1/D_f$ for Group 1	Change in Σ_a for Group 1	Change in $v\Sigma_f$ Group 1	Change $\Sigma_r(1 \rightarrow 2)$	Comp. Number (repeat opt.)	
Symbol	DELMAC(1)	DELMAC(2)	DELMAC(3)	DELMAC(4)	N	

Note: All No. 1 cards are read before No. 2 cards.

Column	1-12	13-24	25-36	37-48	49-54	
Format	Decimal	Decimal	Decimal	Decimal	Integer	
Card No. 2 of \$ROD Group	Change in $1/D_{th}$ Group 2	Change in Σ_a for Group 2	Change in $v\Sigma_f$ Group 2	Not Used	Comp. Number (repeat opt.)	
Symbol	DELMAC(5)	DELMAC(6)	DELMAC(7)		N	

If the problem type is NOT radial, that is NTYPE $\neq$ 2 on the SWIG card, the following cards are NOT needed:

Column	1-6	7-12
Format	Integer	Integer
Card #1 of control rod table.	Number of points in table.	Order of interpolation Defaults to 2 if MRØDØ=0
Symbol	MRØD	MRØDØ

Column	1-12	13-24	25-36	37-48	49-60	61-72
Format	Decimal	Decimal	Decimal	Decimal	Decimal	Decimal
Fraction of control rod inserted. 0 to 1.0						
Symbol	XRØD(1)	XRØD(2)	XRØD(3)	XRØD(4)	XRØD(5)	XRØD(6)

Repeat until MRØD values have been entered.

Column	1-12	13-24	25-36	37-48	49-60	61-72
Format	Decimal	Decimal	Decimal	Decimal	Decimal	Decimal
Fraction of rod worth inserted. 0 to 1.0						
Symbol	YRØD(1)	YRØD(2)	YRØD(3)	YRØD(4)	YRØD(5)	YRØD(6)

Repeat until MRØD values have been entered.

The _\$T ROD Card Group

This card group is for a second independent rod bank. The only way to input this card group is via cards shown on page 4.17. (Note: The \$ROD NAME LIST does not apply to this rod group!!) The changes in the diffusion theory parameters are for the insertion of an entire control rod of height HIGH2. The three additional parameters associated with this group are TROD2, R2ZERO, and V2ROD; they represent the time delay from a trip signal, the initial length of rod withdrawn at time of trip, and the velocity the rod will travel at time of trip plus TROD2, respectively. This rod bank differs from the first (_\$ROD) in that each composition number has a "rod" associated with it, and this "rod" has its own delay time, initial withdrawal distance, and velocity. This is the only rod bank which is affected by the trip section, i.e., when a trip limit is exceeded, only this rod bank is activated. It should be noted that with a little arithmetic this rod bank can be made to represent a rod moving either parallel or perpendicular to the direction of interest. Note: TROD2 is the trip time if - ITRIP = -1.

The \$TROD Card Group Format

Change in cross sections due to addition of entire control rod of length HIGH2 - Rod Bank No. 2.

Column	1-12	13-24	25-36	37-48	49-60	61-66
Format	Decimal	Decimal	Decimal	Decimal	Decimal	Integer
Card No. 1 of TROD Group	Change in $1/D_f$ Group 1	Change in Σ_a Group 1	Change in $v\Sigma_f$ Group 1	Change $\Sigma_r(1 \rightarrow 2)$	Delay time of this rod from time of trip (sec)	Comp. Number (repeat opt.)
Symbol	D2MAC(1)	D2MAC(2)	D2MAC(3)	D2MAC(4)	TROD2	N

- Note: (1) One card is required for each different rodged material in reactor, and the last value of N = NCMP of \$WIG.
- (2) All No. 1 cards are read before No. 2 cards.
- (3) TROD2 is trip time if \$TRIP is not input.

Column	1-12	13-24	25-36	37-48	49-60	61-66
Format	Decimal	Decimal	Decimal	Decimal	Decimal	Integer
Card No. 2 of TROD Group	Change in $1/D_{th}$ Group 2	Change in Σ_a Group 2	Change in $v\Sigma_f$ Group 2	Initial Withdrawal Distance of This Rod (cm)	Velocity of Rod after Trip(cm/sec)	Comp. Number
Symbol	D2MAC(5)	D2MAC(6)	D2MAC(7)	R2ZERO	V2ROD	N

- Note: (1) Same as (1) above.
- (2) V2 rod may be negative.
- (3) R2ZERO may be greater than HIGH2 if desired for special cases.

If the problem type is NOT radial, that is NTYPE +2 on the \$WIG card,
the following cards are NOT needed.

Column	1-6	7-12
Format	Integer	Integer
Card #1 of of 2nd rod bank.	Number of points in table.	Order of interpolation Defaults to 2 if MTR0D=0
Symbol	MTR0D	MTR0D0

Column	1-12	13-24	25-36	37-48	49-60	61-72
Format	Decimal	Decimal	Decimal	Decimal	Decimal	Decimal
Fraction of 2nd rod inserted. 0 to 1.0						
Symbol	XTROD(1)	XTROD(2)	XTROD(3)	XTROD(4)	XTROD(5)	XTROD(6)

Repeat until MTR0D values have been entered.

Column	1-12	13-24	25-36	37-48	49-60	61-72
Format	Decimal	Decimal	Decimal	Decimal	Decimal	Decimal
Fraction of 2nd rod worth inserted. 0 to 1.0						
Symbol	YTROD(1)	YTROD(2)	YTROD(3)	YTROD(4)	YTROD(5)	YTROD(6)

Repeat until MTR0D values have been entered.

The \$TRIP Card Group

The \$TRIP is a true name list which will recognize the 19 parameters in the following table. Because not all the trip options will normally be used at the same time, only those which are to be used should be inputted. It should be noted that some of the parameters are predefined to specific nonzero values if not inputted. This section is largely untested, so the user should beware.

Entry No.	Name in Name List	Description	Comment and/or Predefined Value
1	T4MAX	Nodal temperature trip level	Node = T-H region
2	T4BMAX	Avg. temperature trip level	
3	DT4MAX	Temperature rate trip level	
4	C2MAX	Power from coolant temp. trip level	
5	FRMAX	Nuclear rate trip level	
6(a)	(+)FIMAX	Indicated flux trip level	6(a-b) is one entry ABS value of FIMAX is used in test + or - determines which test is performed
6(b)	(-)FIMAX	Weighted flux trip level	
7	PMAX	Maximum period trip level	Pointwise
8	TC0	Time constant of temp. detector	See Equation
9	TC1	Time constant of diff. circuit	See Equation
10	TC2	Time constant of integrating circuit	
11	TC3	Time constant of diff. circuit	
12	TC4	Time constant of integrating circuit	
13	TC5	Time constant of neutron level inst.	
14	TC6	Coolant passage time constant	
15	SIGD1	Detector efficiency to neutrons of Group 1	$\Sigma_{d1} = 0.0$
16	SIGD2	Detector efficiency to neutrons of Group 2	$\Sigma_{d2} = 0.0$
17	W1	Weighting factor used in temp. trip	One per T-H region if ITRIP=1,3,5,7 (MAX of 50 T-H Regions)
18	W2	Weighting factor used in average nuclear trip	One per mesh point if ITRIP=2,3,6,7 (MAX of 200 mesh points)
19	W4	Weighting factors used in indicated node flux trip	One per T-H region if ITRIP=4,5,6,7 (MAX of 50 T-H Regions)
20	PWRTRP	Relative reactor power to trip at	
21	TVMPLY	Time delay after trip to begin insertion of scram rods	

The \$THPR Card Group

This card group contains the parameters for the heat transfer equations used in WIGL2. It should be noted that the direction of flow and control rod motion differs between axial-type problems and radial-type problems. For this reason there are two different heat transfer and control equations programmed in WIGL2. (See Section IV of Appendix A for details.)

The heat transfer parameters are defined as follows:

- 1) A_h : Total heat transfer area for the composition in question divided by the total volume of coolant for that composition $(ft)^{-1}$.
- 2) U : Conductivity/conduction length of the fuel cladding $(btu/ft^2/^{\circ}F/hr)$.
- 3) h_o : Film coefficient at initial flow rate $(btu/ft^2/^{\circ}F/hr)$.
- 4) C_c : Specific heat of coolant $(btu/^{\circ}F)$.
- 5) r : Fraction of fission power appearing in coolant.
- 6) $\rho_f C_f V_f / V_c$: Heat capacity of fuel $(btu/ft^3/^{\circ}F)$.
- 7) $V_c / (V_c + V_f)$: Coolant volume fraction.
- 8) $\left[\frac{\partial \rho_c H^*}{\partial T_c} \right]$: Heat required to raise the temperature of one cubic foot of coolant one degree Fahrenheit $(btu/ft^3/^{\circ}F)$.

Each of the above parameters must be input for each nuclear composition. This may be done by using the library read option (see page 4.27) or by inputting cards using the format shown on the following page. If this card group is not included, the heat transfer calculations will not be utilized.

\$TAPR must have thermal hydraulic data input for all regions for axial cases or the region inlet temperature in subroutine HTRAN will oscillate producing a non-equilibrium state.

The \$THPR Card Group Format

Column	1-12	13-24	25-36	37-48	49-54	
Format	Decimal	Decimal	Decimal	Decimal	Integer	
Card No. 1 of \$THPR Group	Total H-T area/total vol coolant comp(ft ⁻¹)	Conductivity/ conduction lgth fuel cl (btu/ft ² /°F/hr)	Film coeff. initial flow rate(btu/ ft ² /°F/hr)	Specific heat of coolant (btu/#/°F)	Comp. Number (repeat opt.)	
Symbol	HTAREA	UCOND	FILMC	SCHOOL	N	

Column	1-12	13-24	25-36	37-48	49-54	
Format	Decimal	Decimal	Decimal	Decimal	Integer	
Card No. 2 of \$THPR Group	Fraction of fission power in coolant	Heat cap.of fuel (btu/ ft ² /°F)	Coolant Volume Fraction	Heat req'd to raise temp 1 ft ³ coolant 1°°F(btu/ft ³ /°F)	Comp. Number (repeat opt.)	
Symbol	RFRAC	HCAPFL	CVOL	REFRT	N	

The \$XEON Card Group

This card group contains the parameters associated with the xenon buildup/burnout. If this card group is input, the xenon and iodine concentration will be determined during the transient. The governing equations are given in Section V of Appendix A, and they are consistent with the following definitions.

- 1) σ_x^* : Reference thermal microscopic xenon cross section.
- 2) $\frac{\partial \sigma_x}{\partial \rho_c}$: Change in thermal microscopic xenon absorption cross section with respect to the density of the coolant ($\text{cm}^2/\text{\#}/\text{ft}^3$).
- 3) X^* : Reference concentration of xenon.
- 4) γ_I : Cumulative yield of I^{135} .

The above parameters must be input for each nuclear composition if the card group is included with the input. This can be done by use of the library read option (see page 4.27) or by cards using the format shown below. If this card group is not included, the xenon-iodine concentration will not be calculated.

The \$XEON Card Group Format

Column	1-12	13-24	25-36	37-48	49-54
Format	Decimal	Decimal	Decimal	Decimal	Integer
Card No. 1 of \$XEON Group	Reference thermal micro x-sect for xenon	Change in thermal micro σ_{2g} of Xe ($\text{cm}^2/\text{\#}/\text{ft}^3$)	Reference concentration of xenon	Cumulative yield of I^{135}	Comp. Number (repeat opt.)
Symbol	REFSX	PDSX	REFXN	GAMI	N

The -\$SSTX Card Group

This card group contains the initial fuel and coolant temperature profile, and the initial xenon and iodine concentrations. If this card group is input, the format shown below must be used. If the card group is not included, a steady-state temperature distribution is calculated for the fuel and coolant using the input thermal hydraulic parameters and the initial flux distribution. Likewise the xenon-iodine concentration is calculated assuming steady-state conditions and using the xenon-iodine parameters input. Note that both the temperature and concentrations are calculated if this card group is not inputted, but neither will be calculated if this card group is included.

The _\$SSTX Card Group Format

Column	1-12	13-24	25-30	
Format	Decimal	Decimal	Integer	
Card No. 1 of \$SSXT Group	Initial Coolant Temperature OF	Initial Fuel Temperature OF	T-H Region Number (repeat opt.)	
Symbol	TBARC	TBARF	K	

Column	1-12	13-24	25-30	
Format	Decimal	Decimal	Integer	
Card No. 2 of \$SSXT Group	Initial Conc. of I ¹³⁵ (at/cc)	Initial Conc. of Xe ¹³⁵ (at/cc)	T-H Region Number (repeat opt.)	
Symbol	XIOD	XEN	K	

The \$BETA Card Group

These are the parameters associated with the delayed neutron precursors, i.e., λ and β in Equation 1.a, 1.b, and 1.c in Appendix A. There is only one set of λ_i ($i = 1, 2, 3, \dots$ number of delayed groups), but the $\beta_{i,n}$ are input both by delayed group and by material composition. The number of delayed groups must be 0, 1, or 6. If this card group is not input but NBETA=6 in the \$WIG name list, then the following values will be assumed for all materials.

i	$\beta_{i,n}$ (all n)	λ_i (sec ⁻¹)
1	0.0002470	0.0127
2	0.0013845	0.0317
3	0.0012220	0.1150
4	0.0026455	0.3110
5	0.0008320	1.4000
6	0.0001690	3.8700

If this card group is to be input, the format shown on the following page must be used.

The \$BETA Card Group Format

NBETA (in \$WIG) must be 0, 1, or 6. If NBETA=0, card group \$BETA is not used; if NBETA is 1, only columns 1-12 of the following cards are used; and if NBETA=6, the card is as shown:

Column	1-12	13-24		49-60	61-72	
Format	Decimal	Decimal		Decimal	Decimal	
Card No. 1 of \$BETA Group	Decay const. of precursor Group 1	Decay const. of precursor Group 2	. . .	Decay const. for precursor group 5	Decay const. for precursor Group 6	
Symbol	XLAMDA(1)	XLAMDA(2)		XLAMDA(5)	XLAMDA(6)	

Note: Only one card is used per case.

Column	1-6
Format	Integer
Composition N Repeat Option	
Symbol	N

Column	1-12	13-24			61-72	
Format	Decimal	Decimal			Decimal	
Card No. 2	Delayed neut. fraction of delayed Gp.1 Comp. N	Delayed neut. fraction of delayed Gp.2 Comp. N	. . .		Delayed neut. fraction of delayed Gp.6 Comp. N	
Symbol	BETA(I,N)	BETA(I+1,N)			BETA(I+6,N)	

Note: (1) On last card of this group N=NCMP of \$WIG.

(2) Order of these cards must be the same as that of \$XSEC.

The -\$PREC Card Group

This card group allows for the input of the delayed neutron precursor concentrations $C_{i,n}$ (Equation 1, Appendix A) of delayed group i_1 ($i=1,2, \dots, \text{NBETA}$) and composition N ($N=1,2, \dots, \text{NCOMP}$). If this card group is not inputted, the initial flux distribution will be used to calculate an equilibrium precursor concentration distribution.

If this card group is included, the format 6E12.8 must be used for each material. This card group must be included to start a case of $t_0 \neq 0$. The necessary input can be automatically punched using the punch option.

The -\$SOR Card Group

This is the strength of all external sources of neutrons for each group and nuclear material. Source contribution appears only in WIGL calculations and is not part of HFN calculations. If the same source values are to be put in HFN, the \$HFN card can be used.

The -\$SOR Card Group Format

Column	1-12	13-24	25-30	
Format	Decimal	Decimal	Integer	
Card No. 1 of \$SOR Group	External source for Group 1 Material N	External source for Group 2 Material N	Nuclear Comp. Number (repeat opt.)	
Symbol	SOURCE(2N-1)	SOURCE(2N)	N	

Note: Repeat option can be used, and the last value of $N=\text{NCOMP}$.

The _\$BUCK Card Group

This is the transverse buckling for the material and group, and it will be added to the total removal cross section of the group

$$\left\{ \begin{array}{l} \text{i.e., } \sum_{l,g}^{\text{mat}} = \sum_{ag}^{\text{mat}} + \sum_{rg}^{\text{mat}} (g \rightarrow g - 1) + D_g^{\text{mat}} (B_g^{\text{mat}})^2 \end{array} \right\}$$

to account for leakage in transverse directions. This buckling will go only in WIGL. If the same value is to be used in HFN, the \$HFN cards can be used.

The _\$BUCK Card Group Format

Column	1-12	13-24	25-30	
Format	Decimal	Decimal	Integer	
Card No. 1 of \$BUCK Group	Buckling Group 1 Region NR	Buckling Group 2 Region NK	Comp. Number (repeat opt.)	
Symbol	TBUCK(2r-1)	TBUCK(2r)	N	

Note: Last value or NR must be NREG.

The _\$HFN Card Group

This is a true name list which is used to input special instructions to the HFN program. When the HFN subroutine is used by WIGL2, the entire case is set up and executed using predefined options. If for any reason the input of the HFN case must be modified, this card group can be used to input the special "instructions." The name list recognizes only two names, FN and NC, which are used in connection with the variable location shown in the HFN document (Appendix B). The FN is used for all floating point numbers, while the NC is used for all integer constants. For example, if detailed output is desired from HFN, then the correct input is zeros for all locations 62-77, which could be inputted as: _\$HFN NC(62)=16*0. In UNIWIGL, the _\$HFN card should be the last card type in the deck and should be terminated with a regular name list _\$END card.

REFERENCES

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3. L. J. Agee, "WIGL2, A Self-Initializing Version," DUN-7538, February 5, 1971.
4. A. F. Kupinski, "Supplemental Notes on the Computer Code WIGL2," DUN-8021, July 17, 1974.

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APPENDIX A

WIGL2 THEORY AND DESCRIPTION

The time-dependent, two energy group diffusion theory routines of the original WIGL2 Code have been retained without major modifications in NEWIGL. Therefore, for sake of completeness, the theory and description as reported in WAPD-TM-532 are reproduced as an appendix in this document.

A description is given of WIGL2, a one-dimensional, two-group, space-time diffusion theory program with zero, one, or six delayed neutron groups. The program will treat slab, cylindrical and spherical geometries and includes non-boiling heat transfer. Xenon feedback and feedback effects due to fuel and coolant temperature are accounted for. Control rod motion and control system feedback based on total core power or outlet coolant temperature can be simulated. Transients may be excited by prescribed changes in inlet coolant temperature, coolant flow rate, or rod position. This report includes the governing equations and a description of the input and edit features of the program.

WIGL2
A PROGRAM FOR THE SOLUTION OF THE ONE-DIMENSIONAL,
TWO-GROUP, SPACE-TIME DIFFUSION EQUATIONS
ACCOUNTING FOR TEMPERATURE, XENON, AND CONTROL FEEDBACK

A. F. Henry
A. V. Vota

I. INTRODUCTION

WIGL2 is a program for the solution of the one-dimensional, two-group, space-time diffusion equations. It represents an extension of the program WIGLE (Ref. 1) to cover cylindrical and spherical geometries as well as slab, and to cover situations involving feedback. In addition, the treatment of the time-dependent diffusion equations is different. Specifically, the difference equations are derived in a more general form, and the program has the capability of adjusting its difference equations internally so that the forms of these equations are best suited to the particular time step chosen for a given problem. Three feedback effects are accounted for: that due to transient xenon, that due to fuel and coolant temperature, and that due to the motion of control rods.

The neutron equations along with the various feedback processes form a nonlinear system of equations. The most practical method of solution appears

to be the conventional one of computing the changes in nuclear parameters during a given time step by using the neutron fluxes at the beginning of the time step, and then determining the new flux shape associated with these parameters. When this procedure is used, the overall program splits naturally into segments: neutron equations, xenon description, temperature feedback and control. The governing equations for each of these segments will be presented and discussed in the succeeding sections.

WIGL2 was written in FORTRAN II and has been compiled on the Philco-2000 computer. It runs under control of the EKSB monitor system (Ref. 2). Input is read and processed by calls on the INPT subroutine package (Ref. 3); and cards are punched through the PUNCH subroutine (Ref. 3).

II. THE NEUTRON EQUATIONS

The basic two-group time dependent diffusion equations solved by WIGL2 are

$$\nabla \cdot D_1(x,t) \nabla \phi_1(x,t) - \Sigma_1(x,t) \phi_1(x,t) + [\omega \Sigma_{f_1}(x,t) \phi_1(x,t) + \omega \Sigma_{f_2}(x,t) \phi_2(x,t)](1 - \beta) \quad (1a)$$

$$+ \sum_{i=1}^I c_i(x,t) \lambda_i + s_1(x,t) = \frac{1}{v_1} \frac{\partial \phi_1(x,t)}{\partial t}$$

$$\nabla \cdot D_2(x,t) \nabla \phi_2(x,t) - \Sigma_2(x,t) \phi_2(x,t) + \Sigma_{r_1}(x,t) \phi_1(x,t) + s_2(x,t) = \frac{1}{v_2} \frac{\partial \phi_2(x,t)}{\partial t} \quad (1b)$$

$$- \lambda_i c_i(x,t) + \beta_i [\omega \Sigma_{f_1}(x,t) \phi_1(x,t) + \omega \Sigma_{f_2}(x,t) \phi_2(x,t)] = \frac{\partial c_i(x,t)}{\partial t}, \quad i=1 \dots I \quad (1c)$$

where

$$\beta = \sum_{i=1}^I \beta_i .$$

In order to obtain the time-difference form, we first replace continuous time by a sequence of times $t_0, t_1, \dots, t_j, \dots, t_T$ where t_0 is the initial time. (For the neutron, xenon and control equations we shall measure time in seconds and distance in cm.; for heat transfer we shall use hours and feet.) We symbolize the time dependent quantities in (1) by superscript, j . (Thus $\rho_1(x, t_j) \equiv \rho_1^j$; $D_1(x, t_j) \equiv D_1^j$, etc.) We then replace time derivative $\frac{\partial \rho_1}{\partial t}$ by $\frac{\rho_1^{j+1} - \rho_1^j}{\Delta t_j}$ ($\Delta t_j \equiv t_{j+1} - t_j$ is the length of time step $j + 1$) and replace time dependent quantities such as $\sum_1(x, t) \rho_1(x, t)$ by $\theta_{\sigma}^j \sum_1^{j+1} \rho_1^{j+1} + (1 - \theta_{\sigma}^j) \sum_1^j \rho_1^j$ where the θ_{σ}^j are constants introduced to increase the stability and accuracy of the numerical method. (For $\frac{1}{v_1}$ and $\frac{1}{v_2} \neq 0$, $\theta_{\sigma}^j = \frac{1}{2}$ was used for all terms, subscripts σ , and all time steps, j , in WIGLE; it is the best choice for small time steps but can lead to violent oscillations for large time steps.) In general the θ_{σ}^j can differ at every spatial point for each term on the left hand side of (1) (such a change would be symbolized by different subscripts, σ) and can change for each time step, j . We shall not make use of this complete generality, although those θ 's introduced will be time dependent in accord with equations to be specified. Specifically, with definitions

$$G_1^j \equiv \nabla \cdot D_1^j \nabla \rho_1^j - \sum_1^j \rho_1^j ; \quad i=1,2 \quad (2a)$$

$$F_1^j \equiv \sum_{f_1}^j \rho_1^j ; \quad i=1,2 \quad (2b)$$

We write the time difference form of Eqs (1) as

$$\begin{aligned} & \theta_{11}^j g_1^{j+1} + (1 - \theta_{11}^j) g_1^j + [\theta_{11}^j r_1^{j+1} + (1 - \theta_{11}^j) r_1^j + \theta_{12}^j r_2^{j+1} + (1 - \theta_{12}^j) r_2^j] (1 - \beta) \\ & + \sum_{i=1}^I \lambda_i [\theta_d^j c_i^{j+1} + (1 - \theta_d^j) c_i^j] + \frac{1}{2} (s_1^{j+1} + s_1^j) = \frac{1}{v_1} \frac{\rho_1^{j+1} - \rho_1^j}{\Delta t_j} \end{aligned} \quad (3a)$$

$$\theta_{22}^j g_2^{j+1} + (1 - \theta_{22}^j) g_2^j + \theta_{21}^j \sum_{r_1}^{j+1} \rho_1^{j+1} + (1 - \theta_{21}^j) \sum_{r_1}^j \rho_1^j + \frac{1}{2} (s_2^{j+1} + s_2^j) = \frac{1}{v_2} \frac{\rho_2^{j+1} - \rho_2^j}{\Delta t_j} \quad (3b)$$

$$\begin{aligned} & - \lambda_1 [\theta_d^j c_1^{j+1} + (1 - \theta_d^j) c_1^j] + \beta_1 [\theta_{11}^j r_1^{j+1} + (1 - \theta_{11}^j) r_1^j + \theta_{12}^j r_2^{j+1} + (1 - \theta_{12}^j) r_2^j] \\ & = \frac{c_1^{j+1} - c_1^j}{\Delta t_j} \end{aligned} \quad (3c)$$

With some rearranging and (3c) used to eliminate c_1^{j+1} from (3a) we obtain

$$\begin{aligned} & - \theta_{11}^j [g_1^{j+1} + r_1^{j+1} (1 - \beta)] - \theta_{12}^j r_2^{j+1} (1 - \beta) + \frac{1}{v_1 \Delta t_j} \rho_1^{j+1} = \frac{1}{2} (s_1^{j+1} + s_1^j) + \frac{1}{v_1 \Delta t_j} \rho_1^j \\ & + (1 - \theta_{11}^j) [g_1^j + r_1^j (1 - \beta)] + (1 - \theta_{12}^j) r_2^j (1 - \beta) + \sum_i \frac{\lambda_i c_i^j}{1 + \theta_d^j \lambda_i \Delta t_j} \end{aligned} \quad (4a)$$

$$\begin{aligned} & - \theta_{22}^j g_2^{j+1} - \theta_{21}^j \sum_{r_1}^{j+1} \rho_1^{j+1} + \frac{1}{v_2 \Delta t_j} \rho_2^{j+1} = \frac{1}{2} (s_2^{j+1} + s_2^j) + (1 - \theta_{22}^j) g_2^j \\ & + (1 - \theta_{21}^j) \sum_{r_1}^j \rho_1^j + \frac{1}{v_2 \Delta t_j} \rho_2^j \end{aligned} \quad (4b)$$

$$c_1^{j+1} = \frac{1 - (1 - \theta_d^j) \lambda_1 \Delta t_j}{1 + \theta_d^j \lambda_1 \Delta t_j} c_1^j + \beta_1 \Delta t_j [\theta_{11}^j r_1^{j+1} + (1 - \theta_{11}^j) r_1^j + \theta_{12}^j r_2^{j+1} + (1 - \theta_{12}^j) r_2^j] \quad (4c)$$

where

$$B_1^j \equiv \frac{\beta_1}{1 + \lambda_1 \Delta t_j \theta_d^j} ; \quad B^j = \sum_1 B_1^j \quad (5)$$

III. DETERMINATION OF THE θ 's FOR NEUTRON EQUATIONS

To motivate the θ -scheme and to justify the particular manner in which the θ 's have been introduced into equations (3) it is convenient to consider the following cases.

We begin with the equation

$$\frac{dZ(t)}{dt} = \omega Z(t) ; \quad Z(t_j + \Delta t_j) = Z(t_j) e^{\omega \Delta t_j} \quad (6)$$

In the θ -difference formulation, the solution of (6) for the time step $j + 1$ is

$$Z^{j+1} = \frac{1 + (1 - \theta^j) \omega \Delta t_j}{1 - \theta^j \omega \Delta t_j} Z^j \quad (7)$$

It is clear from the equation that (for example), if $\omega \Delta t_j \ll 0$, choosing $\theta^j = 0$ leads to oscillations ($Z^{j+1} \simeq \omega \Delta t_j Z^j$); whereas choosing $\theta^j = 1$ leads to $Z^{j+1} \simeq \frac{Z^j}{-\omega \Delta t_j}$. The second choice is clearly preferable, and this fact suggests that an optimum value of θ^j may exist for a particular $\omega \Delta t_j$ such that, if it is used in (7), that equation gives a rigorous result no matter how large Δt_j has been taken. This is indeed the case for this simple example where the exact answer is known. Thus, for a given time step, Δt_j , (7) will be exact if we choose θ^j such that $\frac{Z(t_j + \Delta t_j)}{Z(t_j)}$ of Eq (6) equals $\frac{Z^{j+1}}{Z^j}$ of (7). The result is

$$\theta^j = \frac{1}{\omega \Delta t_j} - \frac{1}{e^{\omega \Delta t_j} - 1} \quad (8a)$$

For that part of the range commonly used, a simple approximation (valid to ~3% and correct in the limits $\omega\Delta t_j = 0$ or $-\infty$) is adequate, namely

$$\left. \begin{aligned} \theta^j &= 0.5 - \frac{\omega\Delta t_j}{12} \quad ; \quad -3 \leq \omega\Delta t_j \leq 1 \\ \theta^j &= \frac{\omega\Delta t_j}{\omega\Delta t_j - 1} \quad ; \quad \omega\Delta t_j < -3 \end{aligned} \right\} \quad (8b)$$

This result can easily be generalized. Accordingly we now consider the following two-point model with a constant source term. We shall thus obtain a two-by-two matrix generalization of (8) which is the actual basis for the form of the difference equations (3) used in WIGL2.

We begin with the matrix equation

$$\dot{V} = \mathcal{Q}V + S \quad (9)$$

where

$$V = \begin{pmatrix} V_1(t) \\ V_2(t) \end{pmatrix}, \quad \mathcal{Q} = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}, \quad S = \begin{pmatrix} S_1 \\ S_2 \end{pmatrix} \quad (10)$$

For $\mathcal{Q}$ and S constant the solution V^{j+1} , of (9) for a time interval Δ at the beginning of which $V = V^j$ is

$$V^{j+1} = e^{a\Delta} V^j + (e^{a\Delta} - I) a^{-1} S \quad (11)$$

where $e^{a\Delta}$ is defined by

$$e^{a\Delta} = I + a\Delta + \frac{1}{2}[a\Delta]^2 + \frac{1}{3!}[a\Delta]^3 + \dots \quad (12)$$

In finite difference form we write the solution of (9) for the time step, Δ , as

$$\frac{1}{\Delta}(v^{j+1} - v^j) = Mv^{j+1} + (\mathcal{Q} - M)v^j + S \quad (13)$$

where M is the full matrix

$$M \equiv \begin{pmatrix} M_{11} & M_{12} \\ M_{21} & M_{22} \end{pmatrix} \equiv \begin{pmatrix} \theta_{11}^a & \theta_{12}^a \\ \theta_{21}^a & \theta_{22}^a \end{pmatrix} \quad (14)$$

We wish to find the elements, M_{ij} and thence the θ_{ij} so that (13) and (11) yield identical values of v^{j+1} . (The second form of M , involving the θ_{ij} 's, permits the difference equations, (13) to be formed by a straightforward "0-weighting" of terms.) To find M we rearrange (13) as

$$v^{j+1} = [I - \Delta M]^{-1} [I + \Delta(\mathcal{Q} - M)] v^j + [I - \Delta M]^{-1} S \Delta \quad (15)$$

Since the only term in (11) involving Δ is $e^{a\Delta}$, we suspect that (15) and (11) may be made equivalent by determining M so that

$$e^{a\Delta} = [I - \Delta M]^{-1} [I + \Delta(\mathcal{Q} - M)] \quad (16)$$

If (16) is true and if

$$(e^{a\Delta} - I)a^{-1} = [I - \Delta M]^{-1} \Delta \quad (17)$$

then (15) and (11) will yield identical results for v^{j+1} . But (16) and (17) are just rearrangements of the same equation, and from either equation we get

$$M = \Delta^{-1} I - a[e^{a\Delta} - I]^{-1} \quad (18)$$

which is just the matrix generalization of (8a). To find the components of M we seek a transformation which will diagonalize a . Thus we let ω_I and ω_{II} be the eigenvalues of a and assume $\omega_I \neq \omega_{II}$. Then

$$a\psi^n = \omega_n \psi^n, \quad n = I, II; \quad \psi^n \equiv \begin{pmatrix} \psi_1^n \\ \psi_2^n \end{pmatrix} \quad (19)$$

and let $\psi^{*n} \equiv \begin{pmatrix} \psi_1^{*n} \\ \psi_2^{*n} \end{pmatrix}$ be the eigenfunctions of the transpose, a^T , of a . (Recall that a and a^T have the same eigenvalues.) Then, if we construct matrices of the eigenvectors of a and a^T as

$$\Psi \equiv \begin{pmatrix} \psi_1^I & \psi_1^{II} \\ \psi_2^I & \psi_2^{II} \end{pmatrix}, \quad \Psi^* \equiv \begin{pmatrix} \psi_1^{*I} & \psi_1^{*II} \\ \psi_2^{*I} & \psi_2^{*II} \end{pmatrix} \quad (20)$$

we may write

$$\left. \begin{aligned} a\Psi &= \Psi\Omega \\ a^T\Psi^* &= \Psi^*\Omega \end{aligned} \right\}, \quad \Omega \equiv \begin{pmatrix} \omega_I & 0 \\ 0 & \omega_{II} \end{pmatrix} \quad (21)$$

It follows that

$$\left. \begin{aligned} \Psi^{*T} a \Psi &= \Psi^{*T} \Psi \Omega \\ \Psi^T a^T \Psi^* &= \Psi^T \Psi^* \Omega \end{aligned} \right\} \quad (22)$$

and

The transpose of the second of Eqs (22) is

$$\Psi^{*T} a \Psi = \Omega \Psi^{*T} \Psi \quad (23)$$

Thus the matrix $\Psi^{*T} \Psi$ commutes with the diagonal matrix $\Omega(\omega_I \neq \omega_{II})$. Thus $\Psi^{*T} \Psi$ is diagonal so that ψ^n and ψ^{*n} may be normalized to give

$$\left. \begin{aligned} \Psi^{*T} \Psi &= I \\ \Psi^{*T} &= \Psi^{-1} \end{aligned} \right\} \quad (24)$$

or

Equation (23) then becomes

$$\left. \begin{aligned} \Psi^{*T} a \Psi &= n \\ a &= \Psi n \Psi^{*T} \end{aligned} \right\} \quad (25)$$

or

Substitution into (18) yields

$$\begin{aligned} M &= \Delta^{-1} \Psi \Psi^{*T} - \Psi n \Psi^{*T} [e^{\Psi n \Psi^{*T}} - \Psi \Psi^{*T}]^{-1} \\ &= \Delta^{-1} \Psi \Psi^{*T} - \Psi n \Psi^{*T} [\Psi (e^{n \Delta} - I) \Psi^{*T}]^{-1} \\ &= \Psi [\Delta^{-1} I - n (e^{n \Delta} - I)^{-1}] \Psi^{*T} \end{aligned} \quad (26)$$

Since n is diagonal, we may write

$$\Delta^{-1} I - n [e^{n \Delta} - I]^{-1} = \begin{bmatrix} \frac{1}{\Delta} - \frac{\omega_I}{e^{\omega_I \Delta} - 1} & 0 \\ 0 & \frac{1}{\Delta} - \frac{\omega_{II}}{e^{\omega_{II} \Delta} - 1} \end{bmatrix} \equiv \begin{bmatrix} \omega_I \Theta_I & 0 \\ 0 & \omega_{II} \Theta_{II} \end{bmatrix} \quad (27)$$

where ω_I and ω_{II} (the eigenvalues of a) are given by

$$\left. \begin{aligned} \omega_I &= \frac{1}{2}(a_{11} + a_{22}) - \frac{1}{2} \left| \sqrt{(a_{11} - a_{22})^2 + 4a_{12}a_{21}} \right| \\ \omega_{II} &= \frac{1}{2}(a_{11} + a_{22}) + \frac{1}{2} \left| \sqrt{(a_{11} - a_{22})^2 + 4a_{12}a_{21}} \right| \end{aligned} \right\} \quad (28)$$

We also note that θ_I and θ_{II} defined by (27) are the same as the θ 's found from (8a) (with an obvious change in notation).

Finding Ψ and Ψ^* from (19), (20) and (24) is straightforward. Equation (26) then yields (after a moderate amount of algebraic manipulation)

$$M = \Psi \begin{bmatrix} \omega_I \theta_I & 0 \\ 0 & \omega_{II} \theta_{II} \end{bmatrix} \Psi^* = \begin{bmatrix} \frac{(\omega_I - a_{22})\omega_I \theta_I - (\omega_{II} - a_{22})\omega_{II} \theta_{II}}{\omega_I - \omega_{II}} & \frac{a_{12}(\omega_I \theta_I - \omega_{II} \theta_{II})}{\omega_I - \omega_{II}} \\ \frac{a_{21}(\omega_I \theta_I - \omega_{II} \theta_{II})}{\omega_I - \omega_{II}} & \frac{(\omega_I - a_{11})\omega_I \theta_I - (\omega_{II} - a_{11})\omega_{II} \theta_{II}}{\omega_I - \omega_{II}} \end{bmatrix} \quad (29)$$

To summarize:

Equation (15), with M defined in terms of the θ_{ij} by (14), will yield an exact solution of (9) for any Δ provided we define the weight factors, θ_{ij} , as

$$\left. \begin{aligned} \theta_{11} &\equiv \frac{(\omega_I - a_{22})\omega_I \theta_I - (\omega_{II} - a_{22})\omega_{II} \theta_{II}}{a_{11}(\omega_I - \omega_{II})} & \theta_{12} &\equiv \frac{\omega_I \theta_I - \omega_{II} \theta_{II}}{\omega_I - \omega_{II}} \\ \theta_{21} &\equiv \frac{\omega_I \theta_I - \omega_{II} \theta_{II}}{\omega_I - \omega_{II}} (= \theta_{12}) & \theta_{22} &\equiv \frac{(\omega_I - a_{11})\omega_I \theta_I - (\omega_{II} - a_{11})\omega_{II} \theta_{II}}{a_{22}(\omega_I - \omega_{II})} \end{aligned} \right\} \quad (30)$$

with θ_I and θ_{II} given by (27) and ω_I and ω_{II} , by (28).

The development Eqs (9) through (27) is valid for any order non-singular matrix, $\mathcal{Q}$ having distinct eigenvalues. However, extension beyond second order raises two practical difficulties. First, the computation of eigenvalues, ω_n , and eigenfunctions, Ψ , of Eq (19) becomes increasingly difficult for $n > 2$. Second, the matrix M will generally be full (all $M_{ij} \neq 0$) even though $\mathcal{Q}$ has some

elements which are zero. Thus, the time differenced form of (1b) would contain terms in the c_1 even though the differential form does not. (Appendix A of this report illustrates this situation for the case of 3×3 $\mathcal{A}$ matrix, full except for $\mathcal{A}_{23} = 0$ -- representative of the space independent two group equations with one delayed group.)

Accordingly, until some experience has been gained, it seems better to treat the delayed neutrons as a source term in the fast neutron equation (1a) and to use the method just outlined to couple only the fast and slow neutron equations. In so doing we make the further approximation of neglecting any spatial dependence of θ_1 and θ_2 . Accordingly, at any time step, j , the elements of the $\mathcal{A}$ matrix (Eq 10) are approximated as

$$\left. \begin{aligned} a_{11}^j &= \frac{\int \phi_1^j [G_1^j + F_1^j(1-\beta)] dv}{\int \phi_1^j \frac{1}{v_1} \phi_1^j dv} & a_{12}^j &= \frac{\int \phi_1^j F_2^j(1-\beta) dv}{\int \phi_1^j \frac{1}{v_1} \phi_1^j dv} \\ a_{21}^j &= \frac{\int \phi_2^j \Sigma_{r1}^j \phi_1^j dv}{\int \phi_2^j \frac{1}{v_2} \phi_2^j dv} & a_{22}^j &= \frac{\int \phi_2^j G_2^j dv}{\int \phi_2^j \frac{1}{v_2} \phi_2^j dv} \end{aligned} \right\} \quad (31)$$

where F_1^j and G_1^j are defined by Eq (2).

Thus the matrix elements, θ_{ij} , at any time step, j , are computed from flux weighted volume integrals of the appropriate terms in Eq (1). Since the instantaneous flux shape at time step j is approximately equal to the fundamental system mode of the two group operator

$$\begin{pmatrix} \nabla \cdot D_1 \nabla - \Sigma_1 + \lambda \Sigma_{r1} (1 - \beta) & \lambda \Sigma_{r2} (1 - \beta) \\ \Sigma_{r1} & \nabla \cdot D_2 \nabla - \Sigma_2 \end{pmatrix}$$

at that time and since it also has approximately the same shape within each group as the corresponding adjoint flux, the roots, ω_I and ω_{II} (Eq 28) which result from this procedure are expected to approximate the natural time constants of neutrons in the fundamental fast and thermal flux shapes. Since most neutrons present at any time step generally belong to the two corresponding modes - fundamental in shape (i.e., having everywhere the same sign for a given group) but with different fast to slow flux ratios - the θ_{ij} 's generated by (30) are expected to provide a near optimum calculational method for fast transients. Moreover, since for all transients below prompt critical the "natural" time constants, ω_I and ω_{II} , are large negative numbers, θ_1^j and θ_2^j (Eq 8a) for Δt_j of a size appropriate for accurate description of delayed neutron behavior (the $|\lambda_1 \Delta t_j| \sim 0.1$) should be close to unity, and Eq (30) (along with $\omega_I + \omega_{II} = a_{11} + a_{22}$) shows that all $\theta_{ij} = 1$. Examination of Eq (4) along with the discussion following Eq (7) then suggests that the differencing scheme being used will be stable for transients on the delayed neutron time scale even if $\omega_I^j \Delta t_j$ and $\omega_{II}^j \Delta t_j$ are very large negative numbers.

The optimizing parameter, θ_d , for delayed neutrons is computed from (8a,b) using

$$\omega_d = \begin{cases} - 0.08 \text{ sec}^{-1} & \text{if six delayed groups are used} \\ - \lambda_I & \text{if one delayed group is used} \end{cases} \quad (32)$$

This choice is based on treating the delayed neutron equations (3c) as an equivalent single equation with a source term of fission neutrons. It does not lead to an optimum value for θ_d since the very important coupling with the neutron equations is lacking. Thus the slow rising period associated with a small positive reactivity is nowhere used to determine any of the θ 's in (4).

As was mentioned earlier, to account for this period would require the use of the more complicated three by three matrix method given in the appendix. We defer this complication in the present program on the grounds that a θ_d chosen on the basis of (32) ought to be close to optimum for all transients in the near-delayed critical range.

IV. TREATMENT OF INPUT PARAMETERS TO NEUTRON EQUATIONS

In order to cut down on input and still permit an effective description of the input parameters, two types of regions are defined. The continuous space dimension is replaced by a sequence of mesh points $0, 1, 2, \dots, P$. The mesh is divided into "nuclear regions" consisting of only one composition with region interfaces occurring only at mesh points. The nuclear regions are numbered sequentially across the mesh, beginning with region 1 and continuing through region NR, and are defined by a composition overlay which is used to distribute compositions in various segments of the mesh. In addition, the mesh is divided into "thermal-hydraulic regions" which are also numbered sequentially across the mesh with interfaces only at mesh points. Although T-H regions must be composed of only one composition, their interfaces need not correspond to the nuclear region interfaces.

The coefficients, D_1 , Σ_1 etc., in Eqs (1) are in general functions of local coolant temperature and fuel metal temperature. In addition they may change because of control motion. Studies by Breen and Yasinsky indicate that it is sufficient to account for temperature and xenon effects in rather gross regions rather than at every mesh point. Accordingly we shall compute average temperatures and xenon concentrations in "thermal-hydraulic regions" (T-H regions) designated by subscript, k ; $k=1, 2, \dots, K$, each T-H region being made

up of a single nuclear "composition". Thus we shall need to specify the input parameters for a number of compositions. These will be designated by subscript, n ; $n=1,2,\dots,N$. We permit the number of T-H regions to exceed the number of compositions ($N \leq K$).

The base parameters required for each composition are $D_{1,n}^*$, $\Sigma_{a1,n}^*$, $\Sigma_{r1,n}^*$, $\Sigma_{f1,n}^*$, $\Sigma_{f1,n}^*$, $\Sigma_{r1,n}^*$, $\sigma_{x,n}^*$, $i=1,2,\dots,n$; $n=1,2,\dots,N$. Here σ_x^* is the microscopic thermal absorption cross section for xenon at the base temperature.

In addition, for each composition, certain temperature and density coefficients are required. For metal temperature it is sufficient to specify the constants

$$\left(\frac{\partial \Sigma_{a1}}{\partial T_f} \right)_n, \left(\frac{\partial \Sigma_{r1}}{\partial T_f} \right)_n \text{ and } \left(\frac{\partial \Sigma_{f1}}{\partial T_f} \right)_n$$

These constants must refer to absolute fuel temperature. For moderator temperature effects it is necessary to supply a more complete set. Moreover it is convenient to supply them as coefficients with respect to the coolant density, ρ_c . Thus we require for each composition

$$\left(\frac{\partial}{\partial \rho_c} \left(\frac{1}{D_1} \right) \right)_n, \left(\frac{\partial \Sigma_{f1}}{\partial \rho_c} \right)_n, \left(\frac{\partial \Sigma_{a1}}{\partial \rho_c} \right)_n, \left(\frac{\partial \Sigma_{r1}}{\partial \rho_c} \right)_n, \left(\frac{\partial (\Sigma_{2-x})}{\partial \rho_c} \right)_n, \left(\frac{\partial \sigma_x}{\partial \rho_c} \right)_n; n=1,2,\dots,N$$

where Σ_{2-x} is the xenon-free thermal absorption cross section ($\Sigma_{a2} = \Sigma_{2-x} + X\sigma_x$) and σ_x is the microscopic thermal absorption cross section for xenon.

To simulate control rod motion we require for each composition a set of coefficient changes associated with inserting the rods. These are designated

$$\Delta \left(\frac{1}{D_1} \right)_n, \left(\Delta \Sigma_{a1} \right)_n, \left(\Delta \Sigma_{f1} \right)_n, \text{ and } \left(\Delta \Sigma_{r1} \right)_n; n=1,2,\dots,N$$

From these definitions it follows that at time step, j , in a given thermal-hydraulic region containing a given composition the appropriate equations for the coefficients in the nuclear equations are

$$\begin{aligned}
 D_{1,k}^j &= \left\{ (D_{1,k}^*)^{-1} + \left[\frac{\partial}{\partial \rho_c} \left(\frac{1}{D_1} \right) \right]_k (\rho_{c,k}^j - \rho_{c,k}^*) + \Delta \left(\frac{1}{D_1} \right)_k r^j \right\}^{-1} \quad i=1,2 \\
 \Sigma_{1,k}^j &= \Sigma_{1,k}^* + \left(\frac{\partial \Sigma_{1,k}}{\partial T_f^{1/2}} \right)_k \left(\sqrt{T_{f,k}^j + 459.72} - \sqrt{T_{f,k}^* + 459.72} \right) + \left(\frac{\partial \Sigma_{1,k}}{\partial \rho_c} \right)_k (\rho_{c,k}^j - \rho_{c,k}^*) \\
 &\quad + (\Delta \Sigma_{1,k})_k r^j \\
 \Sigma_{f1,k}^j &= \Sigma_{f1,k}^* + \left(\frac{\partial \Sigma_{f1,k}}{\partial T_f^{1/2}} \right)_k \left(\sqrt{T_{f,k}^j + 459.72} - \sqrt{T_{f,k}^* + 459.72} \right) + \left(\frac{\partial \Sigma_{f1,k}}{\partial \rho_c} \right)_k (\rho_{c,k}^j - \rho_{c,k}^*) \\
 &\quad + (\Delta \Sigma_{f1,k})_k r^j \\
 \Sigma_{r1,k}^j &= \Sigma_{r1,k}^* + \left(\frac{\partial \Sigma_{r1,k}}{\partial T_f^{1/2}} \right)_k \left(\sqrt{T_{f,k}^j + 459.72} - \sqrt{T_{f,k}^* + 459.72} \right) + \left(\frac{\partial \Sigma_{r1,k}}{\partial \rho_c} \right)_k (\rho_{c,k}^j - \rho_{c,k}^*) \quad (33) \\
 &\quad + (\Delta \Sigma_{r1,k})_k r^j \\
 \Sigma_{1,k}^j &= \Sigma_{1,k}^j + \Sigma_{r1,k}^j + D_{1,k}^j B_{1,k}^2 \\
 \Sigma_{2,k}^j &= \Sigma_{2,k}^* + \left(\frac{\partial \Sigma_{2-k}}{\partial \rho_c} \right)_k (\rho_{c,k}^j - \rho_{c,k}^*) + X_k^j [\sigma_{x,k}^* + \left(\frac{\partial \sigma_x}{\partial \rho_c} \right)_k (\rho_{c,k}^j - \rho_{c,k}^*)] - X_k^* \sigma_{x,k}^* \\
 &\quad + (\Delta \Sigma_{2,k})_k r^j + D_{2,k}^j B_{2,k}^2 \\
 \Sigma_{f2,k}^j &= \Sigma_{f2,k}^* + \left(\frac{\partial \Sigma_{f2,k}}{\partial \rho_c} \right)_k (\rho_{c,k}^j - \rho_{c,k}^*) + (\Delta \Sigma_{f2,k})_k r^j
 \end{aligned}$$

$$\sigma_{x,k}^j = \sigma_{x,k}^* + \left(\frac{\partial \sigma_x}{\partial \rho_c} \right)_k (\rho_{c,k}^j - \rho_{c,k}^*) \quad (33)$$

$$\Sigma_{f,1,k}^j = \frac{\Sigma_{f,1,k}^*}{\nu \Sigma_{f,1,k}^*} \nu \Sigma_{f,1,k}^j$$

where the starred quantities, density coefficients, temperature coefficients and changes due to control are appropriate to the composition in question and ρ_c^j is appropriate to the thermal-hydraulic region in question at time step, j . B_1^2 is the transverse buckling appropriate to the nuclear region in question. The term, r^j , (a control parameter to be discussed below) may be composition dependent (radial type problems) or mesh interval dependent (axial type problems). In this latter case subscript, k , in (33) should be replaced by p so that, for example, Σ_{1p}^j represents the value of Σ_1 at time step j in mesh interval, p , which is associated with T-H region, k , and composition, n .

The constants $\frac{1}{\nu_1}$ and $\frac{1}{\nu_2}$ are taken the same for all compositions. Because of (31) they may not be set equal to zero. However, because of the use of the θ_{1j} , their being kept finite should not lead to any numerical instabilities.

Parameters associated with delayed precursors are to be treated as in WIGLE; that is, $\lambda_1, \beta_{1,n}$ $n=1,2,\dots,I$ are needed (the $\beta_{1,n}$ by composition) and I may be 0, 1 or 6. If $I=1$, λ_1 and $\beta_{1,n}$ must be input. If $I=6$, the λ_1 and $\beta_{1,n}$ may be input, but if they are not, the program will use for all n

<u>1</u>	<u>$\beta_{1,n}$ (all n)</u>	<u>λ_1 (sec⁻¹)</u>
1	0.0002470	0.0127
2	0.0013845	0.0317
3	0.0012220	0.1150
4	0.0026455	0.3110
5	0.0008320	1.4000
6	0.0001690	3.8700

Finally it is necessary to specify the sources for each composition. This will be done by the equation

$$S_{1,n} = \begin{cases} S_{1,n}(0) & ; t \leq t_s \\ \frac{S_{1,n}(0)}{1 + \alpha_s(t - t_s)} & ; t > t_s \end{cases} ; i=1,2; n=1,2\dots N \quad (34)$$

Thus the numbers t_s and α_s along with the constants $S_{1,n}$ for each composition must be input.

V. THE TREATMENT OF TRANSIENT XENON

For each T-H region (subscript k) the equations which determine the average concentration of transient Iodine and Xenon (symbolized by I and X) are

$$\left. \begin{aligned} \dot{I}_k &= \frac{\gamma_{I,k} \int_k (\Sigma_{f1} \rho_1 + \Sigma_{f2} \rho_2) dv}{\int_k dv} - \lambda_{I,k} I_k \\ \dot{X}_k &= \lambda_{I,k} I_k + 0.0358 \gamma_{I,k} \frac{\int_k (\Sigma_{f1} \rho_1 + \Sigma_{f2} \rho_2) dv}{\int_k dv} - X_{k,\sigma} \frac{\int_k \rho_2 dv}{\int_k dv} - \lambda_{X,k} X_k \end{aligned} \right\} \quad (35)$$

where the constants λ_I and λ_x are fixed in the program as $\lambda_I = 2.874 \times 10^{-5} \text{sec}^{-1}$, $\lambda_x = 2.093 \times 10^{-5} \text{sec}^{-1}$.

It appears needlessly complicated to treat the flux implicitly in solving the xenon equations. Hence we shall assume it retains its initial value throughout any given time step. Thus at t_{j+1} , the xenon and iodine concentrations for a given T-H region may be found from

$$I_k^{j+1} = \left[I_k^j - \frac{\gamma_{I,k}}{\lambda_I} \frac{\int_k (\sum_{f1}^j \rho_1^j + \sum_{f2}^j \rho_2^j) dv}{\int_k dv} \right] e^{-\lambda_I \Delta t_j} + \frac{\gamma_{I,k}}{\lambda_I} \frac{\int_k (\sum_{f1}^j \rho_1^j + \sum_{f2}^j \rho_2^j) dv}{\int_k dv}; k=1,2,\dots,K \quad (36)$$

and

$$X_k^{j+1} = \frac{1.0358 \gamma_{I,k}}{\lambda_x + \sigma_{x,k} \bar{\rho}_{2,k}} \frac{\int_k (\sum_{f1}^j \rho_1^j + \sum_{f2}^j \rho_2^j) dv}{\int_k dv} + \frac{\lambda_I I_k^j - \gamma_{I,k}}{\lambda_x + \sigma_{x,k} \bar{\rho}_{2,k} - \lambda_I} \frac{\int_k (\sum_{f1}^j \rho_1^j + \sum_{f2}^j \rho_2^j) dv}{\int_k dv} e^{-\lambda_I \Delta t_j} \quad (37)$$

$$+ \left[X_k^j - \frac{.0358 \gamma_{I,k}}{\lambda_x + \sigma_{x,k} \bar{\rho}_{2,k}} \frac{\int_k (\sum_{f1}^j \rho_1^j + \sum_{f2}^j \rho_2^j) dv}{\int_k dv} - \frac{\lambda_I I_k^j}{\lambda_x + \sigma_{x,k} \bar{\rho}_{2,k} - \lambda_I} + \frac{\lambda_I \gamma_{I,k}}{(\lambda_x + \sigma_{x,k} \bar{\rho}_{2,k})(\lambda_x + \sigma_{x,k} \bar{\rho}_{2,k} - \lambda_I)} \frac{\int_k (\sum_{f1}^j \rho_1^j + \sum_{f2}^j \rho_2^j) dv}{\int_k dv} \right] e^{-(\lambda_x + \sigma_{x,k} \bar{\rho}_{2,k}) \Delta t_j}; k=1,2,\dots,K$$

where $\bar{\rho}_{2,k} \equiv \frac{\int_k \rho_2^j dv}{\int_k dv}$.

(Note that γ_I and σ_x depend on T-H region by virtue of its being associated with a particular composition.)

VI. HEAT TRANSFER AND CONTROL - AXIAL TYPE PROBLEMS

Since the direction of flow and of control rod motion differ between axial type problems (slabs of either rectangular or circular cross sections in which flow and rod motion are parallel to the direction along which the flux shape is computed) and radial type problems (either slabs or cylinders in which flow and rod motion are perpendicular to the direction along which the flux shape is computed), it is necessary to develop different heat transfer and control equations for these two situations. (For spheres it will turn out that either set will do, since no flow or rod motion will be simulated for this geometry.) We shall consider axial type problems first.

A. Heat Transfer-Axial Type Problems

A very elementary description of heat transfer processes is to be included in WIGL2. In particular, boiling effects are to be neglected. This restriction simplifies programming effort and input preparation considerably and still permits a moderately realistic investigation of space-time neutron effects in many practical situations. The appropriate heat transfer equations for a given thermal-hydraulic region are

$$\left. \begin{aligned} v_c \left(\frac{\partial \rho_c}{\partial T_c} \right) \frac{d\bar{T}_c}{dt_h} &= v_c \left[\frac{1}{A_H U} + \frac{1}{A_H h_0 \left(\frac{W}{W_0} \right)^{.8}} \right]^{-1} (\bar{T}_f - \bar{T}_c) + 2W_r C_c (T_b - \bar{T}_c) + r q V_f \\ \rho_f V_f C_f \frac{d\bar{T}_f}{dt_h} &= (1 - r) q V_f - v_c \left[\frac{1}{A_H U} + \frac{1}{A_H h_0 \left(\frac{W}{W_0} \right)^{.8}} \right]^{-1} (\bar{T}_f - \bar{T}_c) \\ W &= \begin{cases} W_0 & ; t \leq t_w \\ W_0 \frac{1}{1 + \alpha_w (t - t_w)} & ; t > t_w \end{cases} \end{aligned} \right\} \quad (38)$$

where

V_c = volume of coolant in the T-H region in question (ft^3)

$\left(\frac{\partial p_c H}{\partial T_c}\right)$ = heat required to raise temperature of one cubic foot of coolant one degree F. ($\text{btu}/\text{ft}^3/^{\circ}\text{F}$)

(ρ_c = coolant density in $\#/\text{ft}^3$; H = coolant enthalpy in $\text{btu}/\#$)

$\bar{T}_c$ = average coolant temperature in T-H region in question ($^{\circ}\text{F}$)

t_h = time measured in hours

A_H = total heat transfer area for the composition in question $\div$ total volume coolant in that composition (ft^{-1})

U = conductivity/conduction length of the fuel cladding ($\text{btu}/\text{ft}^2/^{\circ}\text{F}/\text{hr}$)

h_0 = film coefficient at initial flow rate ($\text{btu}/\text{ft}^2/^{\circ}\text{F}/\text{hr}$)

W = flow rate into core ($\#/\text{hr}$)

W_0 = flow rate into core at time, $t_h = 0$ ($\#/\text{hr}$)

$\bar{T}_f$ = average fuel temperature in the T-H region in question ($^{\circ}\text{F}$)

W_r = flow rate through the T-H region in question ($\#/\text{hr}$)

C_c = specific heat of coolant ($\text{btu}/\#/^{\circ}\text{F}$)

T_b = inlet temperature of the T-H region in question ($^{\circ}\text{F}$)

r = fraction of fission power appearing in coolant

q = average fission power in region ($\text{btu}/\text{hr}/\text{ft}^3$ of fuel)

V_f = volume of fuel in region (ft^3) ($V_c + V_f$) = total volume of the region in question)

ρ_f = density of fuel ($\#/\text{ft}^3$)

C_f = specific heat of fuel in region in question ($\text{btu}/\#/^{\circ}\text{F}$)

α_w = coefficient specifying flow coast down (sec^{-1})

Equations (38) are valid for both axial and radial type problems in all geometries. Distinctions arise in computing volumes, inlet temperatures and flows. An "axial type problem" is per force concerned with slab geometry in the axial direction. Thermal hydraulic regions will then be either rectangular or circular slabs of thickness ΔX_k ; $k=1,2,\dots,K$. These slabs will be stacked on top of one another so that $W_r = W$ at all times and so that the inlet (or bottom) temperature $T_{b,k}$ of section k equals the outlet temperature of section $k - 1$.

For both axial and radial type problems, the thermal hydraulic input (by material composition) is $(\frac{\partial p_c}{\partial T_c} H^*)_n$, $A_H U_n$, $A_H^h O_n$, $C_{c,n} r_n$, and $(\rho_f \frac{V_f}{V_c} C_f)_{n=1,2,\dots,N}$; $(\frac{V_c}{V_c + V_f})$ will also be needed for future purposes. In addition the constants W_0 , t_w and α_w must be supplied.

The supplementary equations which complete the thermal description are - and these do depend on whether the problem is "axial" or "radial" -

$$W_{r,k} = W \quad (39)$$

$$\left. \begin{aligned} T_{b,k} &= 2\bar{T}_{c,k-1} - T_{b,k-1} \quad ; \quad k=2,3,\dots,K+1 \quad (T_{b,K+1} \text{ is the exit temperature}) \\ T_{b,1} &= \begin{cases} T_{in} , & t \leq t_{in} \\ T_{in} \left(\frac{1}{1 + \alpha_{in}(t - t_{in})} \right) \end{cases} ; \quad T_{in} , \alpha_{in} , t_{in} \text{ input numbers} \end{aligned} \right\} \quad (40)$$

and

$$(qV_f)_k = 1.08133 \times 10^{-10} \int_k (\sum_{f_1} \rho_1 + \sum_{f_2} \rho_2) dV \quad (41)$$

$$dV = Adx \quad (41a)$$

where 1.08133×10^{-10} is a proportionality constant transforming fission/sec into btu/hr and A is the cross-sectional area of the core in cm^2 (an input number).

It is convenient to simplify notation by the definitions

$$\begin{aligned}\gamma_{1,k} &\equiv v_{c,k} \left(\frac{\partial \rho_c^H}{\partial T_c} \right)_k^* \\ \gamma_{2,k}^j &\equiv v_{c,k} \left[\frac{1}{A_H U} + \frac{1}{A_{H^2O} (W(0))^{.8}} \right]_k^{-1} \\ \gamma_{3,k}^j &\equiv 2W_{r,k} C_{c,k}\end{aligned}\tag{42}$$

$$\gamma_{4,k} = v_{c,k} \left[\rho_f \left(\frac{v_f}{v_c} \right) C_f \right]_k$$

$$v_{c,k} = 3.5314 \times 10^{-5} \left(\frac{v_c}{v_c + v_f} \right)_k \int_k dv \text{ where } \frac{v_c}{v_c + v_f} \text{ is the coolant fraction of}$$

the composition in question.

Because of the last equation the quantities $\gamma_{1,k}$, $\gamma_{2,k}$ and $\gamma_{4,k}$ can differ for each T-H region ($C_{c,k}$ is likely to be independent of k). In addition, $\gamma_{2,k}$ and $\gamma_{3,k}$ can be time dependent.

If these definitions are substituted into Eq (38) and the result time-differenced using the θ -method described for the neutron equations we get

$$\begin{aligned}\left[\frac{\gamma_{1,k}}{\Delta t_{hj}} + \theta_{11,k}^j (\gamma_{2,k}^{j+1} + \gamma_{3,k}^{j+1}) \right] \bar{T}_{c,k}^{j+1} - \theta_{12,k}^j \gamma_{2,k}^{j+1} \bar{T}_{f,k}^{j+1} &= \left[\frac{\gamma_{1,k}}{\Delta t_{hj}} - (1 - \theta_{11,k}^j) (\gamma_{2,k}^j + \gamma_{3,k}^j) \right] \bar{T}_{c,k}^j \\ + -\theta_{12,k}^j \gamma_{2,k}^j \bar{T}_{f,k}^j &+ \left[\gamma_{3,k}^{j+1} \theta_{11,k-1}^j \bar{T}_{b,k}^{j+1} + \gamma_{3,k}^j (1 - \theta_{11,k-1}^j) \bar{T}_{b,k}^j \right] + r q^j v_f \\ \left[\frac{\gamma_{4,k}}{\Delta t_{hj}} + \theta_{22,k}^j \gamma_{2,k}^{j+1} \right] \bar{T}_{f,k}^{j+1} - \theta_{21,k}^j \gamma_{2,k}^{j+1} \bar{T}_{c,k}^{j+1} &= \left[\frac{\gamma_{4,k}}{\Delta t_{hj}} - (1 - \theta_{22,k}^j) \gamma_{2,k}^j \right] \bar{T}_{f,k}^j \\ + (1 - \theta_{21,k}^j) \gamma_{2,k}^j \bar{T}_{c,k}^j &+ (1-r) q^j v_f \quad k=1,2,\dots,K\end{aligned}\tag{43}$$

where superscripts, j , refer to times, $t_{h,j}$, ($\Delta t_{h,j}(\text{hours}) = \frac{1}{3600} \Delta t_j(\text{seconds})$) and subscripts, k , ($k=1,2,\dots,K$) refer to thermal hydraulic regions. The $T_{b,k}^{j+1}$ and $T_{b,k}^j$ on the right hand side of (43) are found from (40). Since the $T_{b,1}^j$ are known a priori for all j , Eq (43) may be solved for one T-H region at a time. (With all quantities known at time $t_{h,j}$, $T_{b,1}^j$ and $T_{b,1}^{j+1}$, obtained from (40) permit finding $T_{c,1}^{j+1}$ and $T_{f,1}^{j+1}$; use of (43) again yields $T_{b,2}^{j+1}$ and $T_{b,2}^j$, and the process continues until $k = K$.)

Since coolant density rather than temperature is needed for use with the diffusion equations, fluid properties tables are used to translate the results of (43) into appropriate densities.

$\theta_{11,0}^j$ is assumed to equal $\frac{1}{2}$. The four θ_{1j} 's for each time step and in each thermal-hydraulic region are again given by (30) where ω_I and ω_{II} correspond to the roots $\omega_{c,k}^j$ and $\omega_{f,k}^j$ of

$$\begin{vmatrix} (\gamma_{1,k}\omega_k^j + \gamma_{2,k}^j + \gamma_{3,k}^j) & -\gamma_{2,k}^j \\ -\gamma_{2,k}^j & (\gamma_{4,k}\omega_k^j + \gamma_{2,k}^j) \end{vmatrix} = 0 \quad (44)$$

which are

$$\left. \begin{aligned} 3600 \omega_{c,k}^j &= -\frac{1}{2} \left(\frac{\gamma_{2,k}^j}{\gamma_{4,k}} + \frac{\gamma_{2,k}^j + \gamma_{3,k}^j}{\gamma_{1,k}} \right) - \sqrt{\frac{1}{4} \left(\frac{\gamma_{2,k}^j}{\gamma_{4,k}} + \frac{\gamma_{2,k}^j + \gamma_{3,k}^j}{\gamma_{1,k}} \right)^2 - \frac{\gamma_{2,k}^j \gamma_{3,k}^j}{\gamma_{1,k} \gamma_{4,k}}} \\ 3600 \omega_{f,k}^j &= -\frac{1}{2} \left(\frac{\gamma_{2,k}^j}{\gamma_{4,k}} + \frac{\gamma_{2,k}^j + \gamma_{3,k}^j}{\gamma_{1,k}} \right) + \sqrt{\frac{1}{4} \left(\frac{\gamma_{2,k}^j}{\gamma_{4,k}} + \frac{\gamma_{2,k}^j + \gamma_{3,k}^j}{\gamma_{1,k}} \right)^2 - \frac{\gamma_{2,k}^j \gamma_{3,k}^j}{\gamma_{1,k} \gamma_{4,k}}} \end{aligned} \right\} \quad (45)$$

where the ω 's are now in units of sec^{-1} .

θ_I and θ_{II} are the $\theta_{c,k}^j$ and $\theta_{f,k}^j$ from (8) based on these w 's and, here

$$\left. \begin{aligned} 3600 a_{11} &= - \frac{\gamma_{2,k}^j + \gamma_{3,k}^j}{\gamma_{1,k}^j} \\ 3600 a_{22} &= - \frac{\gamma_{2,k}^j}{\gamma_{4,k}^j} \end{aligned} \right\} \quad (46)$$

B. Control-Axial Type Problems

For axial type problems the control system is envisioned as rods moving in a bank so that the control parameters $\Delta D_{i,k}$, $\Delta a_{i,k}$ etc. are all present above a certain mesh point and vanish below that mesh point. To represent this situation we introduce for every mesh interval, Δx_p , a time dependent parameter $f_p(t)$, $p=1,2,\dots,P$ such that with $R(t)$ representing the distance (in cm) that the rod bank is withdrawn and Δx_p (in cm) representing the sizes of a mesh interval

$$f_p(t) = \begin{cases} 1 & \left\{ \begin{array}{l} R(t) < \Delta x_1 \\ \text{or} \\ p > p_r \end{array} \right. \\ 0 & \left\{ \begin{array}{l} p \leq p_r \\ \text{or} \\ R(t) \geq \sum_{p=1}^P \Delta x_p \end{array} \right. \end{cases} \quad (47)$$

The mesh point, p_r , near which the tip of the rod is located at any given time is found as that integer, p_r , such that

$$\sum_{p=1}^{p_r+1} \Delta x_p > R(t) \geq \sum_{p=1}^{p_r} \Delta x_p \quad (48)$$

We shall let $R(t)$ be composed of an externally imposed behavior, $R_e(t)$ and a feedback term $R_f(t)$ which actuates the control bank so as to maintain the power and/or the outlet coolant temperature at some present level.

Thus we write

$$R(t) = R_e(t) + R_f(t) \quad (49)$$

where

$$R_e(t) = \begin{cases} R(0) & t \leq t_r \\ R(0) + \dot{R}_e(t - t_r) & ; t > t_r \end{cases} \quad (50)$$

and

$$\begin{aligned} \frac{dR_f(t)}{dt} = & \alpha_{r_1} \left[0.316755 \times 10^{-16} \frac{1}{P_0} \int_{\text{core}} (\Sigma_{f_1} \phi_1 + \Sigma_{f_2} \phi_2) dV - 1 \right] + \alpha_{r_2} \frac{\dot{T}_h}{T_h} \\ & + \alpha_{r_3} \left(\frac{T_{b,K+1}}{T_{\text{out}}} - 1 \right) + \frac{\alpha_{r_4}}{3600} \left(\frac{1}{\bar{T}_{c,K}} \frac{d\bar{T}_{c,K}}{dt_h} \right) ; \quad R_f(0) = 0 \end{aligned} \quad (51)$$

In the last expression P_0 is the desired power in megawatts and the constant 0.316755×10^{-16} is such that $0.316755 \times 10^{-16} \int_{\text{core}} (\Sigma_{f_1} \phi_1 + \Sigma_{f_2} \phi_2) dV$ is the total core power in the same units.

Since it is impractical to solve (51) simultaneously with the neutron equations, values of time dependent quantities on its right hand side should be taken as constant during a given time step. The relationship between R_f^{j+1} and R_f^j is then simply

$$\begin{aligned}
 R_f^{j+1} = R_f^j + \left\{ \alpha_{r_1} [0.316755 \times 10^{-16} \frac{1}{P_0} \int_{\text{core}} (\sum_{f_1}^j \rho_1^j + \sum_{f_2}^j \rho_2^j) dv - 1] \right. \\
 \left. + \alpha_{r_2} \frac{\dot{T}^j}{T^j} + \alpha_{r_3} \left(\frac{T_{b,K+1}^j}{T_{\text{out}}^j} - 1 \right) + \frac{\alpha_{r_4}}{3600} \left(\frac{1}{T_{c,K}^j} \frac{dT_{c,K}^j}{dt_h} \right) \right\} \Delta t_j
 \end{aligned} \quad (52)$$

where the "rate of power increase" term, $\frac{\dot{T}^j}{T^j}$ is estimated by flux-weighting, adding and volume-integrating Eq (1a) and (1b). The result being

$$\frac{\dot{T}^j}{T^j} = \frac{\left\{ \int \rho_1^j [G_1^j + (F_1^j + F_2^j)(1 - \beta) + \sum_{i=1}^I c_i \lambda_i] dv + \int \rho_2^j [G_2^j + \sum_{r_1}^j \rho_1^j] dv \right\}}{\int [\frac{1}{v_1} \rho_1^2 + \frac{1}{v_2} \rho_2^2] dv} \quad (53)$$

The initial value of R_f is always taken to be zero, any actual initial rod withdrawal being given by $R(0)$ of Eq (50). It is however necessary to input P_0 , T_{out} and the α_{r_i} . Choosing these latter for a given problem may require some experimentation until experience is gained. The signs of the α_{r_i} present no problem. If an increase in R (pulling out the control bank) increases reactivity, all the α_{r_i} 's should be negative. If increasing R decreases reactivity all signs should be positive. An analog study by Kaplan, Reihing and Yasinsky confirms (for the case of power feedback only) that introducing α_{r_2} improves stability greatly. Qualitatively it seems plausible to choose α_{r_1} and α_{r_3} so that power or temperature disbalances of five or ten percent result in control bank motions of a few mesh intervals during a time step. The constants α_{r_2} and α_{r_4} may be estimated by dividing α_{r_1} and α_{r_3} by time constants (perhaps ω_{II} , $\omega_{c,K}$) appropriate to the power and temperature behavior.

VII. HEAT TRANSFER AND CONTROL - RADIAL TYPE PROBLEMS

When the flow and control rod motion is perpendicular to the direction along which the flux shape is computed the heat transfer and control equations must be altered. The principal reason for this alteration is that the thermal-hydraulic regions are no longer stacked on top of one another. Instead, coolant flows in a parallel fashion through neighboring T-H regions, and there is a possibility of a two-pass core arrangement.

A. Heat Transfer-Radial Type Problems

To account for the possibility of two-pass flow we shall label the first k_1 T-H regions as belonging to the first pass, region K as being the down pass (reflector) region and the regions $(k_1 + 1)$ to $K - 1$ as belonging to the second pass. Then with the symbol Z standing for core height and Y for width (needed for a slab core when flow is of the radial type) we must make the following changes in the thermal hydraulics equations.

Equation (39) becomes

$$W_{r,k} = \begin{cases} W \frac{\Delta A_k}{\sum_{k=1}^{k_1} \Delta A_k} & ; 1 \leq k \leq k_1 \\ W & ; k = K \\ W \frac{\Delta A_k}{\sum_{k=k_1+1}^{K-1} \Delta A_k} & ; k_1 < k \leq K - 1 \end{cases} \quad (54)$$

where

$$\Delta A_k = \begin{cases} \int_k 2\pi x dx & ; \text{ cylinders} \\ Y \int_k dx & ; \text{ slabs} \end{cases} \quad (55)$$

Equation (40) becomes

$$\left. \begin{aligned} T_{b,k} &= T_{b,1} \text{ (Eq 40)} & ; \quad 1 \leq k \leq k_1 \\ T_{b,K} &= \frac{\sum_{k=1}^{k_1} (2\bar{T}_{c,k} - T_{b,k}) \Delta A_k}{\sum_{k=1}^{k_1} \Delta A_k} \\ T_{b,k} &= 2\bar{T}_{c,K} - T_{b,K} & ; \quad k_1 < k \leq K - 1 \end{aligned} \right\} \quad (56)$$

Equation (41) is unchanged except that (41a) becomes

$$\left. \begin{aligned} dV &= 2\pi Z x dx \text{ for cylinders} \\ dV &= Y Z dx \text{ for slabs} \end{aligned} \right\} \quad (57)$$

The input quantities $\left(\frac{\partial p_c H}{\partial T_c} \right)_n^*$, U_n etc. and Eqs (38), (42), (43), (44), (45), and (46) remain unchanged.

B. Control-Radial Type Problems

In dealing with radial type problems it seems best to associate the sequence of regions from which rods are withdrawn with a sequence of compositions.

This procedure may necessitate labelling as different several regions actually having identical properties. However it avoids introducing another overlay. We picture the rods then as being withdrawn from that radial zone (or those radial zones) composed of composition 1 ($n = 1$), then out of zones composed of composition 2, and so on. If n_r is the total number of rod-bearing compositions, the total possible "rod-travel-distance" is $n_r Z$, Z again being core height. Then with $f_n(t)$ now representing the fraction of control present in composition, n , the relation between $f_n(t)$ and R , the rod-travel-distance is

$$\left. \begin{aligned} f_n &= 0 && ; R(t) \geq n_r Z && ; \text{all } n \\ f_n &= 0 && ; R(t) \geq nZ \\ f_n &= -\frac{R(t)}{Z} + n && ; nZ > R(t) \geq (n-1)Z \\ f_n &= 1 && ; (n-1)Z > R(t) \end{aligned} \right\} \quad (58)$$

These relations replace (47) and (48) for radial type problems.

In order to account for the different orientation and flow pattern in the radial type problems, Eq (52) for $R_f(t)$ must be replaced by

$$\begin{aligned} R_f^{j+1} = R_f^j &+ \left\{ \alpha_{r_1} \left[0.316755 \times 10^{-16} \frac{1}{P_0} \int_{\text{core}} (\sum_{f_1}^j \rho_1^j + \sum_{f_2}^j \rho_2^j) dv - 1 \right] + \alpha_{r_2} \frac{\dot{T}^j}{T^j} \right. \\ &+ \alpha_{r_3} \left[\frac{\sum_{k_1+1}^{K-1} (2\bar{T}_{c,k}^j - T_{b,k}^j) \Delta A_k}{T_{\text{out}} \sum_{k_1+1}^{K-1} \Delta A_k} - 1 \right] + \frac{\alpha_{r_4}}{3600} \left[\frac{\sum_{k_1+1}^{K-1} (2\dot{\bar{T}}_{c,k}^j - \dot{T}_{b,k}^j) \Delta A_k}{\sum_{k_1+1}^{K-1} (2\bar{T}_{c,k}^j - T_{b,k}^j) \Delta A_k} \right] \left. \right\} \Delta t_j ; \end{aligned} \quad (59a)$$

$$\left. \begin{aligned} &2 \text{ pass core} \\ &(k_1 \leq K - 2) \end{aligned} \right\}$$

or

$$\begin{aligned}
 R_f^{j+1} = R_f^j + & \left\{ \alpha_{r_1} \left[0.316755 \times 10^{-16} \frac{1}{P_0} \int_{\text{core}} (\Sigma_{f_1}^j \rho_1^j + \Sigma_{f_2}^j \rho_2^j) dv - 1 \right] + \alpha_{r_2} \frac{\dot{T}^j}{T^j} \right. \\
 & + \alpha_{r_3} \left\{ \frac{\sum_{k=1}^K (2\bar{T}_{c,k}^j - T_{b,k}^j) \Delta A_k}{T_{\text{out}} \sum_{k=1}^K \Delta A_k} - 1 \right\} + \frac{\alpha_{r_4}}{3600} \left. \frac{\sum_{k=1}^K (2\dot{T}_{c,k}^j - \dot{T}_{b,k}^j) \Delta A_k}{\sum_{k=1}^K (2\bar{T}_{c,k}^j - T_{b,k}^j) \Delta A_k} \right\} \Delta t_j, \quad (59b)
 \end{aligned}$$

$$\left. \begin{array}{l} \text{1 pass core} \\ (k_1 = K) \end{array} \right\}$$

VIII. SPHERICAL GEOMETRY

Possible applications of WIGL2 to situations involving spherical geometry do not appear to require that coolant flow and control rod motion be considered. Accordingly, for problems run in spherical geometry the input parameters required for these calculations may be omitted.

IX. EDIT FEATURES

For every m^{th} time step, where m is specified in the input and may change as many as 20 times throughout a problem, the following parameters are printed: θ 's (Eqs 8 and 30), R (Eq 49), I_k (Eq 36), X_k (Eq 37), $\bar{T}_{c,k}$ and $\bar{T}_{f,k}$ (Eq 43), ρ_1 and ρ_2 (Eq 4). In addition, the relative power

$$\frac{0.316755 \times 10^{-16} \int_{\text{core}} (\Sigma_{f_1} \rho_1 + \Sigma_{f_2} \rho_2) dv}{P_0}$$

and the peak to average power for each T-H region

$$\frac{\left[\int_k (\Sigma_{f_1} \rho_1 + \Sigma_{f_2} \rho_2) dv \right] \left[\int_{\text{power bearing regions}} dv \right]}{\left[\int_{\text{core}} (\Sigma_{f_1} \rho_1 + \Sigma_{f_2} \rho_2) dv \right] \left[\int_k dv \right]} \quad (61)$$

are printed.

On option, the instantaneous reactivity, ρ^j , is calculated and edited.

$$\rho^j = \frac{\int_{\text{core}} [\rho_1^{\text{OK}} (\nabla \cdot D_1^j \nabla \rho_1^j - \Sigma_1^j \rho_1^j + \Sigma_{f_1}^j \rho_1^j + \Sigma_{f_2}^j \rho_2^j) + \rho_2^{\text{OK}} (\nabla \cdot D_2^j \nabla \rho_2^j - \Sigma_2^j \rho_2^j + \Sigma_{f_1}^j \rho_1^j)] dv}{\int_{\text{core}} \rho_1^{\text{OK}} (\Sigma_{f_1}^j \rho_1^j + \Sigma_{f_2}^j \rho_2^j) dv} \quad (62)$$

If ρ^j is desired, the weight functions ρ_1^{OK} and ρ_2^{OK} must be input.

The program also has the capability of punching the following quantities on cards in a format suitable for input to succeeding WIGL2 problems,

- a. $\rho_1, \rho_2, c_i (i=1, 2 \dots I)$ for all mesh points
- b. $I, X, \bar{T}_c, \bar{T}_f$ for all thermal-hydraulic regions.

X. INPUT PREPARATION

Input preparation for WIGL2 follows many of the standards set down in reference 4. In particular, the following points should be noted:

- (1) A job deck consists of an accounting card followed by one or more input decks. An input deck consists of comment cards and data cards followed by a single blank card.

APPENDIX B

HFN INPUT INSTRUCTIONS

The NEWIG user normally has little concern with the details of HFN because all of the necessary input is prepared via the psuedo namelist NEWIG input subroutine. However, it is possible to override the pseudo namelist default options through the use of entries under the \$HFN namelist. To do this, one must know the relative locations of the HFN parameters. These are given in the following pages.

For example, if one wanted to enter an axial buckling using the normal \$BUCK card, one would find that this value is not supplied to HFN. To override this difficulty, one would note that in normal HFN input, the axial buckling is a floating point number entered in relative location 45. Hence, an entry of $FN(45)=1.7 \times 10^{-4}$ under \$HFN and an entry of 1.7×10^{-4} under \$BUCK would put the same axial buckling of $1.7 \times 10^{-4} \text{ cm}^{-2}$ in both HFN and WIGL proper.

The HFN input format differs considerably from the usual types of FORTRAN input formats used on previous Hanford programs. A change in philosophy forms the base for the specially-constructed input routine⁽¹⁾ which HFN uses. A description of this philosophy, with some of the reasons for its choice, will increase the user's understanding of the HFN input instructions. The following few paragraphs also describe some of the differences between this input scheme and those usually used with FORTRAN programs.

The driving force behind the new input scheme is the desire for flexibility, with simultaneous minimization of input volume. As has been described, and will become apparent from the detailed input instructions, HFN contains many optional features. Ordinarily, FORTRAN codes which are built with flexibility as a main objective require large amounts of input, even on the simplest of cases. For instance, many control integers might have to be set to zero in order not to exercise the several available options. In HFN, the user only need enter those data which pertain specifically to the options which he wants to exercise. The input instructions for options other than these may be ignored. Thus, HFN requires very little input for simple cases, and still retains the flexibility necessary for complex calculations.

Another advantage of the input routine becomes apparent when several calculations are to be run in succession. With a few exceptions, only those numbers which change from case to case need to be read in for each successive case.

Thus, extensive parameter survey calculations may be run with a minimum of input data.

Document number HW-70893* describes the input routine in detail. The following review is for those HFN users which have read the description* of the use of the input routine for storing COMMON data.

Column One

The format number is entered in column one of a data card. The possible formats are interpreted as follows:

* See reference, page 44.

<u>Col. 1</u>	<u>Max. No. Data Words/ Card</u>	<u>Type of Data</u>	<u>Cols/ Word</u>	<u>Words Start in Cols.</u>
0	6	Floating point	10	11, 21, 31, ..., 61
1	12	Integer	5	11, 16, 21, ..., 66
2	10	Hollerith	6	11, 17, 23, ..., 65
9	--	End of case input		

Columns Two, Three

These columns optionally contain the number of words to be read from the data card. Columns past the end of the last word so specified may be used for comments.

Column Four

A non-zero entry in column four causes the first data word on the card to be stored in N successive locations, where N is the entry in cols. 2-3. Columns after those for the first data word may be used for comments.

Columns 5 - 10

These columns contain the (decimal) location of the first data word on the card. Succeeding words go to higher locations. A blank causes the continuation of sequencing from the last card.

Columns 11 - 70

These contain the input data.

The following input instructions, then, are arranged to facilitate "cookbooking". Turn the pages and ignore the pages with headings which do not interest you.

1. MISCELLANEOUS CONTROL INFORMATION

FORMAT	LOCATION	ENTRY	MEANING
1	1	$20 \geq N_1 > 1$	Number energy groups.
1	2	$N_2 = 0$	Scattering transfer can only take neutrons from a group to the next lower energy (higher indexed) group.
		$N_1 \geq N_2 > 0$	Neutrons may be scattered from any group into any lower energy group. In addition, neutrons may be up-scattered from any lower energy group into group number N , $N \geq N_2$. (i.e., N_2 is index of first thermal group.)
Example: In a five group calculation, with two thermal groups, $N_1 = 5$ and $N_2 = 4$.			
1	3	$N_3 = 0$	All information on external sources will be input, by space points, into locations 17882 through 19981. This option includes the case where no external source is present.
		$N_3 = 1$	The external source to the right of each space point, SP_i , is input for all points. The program will set the source to the left of the point, SM_i , equal to SP_i unless a non-zero value for SM_i is input.
		$N_3 = 2$	The external source is constant within each region. The regional values of the external source are input to locations 20195 through 20244.
1	11	$N_{11} = 0$	No effect.
		$N_{11} \neq 0$	Clear all data from core immediately, then read input. Any input read in the same input record with this entry will also be destroyed.
1	12	$N_{12} = 0$	Save fluxes and fission densities computed for this case as a starting for the next case.
		$N_{12} = 1$	After this case is run, clear fluxes, fission densities, and pointwise external sources. Following cases start from flat (or input) flux guess.

HFN INPUT2. CROSS SECTION LIBRARY TAPE MANIPULATION

FORMAT	LOCATION	ENTRY	MEANING
1	4	$N_4 = 0$	All cross section data is input from cards, and no data tape is to be generated.
		$N_4 > 0$	Use the cross section data which is in the library at the end of this input record to update the data tape. In case data for a given group are found both on the old data tape (if any) and in the card input, the data which was read from cards will replace the data from the library tape. Sixty Hollerith characters should be entered into locations 101 through 110, (at six per location using format 2) giving the reference for data for first material. The reference for the second material should go into locations 111 through 120, etc.
		$N_4 < 0$	Scan the data tape mounted on unit IT1 (Loc. 5) pulling off data for those materials (with correct group structures) which have been listed as being in the incore library. N_4 will be set to zero, after data is successfully read, to reduce unnecessary tape handling.
1	5	IT1 = 0	No data tape is input.
		IT1 > 0	Data tape is mounted on tape unit IT1. This tape will be searched, if $N_4 < 0$, for cross section data. If $N_4 > 0$, the data on this tape will be merged with that which was input on cards, to make a new data tape on unit number IT2. Suggested entry: 5.
1	6	IT2 = 0	No new data tape will be generated.

FORMAT	LOCATION	ENTRY	MEANING
		IT2 > 0	If data tape updating (using old tape on IT1) or data tape generation (using the in-core library, with IT1 = 0) has been specified, the resultant tape will be on unit IT2. IT2 = 6 is suggested.

NOTE: After an updating pass has been completed, the contents of locations 5 and 6 are interchanged. Thus, in the absence of input to the contrary, successive updating passes will result in the latest data tape alternating between the two tape units. In this way, the tape may be updated and used on the input pass immediately following the last updating pass, with HFN keeping track of the most up-to-date tape. IT2 and IT1 should always be between 5 and 10, inclusive.

FORMAT	LOCATION	ENTRY	MEANING
1	7	$100 \geq N_7 \geq 0$	Indicates that during the tape updating process data for N_7 materials are to be deleted. The material names are entered into the locations starting at 3752. The numbers of groups to which the effected data apply are given starting in location 3952. The group coupling schemes (equivalent of N_2) are given starting in location 4052.
1	8	$N_8 = 0$	Normally.
		$N_8 = 1$	List, in a compressed form, the data which is being added to the new data tape, as it is added.

NOTE: The names, numbers of groups, group coupling schemes, and references for all materials encountered on each tape update pass are always listed on the output. N_8 controls listing of the actual cross sections on the tape.

1	9	$N_9 = 0$	Normally.
		$N_9 = \pm 1$	Causes the computer to stop, on HPR 1,0; HPR 2,0; HPR 3,0; on successive halts. These computer halts give the machine operators time for such things as changing tapes, etc.
		$N_9 = + 1$	Means that HFN should continue with a normal calculation after halt.

FORMAT	LOCATION	ENTRY	MEANING
		$N_9 = - 1$	Means that HFN should look for more input after the halt.

NOTE: N_9 is reset to zero after each halt.

Example:

If a data tape is being used, on tape 6, then N_9 would be set to + 1 with the input for the first case. A separate input record, after the last case, would set N_9 to - 1. On the Scientific Applications card, the reel number and location of the data tape would be listed under input tape 6. In addition, add the notes:

1. Mount tape 6 at HPR 1,0.
2. Demount tape 6 at HPR 2,0.

This technique removes the possibility that the following job will write all over the library tape.

1	10	$N_{10} = 0$	No effect.
		$N_{10} \neq 0$	After getting cross section from library tape, return for more input before running case. Thus, individual neutron parameters from the tape may be changed before use. N_{10} will be reset to zero.

3. CASE SPECIFICATION

FORMAT	LOCATION	ENTRY	MEANING
1	13	$N_{13} = 0$	Slab geometry
		$= 1$	Cylindrical geometry
		$= 2$	Spherical geometry
	14	$50 \geq NR > 0$	Number of homogeneous regions.
	15	$N_{15} = 0$	Compute direct flux.
		$= 1$	Compute adjoint function.
		$= 2$	Compute direct, adjoint functions and their gradients at each point. Also, compute volume integrals of the form. $\int \nabla \phi_i^+ \nabla \phi_i dV; \text{ and } \int \phi_i^+ \phi_j dV$ N_{15} will be set to 0 at the end of this sequence.
1	28	$N_{28} = 0$	No effect.
		$N_{28} = 1$	Compute gradients of the converged (direct or adjoint) fluxes. If $N_{15} = 2$, this entry is not needed.
0	45	N_{45}	Axial buckling (cm^{-2}) $D_i B^2$ is added to the i th group removal cross section in every region.

(The adjoint calculation is run first and the adjoint function and gradient values are saved on tape 4 until the direct calculation is done. Therefore, if this option is specified for any case of a series, the Scientific Applications card should note that tape 4 is a working tape.)

4. ITERATION CONTROLS

FORMAT	LOCATION	ENTRY	MEANING
1	53	LMAX	Maximum number of iterations allowed. Set to 100 if not input. Suggested input: none.
0	57	EPSK	Convergence criterion. The problem is assumed to have converged if the fractional difference between system eigenvalues on two successive iterations is less than EPSK. Set to 10^{-7} if no input. Suggested input: none.
0	58	EPSPHI	Convergence criterion. The maximum fractional change in flux at any point, in any group, on two successive iterations must be less than EPSPHI for convergence. Set to 10^{-4} if no input. Suggested input: none.

NOTE: If sense switch 5 is depressed during operation, HFN will begin final output and will exit after all unread input data are listed.

5. CRITICALITY SEARCH CONTROL

When this option is exercised, HFN varies a single specified parameter in an attempt to attain a pre-specified multiplication. Each calculation involving a new value of the parameter looks, in the output, like a separate case. The difference is that, in contrast with the running of separate cases, no input is read between calculations.

FORMAT	LOCATION	ENTRY	MEANING
1	16	$N_{16} = 0$	For no search, ignore locations 17-21.
		$N_{16} = LOC > 0$	Location of variable parameter.
1	17	$N_{17} = 0$	No effect.
		$N_{17} > 0$	Remake any material mixtures each time the parameter is varied.
1	18	$N_{18} > 2$	Maximum number of calculations to be performed in the attempt to reproduce the desired multiplication.
0	19	k	Desired multiplication.
0	20	dk	Accuracy to which k must be reproduced on a successful criticality search.
0	21	$(\Delta k)^{-1}$	Estimate of parameter change necessary to <u>increase</u> the calculated k by one percent. This number is used only to form an estimate of the parameter, for use in the second calculation, using the results of the first.
1	12	Clear fluxes before next case = 1	

6. OUTPUT CONTROL OPTIONS

Flux and Power Normalization

FORMAT	LOCATION	ENTRY	MEANING
0	42	A = 0.0	Normalize "power" (fission neutron production rate) so that average over <u>core</u> region(s) is 1.0, for output listing.
		A > 0	Normalize core power to total output of A megawatts (for purposes of converting from neutrons to MW, HFN assumes $\nu = 2.46$, with 200 Mev per fission).
1	43	0	Normalize fluxes, for output, to be consistent with the power.
		$N_{43} > 0$	Normalize flux, group N_{43} , to unity at spatial mesh point number N_{44} .
1	44	N_{44}	Mesh point number for flux normalization.

Output list Suppression - suppress selected portions of output by entering a non-zero number.

ALL FORMAT 1

LOCATION

62	Transfer matrices.
63	Few group parameters.
64	Pointwise flux and fission density.
65	Calculated reactivity as a function of iteration, except final iteration (neg. entry suppresses all reactivities).
66	Average fluxes, fission densities, and leakage cross sections computed therefrom.
67	Pointwise gradient.
68	Perturbation integrals
69	Direct-adjoint flux gradient product (point- and group-wise)
70	Direct-adjoint flux product (point- and group-wise).

LOCATION

71	All traverse output.
72	Flux-adjoint product traverse only.
73	Average traverse activity.
74	Un-normalized traverse activity.
75	Normalized traverse activity.
76	Traverse ratio data.
77	Albedoes, region radii, calculation description.

7. JOB IDENTIFICATION

FORMAT	LOCATION	ENTRY
2	13872	18 Hollerith - user's name (6 Hollerith/location)
2	13875	18 Hollerith - date
2	13878	18 Hollerith - case identification

Note: If more than 18 characters are read as the case identification, the identification input may destroy the group one diffusion coefficient for the first material in the in-core library. To circumvent this, the number of words of identification which are read may be limited by an appropriate entry in column 3.

8. CROSS SECTION LIBRARY-MATERIAL IDENTIFICATION

FORMAT	LOCATION	ENTRY
2	17381	12 Hollerith - name of first material in (in-core) cross section library.
2	17383	12 Hollerith - name of second material in (in-core) cross section library.

NOTE: The maximum allowable number of materials in the in-core library is always less than 101, and varies below 100, depending on group structure. The exact dependence will be discussed in detail in the next section, which describes the actual entry of cross section data, from card input, into the core library.

CROSS-SECTION LIBRARY - DATAGeneral Remarks

The following three paragraphs need not be read (by the user) if all cross section data is to be read (by the program) from an existing HFN data tape.

In order to save storage, the macroscopic diffusion parameters used by HFN are stored in a "packed" array. This means that data for material one is entered (using format 0) in consecutive locations (starting at location 13881) until all data for that material has been entered. Data for the second material follows immediately, regardless of the number of groups being used. Thus, on a two-group calculation, data for the second material in the library might start at location 13895 (14 locations per material) while, for a model using twenty thermal groups, it would start at 14421 (540 locations per material). Thirty-five hundred (3500) memory locations have been set aside for cross section storage, with space available for 100 material names. Using this packing scheme, many materials may be used in few-group calculations (100 in the first example) without suffering from the severe limitations imposed when a complex group structure is used (only six materials could be used in the second example). The exact limitations will be discussed after a description of the order in which data is entered for material number one. Data for other materials follow the same scheme.

There are seven parameters, for each group, which are herein referred to as the "few group" parameters. They are in the order in which they are stored in the HFN library for each material and group:

Diffusion coefficient, D^1

Perpendicular buckling, B^{12}

Removal cross section, Σ_r^1

Nu times fission cross section, $\nu \Sigma_{f1}$.

Fraction of fission neutrons born into the group, χ^1

In-scattering cross section (for slowing from next higher energy group when transfer matrix is not used) (zero for group one), Σ_{in}^1 .

Fraction of fixed external source neutrons born into group, χ_{ext}^1 .

The few group parameters for each group, starting with group 1, are entered into successive locations starting with location 13881 (if no external sources are present, the six other parameters for each group will fit on a single card, and the cards should be addressed to 13881, 13888, 13875, 13902, etc.). If the few group slowing-down option ($N_2 = 0$) has been selected, the group 1 few group parameters for material two immediately follow the lowest energy group parameters for material number one.

If a multi-group ($N_2 > 0$) slowing-down model has been specified, the scattering transfer matrix must follow the few group parameters for the lowest energy group. The data for material two will immediately follow the transfer matrix for material one.

The first "row" of the transfer matrix consists of all possible cross sections which can account for scattering into group one, including self-scattering (from one to one). The second row is similarly defined. The lengths of the various rows are determined by the entries in locations one and two. The row for epithermal group i ($1 \leq i < N_2$) has i entries, $(\Sigma_1 \rightarrow i, \Sigma_2 \rightarrow i, \dots, \Sigma_i \rightarrow i)$ which give the probabilities for transfer from higher, or the same, energies. The row for thermal group i , on the other hand, consists of one entry for each energy group, representing the fact that, using the present definition of "thermal" group i , a neutron may be scattered from any group into group i , so that ($N_2 \leq i \leq N_1$) the i -th transfer row consists of $\Sigma_1 \rightarrow i, \Sigma_2 \rightarrow i, \dots, \Sigma_{N_1} \rightarrow i$. The first element of each row, $\Sigma_1 \rightarrow i$, immediately follows the last element of the previous row, $\Sigma_{N_1} \rightarrow i$, or $\Sigma_1 \rightarrow i$. For example, if five groups, of which three are thermal, have been specified, the transfer matrix for material number one would be:

<u>Row No.</u>	<u>Location of 1st Element of Row</u>	<u>Entries</u>
1	13916	$\Sigma_1 \rightarrow 1$
2	13917	$\Sigma_1 \rightarrow 2, \Sigma_2 \rightarrow 2$
3	13919	$\Sigma_1 \rightarrow 3, \Sigma_2 \rightarrow 3, \Sigma_3 \rightarrow 3, \Sigma_4 \rightarrow 3, \Sigma_5 \rightarrow 3$
4	13924	$\Sigma_1 \rightarrow 4, \Sigma_2 \rightarrow 4, \Sigma_3 \rightarrow 4, \Sigma_4 \rightarrow 4, \Sigma_5 \rightarrow 4$
5	13929	$\Sigma_1 \rightarrow 5, \Sigma_2 \rightarrow 5, \Sigma_3 \rightarrow 5, \Sigma_4 \rightarrow 5, \Sigma_5 \rightarrow 5$

(D^1 for material no. 2 would be in location 13934.)

When data is entered sequentially, it is fairly easy to keep track of what cross sections go into what locations. Sometimes, however, data is not entered sequentially, in which case it is handy to know the amount of storage required by the constants for each material. If few group slowing-down has been specified, this is simple,

$$K = 7 * N_1$$

If multigroup slowing-down is specified,

$$K = 7 * N_1 + (N_1 - N_2 + 1) * N_1 + \frac{N_2 - 1 * N_2}{2}$$

The maximum number of materials which may be stored in the in-core library at one time is

$$L = 100 \quad \text{if } K \leq 35$$

$$= (\text{integral part of}) \frac{3500}{K} \quad \text{if } K > 35$$

As an aid in preparing input, Figures 2 and 3 have been prepared to show L and K as a function of the group structure specifications.

9. REGION SPECIFICATIONS

FORMAT	LOCATION	ENTRY	MEANING
0	17781	R_0	Inside radius of inner region.
0	17782	R_1	Outside radius, region one.
0	17783	R_2	Outside radius, region two, etc.
0	17731	$\pm EN_1$	Number of mesh intervals in region one. This does not include the extra mesh interval inserted near left boundary.
0	17732	$\pm EN_2$	Number of mesh intervals in region two.
0	17733	$\pm EN_3$	etc.

NOTE: A region, j , is specified as being a portion of the core (for core power calculation purposes) by entering $-EN_j < 0$, in which case the number of mesh intervals in region j is taken equal to EN_j .

2	17581	REG_1	12 letter BCI giving name of material in region one.
2	17583	REG_2	Material name for region two.
2	17585	REG_3	etc.

NOTE: Region material names must, ordinarily, correspond exactly to the material names used in the cross section library. The only exception occurs when the material in a region is mixture of one or more materials in the library. In this case, a distinct name, which will be assigned to the mixture, should be used. If the name of an existing material is used for a mixture, the cross section data for that material will be replaced by the data computed for the mixture. If two or more regions are composed of a mixture, the mixture need only be specified once.

1	20245	$N47_1 = 0$	Region one material is already in library (either from data tape, input cards, or a previous mixing).
		$N47_1 > 0$	Material in region one is to be manufactured from a mixture of $N47_1$ materials, the names and proportions of which are specified elsewhere. Material library storage will be set aside, and cleared for a new material, with the name

FORMAT	LOCATION	ENTRY	MEANING
			REG ₁ , if none already exist. After clearing this area of the library, the mixture cross sections are computed as

$$\Sigma (\text{mixture}) = \sum_{j = j_1}^{j = j_1 + N47_1 - 1} \text{VOL}(j) * \Sigma (j) \quad N47_1 > 0$$

where VOL(j) is the volume fraction of the j-th mixture component specified, (which is in the library with name PART_j) Σ denotes a typical cross section and (j₁ - 1) materials have been used in making up mixtures for regions which are closer to the origin than the one for which mixing is presently being performed. j₁ = 0 for region 1, and for region j,

$$j_1 = \sum_{i = 1}^{j - 1} N47_i \quad j > 1$$

0	20245	N47 ₁ < 0	The same logic applies as for a positive entry, except that the data area set aside for the "mixture" is not cleared before use.
---	-------	----------------------	--

$$\Sigma (\text{mixture}) = \Sigma' (\text{mixture}) + \sum_{j = j_1}^{j = j_1 - N47_1 - 1} \text{VOL}(j) * \Sigma(j) \quad N47_1 < 0$$

0	20246	N47 ₂	Same logic as above, but applied to region 2.
---	-------	------------------	---

etc.

NOTE: N47 entries are not set to zero by the program. In order to save redundant mixing, they should be set to zero, via input, after being used.

2	20295	PART ₁	12 letter name of material, already specified as part of library, which is first component of first mixture.
2	20297	PART ₂	Name of second mixture component.
		etc.	
0	20495	VOL ₁	Volume fraction of first mixture component in first mixture.
0	20496	VOL ₂	Volume fraction of second mixture component.

EXAMPLES:

Both of the following examples illustrates the use of mixing on the problem in which region two is natural uranium at 10% of normal density. In both cases, $N47_1 = 0$, and REG_2 is NATLURANIUM.

EXAMPLE I: U^{235} and U^{238} in library, at normal density, under names U235URANIUM and U238URANIUM.

$$N47_2 = 2$$

1	PART ₁	VOL ₁
1	U235URANIUM	0.00075
2	U238URANIUM	0.09925

EXAMPLE II: Natural uranium in library, at normal density, and only occurs, in this problem, at 10% of normal density.

$$N47_2 = -1$$

1	PART ₁	VOL ₁
1	NATLURANIUM	-0.90

10. BOUNDARY CONDITIONS

FORMAT	LOCATION	ENTRY
0	20022	Left exterior boundary albedo for group one.
0	20023	Left exterior boundary albedo for group two.
	etc.	
0	20042	Right exterior boundary albedo for group one.
0	20043	Right exterior boundary albedo for group two.

NOTE: An albedo of 1.0 denotes a center of symmetry. A zero albedo is used at the physical boundary of a reactor, and an albedo of -1.0 should be used on cases where the dimensions read into HFN are extrapolated dimensions.

0	20062	Left exterior boundary surface source for Group 1.
0	20063	Left exterior boundary surface source for Group 2.
	etc.	
0	20082	Right exterior boundary surface source for Group 1.
0	20083	Right exterior boundary surface source for Group 2.
	etc.	

NOTE: If location 27 is set to unity (format 1) then the "albedo" entry is interpreted as being a fixed extrapolation distance, in cm. Equation (13) becomes

$$\nabla \phi_o = \frac{\phi_o}{A^-} + \frac{J_{in}^-}{D_o}$$

If location 27 is set to -1, then Cohen's formula for the extrapolation distance from a curved surface is used to compute the right exterior boundary (only) condition:

$$1 = \frac{A^+}{1 + 1.065669 \left(\frac{\mu}{R_{NR}} \right)}$$

where the right "albedo" is the extrapolation distance, in transport mean free paths, from a plane boundary (equals 2/3 according to diffusion theory).

11. DETECTOR TRAVERSE CALCULATION

FORMAT	LOCATION	ENTRY	MEANING
1	29	$N_{29} = 0$	Do not normalize computed activities.
		$N_{29} > 0$	Normalize each traverse to 1.0 at HFN mesh point number N_{29}
		$-N_{29} < 0$	Normalize all traverses so that the activity for traverse number one is unity at mesh point number N_{29} . The same normalizing factor will be used on all traverses.
1	30	Not used.	
1	31	$N_{31} \geq 0$	Number of traverses $N_{31} \leq 10$; also $N_{31} * (\text{no. groups}) \leq 100$.
1	32	$N_{32} = 0$	Traverse ratios, for first traverse, will not be computed.
		$N_{32} > 0$	At each mesh point, compute the activity ratio for traverse one: $\frac{A_1}{A_{N_{32}}} \quad (\text{before normalization})$
		$-N_{32} < 0$	At each mesh point, compute the activity fraction for traverse one: $\frac{A_1}{A_{N_{32}}} - 1 \quad (\text{before normalization})$
1	33	N_{33}	Same logic as location 32, except pertains to traverse number two.
1	34		etc.
2	13852	DETECT ₁	12 Hollerith name for first detector material.
2	13854	DETECT ₂	12 Hollerith name for second detector material.
	etc.		

FORMAT	LOCATION	ENTRY	MEANING
0	13752	ACTCRS _{1,1}	Group one activation cross section for detector type one.
0	13753	ACTCRS _{1,2}	Group two activation cross section for detector type one.
	etc.		
0	13752 + (no. groups)	ACTCRS _{2,1}	Group one activation cross section for detector type two.

12. EXTERNAL SOURCE SPECIFICATIONS

FORMAT	LOCATION	ENTRY	MEANING
0	17882	SP_1	External source to right of HFN mesh point number one.
0	17883	SP_2	External source to right of HFN mesh point number two.

NOTE: Input to SP array destroyed if $N_3 = 2$, specifying a region-wise constant source.

0	18933	SM_2	External source to left of HFN mesh point number two.
0	18934	SM_3	External source to left of HFN mesh point number three.

etc.

NOTE: Input to SM array is destroyed if $N_3 = 1$, specifying $SM_1 = SP_1$, or if $N_3 = 2$.

0	20195	$SOURCE_1$	Strength of spatially constant source in region one.
0	20196	$SOURCE_2$	

etc.

NOTE: The SOURCE array is ignored unless $N_3 = 2$.

13. INITIAL GUESSES FOR FLUX, FISSION DENSITY

FORMAT	LOCATION	ENTRY	MEANING
0	10600	FLUX ₁	Estimate of group one flux, at first mesh point.
0	10601	FLUX ₂	Estimate of group one flux at second mesh point.

etc.

NOTE: If a total of N mesh intervals have been specified in the HFN input, then group one flux estimates are input to locations 10600 through $10600 + (N + 3) - 1$. ($N + 3$ points are used, after insertion of an extra point at each outside boundary.) Group two fluxes go from location $10600 + (N + 3)$ through $10600 + 2(N + 3) - 1$. Flux estimates for other groups follow, in a similar manner.

0	1151	FP ₁	Estimate of fission neutron production to right of mesh point 1.
---	------	-----------------	--

0	1152	FP ₂	
---	------	-----------------	--

etc.

0	2202	FM ₂	Estimate of fission neutron production to left of mesh point two.
---	------	-----------------	---

0	2203	FM ₃	
---	------	-----------------	--

etc.

NOTE: If initial guesses are not made for all quantities for all points, HFN ordinarily sets those values of the fission density and flux, which are zero, to unity. This particular feature may be bypassed by setting location 26 to unit (format 1).

REFERENCE

Lilley, J. R., "A Generalized Fortran Input Routine," HW-70893, August 29, 1961.

APPENDIX C

SAMPLE CASE INPUT AND OUTPUT

FOR BNWIGL - THE UNIVAC-1108 VERSION OF NEWIGL

• ELT NEW/DECK,1,740530, 38572 .12

```

000001 $WIG V1=7.2070-9,V2=2.5860-6,NPTS=141,NCMP=4,NREG=4,NTREG=31,NLBDY=0,
000002 NRBDY=1,NTYPE=2,NCEOM=1,NBETA=6,NTSTP=0002,RZERO=365,76,REDUT=-94,50,
000003 HIGH=365,76,NRBEAR=2,WZERO=61,0+6,TIN=549,0,PZERO=1930,-6,THOD=0,00,
000004 ITRIP=-1,HIGH2=365,76
000005 RHOIN=0,005, NTSTP=511, ITRIP=1,
000006 $TIT BNWIGL ***SAMPLE CASE*****
000007 $GEOM N1 .9554 *18 T1 N2 .086868 *7 T2 N2 .086868 *5 T3 N2 .086868 *4 T4
000008 N3 2,211896 *5 T5 N3 2,599 *4 T6 N3 2,1499 *4 T7 N3 1,4355 *4 T8
000009 N3 1,7303 *3 T9 N3 1,591 *3 T10 N3 1,481 *3 T11 N3 1,391 *3 T12
000010 N3 1,4615 *4 T13 N3 1,3605 *4 T14 N3 1,6667 *3 T15 N3 1,6117 *3 T16
000011 N3 1,5327 *3 T17 N3 1,4643 *3 T18 N3 1,6536 *5 T19 N3 1,5390 *5 T20
000012 N3 1,8070 *4 T21 N3 1,7090 *4 T22 N3 1,6255 *4 T23 N3 1,5533 *4 T24
000013 N3 1,9735 *4 T25 N3 2,2268 *5 T26 N3 2,0856 *5 T27 N3 2,4605 *4 T28
000014 N3 2,3363 *4 T29 N3 2,2290 *4 T30 N4 6,0000 *5 T31
000015 $XSEC
000016 1 CONTROLLED URANIA AT 11.5 GWD/STM
000017 2,634707 .001626291 .008633289 1,361976 .0167434
000018 2,603360 .0350519 .0391230 .3647279
000019 2 UNCONTROLLED URANIA
000020 2,630280+00 1,626291-03 6,331679-03 1,357958+00 1,941622-02 0,000000
000021 2,611261+00 3,700697-02 2,532797-02 3,572569-01 0,000000 0,000000
000022 REGION 3PARTIAL CONTROL, ALPHA= .570000-00
000023 .263028+01 .162781-02 .764208-02 .136024+01 .178932-01
000024 .261126+01 .328221-01 .332516-01 .361478-00
000025 4 WATER REFLECTOR 549 AND 1022,4
000026 3,2680 -4 1,7373 3,56358 -2
000027 1,03603 -2 0,235646
000028 $THPR
000029 43,40 1,0 -12 2104,511 1,0 *10 3
000030 4
000031 .033 27,055 0,42649 1,0 *10 3
000032 4
000033 $SSTX
000034 549, 549,0 31
000035 31
000036 $ROD
000037 +2,173690-03-2,301610-03-7,000000-06+2,672800-03 1
000038 4
000039 5,758370-02-1,884000-02-1,289670-02 1
000040 4
000041 13 2
000042 0, .0833 .1666 .2500 .3333 .4167
000043 .5 .5833 .6667 .7500 .8333 .9167
000044 1,0
000045 0,0 0,480 0,810 0,930 0,970 0,983 11M
000046 0,983 0,995 1,000 1,0 1,0 1,0 11M

```

```

000047      1.0
000048      $TR03
000049
000050      -2.173690-03+2.301610-03+7.000000-06-2.672800-03
000051      -9.373521-04 9.896900-04 3.204157-06-1.149800-03 0.000000
000052
000053
000054      -5.758370-02+7.884000-02+1.289670-02 182.88      -48.77
000055      -2.465016-02 8.101200-03 5.545678-03 182.88      -48.77
000056
000057      15      2
000058      0.0      .03333      .16667      .2500      .3333      .4167
000059      .5003      .5667      .6333      .7000      .7667      .8333
000060      .9003      .9167      1.00
000061      1.0      1.0      0.0      0.0      0.0      0.0
000062      0.0      0.01      0.02      0.05      .11      .24
000063      .60      .66      1.0
000064      $DOP
000065      1.83-5 0.0      -1.4100 -5 549.0      3
000066
000067      15      2      34
000068      .0022      .0794      .0403      .1353      .2597      .3228
000069      .3443      .3761      .5290      .7540      .8303      .9347
000070      .9645      .9820      .9912      .9975      .9988      1.000
000071      2.465      2.462      2.440      2.371      2.282      2.239
000072      2.225      2.201      2.095      1.977      2.042      2.157
000073      2.243      2.319      2.352      2.245      2.196      2.201
000074      $BETA
000075      .124      -1 .375      -1 .11      .301      1.13      3.0
000076      3
000077      .000175      .001262      .001035      .001916      .000541      .000221
000078      4
000079
000080      $BJC<
000081      7.18      -5 7.18      -5      4
000082      $HEN FN(45)=7.18-5, FN(42)=4.8044-6, FN(57)=1.-7, NC(53)=300, NC(16)=0,
000083      NC(63)=0, NC(18)=20, FN(19)=1.0, FN(20)=1.0-5, FN(21)=1.0, NC(64)=1,
000084      $TIME .000001 *1 P1 .049999 *1 P1 .05 *1 P2 .05 *62 P50 .002 *370
000085      P8 .35 *76
000086      $TRI> PWRTRP=1.09+6, TYMDLY=2.0,
000087      $END

```

11R

C-2

```

0 58907 0 0 0 0 0
727445 145489
$TIT BNWIGL ***SAMPLE CASE*****
$WIG2 = .0000000+00,
PRES = .2207000+08,
V1 = .2585999-05,
V2 = 141,
NPTS = 4,
NCMP = 4,
NREG = 31,
NTREG = 1,
NLBDY = 2,
NRBDY = 1,
NTYPE = 6,
NGEOM = 51,
NBETA = -1,
NPUN = .0000000+00,
NTSTP = .0000000+00,
NPERT = .0000000+00,
TALTS = .0000000+00,
ALPHAS = .0000000+00,
TALTW = .0000000+00,
ALPHAH = .0000000+00,
TALTIN = .0000000+00,
ALPHIN = .0000000+00,
TROD = .6100000+08,
WZERO = .5490000+03,
TIN = .0000000+00,
TOUT = .3657600+03,
RZERO = -.9450000+02,
REDOT = .0000000+00,
ALPHR1 = .0000000+00,
ALPHR2 = .0000000+00,
ALPHR3 = .0000000+00,
ALPHR4 = .0000000+00,
PZERO = .1930000-02,
CSAREA = .0000000+00,
NPASS = 31,
NK1 = 2,
NRBEAR = .3657600+03,
HIGH = .0000000+00,
WIDE = .0000000+00,
NTIME = .0000000+00,
TIME = .3657600+03,
HIGH2 = 1,
ITRIP = .4999999-02,
RHOIN $END

```

THERE ARE 6 TIME ZONES.

ZONE NO. 1 RUNS BETWEEN 1.000 AND 1.000SEC. WITH TIME STEPS OF .00000 SEC.; PRINTING A TYPE 'P' OUTPUT EVERY 1STEPS
 ZONE NO. 2 RUNS BETWEEN 1.000 AND 2.000SEC. WITH TIME STEPS OF .05000 SEC.; PRINTING A TYPE 'P' OUTPUT EVERY 1STEPS
 ZONE NO. 3 RUNS BETWEEN 2.000 AND 3.000SEC. WITH TIME STEPS OF .05000 SEC.; PRINTING A TYPE 'P' OUTPUT EVERY 1STEPS
 ZONE NO. 4 RUNS BETWEEN 3.000 AND 65.000SEC. WITH TIME STEPS OF .05000 SEC.; PRINTING A TYPE 'P' OUTPUT EVERY 2STEPS
 ZONE NO. 5 RUNS BETWEEN 65.000 AND 435.000SEC. WITH TIME STEPS OF .00200 SEC.; PRINTING A TYPE 'P' OUTPUT EVERY 50STEPS
 ZONE NO. 6 RUNS BETWEEN 435.000 AND 511.000SEC. WITH TIME STEPS OF .05000 SEC.; PRINTING A TYPE 'P' OUTPUT EVERY 8STEPS

CROSS SECTION INPUT

COMP.# 1	COMP. ID	1	1 CONTROLLED URANIA AT 11.5 GWD/STM						
CROSS SECTION TITLE IS	DIFF COEFF	TRANSPORT	CAPTURE	FISSION	ABSORPTION	NU	NU*FISSION	SCATTERING	(N,2N)
GROUP#1	,13620+01	,24474-00	,86333-02	,16263-02	,10260-01	,26347+01	,42848-02	,16743-01	
GROUP#2	,36473-00	,91392-00	,39123-01	,35052-01	,74175-01	,26034+01	,91253-01	,00000	
COMP.# 2	COMP. ID	2	2 UNCONTROLLED URANIA						
CROSS SECTION TITLE IS	DIFF COEFF	TRANSPORT	CAPTURE	FISSION	ABSORPTION	NU	NU*FISSION	SCATTERING	(N,2N)
GROUP#1	,13580+01	,24547-00	,63317-02	,16263-02	,79580-02	,26303+01	,42776-02	,19416-01	
GROUP#2	,35726-00	,93304-00	,25328-01	,30007-01	,55335-01	,26113+01	,78356-01	,00000	
COMP.# 3	COMP. ID		REGION 3 PARTIAL CONTROL, ALPHA= .570000-00						
CROSS SECTION TITLE IS	DIFF COEFF	TRANSPORT	CAPTURE	FISSION	ABSORPTION	NU	NU*FISSION	SCATTERING	(N,2N)
GROUP#1	,13602+01	,24505-00	,76421-02	,16278-02	,92699-02	,26303+01	,42816-02	,17893-01	
GROUP#2	,36148-00	,92214-00	,33252-01	,32822-01	,66074-01	,26113+01	,85707-01	,00000	
COMP.# 4	COMP. ID	4	4 WATER REFLECTOR 549 AND 1022.4						
CROSS SECTION TITLE IS	DIFF COEFF	TRANSPORT	CAPTURE	FISSION	ABSORPTION	NU	NU*FISSION	SCATTERING	(N,2N)
GROUP#1	,17373+01	,19187-00	,32680-03	-.00000	,32680-03	-.00000	,00000	,35636-01	
GROUP#2	,23565-00	,14146+01	,10360-01	-.00000	,10360-01	,00000	,00000	,00000	

CARD #16 .217369-02 -.230161-02 -.700000-05 .267280-02 1

[illegible]

[illegible]

HFN OUTPUT FOR WIGL2 PARAMETERS FROM PROBLEM SET-UP IN WIGL2 , RUNON 30 MAY 74 OUTPUT PAGE 1
 DIRECT FLUX CALCULATION IN CYLINDRICAL GEOMETRY NUMBER GROUPS= 2, NUMBER REGIONS= 4
 LEFT-HAND BOUNDARY RADIUS .00000 RIGHT-HAND BOUNDARY RADIUS 233.37961

GROUP	ALBEDO	SURFACE SOURCE	GROUP	ALBEDO	SURFACE SOURCE
1	1.000000+00	0.000000	1	-1.000000+00	0.000000
2	1.000000+00	0.000000	2	-1.000000+00	0.000000

REGIONAL DATA

RIGHT BOUNDARY	INTERVALS	COMPOSITION	REGION NO.
17.19720	-19.0	1	1
18.58708	-15.0	2	2
203.37962	-101.0		3
233.37961	5.0	4	4

GROUP	DIFFUSION COEFFICIENT	FEW-GROUP PARAMETERS FOR				FRACTION FISSION SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT. SOURCE FRACTION
		PERPENDICULAR BUCKLING	TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION				
1	1.361976+00	7.180000-05	2.700298-02	4.284800-03	1.000000+00	0.000000	0.000000	
2	3.647279-01	7.180000-05	7.417490-02	9.125271-02	-0.000000	1.674340-02	0.000000	

GROUP	DIFFUSION COEFFICIENT	FEW-GROUP PARAMETERS FOR				FRACTION FISSION SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT. SOURCE FRACTION
		PERPENDICULAR BUCKLING	TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION				
1	1.357959+00	7.180000-05	2.737419-02	4.277601-03	1.000000+00	0.000000	0.000000	
2	3.572569-01	7.180000-05	5.533494-02	7.835603-02	-0.000000	1.941622-02	0.000000	

GROUP	DIFFUSION COEFFICIENT	FEW-GROUP PARAMETERS FOR				FRACTION FISSION SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT. SOURCE FRACTION
		PERPENDICULAR BUCKLING	TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION				
1	1.360240+00	7.180000-05	2.716309-02	4.281596-03	1.000000+00	0.000000	0.000000	
2	3.614780-01	7.180000-05	6.607370-02	8.570704-02	-0.000000	1.789320-02	0.000000	

HEN OUTPUT FOR WIGL2 PARAMETERS FROM PROBLEM SET-UP IN WIGL2 , RUNON 30 MAY 74 OUTPUT PAGE 2

GROUP	DIFFUSION COEFFICIENT	PERPENDICULAR BUCKLING	FEW-GROUP PARAMETERS FOR				FRACTION FISSION SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT. SOURCE FRACTION
			TOTAL REMOVAL CROSS-SECTION	NU FISSION	4 TIMES SIG FISSION				
1	1.737300+00	7.180000-05	3.596260-02	0.000000	0.000000	1.000000+00	0.000000	0.000000	
2	2.356460-01	7.180000-05	1.036030-02	0.000000	0.000000	-0.000000	3.563580-02	0.000000	

FOLLOWING DATA IS A TABULATION, BY ITERATION, OF THE FISSION EIGENVALUE

1 THRU 5	2.1658359+04	9.7288281-01	9.8021162-01	9.8415079-01	9.8669806-01
6 THRU 10	9.8851097-01	9.8988109-01	9.9096051-01	9.9183726-01	9.9256626-01
11 THRU 15	9.9318378-01	9.9371462-01	9.9417671-01	9.9458317-01	9.9494383-01
16 THRU 20	9.9526627-01	9.9555650-01	9.9581923-01	9.9605820-01	9.9627659-01
21 THRU 25	9.9647709-01	9.9666157-01	9.9683207-01	9.9699002-01	9.9713682-01
26 THRU 30	9.9727358-01	9.9740113-01	9.9752056-01	9.9763239-01	9.9773744-01
31 THRU 35	9.9783624-01	9.9792928-01	9.9801706-01	9.9810001-01	9.9817836-01
36 THRU 40	9.9825267-01	9.9832305-01	9.9838985-01	9.9845328-01	9.9851364-01
41 THRU 45	9.9857110-01	9.9862579-01	9.9867792-01	9.9872775-01	9.9877523-01
46 THRU 50	9.9882069-01	9.9886408-01	9.9890568-01	9.9894548-01	9.9898358-01
51 THRU 55	9.9902011-01	9.9905519-01	9.9908882-01	9.9912110-01	9.9915215-01
56 THRU 60	9.9916195-01	9.9921060-01	9.9923819-01	9.9926473-01	9.9929029-01
61 THRU 65	9.9931484-01	9.9933857-01	9.9936134-01	9.9938336-01	9.9940459-01
66 THRU 70	9.9942511-01	9.9944483-01	9.9946386-01	9.9948227-01	9.9950003-01
71 THRU 75	9.9951726-01	9.9953374-01	9.9954981-01	9.9956524-01	9.9958023-01
76 THRU 80	9.9959465-01	9.9960862-01	9.9962222-01	9.9963520-01	9.9964789-01

HFN OUTPUT FOR WIGL2 PARAMETERS		FROM PROBLEM SET-UP IN WIGL2		, RUNON 30 MAY 74		OUTPUT PAGE 3
81 THRU 85	9.9966012-01	9.9967197-01	9.9968341-01	9.9969454-01	9.9970523-01	
86 THRU 90	9.9971567-01	9.9972568-01	9.9973549-01	9.9974486-01	9.9975403-01	
91 THRU 95	9.9976288-01	9.9977145-01	9.9977977-01	9.9978783-01	9.9979559-01	
96 THRU 100	9.9980317-01	9.9981044-01	9.9981757-01	9.9982442-01	9.9983113-01	
101 THRU 105	9.9983755-01	9.9984384-01	9.9984986-01	9.9985577-01	9.9986145-01	
106 THRU 110	9.9986694-01	9.9987235-01	9.9987748-01	9.9988256-01	9.9988740-01	
111 THRU 115	9.9989218-01	9.9989671-01	9.9990119-01	9.9990549-01	9.9990969-01	
116 THRU 120	9.9991371-01	9.9991763-01	9.9992142-01	9.9992519-01	9.9992871-01	
121 THRU 125	9.9993222-01	9.9993559-01	9.9993889-01	9.9994199-01	9.9994510-01	
126 THRU 130	9.9994805-01	9.9995095-01	9.9995376-01	9.9995651-01	9.9995910-01	
131 THRU 135	9.9996167-01	9.9996416-01	9.9996660-01	9.9996889-01	9.9997117-01	
136 THRU 140	9.9997337-01	9.9997547-01	9.9997752-01	9.9997958-01	9.9998144-01	
141 THRU 145	9.9998340-01	9.9998518-01	9.9998697-01	9.9998868-01	9.9999032-01	
146 THRU 150	9.9999198-01	9.9999352-01	9.9999510-01	9.9999652-01	9.9999797-01	
151 THRU 155	9.9999933-01	1.0000007+00	1.0000020+00	1.0000033+00	1.0000045+00	
156 THRU 160	1.0000057+00	1.0000069+00	1.0000080+00	1.0000090+00	1.0000101+00	
161 THRU 165	1.0000111+00	1.0000121+00	1.0000131+00	1.0000140+00	1.0000149+00	
166 THRU 170	1.0000158+00	1.0000166+00	1.0000175+00	1.0000183+00	1.0000190+00	
171 THRU 175	1.0000198+00	1.0000205+00	1.0000212+00	1.0000219+00	1.0000226+00	
176 THRU 180	1.0000232+00	1.0000239+00	1.0000245+00	1.0000250+00	1.0000256+00	

HFN OUTPUT FOR WIGL2 PARAMETERS FROM PROBLEM SET-UP IN WIGL2 , RUNON 30 MAY 74 OUTPUT PAGE 4
 FLUXES AT ALL POINTS IN ALL GROUPS, CONVERGED TO MAX. FRACTIONAL CHANGE OF 1.000+04
 177 THRU 181 1.0000239+00 1.0000245+00 1.0000250+00 1.0000256+00 1.0000262+00

HFN OUTPUT FOR WIGL2 PARAMETERS FROM PROBLEM SET-UP IN WIGL2 , RUNON 30 MAY 74 OUTPUT PAGE 5
 ADJOINT FLUX CALCULATION IN CYLINDRICAL GEOMETRY NUMBER GROUPS= 2, NUMBER REGIONS= 4

LEFT-HAND BOUNDARY RADIUS ,00000 RIGHT-HAND BOUNDARY RADIUS 233,37961

GROUP	ALBEDO	SURFACE SOURCE	GROUP	ALBEDO	SURFACE SOURCE
1	1,000000+00	0,000000	1	-1,000000+00	0,000000
2	1,000000+00	0,000000	2	-1,000000+00	0,000000

REGIONAL DATA

RIGHT BOUNDARY INTERVALS COMPOSITION REGION NO.

17.19720	=19,0	1	1
18.58708	=15,0	2	2
203.37962	-101,0	3	3
233.37961	5,0	4	4

GROUP	DIFFUSION COEFFICIENT	PERPENDICULAR BUCKLING	FEW-GROUP PARAMETERS FOR TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION	FRACTION FISSION SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT, SOURCE FRACTION
1	1,361976+00	7,180000-05	2,700298-02	4,284800-03	1,000000+00	0,000000	0,000000
2	3,647279-01	7,180000-05	7,417490-02	9,125271-02	-0,000000	1,674340-02	0,000000

GROUP	DIFFUSION COEFFICIENT	PERPENDICULAR BUCKLING	FEW-GROUP PARAMETERS FOR TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION	FRACTION FISSION SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT, SOURCE FRACTION
1	1,337958+00	7,180000-05	2,737419-02	4,277601-03	1,000000+00	0,000000	0,000000
2	3,572569-01	7,180000-05	5,533494-02	7,835603-02	-0,000000	1,941622-02	0,000000

GROUP	DIFFUSION COEFFICIENT	PERPENDICULAR BUCKLING	FEW-GROUP PARAMETERS FOR TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION	FRACTION FISSION SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT, SOURCE FRACTION
1	1,360240+00	7,180000-05	2,716309-02	4,281396-03	1,000000+00	0,000000	0,000000
2	3,614780-01	7,180000-05	6,607370-02	8,570704-02	-0,000000	1,789320-02	0,000000

HFN OUTPUT FOR WIGL2 PARAMETERS

FROM PROBLEM SET-UP IN WIGL2 , RUNON 30 MAY 74

OUTPUT PAGE 6

GROUP	DIFFUSION COEFFICIENT	PERPENDICULAR BUCKLING	FEW-GROUP PARAMETERS FOR TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION	FRACTION FISSION, SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT. SOURCE FRACTION
1	1.737300+00	7.180000-05	3.596260-02	0.000000	1.000000+00	0.000000	0.000000
2	2.356460-01	7.180000-05	1.036030-02	0.000000	-0.000000	3.563580-02	0.000000

FOLLOWING DATA IS A TABULATION, BY ITERATION, OF THE FISSION EIGENVALUE

GROUP	DIFFUSION COEFFICIENT	PERPENDICULAR BUCKLING	FEW-GROUP PARAMETERS FOR TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION	FRACTION FISSION, SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT. SOURCE FRACTION
1 THRU 5	1.0190590+00	9.9655674-01	9.9860492-01	9.9921885-01	9.9949444-01	9.9987321-01	9.995300-01
6 THRU 10	9.9964492-01	9.9973718-01	9.9979851-01	9.9984163-01	9.9994294-01	9.9997998-01	1.0000010+00
11 THRU 15	9.9989714-01	9.9991591-01	9.9993079-01	9.9994294-01	9.9997998-01	1.0000010+00	1.0000110+00
16 THRU 20	9.9996138-01	9.9996856-01	9.9997464-01	9.9997998-01	1.00000165+00	1.0000165+00	1.0000177+00
21 THRU 25	9.9998870-01	9.9999221-01	9.9999551-01	9.9999839-01	1.00000217+00	1.0000217+00	1.0000226+00
26 THRU 30	1.0000034+00	1.0000055+00	1.0000075+00	1.0000093+00	1.0000255+00	1.0000255+00	1.0000263+00
31 THRU 35	1.0000125+00	1.0000139+00	1.0000153+00	1.0000165+00	1.0000255+00	1.0000255+00	1.0000263+00
36 THRU 40	1.0000188+00	1.0000198+00	1.0000208+00	1.0000217+00	1.0000255+00	1.0000255+00	1.0000263+00
41 THRU 45	1.0000234+00	1.0000241+00	1.0000249+00	1.0000255+00	1.0000255+00	1.0000255+00	1.0000263+00

FLUXES AT ALL POINTS IN ALL GROUPS, CONVERGED TO MAX. FRACTIONAL CHANGE OF 1.000+04

GROUP	DIFFUSION COEFFICIENT	PERPENDICULAR BUCKLING	FEW-GROUP PARAMETERS FOR TOTAL REMOVAL CROSS-SECTION	NU TIMES SIG FISSION	FRACTION FISSION, SPECTRUM	IN-SCATTERING CROSS-SECTION	EXT. SOURCE FRACTION
41 THRU 45	1.0000234+00	1.0000241+00	1.0000249+00	1.0000255+00	1.0000255+00	1.0000255+00	1.0000263+00

\$ROD

77

ROD TABLE NOT CALCULATED BY HFN ASSUMED INPUT

STIT BNWGL ***SAMPLE CASE***

ELAPSED TIME FROM START OF CASE 23.466 SEC

INPUT EDIT

BOUNDARY CONDITIONS - SYM,ZERO FLUX GEOMETRY - RADIAL, CYL (1 PASS, 31 T-H REGIONS IN PASS 1)

141 POINTS 4 COMPOSITIONS 4 NUCLEAR REGIONS 31 T-H REGIONS 511 TIME STEPS

CORE HEIGHT .36576+03 CORE WIDTH .00000

RECIPROCAL OF NEUTRON VELOCITY .220700+08 .258600+05

TIME AT WHICH SOURCE BEGINS TO CHANGE WITH TIME .00000

PARAMETER EFFECTING RATE OF CHANGE OF SOURCE .00000

INITIAL FLOW INTO CORE .61000+08

TIME AT WHICH FLOW BEGINS TO CHANGE WITH TIME .00000

PARAMETER EFFECTING RATE OF CHANGE OF FLOW .00000

CORE INLET TEMPERATURE .54900+03 DESIRED COOLANT TEMPERATURE .00000

TIME AT WHICH INLET TEMPERATURE BEGINS TO CHANGE WITH TIME .00000

PARAMETER EFFECTING RATE OF CHANGE OF INLET TEMPERATURE .00000

TIME AT WHICH ROD POSITION BEGINS TO CHANGE DUE TO EXTERNAL CONTROL .00000

2 CONTROL-ROD-BEARING COMPOSITION(S)

INITIAL ROD WITHDRAWAL .36576+03

RATE OF ROD BANK MOTION DUE TO EXTERNAL CONTROL -.94500+02

PARAMETERS SPECIFYING RESPONSE TO CONTROL SYSTEM .00000 .00000 .00000 .00000

DESIRED POWER IN MEGAWATTS .193000+02

TIME .0000

IODINE CONCENTRATION

-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000

XENON CONCENTRATION
 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000
 -.0000

-.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000

COOLANT TEMPERATURE
 ,5490+03 ,5490+03
 ,5490+03 ,5490+03
 ,5490+03 ,5490+03
 ,5490+03

,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03
 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03
 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03
 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03

FUEL TEMPERATURE
 ,5490+03 ,5490+03
 ,5490+03 ,5490+03
 ,5490+03 ,5490+03
 ,5490+03

,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03
 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03
 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03
 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03 ,5490+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL	TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1 INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.13520+01	.36473-00	.10260-01	.74175-01	.42848-02	.91253-01	.16743-01	.27101-01	.74201-01
18, 25	2/ 2	.13580+01	.33726-00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
25, 30	3/ 2	.13580+01	.33726-00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
30, 34	4/ 2	.13580+01	.33726-00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
34, 39	5/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
39, 43	6/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
43, 47	7/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
47, 51	8/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
51, 54	9/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
54, 57	10/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
57, 60	11/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
60, 63	12/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
63, 67	13/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
67, 71	14/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
71, 74	15/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
74, 77	16/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
77, 80	17/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
80, 83	18/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
83, 88	19/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
88, 93	20/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
93, 97	21/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
97, 101	22/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
101, 105	23/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
105, 109	24/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
109, 113	25/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
113, 118	26/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
118, 123	27/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
123, 127	28/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
127, 131	29/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
131, 135	30/ 3	.13502+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
135, 140	31/ 4	.17373+01	.23565-00	.32680-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01

PT	DEL	X	DIST	FLUX GR1	FLUX GR2	ADJ GR1	ADJ GR2	PREC GR1	PREC GR2	PREC GR3	PREC GR4	PREC GR5	PREC GR6
-0	.000	.0000	0.0000	1.5033+08	3.4193+07	4.1079+06	5.0899+06	5.3126+04	1.5576+05	3.5419+04	2.3962+04	1.8022+03	2.7731+02
1	.955	9.5340+01	1.5039+08	3.4206+07	4.1093+06	5.0917+06	5.0917+06	5.3146+04	1.5582+05	3.5432+04	2.3971+04	1.8029+03	2.7731+02
2	.955	1.9108+00	1.5054+08	3.4243+07	4.1136+06	5.0971+06	5.0971+06	5.3204+04	1.5599+05	3.5471+04	2.3997+04	1.8049+03	2.7731+02
3	.955	2.8662+00	1.5080+08	3.4307+07	4.1207+06	5.1051+06	5.1051+06	5.3301+04	1.5622+05	3.5536+04	2.4041+04	1.8082+03	2.7822+02
4	.955	3.8216+00	1.5117+08	3.4396+07	4.1307+06	5.1187+06	5.1187+06	5.3438+04	1.5667+05	3.5627+04	2.4103+04	1.8128+03	2.7894+02
5	.955	4.7770+00	1.5164+08	3.4513+07	4.1433+06	5.1350+06	5.1350+06	5.3617+04	1.5720+05	3.5746+04	2.4183+04	1.8189+03	2.7987+02
6	.955	5.7324+00	1.5221+08	3.4659+07	4.1593+06	5.1531+06	5.1531+06	5.3839+04	1.5785+05	3.5895+04	2.4283+04	1.8264+03	2.8103+02
7	.955	6.6878+00	1.5288+08	3.4836+07	4.1779+06	5.1770+06	5.1770+06	5.4108+04	1.5864+05	3.6074+04	2.4405+04	1.8355+03	2.8233+02
8	.955	7.6432+00	1.5366+08	3.5048+07	4.1999+06	5.2099+06	5.2099+06	5.4286+04	1.5958+05	3.6287+04	2.4549+04	1.8464+03	2.8410+02
9	.955	8.5986+00	1.5455+08	3.5300+07	4.2239+06	5.2391+06	5.2391+06	5.4806+04	1.6068+05	3.6539+04	2.4720+04	1.8592+03	2.8608+02
10	.955	9.5540+00	1.5553+08	3.5601+07	4.2513+06	5.2758+06	5.2758+06	5.5253+04	1.6199+05	3.6837+04	2.4921+04	1.8744+03	2.8841+02
11	.955	1.0509+01	1.5661+08	3.5962+07	4.2816+06	5.3175+06	5.3175+06	5.5784+04	1.6355+05	3.7191+04	2.5161+04	1.8924+03	2.9138+02
12	.955	1.1465+01	1.5779+08	3.6402+07	4.3148+06	5.3648+06	5.3648+06	5.6422+04	1.6542+05	3.7671+04	2.5448+04	1.9140+03	2.9431+02
13	.955	1.2420+01	1.5905+08	3.6950+07	4.3509+06	5.4190+06	5.4190+06	5.7203+04	1.6771+05	3.8138+04	2.5801+04	1.9405+03	2.9859+02
14	.955	1.3376+01	1.6038+08	3.7647+07	4.3898+06	5.4844+06	5.4844+06	5.8181+04	1.7058+05	3.8790+04	2.6242+04	1.9737+03	3.0370+02
15	.955	1.4331+01	1.6177+08	3.8556+07	4.4315+06	5.5545+06	5.5545+06	5.9437+04	1.7426+05	3.9627+04	2.6808+04	2.0163+03	3.1035+02
16	.955	1.5286+01	1.6318+08	3.9777+07	4.4757+06	5.6448+06	5.6448+06	6.1093+04	1.7912+05	4.0731+04	2.7555+04	2.0725+03	3.1890+02
17	.955	1.6242+01	1.6456+08	4.1455+07	4.5223+06	5.7486+06	5.7486+06	6.3339+04	1.8570+05	4.2228+04	2.8568+04	2.1487+03	3.3052+02
18	.955	1.7197+01	1.6585+08	4.3817+07	4.5707+06	5.8832+06	5.8832+06	6.5783+04	1.9287+05	4.3558+04	2.9671+04	2.2316+03	3.4338+02
***** END OF NUCLEAR REGION NO. 1 AND THERMAL HYD REGION NO. 1 *****													
18	.955	1.7197+01	1.6585+08	4.3817+07	4.5707+06	5.8832+06	5.8832+06	6.5783+04	1.9287+05	4.3558+04	2.9671+04	2.2316+03	3.4338+02
19	.087	1.7284+01	1.6596+08	4.4075+07	4.5751+06	5.8972+06	5.8972+06	6.5759+04	1.9227+05	3.9174+04	2.6502+04	1.9933+03	3.0611+02
20	.087	1.7371+01	1.6607+08	4.4315+07	4.5795+06	5.9104+06	5.9104+06	6.5831+04	1.7307+05	3.9356+04	2.6625+04	2.0029+03	3.0843+02
21	.087	1.7458+01	1.6618+08	4.4538+07	4.5838+06	5.9229+06	5.9229+06	6.5928+04	1.7381+05	3.9525+04	2.6739+04	2.0111+03	3.0945+02
22	.087	1.7545+01	1.6629+08	4.4744+07	4.5880+06	5.9347+06	5.9347+06	6.5958+04	1.7450+05	3.9681+04	2.6845+04	2.0191+03	3.1057+02
23	.087	1.7632+01	1.6641+08	4.4932+07	4.5921+06	5.9458+06	5.9458+06	6.5973+04	1.7513+05	3.9824+04	2.6942+04	2.0264+03	3.1180+02
24	.087	1.7718+01	1.6653+08	4.5104+07	4.5962+06	5.9561+06	5.9561+06	6.5993+04	1.7571+05	3.9956+04	2.7031+04	2.0331+03	3.1253+02
25	.087	1.7805+01	1.6664+08	4.5260+07	4.6002+06	5.9658+06	5.9658+06	6.6010+04	1.7623+05	4.0076+04	2.7112+04	2.0392+03	3.1376+02
***** END OF THERMAL-HYD REG. NO. 2 *****													
25	.087	1.7805+01	1.6664+08	4.5260+07	4.6002+06	5.9658+06	5.9658+06	6.6010+04	1.7623+05	4.0076+04	2.7112+04	2.0392+03	3.1376+02
26	.087	1.7892+01	1.6676+08	4.5400+07	4.6042+06	5.9748+06	5.9748+06	6.6027+04	1.7671+05	4.0183+04	2.7185+04	2.0446+03	3.1451+02
27	.087	1.7979+01	1.6688+08	4.5523+07	4.6081+06	5.9832+06	5.9832+06	6.6046+04	1.7713+05	4.0299+04	2.7250+04	2.0495+03	3.1536+02
28	.087	1.8066+01	1.6700+08	4.5631+07	4.6119+06	5.9908+06	5.9908+06	6.6054+04	1.7750+05	4.0384+04	2.7307+04	2.0538+03	3.1602+02
29	.087	1.8153+01	1.6712+08	4.5724+07	4.6156+06	5.9978+06	5.9978+06	6.6052+04	1.7782+05	4.0437+04	2.7356+04	2.0575+03	3.1659+02
30	.087	1.8240+01	1.6725+08	4.5800+07	4.6193+06	6.0042+06	6.0042+06	6.6074+04	1.7809+05	4.0498+04	2.7398+04	2.0607+03	3.1707+02
***** END OF THERMAL-HYD REG. NO. 3 *****													
30	.087	1.8240+01	1.6725+08	4.5800+07	4.6193+06	6.0042+06	6.0042+06	6.6074+04	1.7809+05	4.0498+04	2.7398+04	2.0607+03	3.1707+02
31	.087	1.8326+01	1.6737+08	4.5862+07	4.6228+06	6.0098+06	6.0098+06	6.6080+04	1.7833+05	4.0548+04	2.7432+04	2.0632+03	3.1747+02
32	.087	1.8413+01	1.6750+08	4.5908+07	4.6264+06	6.0149+06	6.0149+06	6.6087+04	1.7848+05	4.0588+04	2.7458+04	2.0652+03	3.1777+02
33	.087	1.8500+01	1.6762+08	4.5959+07	4.6298+06	6.0193+06	6.0193+06	6.6090+04	1.7861+05	4.0615+04	2.7477+04	2.0666+03	3.1799+02
34	.087	1.8587+01	1.6775+08	4.5955+07	4.6332+06	6.0230+06	6.0230+06	6.5547+04	1.9217+05	4.3700+04	2.9564+04	2.2236+03	3.4214+02
***** END OF NUCLEAR REGION NO. 2 AND THERMAL HYD REGION NO. 4 *****													
34	.087	1.8587+01	1.6775+08	4.5955+07	4.6332+06	6.0230+06	6.0230+06	6.5547+04	1.9217+05	4.3700+04	2.9564+04	2.2236+03	3.4214+02
35	2.212	2.0799+01	1.7020+08	4.6286+07	4.6986+06	6.0939+06	6.0939+06	6.6270+04	1.9430+05	4.4153+04	2.9890+04	2.2481+03	3.4592+02
36	2.212	2.3011+01	1.7230+08	4.7153+07	4.7559+06	6.1649+06	6.1649+06	6.9155+04	1.9612+05	4.4612+04	3.0181+04	2.2700+03	3.4928+02
37	2.212	2.5223+01	1.7414+08	4.7149+07	4.8062+06	6.2279+06	6.2279+06	6.7553+04	1.9800+05	4.5038+04	3.0469+04	2.2917+03	3.5261+02
38	2.212	2.7435+01	1.7575+08	4.7558+07	4.8504+06	6.2842+06	6.2842+06	6.8145+04	1.9979+05	4.5432+04	3.0736+04	2.3117+03	3.5570+02

39	2.212	2.9647*01	1.7716*08	4.7929*07	4.8893*06	6.3342*06	6.8679*04	2.0136*05	4.5788*04	3.0977*04	2.3298*03	3.5849*02
39	2.212	2.9647*01	1.7716*08	4.7929*07	4.8893*06	6.3342*06	6.8679*04	2.0136*05	4.5788*04	3.0977*04	2.3298*03	3.5849*02
40	2.599	3.2246*01	1.7840*08	4.8258*07	4.9233*06	6.3781*06	6.9152*04	2.0274*05	4.6104*04	3.1190*04	2.3459*03	3.6094*02
41	2.599	3.4845*01	1.7948*08	4.8547*07	4.9530*06	6.4155*06	6.9566*04	2.0396*05	4.6380*04	3.1377*04	2.3599*03	3.6311*02
42	2.599	3.7444*01	1.8041*08	4.8798*07	4.9786*06	6.4486*06	6.9926*04	2.0501*05	4.6619*04	3.1539*04	2.3721*03	3.6500*02
43	2.599	4.0043*01	1.8120*08	4.9012*07	5.0004*06	6.4779*06	7.0232*04	2.0591*05	4.6824*04	3.1677*04	2.3825*03	3.6660*02
43	2.599	4.0043*01	1.8120*08	4.9012*07	5.0004*06	6.4779*06	7.0232*04	2.0591*05	4.6824*04	3.1677*04	2.3825*03	3.6660*02
44	2.150	4.2192*01	1.8186*08	4.9191*07	5.0188*06	6.5016*06	7.0490*04	2.0667*05	4.5980*04	3.1794*04	2.3913*03	3.6794*02
45	2.150	4.4342*01	1.8241*08	4.9339*07	5.0338*06	6.5211*06	7.0702*04	2.0729*05	4.7137*04	3.1889*04	2.3985*03	3.6905*02
46	2.150	4.6492*01	1.8284*08	4.9456*07	5.0457*06	6.5365*06	7.0869*04	2.0778*05	4.7259*04	3.1965*04	2.4041*03	3.6999*02
47	2.150	4.8642*01	1.8317*08	4.9544*07	5.0546*06	6.5481*06	7.0996*04	2.0815*05	4.7333*04	3.2022*04	2.4084*03	3.7038*02
47	2.150	4.8642*01	1.8317*08	4.9544*07	5.0546*06	6.5481*06	7.0996*04	2.0815*05	4.7333*04	3.2022*04	2.4084*03	3.7038*02
48	1.435	5.0078*01	1.8339*08	4.9605*07	5.0607*06	6.5580*06	7.1082*04	2.0840*05	4.7391*04	3.2061*04	2.4114*03	3.7103*02
49	1.435	5.1133*01	1.8352*08	4.9639*07	5.0642*06	6.5605*06	7.1131*04	2.0858*05	4.7423*04	3.2083*04	2.4130*03	3.7129*02
50	1.435	5.2949*01	1.8355*08	4.9647*07	5.0650*06	6.5616*06	7.1144*04	2.0858*05	4.7432*04	3.2088*04	2.4134*03	3.7136*02
51	1.435	5.4384*01	1.8349*08	4.9632*07	5.0634*06	6.5594*06	7.1121*04	2.0852*05	4.7417*04	3.2078*04	2.4127*03	3.7124*02
51	1.435	5.4384*01	1.8349*08	4.9632*07	5.0634*06	6.5594*06	7.1121*04	2.0852*05	4.7417*04	3.2078*04	2.4127*03	3.7124*02
52	1.730	5.6114*01	1.8355*08	4.9593*07	5.0593*06	6.5542*06	7.1121*04	2.0852*05	4.7417*04	3.2078*04	2.4127*03	3.7124*02
53	1.730	5.7845*01	1.8312*08	4.9531*07	5.0530*06	6.5460*06	7.0977*04	2.0809*05	4.7320*04	3.2013*04	2.4078*03	3.7049*02
54	1.730	5.9575*01	1.8281*08	4.9448*07	5.0444*06	6.5349*06	7.0857*04	2.0774*05	4.7241*04	3.1959*04	2.4037*03	3.6986*02
54	1.730	5.9575*01	1.8281*08	4.9448*07	5.0444*06	6.5349*06	7.0857*04	2.0774*05	4.7241*04	3.1959*04	2.4037*03	3.6986*02
55	1.591	6.1166*01	1.8242*08	4.9343*07	5.0336*06	6.5209*06	7.0707*04	2.0730*05	4.7140*04	3.1891*04	2.3986*03	3.6908*02
56	1.591	6.2757*01	1.8196*08	4.9217*07	5.0207*06	6.5043*06	7.0527*04	2.0677*05	4.7020*04	3.1810*04	2.3925*03	3.6818*02
57	1.591	6.4348*01	1.8142*08	4.9071*07	5.0058*06	6.4849*06	7.0318*04	2.0616*05	4.6881*04	3.1716*04	2.3854*03	3.6705*02
57	1.591	6.4348*01	1.8142*08	4.9071*07	5.0058*06	6.4849*06	7.0318*04	2.0616*05	4.6881*04	3.1716*04	2.3854*03	3.6705*02
58	1.481	6.5829*01	1.8081*08	4.8906*07	4.9889*06	6.4630*06	7.0041*04	2.0547*05	4.6723*04	3.1609*04	2.3774*03	3.6581*02
59	1.481	6.7310*01	1.8013*08	4.8722*07	4.9700*06	6.4386*06	6.9818*04	2.0470*05	4.6547*04	3.1509*04	2.3685*03	3.6441*02
60	1.481	6.8791*01	1.7938*08	4.8519*07	4.9493*06	6.4117*06	6.9527*04	2.0384*05	4.6354*04	3.1359*04	2.3586*03	3.6292*02
60	1.481	6.8791*01	1.7938*08	4.8519*07	4.9493*06	6.4117*06	6.9527*04	2.0384*05	4.6354*04	3.1359*04	2.3586*03	3.6292*02
61	1.391	7.0182*01	1.7856*08	4.8298*07	4.9263*06	6.3825*06	6.9210*04	2.0292*05	4.6133*04	3.1217*04	2.3479*03	3.6123*02
62	1.391	7.1573*01	1.7768*08	4.8060*07	4.9023*06	6.3509*06	6.8869*04	2.0191*05	4.5915*04	3.1062*04	2.3363*03	3.5948*02
63	1.391	7.2064*01	1.7674*08	4.7804*07	4.8761*06	6.3170*06	6.8502*04	2.0084*05	4.5670*04	3.0997*04	2.3238*03	3.5757*02
63	1.391	7.2064*01	1.7674*08	4.7804*07	4.8761*06	6.3170*06	6.8502*04	2.0084*05	4.5670*04	3.0997*04	2.3238*03	3.5757*02
64	1.461	7.4246*01	1.7573*08	4.7531*07	4.8483*06	6.2809*06	6.8111*04	1.9969*05	4.5440*04	3.0721*04	2.3106*03	3.5553*02
65	1.461	7.5887*01	1.7466*08	4.7242*07	4.8181*06	6.2426*06	6.7697*04	1.9848*05	4.5133*04	3.0534*04	2.2965*03	3.5336*02
66	1.461	7.7349*01	1.7353*08	4.6937*07	4.7875*06	6.2022*06	6.7259*04	1.9719*05	4.4842*04	3.0336*04	2.2817*03	3.5108*02
67	1.461	7.8810*01	1.7234*08	4.6616*07	4.7547*06	6.1597*06	6.6799*04	1.9584*05	4.4535*04	3.0129*04	2.2661*03	3.4868*02
67	1.461	7.8810*01	1.7234*08	4.6616*07	4.7547*06	6.1597*06	6.6799*04	1.9584*05	4.4535*04	3.0129*04	2.2661*03	3.4868*02
68	1.360	8.0171*01	1.7110*08	4.6279*07	4.7203*06	6.1151*06	6.6316*04	1.9443*05	4.4213*04	2.9911*04	2.2497*03	3.4616*02

69	1.360	8.1531+01	1.6980+08	4.5927+07	4.0843+06	6.0685+06	6.5812+04	1.9395+05	4.3377+04	2.9684+04	2.2326+03	3.4353+02
70	1.360	8.282+01	1.6844+08	4.5561+07	4.6469+06	6.0200+06	6.5287+04	1.9141+05	4.3527+04	2.9447+04	2.2146+03	3.4079+02
71	1.360	8.4252+01	1.6703+08	4.5180+07	4.6080+06	5.9696+06	6.4741+04	1.8981+05	4.3163+04	2.9201+04	2.1963+03	3.3794+02
***** THERMAL-HYD REG. NO.14 *****												
71	1.360	8.4252+01	1.6703+08	4.5180+07	4.6080+06	5.9696+06	6.4741+04	1.8981+05	4.3163+04	2.9201+04	2.1963+03	3.3794+02
72	1.667	8.5919+01	1.6557+08	4.4784+07	4.5676+06	5.9173+06	6.4173+04	1.8151+05	4.2786+04	2.8943+04	2.1770+03	3.3498+02
73	1.667	8.7585+01	1.6406+08	4.4375+07	4.5258+06	5.8632+06	6.3595+04	1.8431+05	4.2395+04	2.8681+04	2.1572+03	3.3194+02
74	1.667	8.9252+01	1.6250+08	4.3953+07	4.4827+06	5.8073+06	6.2983+04	1.8466+05	4.1991+04	2.8408+04	2.1366+03	3.2876+02
***** THERMAL-HYD REG. NO.15 *****												
74	1.667	8.9252+01	1.6250+08	4.3953+07	4.4827+06	5.8073+06	6.2983+04	1.8466+05	4.1991+04	2.8408+04	2.1366+03	3.2876+02
75	1.612	9.0864+01	1.6089+08	4.3517+07	4.4382+06	5.7497+06	6.2359+04	1.8283+05	4.1575+04	2.8126+04	2.1154+03	3.2550+02
76	1.612	9.2476+01	1.5923+08	4.3068+07	4.3923+06	5.6903+06	6.1716+04	1.8094+05	4.1146+04	2.7836+04	2.0936+03	3.2214+02
77	1.612	9.4087+01	1.5752+08	4.2607+07	4.3452+06	5.6293+06	6.1055+04	1.7900+05	4.0705+04	2.7538+04	2.0712+03	3.1869+02
***** THERMAL-HYD REG. NO.16 *****												
77	1.612	9.4087+01	1.5752+08	4.2607+07	4.3452+06	5.6293+06	6.1055+04	1.7900+05	4.0705+04	2.7538+04	2.0712+03	3.1869+02
78	1.533	9.5620+01	1.5577+08	4.2133+07	4.2959+06	5.5667+06	6.0376+04	1.7701+05	4.0253+04	2.7232+04	2.0482+03	3.1515+02
79	1.533	9.7153+01	1.5397+08	4.1647+07	4.2473+06	5.5024+06	5.9679+04	1.7477+05	3.9788+04	2.6915+04	2.0245+03	3.1152+02
80	1.533	9.8688+01	1.5214+08	4.1150+07	4.1965+06	5.4366+06	5.8966+04	1.7288+05	3.9313+04	2.6596+04	2.0044+03	3.0779+02
***** THERMAL-HYD REG. NO.17 *****												
80	1.533	9.8688+01	1.5214+08	4.1150+07	4.1965+06	5.4366+06	5.8966+04	1.7288+05	3.9313+04	2.6596+04	2.0044+03	3.0779+02
81	1.464	1.0045+02	1.5025+08	4.0641+07	4.1445+06	5.3693+06	5.8237+04	1.7074+05	3.8827+04	2.6267+04	1.9756+03	3.0399+02
82	1.464	1.0161+02	1.4833+08	4.0120+07	4.0914+06	5.3005+06	5.7491+04	1.6856+05	3.8330+04	2.5931+04	1.9503+03	3.0009+02
83	1.464	1.0308+02	1.4637+08	3.9589+07	4.0372+06	5.2303+06	5.6730+04	1.6633+05	3.7822+04	2.5587+04	1.9245+03	2.9612+02
***** THERMAL-HYD REG. NO.18 *****												
83	1.464	1.0308+02	1.4637+08	3.9589+07	4.0372+06	5.2303+06	5.6730+04	1.6633+05	3.7822+04	2.5587+04	1.9245+03	2.9612+02
84	1.654	1.0473+02	1.4436+08	3.9047+07	3.9819+06	5.1587+06	5.5954+04	1.6405+05	3.7304+04	2.5237+04	1.8982+03	2.9207+02
85	1.654	1.0639+02	1.4232+08	3.8495+07	3.9256+06	5.0857+06	5.5163+04	1.6173+05	3.6777+04	2.4869+04	1.8713+03	2.8794+02
86	1.654	1.0804+02	1.4024+08	3.7933+07	3.8682+06	5.0114+06	5.4357+04	1.5937+05	3.6240+04	2.4517+04	1.8440+03	2.8373+02
87	1.654	1.0969+02	1.3813+08	3.7361+07	3.8098+06	4.9358+06	5.3537+04	1.5696+05	3.5693+04	2.4147+04	1.8162+03	2.7946+02
88	1.654	1.1133+02	1.3598+08	3.6780+07	3.7505+06	4.8590+06	5.2704+04	1.5452+05	3.5138+04	2.3772+04	1.7879+03	2.7511+02
***** THERMAL-HYD REG. NO.19 *****												
88	1.654	1.1133+02	1.3598+08	3.6780+07	3.7505+06	4.8590+06	5.2704+04	1.5452+05	3.5138+04	2.3772+04	1.7879+03	2.7511+02
89	1.539	1.1289+02	1.3380+08	3.6183+07	3.6903+06	4.7809+06	5.1858+04	1.5204+05	3.4574+04	2.3390+04	1.7592+03	2.7069+02
90	1.539	1.1442+02	1.3158+08	3.5589+07	3.6211+06	4.7017+06	5.0999+04	1.4952+05	3.4001+04	2.3002+04	1.7301+03	2.6620+02
91	1.539	1.1596+02	1.2933+08	3.4981+07	3.5671+06	4.6213+06	5.0127+04	1.4697+05	3.3420+04	2.2609+04	1.7005+03	2.6168+02
92	1.539	1.1755+02	1.2705+08	3.4365+07	3.5042+06	4.5359+06	4.9244+04	1.4438+05	3.2831+04	2.2211+04	1.6705+03	2.5705+02
93	1.539	1.1904+02	1.2474+08	3.3740+07	3.4405+06	4.4573+06	4.8349+04	1.4175+05	3.2235+04	2.1807+04	1.6402+03	2.5237+02
***** THERMAL-HYD REG. NO.20 *****												
93	1.539	1.1904+02	1.2474+08	3.3740+07	3.4405+06	4.4573+06	4.8349+04	1.4175+05	3.2235+04	2.1807+04	1.6402+03	2.5237+02
94	1.807	1.2085+02	1.2241+08	3.3108+07	3.3760+06	4.3738+06	4.7443+04	1.3910+05	3.1631+04	2.1399+04	1.6095+03	2.4763+02
95	1.807	1.2246+02	1.2004+08	3.2465+07	3.3107+06	4.2893+06	4.6527+04	1.3641+05	3.1019+04	2.0955+04	1.5784+03	2.4286+02
96	1.807	1.2446+02	1.1765+08	3.1822+07	3.2448+06	4.2038+06	4.5600+04	1.3369+05	3.0401+04	2.0567+04	1.5469+03	2.3802+02
97	1.807	1.2627+02	1.1523+08	3.1168+07	3.1781+06	4.1174+06	4.4663+04	1.3095+05	2.9777+04	2.0143+04	1.5151+03	2.3313+02
***** THERMAL-HYD REG. NO.21 *****												
97	1.807	1.2627+02	1.1523+08	3.1168+07	3.1781+06	4.1174+06	4.4663+04	1.3095+05	2.9777+04	2.0143+04	1.5151+03	2.3313+02
98	1.709	1.2794+02	1.1279+08	3.0508+07	3.1108+06	4.0302+06	4.3717+04	1.2817+05	2.9146+04	1.9718+04	1.4830+03	2.2811+02
99	1.709	1.2969+02	1.1033+08	2.9841+07	3.0428+06	3.9421+06	4.2765+04	1.2537+05	2.8509+04	1.9287+04	1.4506+03	2.2321+02
100	1.709	1.3140+02	1.0784+08	2.9168+07	2.9742+06	3.8533+06	4.1790+04	1.2255+05	2.7867+04	1.8892+04	1.4199+03	2.1818+02

101	1.709	1.331+02	1.0533+08	2.8490+07	2.9050+06	3.7637+06	4.0826+04	1.1970+05	2.7219+04	1.8414+04	1.3850+03	2.131+00
					END OF	THRMAL-HYD	NO.22					
101	1.709	1.331+02	1.0533+08	2.8490+07	2.9050+06	3.7637+06	4.0826+04	1.1970+05	2.7219+04	1.8414+04	1.3850+03	2.131+00
102	1.625	1.3473+02	1.0280+08	2.7806+07	2.8353+06	3.6733+06	3.9846+04	1.1682+05	2.6565+04	1.7972+04	1.3517+03	2.0799+02
103	1.625	1.3636+02	1.0026+09	2.7118+07	2.7650+06	3.6233+06	3.8859+04	1.1393+05	2.5927+04	1.7527+04	1.3182+03	2.0284+02
104	1.625	1.3798+02	9.7893+02	2.6424+07	2.6943+06	3.4907+06	3.7865+04	1.1101+05	2.5245+04	1.7078+04	1.2845+03	1.9765+02
105	1.625	1.3961+02	9.5111+07	2.5726+07	2.6231+06	3.3985+06	3.6864+04	1.0808+05	2.4577+04	1.6627+04	1.2506+03	1.9242+02
					END OF	THRMAL-HYD	NO.23					
105	1.625	1.3961+02	9.5111+07	2.5726+07	2.6231+06	3.3985+06	3.6864+04	1.0808+05	2.4577+04	1.6627+04	1.2506+03	1.9242+02
106	1.553	1.4115+02	9.2514+07	2.5023+07	2.5535+06	3.3057+06	3.5858+04	1.0513+05	2.3906+04	1.6173+04	1.2164+03	1.8717+02
107	1.553	1.4271+02	8.9902+07	2.4317+07	2.4794+06	3.2185+06	3.4845+04	1.0216+05	2.2531+04	1.5177+04	1.1821+03	1.8169+02
108	1.553	1.4427+02	8.7277+07	2.3607+07	2.4070+06	3.1285+06	3.3282+04	9.9187+04	2.2523+04	1.5258+04	1.1476+03	1.7657+02
109	1.553	1.4582+02	8.4639+07	2.2893+07	2.3343+06	3.0243+06	3.2805+04	9.6181+04	2.1871+04	1.4796+04	1.1129+03	1.7124+02
					END OF	THRMAL-HYD	NO.24					
109	1.553	1.4582+02	8.4639+07	2.2893+07	2.3343+06	3.0243+06	3.2805+04	9.6181+04	2.1871+04	1.4796+04	1.1129+03	1.7124+02
110	1.973	1.4779+02	8.1990+07	2.2177+07	2.2612+06	2.9206+06	3.1779+04	9.3171+04	2.1107+04	1.4333+04	1.0780+03	1.6588+02
111	1.973	1.4977+02	7.9331+07	2.1457+07	2.1879+06	2.8346+06	3.0748+04	9.0149+04	2.0500+04	1.3868+04	1.0431+03	1.6050+02
112	1.973	1.5174+02	7.6662+07	2.0736+07	2.1143+06	2.7393+06	2.9714+04	8.7116+04	1.9810+04	1.3402+04	1.0080+03	1.5510+02
113	1.973	1.5371+02	7.3986+07	2.0012+07	2.0405+06	2.6436+06	2.8676+04	8.4071+04	1.9118+04	1.2934+04	9.7280+02	1.4968+02
					END OF	THRMAL-HYD	NO.25					
113	1.973	1.5371+02	7.3986+07	2.0012+07	2.0405+06	2.6436+06	2.8676+04	8.4071+04	1.9118+04	1.2934+04	9.7280+02	1.4968+02
114	2.227	1.5594+02	7.1302+07	1.9286+07	1.9684+06	2.5478+06	2.7636+04	8.1025+04	1.8425+04	1.2465+04	9.3751+02	1.4428+02
115	2.227	1.5817+02	6.8612+07	1.8558+07	1.8923+06	2.4517+06	2.6593+04	7.7988+04	1.7730+04	1.1995+04	9.40215+02	1.3861+02
116	2.227	1.6035+02	6.6180+07	1.7829+07	1.8180+06	2.3554+06	2.5549+04	7.4906+04	1.7034+04	1.1924+04	8.6672+02	1.3336+02
117	2.227	1.6268+02	6.3219+07	1.7099+07	1.7435+06	2.2390+06	2.4503+04	7.1840+04	1.6336+04	1.1052+04	8.3124+02	1.2790+02
118	2.227	1.6488+02	6.0518+07	1.6369+07	1.6690+06	2.1625+06	2.3456+04	6.8770+04	1.5638+04	1.0580+04	7.9572+02	1.2244+02
					END OF	THRMAL-HYD	NO.26					
118	2.227	1.6488+02	6.0518+07	1.6369+07	1.6690+06	2.1625+06	2.3456+04	6.8770+04	1.5638+04	1.0580+04	7.9572+02	1.2244+02
119	2.086	1.6693+02	5.7815+07	1.5638+07	1.5945+06	2.0599+06	2.2490+04	6.5693+04	1.5638+04	1.0580+04	7.9572+02	1.2244+02
120	2.086	1.6902+02	5.5120+07	1.4907+07	1.5199+06	1.9693+06	2.1361+04	6.2627+04	1.4241+04	9.6345+03	7.12464+02	1.1150+02
121	2.086	1.7111+02	5.2409+07	1.4176+07	1.4454+06	1.8727+06	2.0313+04	5.9556+04	1.3543+04	9.1620+03	6.8910+02	1.0603+02
122	2.086	1.7319+02	4.9707+07	1.3445+07	1.3769+06	1.7762+06	1.9266+04	5.6486+04	1.2845+04	8.8498+03	6.5358+02	1.0027+02
123	2.086	1.7528+02	4.7008+07	1.2475+07	1.2965+06	1.6797+06	1.8221+04	5.3420+04	1.2148+04	8.2182+03	6.1811+02	9.5104+01
					END OF	THRMAL-HYD	NO.27					
123	2.086	1.7528+02	4.7008+07	1.2475+07	1.2965+06	1.6797+06	1.8221+04	5.3420+04	1.2148+04	8.2182+03	6.1811+02	9.5104+01
124	2.461	1.7774+02	4.4313+07	1.1987+07	1.2221+06	1.5834+06	1.7177+04	5.0360+04	1.1452+04	7.7473+03	5.8270+02	8.9659+01
125	2.461	1.8020+02	4.1621+07	1.1261+07	1.1479+06	1.4873+06	1.6135+04	4.7307+04	1.0758+04	7.2777+03	5.4737+02	8.4224+01
126	2.461	1.8266+02	3.8935+07	1.0537+07	1.0739+06	1.3713+06	1.5099+04	4.4267+04	1.0066+04	6.8100+03	5.1220+02	7.8411+01
127	2.461	1.8512+02	3.6254+07	9.8200+06	1.0000+06	1.2955+06	1.4069+04	4.1247+04	9.3796+03	6.3455+03	4.7726+02	7.3436+01
					END OF	THRMAL-HYD	NO.28					
127	2.461	1.8512+02	3.6254+07	9.8200+06	1.0000+06	1.2955+06	1.4069+04	4.1247+04	9.3796+03	6.3455+03	4.7726+02	7.3436+01
128	2.336	1.8745+02	3.3578+07	9.1131+06	9.2636+05	1.2000+06	1.3052+04	3.8268+04	8.7017+03	5.8669+03	4.4277+02	6.8129+01
129	2.336	1.8979+02	3.0950+07	8.4271+06	8.5297+05	1.1046+06	1.2061+04	3.5360+04	8.0409+03	5.4490+03	4.0914+02	6.2954+01
130	2.336	1.9213+02	2.8266+07	7.7850+06	7.7988+05	1.0892+06	1.1122+04	3.2600+04	7.4152+03	5.0165+03	3.7731+02	5.8056+01
131	2.336	1.9446+02	2.5928+07	7.2368+06	7.0711+05	9.1339+05	1.0269+04	3.0186+04	6.8643+03	4.6439+03	3.4928+02	5.3743+01
					END OF	THRMAL-HYD	NO.29					
131	2.336	1.9446+02	2.5928+07	7.2368+06	7.0711+05	9.1339+05	1.0269+04	3.0186+04	6.8643+03	4.6439+03	3.4928+02	5.3743+01
132	2.229	1.9669+02	2.2711+07	6.8925+06	6.3480+05	8.1535+05	9.1130+03	2.8477+04	6.4957+03	4.3809+03	3.2950+02	5.0700+01

[illegible]

ST1T BNWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 26.865 SEC

TIME STEP NO. 1 TIME .1000-05 DELTA T = .1000-05

REACTIVITY (TIME STEP -0) = -.1504-03

ROD-TRAVEL-DISTANCE = .3698+03

RELATIVE POWER (TIME STEP -0) = .7942-00

P SORD WT DOP COEF FLUX SOR WTD DOP COEF VOL WTD TEMP SUM OF POWER*VOL SUM OF VOLUMES
 1.0000000+00 1.0000000+00 -2.584188-07 2.1057348+10 2.0681639+04
 PEAK TO AVERAGE POWER (TIME STEP -0)
 .1544+01 .1580+01 .1620+01 .1792+01 .1852+01 .1882+01 .1890+01 .1880+01
 .1362+01 .1438+01 .1501+01 .1700+01 .1851+01 .1598+01 .1540+01 .1457+01
 .1238+01 .1138+01 .1034+01 .8180-00 .6932-00 .5540-00 .4291-00 .3218-00
 .0000

IODINE CONCENTRATION

-.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000

XENON CONCENTRATION

.0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000

COOLANT TEMPERATURE

.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

FUEL TEMPERATURE

.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
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 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.1352+01	.36473+00	.10260-01	.74175-01	.42848-02	.91253-01	.16743-01		.27101-01	.74201-01
18, 25	2/ 2	.1358+01	.35726+00	.79580-02	.55335-01	.42776-02	.75356-01	.19416-01		.27472-01	.55361-01
25, 30	3/ 2	.1358+01	.35726+00	.79580-02	.55335-01	.42776-02	.75356-01	.19416-01		.27472-01	.55361-01
30, 34	4/ 2	.1358+01	.35726+00	.79580-02	.55335-01	.42776-02	.75356-01	.19416-01		.27472-01	.55361-01
34, 39	5/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
39, 43	6/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
43, 47	7/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
47, 51	8/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
51, 54	9/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
54, 57	10/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
57, 60	11/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
60, 63	12/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
63, 67	13/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
67, 71	14/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
71, 74	15/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
74, 77	16/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
77, 80	17/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
80, 83	18/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
83, 88	19/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
88, 93	20/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
93, 97	21/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
97, 101	22/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
101, 105	23/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
105, 109	24/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
109, 113	25/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
113, 118	26/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
118, 123	27/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
123, 127	28/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
127, 131	29/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
131, 135	30/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
135, 140	31/ 4	.17373+01	.23565+00	.32660-03	.10360-01	.00000	.00000	.35636-01		.36087-01	.10377-01
TOTAL OF ALL REGIONS		7.00996170+18	1.90228870+18	9.07469150+18	2.4584570+18	1.00069715+15	1.82650650+14				

ST:IT BNHWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 28.396 SEC

TIME STEP NO. 2 TIME .5000-01 DELTA T = .5000-01

REACTIVITY (TIME STEP 1) = -.1118-03

ROD-TRAVEL-DISTANCE = .3610+03

RELATIVE POWER (TIME STEP 1) = .7944-00

P	S3RD WT DOP COEF	FLUX SGR WTD DOP COEF	VOL WTD TEMP	SUM OF POWER*VOL	SUM OF VOLUMES
1.0000000+00	1.0000000+00	-2.3841858-07	2.1062005+10	2.0681639+04	
PEAK TO AVERAGE POWER (TIME STEP 1)					
.153+01	.1579+01	.1619+01	.1852+01	.1892+01	.1878+01
.1860+01	.1836+01	.1750+01	.1650+01	.1539+01	.1345+01
.1238+01	.1137+01	.1034+01	.6939-00	.4297-00	.2833-00
.0000					

IODINE CONCENTRATION

-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000

XENON CONCENTRATION

.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000

COOLANT TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000					

FUEL TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000					

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	2	GROUP 1	GROUP 2
0, 18	1/ 1	.13517+01	.36416-00	.10088-01	.72772-01	.42643-02	.90293+01	.16942-01	.27126-01	.72799-01	
18, 25	2/ 2	.13580+01	.35726-00	.79580-02	.55335-01	.42776-02	.78356+01	.19416-01	.27472-01	.55361-01	
25, 30	3/ 2	.13580+01	.35726-00	.79580-02	.55335-01	.42776-02	.78356+01	.19416-01	.27472-01	.55361-01	
30, 34	4/ 2	.13580+01	.35726-00	.79580-02	.55335-01	.42776-02	.78356+01	.19416-01	.27472-01	.55361-01	
34, 39	5/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
39, 43	6/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
43, 47	7/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
47, 51	8/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
51, 54	9/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
54, 57	10/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
57, 60	11/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
60, 63	12/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
63, 67	13/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
67, 71	14/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
71, 74	15/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
74, 77	16/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
77, 80	17/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
80, 83	18/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
83, 88	19/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
88, 93	20/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
93, 97	21/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
97, 101	22/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
101, 105	23/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
105, 109	24/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
109, 113	25/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
113, 118	26/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
118, 123	27/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
123, 127	28/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
127, 131	29/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
131, 135	30/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100-01	
135, 140	31/ 4	.13733+01	.23565-00	.12680-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01	
TOTAL OF ALL REGIONS		7.01104320+18	1.90228040+18	9.07615900+18	2.45845000+18	1.00039973+15	1.82608630+14				

STIT BNWGL ***SAMPLE CASE***

ELAPSED TIME FROM START OF CASE 29,930 SEC

TIME STEP NO. 3 TIME .1000+00 DELTA T = .5000-01

REACTIVITY (TIME STEP 2) = .2472-03

ROD-TRAVEL-DISTANCE = .3563+03

RELATIVE POWER (TIME STEP 2) = .8467-00

P SGRD WT DOP COEF FLUX SGR WTD DOP COEF VOL WTD TEMP SUM OF POWER*VOL SUM OF VOLUMES
 6.2105495-01 6.2046736-01 -4.7683716+07 2.2449844+10 2.0681639+04
 PEAK TO AVERAGE POWER (TIME STEP 2)
 .1585+01 .1582+01 .1614+01 .1824+01 .1816+01 .1801+01 .1783+01
 .1761+01 .1738+01 .1706+01 .1623+01 .1580+01 .1491+01 .1424+01
 .1244+01 .1155+01 .1089+01 .8870-00 .7544-00 .6033-00 .3293-00 .2607-00
 .0000

IODINE CONCENTRATION
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000

XENON CONCENTRATION
 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000

COOLANT TEMPERATURE
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

FUEL TEMPERATURE
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

POINT(S) (1 TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	2	GROUP 1	GROUP 2
0, 18	1/ 1	.13614+01	.36359+00	.99169+02	.71370+01	.42838+02	.89333+01	.17141+01		.27156+01	.71396+01
18, 25	2/ 2	.13580+01	.35726+00	.79580+02	.55335+01	.42776+02	.78356+01	.19416+01		.27472+01	.55361+01
25, 30	3/ 2	.13580+01	.35726+00	.79580+02	.55335+01	.42776+02	.78356+01	.19416+01		.27472+01	.55361+01
30, 34	4/ 2	.13580+01	.35726+00	.79580+02	.55335+01	.42776+02	.78356+01	.19416+01		.27472+01	.55361+01
34, 39	5/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
39, 43	6/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
43, 47	7/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
47, 51	8/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
51, 54	9/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
54, 57	10/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
57, 60	11/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
60, 63	12/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
63, 67	13/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
67, 71	14/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
71, 74	15/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
74, 77	16/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
77, 80	17/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
80, 83	18/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
83, 88	19/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
88, 93	20/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
93, 97	21/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
97, 101	22/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
101, 105	23/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
105, 109	24/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
109, 113	25/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
113, 118	26/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
118, 123	27/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
123, 127	28/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
127, 131	29/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
131, 135	30/ 3	.13602+01	.36148+00	.92699+02	.66074+01	.42816+02	.85707+01	.17893+01		.27261+01	.66100+01
135, 140	31/ 4	.13737+01	.23565+00	.12680+03	.10360+01	.00000	.00000	.35636+01		.36067+01	.13037+01
TOTAL OF ALL REGIONS		7.36301370+18	1.99762220+18	9.53180940+18	2.58198310+18	1.02166163+15	1.84790130+14				

STIT BNWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 32,548 SEC

TIME STEP NO. 5 TIME .2000-00 DELTA T = .5000-01

REACTIVITY (TIME STEP 4) = .7701+03

ROD-TRAVEL-DISTANCE = .3469+03

RELATIVE POWER (TIME STEP 4) = .9446-00

P SORD WT DOP COEF FLUX SOR WTD DOP COEF
6.9553572-01 6.9434435-01

PEAK TO AVERAGE POWER (TIME STEP 4)

	VOL WTD TEMP -4.7683716-07	SUM OF POWER*VOL 2.5044525+10	SUM OF VOLUMES 2.0681639+04
.1801+01	.1913+01	.1890+01	.1840+01
.1785+01	.1624+01	.1520+01	.1413+01
.1228+01	.8713-00	.5911-00	.3221-00
.0000			

IODINE CONCENTRATION

-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000

XENON CONCENTRATION

.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000

COOLANT TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03
.0000			

FUEL TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03
.0000			

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL 1 INTO 2	TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2		GROUP 1	GROUP 2
0, 18	1/ 1	.13608+01	.36246-00	.95743-02	.68565-01	.42827-02	.87413-01	.17533-01	.27211-01	.68591-01
18, 25	2/ 2	.13580+01	.35726-00	.79560-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
25, 30	3/ 2	.13580+01	.35726-00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
30, 34	4/ 2	.13580+01	.35726-00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
34, 39	5/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
39, 43	6/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
43, 47	7/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
47, 51	8/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
51, 54	9/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
54, 57	10/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
57, 60	11/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
60, 63	12/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
63, 67	13/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
67, 71	14/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
71, 74	15/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
74, 77	16/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
77, 80	17/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
80, 83	18/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
83, 88	19/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
88, 93	20/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
93, 97	21/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
97, 101	22/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
101, 105	23/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
105, 109	24/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
109, 113	25/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
113, 118	26/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
118, 123	27/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
123, 127	28/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
127, 131	29/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
131, 135	30/ 3	.13602+01	.36148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
135, 140	31/ 4	.17373+01	.23565-00	.32690-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01
TOTAL OF ALL REGIONS		8.26770990+18	2.24441330+18	1.07017961+19	2.90090280+18	1.11126060+15	1.90132240+14			

STIT BNWGL ***SAMPLE CASE***

ELAPSED TIME FROM START OF CASE 35,172 SEC

TIME STEP NO.	7	TIME	.3000-00	DELTA T =	.5000-01
REACTIVITY (TIME STEP 6) = .1467-02					
ROD-TRAVEL-DISTANCE = .3374+03					
RELATIVE POWER (TIME STEP 6) = .1123+01					
P SGRD WT DOP COEF	FLUX SGR WTD DOP COEF	VOL WTD TEMP	SUM OF POWER*VOL	SUM OF VOLUMES	
7.4520279-01	7.4327787-01	-4.7683716-07	2.9764095+10	2.0681639+04	
PEAK TO AVERAGE POWER (TIME STEP 6)					
.2122+01	.2043+01	.2041+01	.1981+01	.1894+01	.1855+01
.1817+01	.1780+01	.1626+01	.1523+01	.1472+01	.1398+01
.1207+01	.1117+01	.8497-00	.5743-00	.4381-00	.3122-00
.0000					
IODINE CONCENTRATION					
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000					
XENON CONCENTRATION					
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000					
COOLANT TEMPERATURE					
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000					
FUEL TEMPERATURE					
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000					

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)	REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2		1	2	GROUP 1	GROUP 2
0, 18	1/ 1	.13602+01	.35134-00	.92316-02	.65760-01	.42817-02	.85493+01	.17937-01	.27266-01	.65786-01
18, 25	2/ 2	.13580+01	.35726-00	.79580-02	.55335-01	.42776-02	.78356+01	.19416-01	.27472-01	.55361-01
25, 30	3/ 2	.13581+01	.35726-00	.79580-02	.55335-01	.42776-02	.78356+01	.19416-01	.27472-01	.55361-01
30, 34	4/ 2	.13580+01	.35726-00	.79580-02	.55335-01	.42776-02	.78356+01	.19416-01	.27472-01	.55361-01
34, 39	5/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
39, 43	6/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
43, 47	7/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
47, 51	8/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
51, 54	9/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
54, 57	10/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
57, 60	11/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
60, 63	12/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
63, 67	13/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
67, 71	14/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
71, 74	15/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
74, 77	16/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
77, 80	17/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
80, 83	18/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
83, 88	19/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
88, 93	20/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
93, 97	21/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
97, 101	22/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
101, 105	23/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
105, 109	24/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
109, 113	25/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
113, 118	26/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
118, 123	27/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
123, 127	28/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
127, 131	29/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
131, 135	30/ 3	.13502+01	.35148-00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
135, 140	31/ 4	.17373+01	.23565-00	.32690-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01
TOTAL OF ALL REGIONS		9.91184320+18	2.69331070+18	1.28298826+19	3.48099630+18	1.27481380+15	2.00240800+14			

ELAPSED TIME FROM START OF CASE 37.824 SEC

STIT BNWIGL ***SAMPLE CASE***

TIME STEP NO.	9	TIME	4000-00	DELTA T =	5000-01
REACTIVITY (TIME STEP 8) = .2347-02					
ROD-TRAVEL-DISTANCE = .3280+03					
RELATIVE POWER (TIME STEP 8) = .1484+01					
P SORD WT DOP COEF	4.8212943-01	FLUX SQR WTD DOP COEF	4.8090128-01	VOL WTD TEMP	-7.1525574+07
PEAK TO AVERAGE POWER (TIME STEP 8)			SUM OF POWER*VOL		
			3.9346042+10		
SUM OF VOLUMES			2.0661639+04		
IODINE CONCENTRATION					
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
XENON CONCENTRATION					
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
COOLANT TEMPERATURE					
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000	.0000	.0000	.0000	.0000	.0000
FUEL TEMPERATURE					
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000	.0000	.0000	.0000	.0000	.0000

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	2	GROUP 1	GROUP 2
0, 18	1/ 1	.13597+01	.36049+00	.89720+02	.63036-01	.42809-02	.84038-01	.18239-01		.27308-01	.63661-01
18, 25	2/ 2	.13582+01	.35726+00	.79580+02	.55335-01	.42776-02	.78356-01	.19416-01		.27472-01	.55361-01
25, 30	3/ 2	.13581+01	.35726+00	.79580+02	.55335-01	.42776-02	.78356-01	.19416-01		.27472-01	.55361-01
30, 34	4/ 2	.13388+01	.35726+00	.79580+02	.55335-01	.42776-02	.78356-01	.19416-01		.27472-01	.55361-01
34, 39	5/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
39, 43	6/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
43, 47	7/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
47, 51	8/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
51, 54	9/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
54, 57	10/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
57, 60	11/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
60, 63	12/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
63, 67	13/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
67, 71	14/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
71, 74	15/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
74, 77	16/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
77, 80	17/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
80, 83	18/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
83, 88	19/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
88, 93	20/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
93, 97	21/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
97, 101	22/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
101, 105	23/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
105, 109	24/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
109, 113	25/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
113, 118	26/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
118, 123	27/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
123, 127	28/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
127, 131	29/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
131, 135	30/ 3	.13502+01	.36148+00	.92699+02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
135, 140	31/ 4	.17373+01	.23365+00	.32680-03	.10360-01	.00000	.00000	.35636-01		.36087-01	.10377-01
TOTAL OF ALL REGIONS		1.32516227+19	3.60493340+18	1.71514126+19	4.65904920+18	1.606979760+15	2.20963320+14				

STIT BNWGL ***SAMPLE CASE***

ELAPSED TIME FROM START OF CASE 40.479 SEC

TIME STEP NO.	11	TIME	.5000-00	DELTA T =	.5000-01
REACTIVITY (TIME STEP 10) = .3256-02					
ROD-TRAVEL-DISTANCE = .3185+03					
RELATIVE POWER (TIME STEP 10) = .2236+01					
P SGRD WT DOP COEF	FLUX SGR WTD DOP COEF	VOL WTD TEMP	SUM OF POWER*VOL	SUM OF VOLUMES	
1.9770311-01	1.9677551-01	-7.1525574-07	5.9295335+10	2.0681639+04	
PEAK TO AVERAGE POWER (TIME STEP 10)					
.2980+01	.2746+01	.2621+01	.2224+01	.2117+01	.2038+01
.1904+01	.1845+01	.1631+01	.1503+01	.1443+01	.1358+01
.1152+01	.1058+01	.7920-00	.5294-00	.4022-00	.2857-00
.0000					.1968+01
					.1251+01
					.2254-00
IODINE CONCENTRATION					
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000					
XENON CONCENTRATION					
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000					
COOLANT TEMPERATURE					
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000					
FUEL TEMPERATURE					
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000					

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL 1 INTO 2	TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2		GROUP 1	GROUP 2
0, 18	1/ 1	.13593+01	.35973+00	.87364-02	.61707-01	.42802-02	.82718-01	.18512-01	.27346-01	.61733-01
18, 25	2/ 2	.13580+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
25, 30	3/ 2	.13580+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
30, 34	4/ 2	.13580+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361-01
34, 39	5/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
39, 43	6/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
43, 47	7/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
47, 51	8/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
51, 54	9/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
54, 57	10/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
57, 60	11/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
60, 63	12/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
63, 67	13/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
67, 71	14/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
71, 74	15/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
74, 77	16/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
77, 80	17/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
80, 83	18/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
83, 88	19/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
88, 93	20/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
93, 97	21/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
97, 101	22/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
101, 105	23/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
105, 109	24/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
109, 113	25/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
113, 118	26/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
118, 123	27/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
123, 127	28/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
127, 131	29/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
131, 135	30/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100-01
135, 140	31/ 4	.17373+01	.23565+00	.32680-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01
TOTAL OF ALL REGIONS		2.02080140+19	5.50384420+18	2.61526500+19	7.11292600+18	2.28645750+15	2.63437110+14			

STIT BNWGL ***SAMPLE CASE***

ELAPSED TIME FROM START OF CASE 43.169 SEC

TIME STEP NO. 13 TIME .6000-00 DELTA T = .5000-01

REACTIVITY (TIME STEP 12) = .4506-02

ROD-TRAVEL-DISTANCE = .3091+03

RELATIVE POWER (TIME STEP 12) = .6304+01

P SGRD WT DOP COEF FLUX SGR WTD DOP COEF VOL WTD TEMP SUM OF POWER*VOL SUM OF VOLUMES
 -3.7688202+00 -3.7463200+00 -2.3841858-07 1.6713434+11 2.0681639+04
 PEAK TO AVERAGE POWER (TIME STEP 12)
 .3602+01 .3253+01 .3209+01 .2629+01 .2399+01 .2248+01 .2141+01 .2048+01
 .1966+01 .1892+01 .1808+01 .1635+01 .1488+01 .1421+01 .1328+01 .1215+01
 .1111+01 .1019+01 .9258-00 .7504-00 .6295-00 .4970-00 .3763-00 .2667-00 .2099-00

IODINE CONCENTRATION
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000

XENON CONCENTRATION
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000

COOLANT TEMPERATURE
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

FUEL TEMPERATURE
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL 1 INTO 2	TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2		GROUP 1	GROUP 2
0, 18	1/ 1	.1359+01	.35897+00	.85009-02	.59779-01	.42795-02	.81398+01	.18786-01	.27384+01	.59805+01
18, 25	2/ 2	.1359+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19415-01	.27472-01	.55361-01
25, 30	3/ 3	.1358+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19415-01	.27472-01	.55361-01
30, 34	4/ 2	.1358+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19415-01	.27472-01	.55361-01
34, 39	5/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
39, 43	6/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
43, 47	7/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
47, 51	8/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
51, 54	9/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
54, 57	10/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
57, 60	11/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
60, 63	12/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
63, 67	13/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
67, 71	14/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
71, 74	15/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
74, 77	16/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
77, 80	17/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
80, 83	18/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
83, 86	19/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
86, 89	20/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
89, 93	21/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
93, 97	22/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
97, 101	23/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
101, 105	24/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
105, 109	25/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
109, 113	26/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
113, 118	27/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
118, 123	28/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
123, 127	29/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
127, 131	30/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
131, 135	31/ 3	.1350+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707+01	.17893-01	.27261-01	.66100+01
135, 140	31/ 4	.1737+01	.23565+00	.32880-03	.10360-01	.00000	.00000	.35636+01	.36087-01	.10377-01
TOTAL OF ALL REGIONS		5.79072160+19	1.57948841+19	7.49249460+19	2.04114520+19	5.97347440+15	4.65063420+14			

*****REACTIVITY WITHIN 0.001 OF RHOIN, CHANGE TO SMALL TIME STEPS.*****
 *****NSTEP = 13

STIT BNWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 98.137 SEC

TIME STEP NO. 63 TIME .7000-00 DELTA T = .2000-02

REACTIVITY (TIME STEP 62) = .6528-02

ROD-TRAVEL-DISTANCE = .2996+03

RELATIVE POWER (TIME STEP 62) = .8065+03

P SGRD WT DOP COEF FLUX SGR WTD DOP COEF VOL WTD TEMP SUM OF POWER*VOL SUM OF VOLUMES
 2.7177442+00 2.6899301+00 2.5272369-05 2.1381928+13 2.0641639+04
 PEAK TO AVERAGE POWER (TIME STEP 62)
 .4596+01 .4054+01 .3905+01 .3569+01 .2659+01 .2440+01 .2290+01 .2163+01
 .2053+01 .1956+01 .1849+01 .1635+01 .1463+01 .1347+01 .1283+01 .1160+01
 .1050+01 .9512-00 .8610-00 .6886-00 .5735-00 .4494-00 .3383-00 .2388-00 .1872-00

IODINE CONCENTRATION

-.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000

XENON CONCENTRATION

.0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000

COOLANT TEMPERATURE

.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

FUEL TEMPERATURE

.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1		GROUP 1		GROUP 1		GROUP 1		GROUP 1	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2
0, 18	1/ 1	.13286+01	.35848+00	.83481-02	.58528-01	.42790-02	.80542-01	.18963-01	.27409-01	.58554+01	
18, 25	2/ 2	.13358+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361+01	
25, 30	3/ 2	.13380+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361+01	
30, 34	4/ 2	.13381+01	.35726+00	.79580-02	.55335-01	.42776-02	.78356-01	.19416-01	.27472-01	.55361+01	
34, 39	5/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
39, 43	6/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
43, 47	7/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
47, 51	8/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
51, 54	9/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
54, 57	10/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
57, 60	11/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
60, 63	12/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
63, 67	13/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
67, 71	14/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
71, 74	15/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
74, 77	16/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
77, 80	17/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
80, 83	18/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
83, 88	19/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
88, 93	20/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
93, 97	21/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
97, 101	22/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
101, 105	23/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
105, 109	24/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
109, 113	25/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
113, 118	26/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
118, 123	27/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
123, 127	28/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
127, 131	29/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
131, 135	30/ 3	.13502+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01	.27261-01	.66100+01	
135, 140	31/ 4	.17373+01	.23565+00	.32680+03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01	
TOTAL OF ALL REGIONS		7.59295750+21	2.07386870+21	9.82351850+21	2.67973250+21	6.58473300+17	-1.15691910+15				

STIT BINWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 152.962 SEC

TIME STEP NO. 113 TIME .8000-00 DELTA T = .2000-02

REACTIVITY (TIME STEP 112) = .7339-02

ROD-TRAVEL-DISTANCE = .2902+03

RELATIVE POWER (TIME STEP 112) = .1955+06

P SGRD WT DOP COEF FLUX SGR WTD DOP COEF VOL WTD TEMP SUM OF POWER*VOL SUM OF VOLUMES
 2.4582308+00 2.4298533+00 4.7547817-03 5.1840879+15 2.0681639+04
 PEAK TO AVERAGE POWER (TIME STEP 112)
 .4985+01 .4364+01 .4272+01 .4190+01 .3787+01 .3143+01 .2753+01 .2508+01 .2342+01 .2203+01
 .2083+01 .1977+01 .1862+01 .1740+01 .1634+01 .1539+01 .1482+01 .1373+01 .1266+01 .1139+01
 .1028+01 .9277-00 .8373-00 .7547-00 .6666-00 .5534-00 .4324-00 .3249-00 .2289+00 .1791-00

IODINE CONCENTRATION

-.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000

XENON CONCENTRATION

.0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000

COOLANT TEMPERATURE

.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

FUEL TEMPERATURE

.5505+03 .5503+03 .5503+03 .5503+03 .5501+03 .5499+03 .5498+03 .5498+03 .5497+03 .5497+03
 .5496+03 .5496+03 .5495+03 .5495+03 .5495+03 .5495+03 .5494+03 .5494+03 .5494+03 .5494+03
 .5493+03 .5493+03 .5493+03 .5492+03 .5492+03 .5492+03 .5491+03 .5491+03 .5491+03 .5491+03

POINT(S) (1 TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.1385+01	.3820+00	.8225-02	.57828-01	.42787-02	.80062-01	.19053-01		.27423-01	.57853-01
18, 25	2/ 2	.1380+01	.3726+00	.7980-02	.55335-01	.42776-02	.78356-01	.19416-01		.27472-01	.55361-01
25, 30	3/ 3	.1380+01	.3726+00	.7980-02	.55335-01	.42776-02	.78356-01	.19416-01		.27472-01	.55361-01
30, 34	4/ 2	.1380+01	.3726+00	.7980-02	.55335-01	.42776-02	.78356-01	.19416-01		.27472-01	.55361-01
34, 39	5/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
39, 43	6/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
43, 47	7/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
47, 51	8/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
51, 54	9/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
54, 57	10/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
57, 60	11/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
60, 63	12/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
63, 67	13/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
67, 71	14/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
71, 74	15/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
74, 77	16/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
77, 80	17/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
80, 83	18/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
83, 88	19/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
88, 93	20/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
93, 97	21/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
97, 101	22/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
101, 105	23/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
105, 109	24/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
109, 113	25/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
113, 118	26/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
118, 123	27/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
123, 127	28/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
127, 131	29/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
131, 135	30/ 3	.1360+01	.36148+00	.92699-02	.66074-01	.42816-02	.85707-01	.17893-01		.27261-01	.66100-01
135, 140	31/ 4	.17373+01	.23565+00	.32880-03	.10360-01	.00000	.00000	.35636+01		.36087+01	.10377-01
TOTAL OF ALL REGIONS		1.85749110+24	5.07459750+23	2.40298520+24	6.55677850+23	1.49199540+20	-6.44506860+18				

POINT(S) (1 TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.13583+01	.35793+00	.83925+02	.57127-01	.42785+02	.79583+01	.18996+01		.27486+01	.57153+01
18, 25	2/ 2	.13580+01	.35726+00	.81477+02	.55335-01	.42776+02	.78356+01	.19270+01		.27515+01	.55361+01
25, 30	3/ 2	.13580+01	.35726+00	.81438+02	.55335-01	.42776+02	.78356+01	.19276+01		.27514+01	.55361+01
30, 34	4/ 2	.13580+01	.35726+00	.81403+02	.55335-01	.42776+02	.78356+01	.19276+01		.27514+01	.55361+01
34, 39	5/ 3	.13502+01	.36148+00	.94348+02	.66074-01	.42816+02	.85707+01	.17666+01		.27299+01	.66100+01
39, 43	6/ 3	.13502+01	.36148+00	.94076+02	.66074-01	.42816+02	.85707+01	.17787+01		.27292+01	.66100+01
43, 47	7/ 3	.13502+01	.36148+00	.93912+02	.66074-01	.42816+02	.85707+01	.17800+01		.27289+01	.66100+01
47, 51	8/ 3	.13502+01	.36148+00	.93809+02	.66074-01	.42816+02	.85707+01	.17808+01		.27286+01	.66100+01
51, 54	9/ 3	.13502+01	.36148+00	.93739+02	.66074-01	.42816+02	.85707+01	.17813+01		.27285+01	.66100+01
54, 57	10/ 3	.13502+01	.36148+00	.93681+02	.66074-01	.42816+02	.85707+01	.17818+01		.27283+01	.66100+01
57, 60	11/ 3	.13502+01	.36148+00	.93631+02	.66074-01	.42816+02	.85707+01	.17821+01		.27282+01	.66100+01
60, 63	12/ 3	.13502+01	.36148+00	.93587+02	.66074-01	.42816+02	.85707+01	.17825+01		.27281+01	.66100+01
63, 67	13/ 3	.13502+01	.36148+00	.93538+02	.66074-01	.42816+02	.85707+01	.17829+01		.27280+01	.66100+01
67, 71	14/ 3	.13502+01	.36148+00	.93486+02	.66074-01	.42816+02	.85707+01	.17833+01		.27279+01	.66100+01
71, 74	15/ 3	.13502+01	.36148+00	.93441+02	.66074-01	.42816+02	.85707+01	.17836+01		.27278+01	.66100+01
74, 77	16/ 3	.13502+01	.36148+00	.93401+02	.66074-01	.42816+02	.85707+01	.17839+01		.27277+01	.66100+01
77, 80	17/ 3	.13502+01	.36148+00	.93364+02	.66074-01	.42816+02	.85707+01	.17842+01		.27276+01	.66100+01
80, 83	18/ 3	.13502+01	.36148+00	.93330+02	.66074-01	.42816+02	.85707+01	.17845+01		.27275+01	.66100+01
83, 86	19/ 3	.13502+01	.36148+00	.93284+02	.66074-01	.42816+02	.85707+01	.17848+01		.27274+01	.66100+01
86, 93	20/ 3	.13502+01	.36148+00	.93229+02	.66074-01	.42816+02	.85707+01	.17852+01		.27273+01	.66100+01
93, 97	21/ 3	.13502+01	.36148+00	.93180+02	.66074-01	.42816+02	.85707+01	.17856+01		.27272+01	.66100+01
97, 101	22/ 3	.13502+01	.36148+00	.93136+02	.66074-01	.42816+02	.85707+01	.17860+01		.27271+01	.66100+01
101, 105	23/ 3	.13502+01	.36148+00	.93093+02	.66074-01	.42816+02	.85707+01	.17863+01		.27270+01	.66100+01
105, 109	24/ 3	.13502+01	.36148+00	.93058+02	.66074-01	.42816+02	.85707+01	.17866+01		.27269+01	.66100+01
109, 113	25/ 3	.13502+01	.36148+00	.93017+02	.66074-01	.42816+02	.85707+01	.17869+01		.27268+01	.66100+01
113, 118	26/ 3	.13502+01	.36148+00	.92985+02	.66074-01	.42816+02	.85707+01	.17873+01		.27267+01	.66100+01
118, 123	27/ 3	.13502+01	.36148+00	.92908+02	.66074-01	.42816+02	.85707+01	.17877+01		.27266+01	.66100+01
123, 127	28/ 3	.13502+01	.36148+00	.92857+02	.66074-01	.42816+02	.85707+01	.17881+01		.27264+01	.66100+01
127, 131	29/ 3	.13502+01	.36148+00	.92811+02	.66074-01	.42816+02	.85707+01	.17885+01		.27263+01	.66100+01
131, 135	30/ 3	.13502+01	.36148+00	.92787+02	.66074-01	.42816+02	.85707+01	.17888+01		.27263+01	.66100+01
135, 140	31/ 4	.17373+01	.23565+00	.32680+03	.10360+01	.00000	.00000	.35636+01		.36087+01	.10377+01

TOTAL OF ALL REGIONS 9.9184840+25 2.71331330+25 1.28320841+26 3.50535/40+25 8.12436200+21 -5.34072590+20

*****BOOM SWE GOES *****

TRIP OCCURRED AT TIME .81 (ALL RODS IN ROD BANK 2 ACTIVATED AT THIS TIME)

SCRAM WILL OCCUR AT 2.808568 SECONDS.

ELAPSED TIME FROM START OF CASE 266.709 SEC

STIT BNWIGL ***SAMPLE CASE*****

TIME STEP NO.	213	TIME	.1000+01	DELTA T =	.2000-02
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REACTIVITY (TIME STEP 212) = .2999-02

ROD-TRAVEL-DISTANCE = .2713+03

RELATIVE POWER (TIME STEP 212) = .8465+06

[illegible]

IODINE CONCENTRATION

XENON CONCENTRATION	
.0000	.0000
.0000	.0000
.0000	.0000
.0000	.0000
.0000	.0000

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COOLANT TEMPERATURE
.5490+03
.5490+03
.5490+03
.5490+03
.0000

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FUEL TEMPERATURE
: 1004+04 .9457+33
: 7379+03 .7288+33
: 6460+03 .6371+33
: 0000

.7750+03	.7604+03	.7483+03
.6764+03	.6671+03	.6559+03
.5809+03	.5715+03	.5667+03

.7966+03	.7750+03	.7604+03
.6833+03	.6764+03	.6671+03
.5912+03	.5809+03	.5715+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL 1 INTO 2	TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2		GROUP 1	GROUP 2
0, 18	1/ 1	.13582+01	.35771+00	.83787-02	.56578-01	.42783-02	.79207+01	.19033-01	.27509+01	.96604-01
18, 25	2/ 2	.13581+01	.35726+00	.81950-02	.55335-01	.42776-02	.78356+01	.19234-01	.27526+01	.95361-01
25, 30	3/ 2	.13580+01	.35726+00	.81901-02	.55335-01	.42776-02	.78356+01	.19237-01	.27525+01	.95361-01
30, 34	4/ 2	.13581+01	.35726+00	.81898-02	.55335-01	.42776-02	.78356+01	.19241-01	.27524+01	.95361-01
34, 39	5/ 3	.13602+01	.36148+00	.94762-02	.66074-01	.42816-02	.85707+01	.17734-01	.27308+01	.66100-01
39, 43	6/ 3	.13602+01	.36148+00	.94428-02	.66074-01	.42816-02	.85707+01	.17760-01	.27300+01	.66100-01
43, 47	7/ 3	.13602+01	.36148+00	.94223-02	.66074-01	.42816-02	.85707+01	.17776-01	.27296+01	.66100-01
47, 51	8/ 3	.13602+01	.36148+00	.94097-02	.66074-01	.42816-02	.85707+01	.17785-01	.27293+01	.66100-01
51, 54	9/ 3	.13602+01	.36148+00	.94011-02	.66074-01	.42816-02	.85707+01	.17792-01	.27291+01	.66100-01
54, 57	10/ 3	.13602+01	.36148+00	.93939-02	.66074-01	.42816-02	.85707+01	.17798-01	.27289+01	.66100-01
57, 60	11/ 3	.13602+01	.36148+00	.93877-02	.66074-01	.42816-02	.85707+01	.17802-01	.27288+01	.66100-01
60, 63	12/ 3	.13602+01	.36148+00	.93822-02	.66074-01	.42816-02	.85707+01	.17807-01	.27287+01	.66100-01
63, 67	13/ 3	.13602+01	.36148+00	.93762-02	.66074-01	.42816-02	.85707+01	.17811-01	.27285+01	.66100-01
67, 71	14/ 3	.13602+01	.36148+00	.93698-02	.66074-01	.42816-02	.85707+01	.17818-01	.27284+01	.66100-01
71, 74	15/ 3	.13602+01	.36148+00	.93643-02	.66074-01	.42816-02	.85707+01	.17820-01	.27282+01	.66100-01
74, 77	16/ 3	.13602+01	.36148+00	.93593-02	.66074-01	.42816-02	.85707+01	.17824-01	.27281+01	.66100-01
77, 80	17/ 3	.13602+01	.36148+00	.93547-02	.66074-01	.42816-02	.85707+01	.17828-01	.27280+01	.66100-01
80, 83	18/ 3	.13602+01	.36148+00	.93504-02	.66074-01	.42816-02	.85707+01	.17831-01	.27279+01	.66100-01
83, 88	19/ 3	.13602+01	.36148+00	.93447-02	.66074-01	.42816-02	.85707+01	.17836-01	.27278+01	.66100-01
88, 93	20/ 3	.13602+01	.36148+00	.93378-02	.66074-01	.42816-02	.85707+01	.17841-01	.27276+01	.66100-01
93, 97	21/ 3	.13602+01	.36148+00	.93317-02	.66074-01	.42816-02	.85707+01	.17848-01	.27275+01	.66100-01
97, 101	22/ 3	.13602+01	.36148+00	.93261-02	.66074-01	.42816-02	.85707+01	.17850-01	.27274+01	.66100-01
101, 105	23/ 3	.13602+01	.36148+00	.93210-02	.66074-01	.42816-02	.85707+01	.17853-01	.27272+01	.66100-01
105, 109	24/ 3	.13602+01	.36148+00	.93162-02	.66074-01	.42816-02	.85707+01	.17858-01	.27271+01	.66100-01
109, 113	25/ 3	.13602+01	.36148+00	.93111-02	.66074-01	.42816-02	.85707+01	.17861-01	.27270+01	.66100-01
113, 118	26/ 3	.13602+01	.36148+00	.93044-02	.66074-01	.42816-02	.85707+01	.17867-01	.27269+01	.66100-01
118, 123	27/ 3	.13602+01	.36148+00	.92971-02	.66074-01	.42816-02	.85707+01	.17872-01	.27267+01	.66100-01
123, 127	28/ 3	.13602+01	.36148+00	.92905-02	.66074-01	.42816-02	.85707+01	.17877-01	.27265+01	.66100-01
127, 131	29/ 3	.13602+01	.36148+00	.92845-02	.66074-01	.42816-02	.85707+01	.17882-01	.27264+01	.66100-01
131, 135	30/ 3	.13602+01	.36148+00	.92814-02	.66074-01	.42816-02	.85707+01	.17884-01	.27263+01	.66100-01
135, 140	31/ 4	.17373+01	.23565+00	.32680-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01
TOTAL OF ALL REGIONS		7.90966010+24	2.15982370+24	1.02324573+25	2.79016330+24	6.23697830+20	-5.91336440+19			

STIT BNWICL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 320.106 SEC

TIME STEP NO. 263 TIME .1100+01 DELTA T = .2000-02

REACTIVITY (TIME STEP 262) = .2904-02

ROD-TRAVEL-DISTANCE = .2618+03

RELATIVE POWER (TIME STEP 262) = .7676+06

P	SGRD	WT DOP	COEF	FLUX	SGR	WTD	DOP	COEF	VOL	WTD	TEMP	SUM	OF	POWER	VOL	SUM	OF	VOLUMES
2.2762983+00				2.2495413+00					1.5423069+00			2.0350447+16				2.0681639+04		
PEAK TO AVERAGE POWER (TIME STEP 262)																		
.4955+01				.4185+01					.3641+01			.2983+01				.2375+01		
.1988+01				.1824+01					.1591+01			.1507+01				.1360+01		
.1049+01				.9562-00					.7053-00			.5921-00				.3548-00		
.0000																		
IODINE CONCENTRATION																		
-.0000				-.0000					-.0000			-.0000				-.0000		
-.0000				-.0000					-.0000			-.0000				-.0000		
-.0000				-.0000					-.0000			-.0000				-.0000		
-.0000				-.0000					-.0000			-.0000				-.0000		
XENON CONCENTRATION																		
.0000				.0000					.0000			.0000				.0000		
.0000				.0000					.0000			.0000				.0000		
.0000				.0000					.0000			.0000				.0000		
.0000				.0000					.0000			.0000				.0000		
COOLANT TEMPERATURE																		
.5490+03				.5490+03					.5490+03			.5490+03				.5490+03		
.5490+03				.5490+03					.5490+03			.5490+03				.5490+03		
.5490+03				.5490+03					.5490+03			.5490+03				.5490+03		
.0000				.0000					.0000			.0000				.0000		
FUEL TEMPERATURE																		
.1040+04				.9766+03					.9169+03			.8531+03				.7923+03		
.7524+03				.7319+03					.7107+03			.7019+03				.6864+03		
.6537+03				.6453+03					.6184+03			.6070+03				.5834+03		
.0000				.0000					.0000			.0000				.0000		

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.13582+01	.35762+00	.83675-02	.56344-01	.42782-02	.79047-01	.19052-01	.27517-01	.56370-01	.56370-01
18, 25	2/ 2	.13580+01	.35726+00	.82103-02	.55335-01	.42776-02	.78356-01	.19222-01	.27530-01	.55361-01	.55361-01
25, 30	3/ 2	.13580+01	.35726+00	.82051-02	.55335-01	.42776-02	.78356-01	.19226-01	.27288-01	.55361-01	.55361-01
30, 34	4/ 2	.13580+01	.35726+00	.82003-02	.55335-01	.42776-02	.78356-01	.19229-01	.27527-01	.55361-01	.55361-01
34, 39	5/ 3	.13502+01	.36148+00	.94895-02	.66074-01	.42816-02	.85707-01	.17724-01	.27311-01	.66100-01	.66100-01
39, 43	6/ 3	.13502+01	.36148+00	.94533-02	.66074-01	.42816-02	.85707-01	.17752-01	.27303-01	.66100-01	.66100-01
43, 47	7/ 3	.13502+01	.36148+00	.94322-02	.66074-01	.42816-02	.85707-01	.17768-01	.27298-01	.66100-01	.66100-01
47, 51	8/ 3	.13502+01	.36148+00	.94189-02	.66074-01	.42816-02	.85707-01	.17778-01	.27295-01	.66100-01	.66100-01
51, 54	9/ 3	.13502+01	.36148+00	.94097-02	.66074-01	.42816-02	.85707-01	.17786-01	.27293-01	.66100-01	.66100-01
54, 57	10/ 3	.13502+01	.36148+00	.94020-02	.66074-01	.42816-02	.85707-01	.17791-01	.27291-01	.66100-01	.66100-01
57, 60	11/ 3	.13502+01	.36148+00	.93958-02	.66074-01	.42816-02	.85707-01	.17796-01	.27290-01	.66100-01	.66100-01
60, 63	12/ 3	.13502+01	.36148+00	.93898-02	.66074-01	.42816-02	.85707-01	.17801-01	.27288-01	.66100-01	.66100-01
63, 67	13/ 3	.13502+01	.36148+00	.93833-02	.66074-01	.42816-02	.85707-01	.17806-01	.27287-01	.66100-01	.66100-01
67, 71	14/ 3	.13502+01	.36148+00	.93765-02	.66074-01	.42816-02	.85707-01	.17811-01	.27285-01	.66100-01	.66100-01
71, 74	15/ 3	.13502+01	.36148+00	.93708-02	.66074-01	.42816-02	.85707-01	.17816-01	.27284-01	.66100-01	.66100-01
74, 77	16/ 3	.13502+01	.36148+00	.93653-02	.66074-01	.42816-02	.85707-01	.17820-01	.27283-01	.66100-01	.66100-01
77, 80	17/ 3	.13502+01	.36148+00	.93604-02	.66074-01	.42816-02	.85707-01	.17823-01	.27282-01	.66100-01	.66100-01
80, 83	18/ 3	.13502+01	.36148+00	.93559-02	.66074-01	.42816-02	.85707-01	.17827-01	.27281-01	.66100-01	.66100-01
83, 88	19/ 3	.13502+01	.36148+00	.93498-02	.66074-01	.42816-02	.85707-01	.17832-01	.27279-01	.66100-01	.66100-01
88, 93	20/ 3	.13502+01	.36148+00	.93425-02	.66074-01	.42816-02	.85707-01	.17837-01	.27277-01	.66100-01	.66100-01
93, 97	21/ 3	.13502+01	.36148+00	.93360-02	.66074-01	.42816-02	.85707-01	.17842-01	.27276-01	.66100-01	.66100-01
97, 101	22/ 3	.13502+01	.36148+00	.93300-02	.66074-01	.42816-02	.85707-01	.17847-01	.27275-01	.66100-01	.66100-01
101, 105	23/ 3	.13502+01	.36148+00	.93243-02	.66074-01	.42816-02	.85707-01	.17851-01	.27273-01	.66100-01	.66100-01
105, 109	24/ 3	.13502+01	.36148+00	.93195-02	.66074-01	.42816-02	.85707-01	.17855-01	.27272-01	.66100-01	.66100-01
109, 113	25/ 3	.13502+01	.36148+00	.93140-02	.66074-01	.42816-02	.85707-01	.17859-01	.27271-01	.66100-01	.66100-01
113, 118	26/ 3	.13502+01	.36148+00	.93065-02	.66074-01	.42816-02	.85707-01	.17865-01	.27269-01	.66100-01	.66100-01
118, 123	27/ 3	.13502+01	.36148+00	.92991-02	.66074-01	.42816-02	.85707-01	.17871-01	.27267-01	.66100-01	.66100-01
123, 127	28/ 3	.13502+01	.36148+00	.92920-02	.66074-01	.42816-02	.85707-01	.17876-01	.27266-01	.66100-01	.66100-01
127, 131	29/ 3	.13502+01	.36148+00	.92858-02	.66074-01	.42816-02	.85707-01	.17881-01	.27264-01	.66100-01	.66100-01
131, 135	30/ 3	.13502+01	.36148+00	.92822-02	.66074-01	.42816-02	.85707-01	.17884-01	.27264-01	.66100-01	.66100-01
135, 140	31/ 4	.17373+01	.23565-00	.32680-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01	.10377-01
TOTAL OF ALL REGIONS		7.18025480+24	1.96069330+24	9.28868170+24	2.53285680+24	5.54109860+20	-6.15184540+19				

STIT BNWGL ***SAMPLE CASE*****

ELAPSED TIME FROM START OF CASE 390.772 SEC

TIME STEP NO. 313 TIME .1200+01 DELTA T = .2000-02

REACTIVITY (TIME STEP 312) = .2845-02

ROD-TRAVEL-DISTANCE = .2524+03

RELATIVE POWER (TIME STEP 312) = .7267+06

P SGRS HT DOP COEF 2.2872522+00 FLUX SGR WTD DOP COEF 2.2594755+00

PEAK TO AVERAGE POWER (TIME STEP 312)	VOL WTD TEMP 1.6444035+00	SUM OF POWER*VOL 1.9266003+16	SUM OF VOLUMES 2.0661639+04
.5050+01	.3686+01	.2619+01	.2227+01
.1989+01	.1588+01	.1427+01	.1261+01
.1045+01	.7022-00	.4659-00	.2508-00
.0000			

IODINE CONCENTRATION

-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000
-.0000			

XENON CONCENTRATION

.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000
.0000			

COOLANT TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03
.0000			

FUEL TEMPERATURE

.1074+04	.9869+03	.8333+03	.7917+03
.7659+03	.7320+03	.7035+03	.6849+03
.6608+03	.6325+03	.5978+03	.5751+03
.0000			

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	2	GROUP 1	GROUP 2
0, 18	1/ 1	.13581+01	.35753-00	.83551-02	.56111-01	.42781-02	.78887-01	.19073-01		.27526-01	.56136-01
18, 25	2/ 2	.13580+01	.35726-00	.82246-02	.55335-01	.42776-02	.78356-01	.19211-01		.27533-01	.55361-01
25, 30	3/ 3	.13580+01	.35726-00	.82191-02	.55335-01	.42776-02	.78356-01	.19211-01		.27532-01	.55361-01
30, 34	4/ 4	.13581+01	.35726-00	.82141-02	.55335-01	.42776-02	.78356-01	.19211-01		.27531-01	.55361-01
34, 39	5/ 5	.13580+01	.36148-00	.95018-02	.66074-01	.42816-02	.85707-01	.17713-01		.27314-01	.66100-01
39, 43	6/ 6	.13580+01	.36148-00	.94641-02	.66074-01	.42816-02	.85707-01	.17744-01		.27305-01	.66100-01
43, 47	7/ 7	.13580+01	.36148-00	.94414-02	.66074-01	.42816-02	.85707-01	.17761-01		.27300-01	.66100-01
47, 51	8/ 8	.13580+01	.36148-00	.94272-02	.66074-01	.42816-02	.85707-01	.17772-01		.27297-01	.66100-01
51, 54	9/ 9	.13580+01	.36148-00	.94176-02	.66074-01	.42816-02	.85707-01	.17776-01		.27295-01	.66100-01
54, 57	10/ 10	.13580+01	.36148-00	.94095-02	.66074-01	.42816-02	.85707-01	.17786-01		.27293-01	.66100-01
57, 60	11/ 11	.13580+01	.36148-00	.94026-02	.66074-01	.42816-02	.85707-01	.17791-01		.27291-01	.66100-01
60, 63	12/ 12	.13580+01	.36148-00	.93965-02	.66074-01	.42816-02	.85707-01	.17796-01		.27290-01	.66100-01
63, 67	13/ 13	.13580+01	.36148-00	.93898-02	.66074-01	.42816-02	.85707-01	.17801-01		.27288-01	.66100-01
67, 71	14/ 14	.13580+01	.36148-00	.93827-02	.66074-01	.42816-02	.85707-01	.17805-01		.27287-01	.66100-01
71, 74	15/ 15	.13580+01	.36148-00	.93765-02	.66074-01	.42816-02	.85707-01	.17811-01		.27285-01	.66100-01
74, 77	16/ 16	.13580+01	.36148-00	.93709-02	.66074-01	.42816-02	.85707-01	.17815-01		.27284-01	.66100-01
77, 80	17/ 17	.13580+01	.36148-00	.93657-02	.66074-01	.42816-02	.85707-01	.17819-01		.27283-01	.66100-01
80, 83	18/ 18	.13580+01	.36148-00	.93610-02	.66074-01	.42816-02	.85707-01	.17823-01		.27282-01	.66100-01
83, 86	19/ 19	.13580+01	.36148-00	.93545-02	.66074-01	.42816-02	.85707-01	.17828-01		.27280-01	.66100-01
86, 93	20/ 20	.13580+01	.36148-00	.93488-02	.66074-01	.42816-02	.85707-01	.17834-01		.27278-01	.66100-01
93, 97	21/ 21	.13580+01	.36148-00	.93399-02	.66074-01	.42816-02	.85707-01	.17839-01		.27277-01	.66100-01
97, 101	22/ 22	.13580+01	.36148-00	.93336-02	.66074-01	.42816-02	.85707-01	.17844-01		.27275-01	.66100-01
101, 105	23/ 23	.13580+01	.36148-00	.93279-02	.66074-01	.42816-02	.85707-01	.17849-01		.27274-01	.66100-01
105, 109	24/ 24	.13580+01	.36148-00	.93225-02	.66074-01	.42816-02	.85707-01	.17853-01		.27273-01	.66100-01
109, 113	25/ 25	.13580+01	.36148-00	.93167-02	.66074-01	.42816-02	.85707-01	.17857-01		.27272-01	.66100-01
113, 118	26/ 26	.13580+01	.36148-00	.93092-02	.66074-01	.42816-02	.85707-01	.17861-01		.27270-01	.66100-01
118, 123	27/ 27	.13580+01	.36148-00	.93009-02	.66074-01	.42816-02	.85707-01	.17863-01		.27268-01	.66100-01
123, 127	28/ 28	.13580+01	.36148-00	.92934-02	.66074-01	.42816-02	.85707-01	.17873-01		.27266-01	.66100-01
127, 131	29/ 29	.13580+01	.36148-00	.92866-02	.66074-01	.42816-02	.85707-01	.17880-01		.27265-01	.66100-01
131, 135	30/ 30	.13580+01	.36148-00	.92830-02	.66074-01	.42816-02	.85707-01	.17883-01		.27264-01	.66100-01
135, 140	31/ 31	.17373+01	.23565-00	.32680-03	.10360-01	.00000	.00000	.35636-01		.36087-01	.10377-01
TOTAL OF ALL REGIONS		6.80675530+24	1.85874720+24	8.80455770+24	2.40110230+24	5.13032590+20	-6.61420470+19				

ST11 RNW1GL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 453.981 SEC

TIME STEP NO. 363 TIME .1300+01 DELTA T = .2000-02

REACTIVITY (TIME STEP 362) = .2803-02

ROD-TRAVEL-DISTANCE = .2429+03

RELATIVE POWER (TIME STEP 362) = .7006+06

P SRD WT DOP COEF	FLUX SGR WTD DOP COEF	VOL WTD TEMP	SUM OF POWER*VOL	SUM OF VOLUMES
2.2995310+00	2.2707028+00	1.7417097+00	1.8574977+16	2.0681639+04
PEAK TO AVERAGE POWER (TIME STEP 362)				
.5146+01	.4322+01	.3731+01	.2633+01	.2393+01
.1991+01	.1793+01	.1585+01	.1423+01	.1352+01
.1040+01	.8631-00	.6988-00	.4636-00	.3516-00
.0000				.2102+01
				.1142+01
				.1968-00
IODINE CONCENTRATION				
-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000
-.0000				
XENON CONCENTRATION				
.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000
.0000				
COOLANT TEMPERATURE				
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000				
FUEL TEMPERATURE				
.1107+04	.1024+04	.9660+03	.8504+03	.7915+03
.7789+03	.7557+03	.7318+03	.7128+03	.6796+03
.6676+03	.6463+03	.6277+03	.6008+03	.5708+03
.0000				

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	2	GROUP 1	GROUP 2
0, 18	1/ 1	.13381+01	.35744+00	.83436-02	.55893-01	.42780-02	.78738-01	.19092-01		.27534-01	.55918-01
18, 25	2/ 2	.13380+01	.35726+00	.82360-02	.55335-01	.42776-02	.78356-01	.19200-01		.27536-01	.55361-01
25, 30	3/ 2	.13380+01	.35726+00	.82322-02	.55335-01	.42776-02	.78356-01	.19205-01		.27535-01	.55361-01
30, 34	4/ 2	.13380+01	.35726+00	.82271-02	.55335-01	.42776-02	.78356-01	.19209-01		.27533-01	.55361-01
34, 39	5/ 3	.13302+01	.35148+00	.95134-02	.66074-01	.42816-02	.85707-01	.17706-01		.27317-01	.66100-01
39, 43	6/ 3	.13302+01	.35148+00	.94737-02	.66074-01	.42816-02	.85707-01	.17736-01		.27308-01	.66100-01
43, 47	7/ 3	.13302+01	.35148+00	.94499-02	.66074-01	.42816-02	.85707-01	.17754-01		.27302-01	.66100-01
47, 51	8/ 3	.13302+01	.35148+00	.94351-02	.66074-01	.42816-02	.85707-01	.17766-01		.27299-01	.66100-01
51, 54	9/ 3	.13302+01	.35148+00	.94250-02	.66074-01	.42816-02	.85707-01	.17774-01		.27296-01	.66100-01
54, 57	10/ 3	.13302+01	.35148+00	.94165-02	.66074-01	.42816-02	.85707-01	.17780-01		.27294-01	.66100-01
57, 60	11/ 3	.13302+01	.35148+00	.94093-02	.66074-01	.42816-02	.85707-01	.17786-01		.27293-01	.66100-01
60, 63	12/ 3	.13302+01	.35148+00	.94029-02	.66074-01	.42816-02	.85707-01	.17791-01		.27291-01	.66100-01
63, 67	13/ 3	.13302+01	.35148+00	.93958-02	.66074-01	.42816-02	.85707-01	.17796-01		.27290-01	.66100-01
67, 71	14/ 3	.13302+01	.35148+00	.93884-02	.66074-01	.42816-02	.85707-01	.17802-01		.27288-01	.66100-01
71, 74	15/ 3	.13302+01	.35148+00	.93819-02	.66074-01	.42816-02	.85707-01	.17807-01		.27286-01	.66100-01
74, 77	16/ 3	.13302+01	.35148+00	.93760-02	.66074-01	.42816-02	.85707-01	.17811-01		.27285-01	.66100-01
77, 80	17/ 3	.13302+01	.35148+00	.93706-02	.66074-01	.42816-02	.85707-01	.17816-01		.27284-01	.66100-01
80, 83	18/ 3	.13302+01	.35148+00	.93657-02	.66074-01	.42816-02	.85707-01	.17819-01		.27283-01	.66100-01
83, 88	19/ 3	.13302+01	.35148+00	.93589-02	.66074-01	.42816-02	.85707-01	.17823-01		.27281-01	.66100-01
88, 93	20/ 3	.13302+01	.35148+00	.93508-02	.66074-01	.42816-02	.85707-01	.17831-01		.27279-01	.66100-01
93, 97	21/ 3	.13302+01	.35148+00	.93436-02	.66074-01	.42816-02	.85707-01	.17836-01		.27278-01	.66100-01
97, 101	22/ 3	.13302+01	.35148+00	.93370-02	.66074-01	.42816-02	.85707-01	.17841-01		.27276-01	.66100-01
101, 105	23/ 3	.13302+01	.35148+00	.93310-02	.66074-01	.42816-02	.85707-01	.17846-01		.27275-01	.66100-01
105, 109	24/ 3	.13302+01	.35148+00	.93253-02	.66074-01	.42816-02	.85707-01	.17850-01		.27273-01	.66100-01
109, 113	25/ 3	.13302+01	.35148+00	.93193-02	.66074-01	.42816-02	.85707-01	.17855-01		.27272-01	.66100-01
113, 118	26/ 3	.13302+01	.35148+00	.93113-02	.66074-01	.42816-02	.85707-01	.17861-01		.27270-01	.66100-01
118, 123	27/ 3	.13302+01	.35148+00	.93026-02	.66074-01	.42816-02	.85707-01	.17868-01		.27268-01	.66100-01
123, 127	28/ 3	.13302+01	.35148+00	.92947-02	.66074-01	.42816-02	.85707-01	.17874-01		.27266-01	.66100-01
127, 131	29/ 3	.13302+01	.35148+00	.92875-02	.66074-01	.42816-02	.85707-01	.17880-01		.27265-01	.66100-01
131, 135	30/ 3	.13302+01	.35148+00	.92838-02	.66074-01	.42816-02	.85707-01	.17883-01		.27264-01	.66100-01
135, 140	31/ 4	.17373+01	.23565+00	.32680-03	.10360-01	.00000	.00000	.35616-01		.36087-01	.10377-01
TOTAL OF ALL REGIONS		6.57052260+24	1.79464330+24	8.49958280+24	2.31823880+24	4.83580360+20	-7.12846740+19				

STIT BNWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 488.424 SEC

TIME STEP NO. 391 TIME .1740+01 DELTA T = .5000-01

REACTIVITY (TIME STEP 390) = .2165-02

ROD-TRAVEL-DISTANCE = .2013+03

RELATIVE POWER (TIME STEP 390) = .5188+06

P SORD	WT DOP COEF	FLUX SQR WTD DOP COEF	VOL WTD TEMP	SUM OF POWER*VOL	SUM OF VOLUMES
2.2845603+00	2.2554418+00	2.0617972+00	1.3754271+16	2.3441639+04	
PEAK TO AVERAGE POWER (TIME STEP 390)					
.5162+01	.4441+01	.4323+01	.4227+01	.2617+01	.2219+01
.1979+01	.1884+01	.1780+01	.1672+01	.1495+01	.1255+01
.1042+01	.9503-00	.8665-00	.7883-00	.5911-00	.3553-00
.0000					.2524-00
					.2089+01
					.1143+01
					.1992-00

IODINE CONCENTRATION

-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000

XENON CONCENTRATION

.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000	.0000

COOLANT TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.0000					

FUEL TEMPERATURE

.1219+04	.1131+04	.1046+04	.9585+03	.8755+03	.8367+03
.8217+03	.8085+03	.7659+03	.7542+03	.7335+03	.7042+03
.6900+03	.6772+03	.6654+03	.6275+03	.5958+03	.5751+03
.0000					

STIT BNWGL ***SAMPLE CASE***

ELAPSED TIME FROM START OF CASE 498.260 SEC

TIME STEP NO. 399 TIME .2140+01 DELTA T = .5000-01

REACTIVITY (TIME STEP 398) = .1556-02

ROD-TRAVEL-DISTANCE = .1635+03

RELATIVE POWER (TIME STEP 398) = .4041+06

P 50RD WT DOP COEF 2.2535789+00
2.2535789+00

PEAK TO AVERAGE POWER (TIME STEP 398)
.5126+01 .4407+01 .4193+01
.196+01 .1873+01 .1772+01
.1046+01 .9557-00 .8721-00
.0000

IODINE CONCENTRATION

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XENON CONCENTRATION

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.0000

COOLANT TEMPERATURE

.5490+03 .5490+03 .5490+03
.5490+03 .5490+03 .5490+03
.5490+03 .5490+03 .5490+03
.0000

FUEL TEMPERATURE

.1302+04 .1202+04
.8536+03 .8390+03
.7070+03 .6927+03
.0000

SUM OF POWER*VOL
1.0713503+16

SUM OF VOLUMES
2.0681639+04

.2988+01 .2594+01 .2358+01 .2202+01 .2074+01
.1492+01 .1418+01 .1349+01 .1257+01 .1146+01
.5970-00 .4733-00 .3597-00 .2558-00 .2020-00

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.5490+03 .5490+03 .5490+03 .5490+03 .5490+03
.5490+03 .5490+03 .5490+03 .5490+03 .5490+03
.5490+03 .5490+03 .5490+03 .5490+03 .5490+03

.1007+04 .9492+03 .9138+03 .8901+03 .8704+03
.778+03 .7664+03 .7558+03 .7406+03 .7228+03
.6371+03 .6185+03 .6016+03 .5863+03 .5783+03

POINT(S) (1 TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)	REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2		1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.1358*01	.35734*00	.83616-02	.55640-01	.42779-02	.85665-01	.19091-01	.27550-01	.55666-01
18, 25	2/ 2	.1358*01	.35726*00	.82811-02	.55335-01	.42776-02	.83556-01	.19167-01	.27546-01	.55361-01
25, 30	3/ 2	.1358*01	.35726*00	.82743-02	.55335-01	.42776-02	.83556-01	.19172-01	.27544-01	.55361-01
30, 34	4/ 2	.1358*01	.35726*00	.82684-02	.55335-01	.42776-02	.83556-01	.19177-01	.27543-01	.55361-01
34, 39	5/ 3	.1350*01	.35148*00	.95014-02	.66074-01	.42816-02	.85707-01	.17671-01	.27325-01	.66100-01
39, 43	6/ 3	.1350*01	.35148*00	.95046-02	.66074-01	.42816-02	.85707-01	.17712-01	.27315-01	.66100-01
43, 47	7/ 3	.1350*01	.35148*00	.94772-02	.66074-01	.42816-02	.85707-01	.17733-01	.27308-01	.66100-01
47, 51	8/ 3	.1350*01	.35148*00	.94601-02	.66074-01	.42816-02	.85707-01	.17747-01	.27304-01	.66100-01
51, 54	9/ 3	.1350*01	.35148*00	.94485-02	.66074-01	.42816-02	.85707-01	.17756-01	.27302-01	.66100-01
54, 57	10/ 3	.1350*01	.35148*00	.94388-02	.66074-01	.42816-02	.85707-01	.17763-01	.27300-01	.66100-01
57, 60	11/ 3	.1350*01	.35148*00	.94305-02	.66074-01	.42816-02	.85707-01	.17769-01	.27298-01	.66100-01
60, 63	12/ 3	.1350*01	.35148*00	.94232-02	.66074-01	.42816-02	.85707-01	.17775-01	.27296-01	.66100-01
63, 67	13/ 3	.1350*01	.35148*00	.94151-02	.66074-01	.42816-02	.85707-01	.17781-01	.27294-01	.66100-01
67, 71	14/ 3	.1350*01	.35148*00	.94066-02	.66074-01	.42816-02	.85707-01	.17788-01	.27292-01	.66100-01
71, 74	15/ 3	.1350*01	.35148*00	.93992-02	.66074-01	.42816-02	.85707-01	.17794-01	.27290-01	.66100-01
74, 77	16/ 3	.1350*01	.35148*00	.93925-02	.66074-01	.42816-02	.85707-01	.17799-01	.27289-01	.66100-01
77, 80	17/ 3	.1350*01	.35148*00	.93853-02	.66074-01	.42816-02	.85707-01	.17804-01	.27287-01	.66100-01
80, 83	18/ 3	.1350*01	.35148*00	.93806-02	.66074-01	.42816-02	.85707-01	.17808-01	.27286-01	.66100-01
83, 88	19/ 3	.1350*01	.35148*00	.93729-02	.66074-01	.42816-02	.85707-01	.17814-01	.27284-01	.66100-01
88, 93	20/ 3	.1350*01	.35148*00	.93637-02	.66074-01	.42816-02	.85707-01	.17821-01	.27282-01	.66100-01
93, 97	21/ 3	.1350*01	.35148*00	.93553-02	.66074-01	.42816-02	.85707-01	.17827-01	.27280-01	.66100-01
97, 101	22/ 3	.1350*01	.35148*00	.93478-02	.66074-01	.42816-02	.85707-01	.17833-01	.27279-01	.66100-01
101, 105	23/ 3	.1350*01	.35148*00	.93408-02	.66074-01	.42816-02	.85707-01	.17839-01	.27277-01	.66100-01
105, 109	24/ 3	.1350*01	.35148*00	.93344-02	.66074-01	.42816-02	.85707-01	.17844-01	.27276-01	.66100-01
109, 113	25/ 3	.1350*01	.35148*00	.93274-02	.66074-01	.42816-02	.85707-01	.17849-01	.27274-01	.66100-01
113, 118	26/ 3	.1350*01	.35148*00	.93181-02	.66074-01	.42816-02	.85707-01	.17856-01	.27272-01	.66100-01
118, 123	27/ 3	.1350*01	.35148*00	.93080-02	.66074-01	.42816-02	.85707-01	.17864-01	.27270-01	.66100-01
123, 127	28/ 3	.1350*01	.35148*00	.92988-02	.66074-01	.42816-02	.85707-01	.17871-01	.27267-01	.66100-01
127, 131	29/ 3	.1350*01	.35148*00	.92905-02	.66074-01	.42816-02	.85707-01	.17877-01	.27265-01	.66100-01
131, 135	30/ 3	.1350*01	.35148*00	.92861-02	.66074-01	.42816-02	.85707-01	.17881-01	.27264-01	.66100-01
135, 140	31/ 4	.1737*01	.23565-00	.32680-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01
TOTAL OF ALL REGIONS		4.85811480*24	1.32640380*24	6.28462900*24	1.71333420*24	3.53626490*20	-5.71235810*19			

POINT(S) (I TO J)	REGIONS T-W/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1		GROUP 2		GROUP 1		GROUP 2		GROUP 1	
		GROUP 1		GROUP 2		GROUP 1		GROUP 2		GROUP 1	
0, 18	1/ 1	.13380+01	.35729+00	.83773-02	.55498-01	.42779-02	.78468-01	.19085-01	.27560-01	.55524-01	
18, 25	2/ 2	.13380+01	.35726+00	.83104-02	.55335-01	.42776-02	.78356-01	.19145-01	.27555-01	.55361-01	
25, 30	3/ 2	.13380+01	.35726+00	.83030-02	.55335-01	.42776-02	.78356-01	.19145-01	.27551-01	.55361-01	
30, 34	4/ 2	.13380+01	.35726+00	.82965-02	.55335-01	.42776-02	.78356-01	.19155-01	.27549-01	.55361-01	
34, 39	5/ 3	.13380+01	.36148+00	.95756-02	.66074-01	.42816-02	.85707-01	.17658-01	.27331-01	.66100-01	
39, 43	6/ 3	.13380+01	.36148+00	.95257-02	.66074-01	.42816-02	.85707-01	.17696-01	.27319-01	.66100-01	
43, 47	7/ 3	.13380+01	.36148+00	.94959-02	.66074-01	.42816-02	.85707-01	.17719-01	.27313-01	.66100-01	
47, 51	8/ 3	.13380+01	.36148+00	.94773-02	.66074-01	.42816-02	.85707-01	.17733-01	.27308-01	.66100-01	
51, 54	9/ 3	.13380+01	.36148+00	.94647-02	.66074-01	.42816-02	.85707-01	.17743-01	.27305-01	.66100-01	
54, 57	10/ 3	.13380+01	.36148+00	.94542-02	.66074-01	.42816-02	.85707-01	.17751-01	.27303-01	.66100-01	
57, 60	11/ 3	.13380+01	.36148+00	.94452-02	.66074-01	.42816-02	.85707-01	.17758-01	.27301-01	.66100-01	
60, 63	12/ 3	.13380+01	.36148+00	.94372-02	.66074-01	.42816-02	.85707-01	.17764-01	.27298-01	.66100-01	
63, 67	13/ 3	.13380+01	.36148+00	.94285-02	.66074-01	.42816-02	.85707-01	.17771-01	.27297-01	.66100-01	
67, 71	14/ 3	.13380+01	.36148+00	.94193-02	.66074-01	.42816-02	.85707-01	.17778-01	.27295-01	.66100-01	
71, 74	15/ 3	.13380+01	.36148+00	.94112-02	.66074-01	.42816-02	.85707-01	.17784-01	.27293-01	.66100-01	
74, 77	16/ 3	.13380+01	.36148+00	.94040-02	.66074-01	.42816-02	.85707-01	.17790-01	.27292-01	.66100-01	
77, 80	17/ 3	.13380+01	.36148+00	.93973-02	.66074-01	.42816-02	.85707-01	.17795-01	.27290-01	.66100-01	
80, 83	18/ 3	.13380+01	.36148+00	.93911-02	.66074-01	.42816-02	.85707-01	.17800-01	.27289-01	.66100-01	
83, 88	19/ 3	.13380+01	.36148+00	.93828-02	.66074-01	.42816-02	.85707-01	.17806-01	.27287-01	.66100-01	
88, 93	20/ 3	.13380+01	.36148+00	.93727-02	.66074-01	.42816-02	.85707-01	.17814-01	.27284-01	.66100-01	
93, 97	21/ 3	.13380+01	.36148+00	.93637-02	.66074-01	.42816-02	.85707-01	.17821-01	.27282-01	.66100-01	
97, 101	22/ 3	.13380+01	.36148+00	.93554-02	.66074-01	.42816-02	.85707-01	.17827-01	.27280-01	.66100-01	
101, 105	23/ 3	.13380+01	.36148+00	.93479-02	.66074-01	.42816-02	.85707-01	.17833-01	.27279-01	.66100-01	
105, 109	24/ 3	.13380+01	.36148+00	.93408-02	.66074-01	.42816-02	.85707-01	.17839-01	.27277-01	.66100-01	
109, 113	25/ 3	.13380+01	.36148+00	.93331-02	.66074-01	.42816-02	.85707-01	.17844-01	.27275-01	.66100-01	
113, 118	26/ 3	.13380+01	.36148+00	.93230-02	.66074-01	.42816-02	.85707-01	.17852-01	.27273-01	.66100-01	
118, 123	27/ 3	.13380+01	.36148+00	.93120-02	.66074-01	.42816-02	.85707-01	.17861-01	.27270-01	.66100-01	
123, 127	28/ 3	.13380+01	.36148+00	.93019-02	.66074-01	.42816-02	.85707-01	.17869-01	.27268-01	.66100-01	
127, 131	29/ 3	.13380+01	.36148+00	.92926-02	.66074-01	.42816-02	.85707-01	.17876-01	.27266-01	.66100-01	
131, 135	30/ 3	.13380+01	.36148+00	.92878-02	.66074-01	.42816-02	.85707-01	.17879-01	.27265-01	.66100-01	
135, 140	31/ 4	.17373+01	.23565+00	.32680-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01	
TOTAL OF ALL REGIONS		3.77634200+24	1.03049515+24	4.88502580+24	1.3310A160+24	2.75590910+20	-4.53580830+19				

STIT BNWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 507.927 SEC

TIME STEP NO. 407 TIME .2540+01 DELTA T = .5000-01

REACTIVITY (TIME STEP 406) = .1180-02

ROD-TRAVEL-DISTANCE = .1257+03

RELATIVE POWER (TIME STEP 406) = .3466+06

P SRRD HT DOP COEF FLUX SRR WTD DOP COEF
2.2543242+00 2.2253665+00

PEAK TO AVERAGE POWER (TIME STEP 406)

	VOL WTD TEMP 2.4993529+00	SUM OF POWER*VOL 9.1902388+15	SUM OF VOLUMES 2.0661639+04
.5149+01	.3688+01	.2983+01	.2350+01
.1960+01	.1570+01	.1489+01	.1347+01
.1047+01	.7113-00	.5992-00	.3616-00
.0000			

IODINE CONCENTRATION

-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000

XENON CONCENTRATION

.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000

COOLANT TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03
.0000			

FUEL TEMPERATURE

.1371+04	.1231+04	.9458+03	.8985+03
.8603+03	.8287+03	.7737+03	.7363+03
.7212+03	.6782+03	.6065+03	.5811+03
.0000			

POINT(S) (1 TO J)	REGIONS T-W/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.13580+01	.35723+00	.83850+02	.55347+01	.42778-02	.78364+01	.19087+01		.27569+01	.55372+01
18, 25	2/ 2	.13580+01	.35726+00	.83336+02	.55335+01	.42776-02	.78356+01	.19127+01		.27558+01	.55361+01
25, 30	3/ 2	.13580+01	.35726+00	.83257+02	.55335+01	.42776-02	.78356+01	.19133+01		.27556+01	.55361+01
30, 34	4/ 2	.13580+01	.35726+00	.83188+02	.55335+01	.42776-02	.78356+01	.19138+01		.27555+01	.55361+01
34, 39	5/ 3	.13502+01	.36148+00	.95956+02	.66074+01	.42816-02	.85707+01	.17642+01		.27335+01	.66100+01
39, 43	6/ 3	.13502+01	.36148+00	.95424+02	.66074+01	.42816-02	.85707+01	.17683+01		.27335+01	.66100+01
43, 47	7/ 3	.13502+01	.36148+00	.95107+02	.66074+01	.42816-02	.85707+01	.17703+01		.27316+01	.66100+01
47, 51	8/ 3	.13502+01	.36148+00	.94909+02	.66074+01	.42816-02	.85707+01	.17723+01		.27311+01	.66100+01
51, 54	9/ 3	.13502+01	.36148+00	.94776+02	.66074+01	.42816-02	.85707+01	.17733+01		.27308+01	.66100+01
54, 57	10/ 3	.13502+01	.36148+00	.94664+02	.66074+01	.42816-02	.85707+01	.17749+01		.27306+01	.66100+01
57, 60	11/ 3	.13502+01	.36148+00	.94568+02	.66074+01	.42816-02	.85707+01	.17756+01		.27304+01	.66100+01
60, 63	12/ 3	.13502+01	.36148+00	.94484+02	.66074+01	.42816-02	.85707+01	.17756+01		.27302+01	.66100+01
63, 67	13/ 3	.13502+01	.36148+00	.94392+02	.66074+01	.42816-02	.85707+01	.17763+01		.27300+01	.66100+01
67, 71	14/ 3	.13502+01	.36148+00	.94294+02	.66074+01	.42816-02	.85707+01	.17770+01		.27297+01	.66100+01
71, 74	15/ 3	.13502+01	.36148+00	.94208+02	.66074+01	.42816-02	.85707+01	.17777+01		.27295+01	.66100+01
74, 77	16/ 3	.13502+01	.36148+00	.94131+02	.66074+01	.42816-02	.85707+01	.17783+01		.27294+01	.66100+01
77, 80	17/ 3	.13502+01	.36148+00	.94060+02	.66074+01	.42816-02	.85707+01	.17788+01		.27292+01	.66100+01
80, 83	18/ 3	.13502+01	.36148+00	.93995+02	.66074+01	.42816-02	.85707+01	.17793+01		.27291+01	.66100+01
83, 88	19/ 3	.13502+01	.36148+00	.93906+02	.66074+01	.42816-02	.85707+01	.17800+01		.27288+01	.66100+01
88, 93	20/ 3	.13502+01	.36148+00	.93799+02	.66074+01	.42816-02	.85707+01	.17808+01		.27286+01	.66100+01
93, 97	21/ 3	.13502+01	.36148+00	.93704+02	.66074+01	.42816-02	.85707+01	.17816+01		.27284+01	.66100+01
97, 101	22/ 3	.13502+01	.36148+00	.93616+02	.66074+01	.42816-02	.85707+01	.17823+01		.27282+01	.66100+01
101, 105	23/ 3	.13502+01	.36148+00	.93535+02	.66074+01	.42816-02	.85707+01	.17829+01		.27280+01	.66100+01
105, 109	24/ 3	.13502+01	.36148+00	.93460+02	.66074+01	.42816-02	.85707+01	.17835+01		.27278+01	.66100+01
109, 113	25/ 3	.13502+01	.36148+00	.93378+02	.66074+01	.42816-02	.85707+01	.17841+01		.27276+01	.66100+01
113, 118	26/ 3	.13502+01	.36148+00	.93270+02	.66074+01	.42816-02	.85707+01	.17849+01		.27274+01	.66100+01
118, 123	27/ 3	.13502+01	.36148+00	.93152+02	.66074+01	.42816-02	.85707+01	.17858+01		.27271+01	.66100+01
123, 127	28/ 3	.13502+01	.36148+00	.93043+02	.66074+01	.42816-02	.85707+01	.17867+01		.27269+01	.66100+01
127, 131	29/ 3	.13502+01	.36148+00	.92944+02	.66074+01	.42816-02	.85707+01	.17874+01		.27266+01	.66100+01
131, 135	30/ 3	.13502+01	.36148+00	.92892+02	.66074+01	.42816-02	.85707+01	.17878+01		.27265+01	.66100+01
135, 140	31/ 4	.17373+01	.23565+00	.32680+03	.10360+01	.00000	.00000	.35636+01		.36087+01	.10377+01
TOTAL OF ALL REGIONS		3.23740780+24	8.83228980+23	4.18783860+24	1.14083516+24	2.33964690+20	-4.10499110+19				

ELAPSED TIME FROM START OF CASE 517.795 SEC

STIT BNWGL ***SAMPLE CASE*****

TIME STEP NO. 415 TIME .2940+01 DELTA T = .5000-01

REACTIVITY (TIME STEP 414) = .5765-03

ROD-TRAVEL-DISTANCE = .8793+02

RELATIVE POWER (TIME STEP 414) = .2863+06

P SGRD WT DOP COEF FLUX SGR WTD DOP COEF
2,2345630+00 2,2041569+00

PEAK TO AVERAGE POWER (TIME STEP 414)

	VOL WTD TEMP 2,6674824+00	SUM OF POWER*VOL 7,5910228+15	SUM OF VOLUMES 2,0681639+04	
.5100+01	.3653+01	.2957+01	.2334+01	.2181+01
.1951+01	.1567+01	.1488+01	.1348+01	.1257+01
.1050+01	.8010+00	.6041+00	.3652+00	.2600+00
.0000				

IODINE CONCENTRATION

-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000

XENON CONCENTRATION

.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000
.0000	.0000	.0000	.0000	.0000

COOLANT TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03

FUEL TEMPERATURE

.1451+04	.1313+04	.1279+04	.1199+04	.1014+04
.9029+03	.8859+03	.8479+03	.8309+03	.8020+03
.7333+03	.7167+03	.6874+03	.6722+03	.6304+03
.0000				

POINT(S) (1 TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.13580*01	.35723*00	.84052-02	.55335-01	.42778-02	.8356-01	.19072-01		.27574-01	.55361-01
18, 25	2/ 2	.13580*01	.35728*00	.83587-02	.55384-01	.42776-02	.78389-01	.19005-01		.27561-01	.55409-01
25, 30	3/ 2	.13580*01	.35728*00	.83550-02	.55384-01	.42776-02	.78389-01	.19112-01		.27559-01	.55409-01
30, 34	4/ 2	.13580*01	.35728*00	.83432-02	.55384-01	.42776-02	.78389-01	.19117-01		.27558-01	.55409-01
34, 39	5/ 3	.13502*01	.36149*00	.96146-02	.66095-01	.42816-02	.85721-01	.17627-01		.27339-01	.66121-01
39, 43	6/ 3	.13502*01	.36149*00	.95588-02	.66095-01	.42816-02	.85721-01	.17670-01		.27326-01	.66121-01
43, 47	7/ 3	.13502*01	.36149*00	.95255-02	.66095-01	.42816-02	.85721-01	.17695-01		.27318-01	.66121-01
47, 51	8/ 3	.13502*01	.36149*00	.95048-02	.66095-01	.42816-02	.85721-01	.17711-01		.27314-01	.66121-01
51, 54	9/ 3	.13502*01	.36149*00	.94908-02	.66095-01	.42816-02	.85721-01	.17722-01		.27310-01	.66121-01
54, 57	10/ 3	.13502*01	.36149*00	.94791-02	.66095-01	.42816-02	.85721-01	.17731-01		.27308-01	.66121-01
57, 60	11/ 3	.13502*01	.36149*00	.94691-02	.66095-01	.42816-02	.85721-01	.17739-01		.27305-01	.66121-01
60, 63	12/ 3	.13502*01	.36149*00	.94603-02	.66095-01	.42816-02	.85721-01	.17745-01		.27303-01	.66121-01
63, 67	13/ 3	.13502*01	.36149*00	.94506-02	.66095-01	.42816-02	.85721-01	.17753-01		.27301-01	.66121-01
67, 71	14/ 3	.13502*01	.36149*00	.94404-02	.66095-01	.42816-02	.85721-01	.17761-01		.27299-01	.66121-01
71, 74	15/ 3	.13502*01	.36149*00	.94314-02	.66095-01	.42816-02	.85721-01	.17768-01		.27297-01	.66121-01
74, 77	16/ 3	.13502*01	.36149*00	.94234-02	.66095-01	.42816-02	.85721-01	.17774-01		.27295-01	.66121-01
77, 80	17/ 3	.13502*01	.36149*00	.94160-02	.66095-01	.42816-02	.85721-01	.17780-01		.27293-01	.66121-01
80, 83	18/ 3	.13502*01	.36149*00	.94091-02	.66095-01	.42816-02	.85721-01	.17785-01		.27292-01	.66121-01
83, 88	19/ 3	.13502*01	.36149*00	.93998-02	.66095-01	.42816-02	.85721-01	.17792-01		.27290-01	.66121-01
88, 93	20/ 3	.13502*01	.36149*00	.93886-02	.66095-01	.42816-02	.85721-01	.17801-01		.27287-01	.66121-01
93, 97	21/ 3	.13502*01	.36149*00	.93785-02	.66095-01	.42816-02	.85721-01	.17808-01		.27285-01	.66121-01
97, 101	22/ 3	.13502*01	.36149*00	.93694-02	.66095-01	.42816-02	.85721-01	.17816-01		.27283-01	.66121-01
101, 105	23/ 3	.13502*01	.36149*00	.93609-02	.66095-01	.42816-02	.85721-01	.17822-01		.27281-01	.66121-01
105, 109	24/ 3	.13502*01	.36149*00	.93529-02	.66095-01	.42816-02	.85721-01	.17828-01		.27279-01	.66121-01
109, 113	25/ 3	.13502*01	.36149*00	.93443-02	.66095-01	.42816-02	.85721-01	.17835-01		.27277-01	.66121-01
113, 118	26/ 3	.13502*01	.36149*00	.93330-02	.66095-01	.42816-02	.85721-01	.17844-01		.27274-01	.66121-01
118, 123	27/ 3	.13502*01	.36149*00	.93204-02	.66095-01	.42816-02	.85721-01	.17853-01		.27271-01	.66121-01
123, 127	28/ 3	.13502*01	.36149*00	.93090-02	.66095-01	.42816-02	.85721-01	.17862-01		.27269-01	.66121-01
127, 131	29/ 3	.13502*01	.36149*00	.92984-02	.66095-01	.42816-02	.85721-01	.17870-01		.27266-01	.66121-01
131, 135	30/ 3	.13502*01	.36149*00	.92930-02	.66095-01	.42816-02	.85721-01	.17874-01		.27265-01	.66121-01
135, 140	31/ 4	.17373*01	.23565*00	.32680-03	.10360-01	.00000	.00000	.35636-01		.36087-01	.10377-01
TOTAL OF ALL REGIONS		2.66945420*24	7.27825400*24	3.45342960*24	9.40098510*23	1.94437500*20	-3.36253600*19				

STIT BNWGL ***SAMPLE CASE*****

ELAPSED TIME FROM START OF CASE 528.175 SEC

TIME STEP NO. 423 TIME .3340+01 DELTA T = .5000-01

REACTIVITY (TIME STEP 422) = -.5249-03

ROD-TRAVEL-DISTANCE = .5013+02

RELATIVE POWER (TIME STEP 422) = .2163+06

P SRRD WT DOP COEF FLUX SRR WTD DOP COEF VOL WTD TEMP SUM OF POWER*VOL SUM OF VOLUMES
 2.2220512+00 2.1939278+00 2.7968440+00 5.7338101+15 2.0681639+04
 PEAK TO AVERAGE POWER (TIME STEP 422)
 .5078+01 .4360+01 .4243+01 .4145+01 .3634+01 .2942+01 .2555+01 .2324+01 .2173+01 .2049+01
 .1945+01 .1854+01 .1756+01 .1654+01 .1565+01 .1466+01 .1414+01 .1348+01 .1258+01 .1150+01
 .1052+01 .9435+00 .8811+00 .8039+00 .7194+00 .6070+00 .4824+00 .3674+00 .2617+00 .2069+00

IODINE CONCENTRATION

-.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000

XENON CONCENTRATION

.0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000

COOLANT TEMPERATURE

.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

FUEL TEMPERATURE

.1476+04 .1352+04 .1333+04 .1316+04 .1231+04 .1108+04 .1037+04 .9936+03 .9646+03 .9407+03
 .9202+03 .9024+03 .8833+03 .8626+03 .8449+03 .8291+03 .8146+03 .8013+03 .7833+03 .7618+03
 .7427+03 .7253+03 .7094+03 .6946+03 .6786+03 .6576+03 .6347+03 .6159+03 .5953+03 .5853+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.1358+01	.33723-00	.84216-02	.55335-01	.42778-02	.78356-01	.19059-01		.27578-01	.55361-01
18, 25	2/ 2	.1358+01	.35733-00	.8397-02	.55534-01	.42777-02	.78493-01	.19073-01		.27562-01	.55560-01
25, 30	3/ 2	.1358+01	.35733-00	.83830-02	.55534-01	.42777-02	.78493-01	.19073-01		.27560-01	.55560-01
30, 34	4/ 2	.1358+01	.35733-00	.83756-02	.55534-01	.42777-02	.78493-01	.19083-01		.27558-01	.55560-01
34, 39	5/ 3	.1360+01	.36151-00	.96351-02	.66159-01	.42816-02	.85766-01	.17608-01		.27340-01	.66185-01
39, 43	6/ 3	.1360+01	.36151-00	.95773-02	.66159-01	.42816-02	.85766-01	.17652-01		.27327-01	.66185-01
43, 47	7/ 3	.1360+01	.36151-00	.95428-02	.66159-01	.42816-02	.85766-01	.17679-01		.27319-01	.66185-01
47, 51	8/ 3	.1360+01	.36151-00	.95214-02	.66159-01	.42816-02	.85766-01	.17693-01		.27314-01	.66185-01
51, 54	9/ 3	.1360+01	.36151-00	.95069-02	.66159-01	.42816-02	.85766-01	.17706-01		.27311-01	.66185-01
54, 57	10/ 3	.1360+01	.36151-00	.94949-02	.66159-01	.42816-02	.85766-01	.17716-01		.27308-01	.66185-01
57, 60	11/ 3	.1360+01	.36151-00	.94845-02	.66159-01	.42816-02	.85766-01	.17724-01		.27306-01	.66185-01
60, 63	12/ 3	.1360+01	.36151-00	.94754-02	.66159-01	.42816-02	.85766-01	.17731-01		.27304-01	.66185-01
63, 67	13/ 3	.1360+01	.36151-00	.94654-02	.66159-01	.42816-02	.85766-01	.17738-01		.27302-01	.66185-01
67, 71	14/ 3	.1360+01	.36151-00	.94548-02	.66159-01	.42816-02	.85766-01	.17747-01		.27299-01	.66185-01
71, 74	15/ 3	.1360+01	.36151-00	.94455-02	.66159-01	.42816-02	.85766-01	.17754-01		.27297-01	.66185-01
74, 77	16/ 3	.1360+01	.36151-00	.94372-02	.66159-01	.42816-02	.85766-01	.17760-01		.27295-01	.66185-01
77, 80	17/ 3	.1360+01	.36151-00	.94295-02	.66159-01	.42816-02	.85766-01	.17766-01		.27293-01	.66185-01
80, 83	18/ 3	.1360+01	.36151-00	.94225-02	.66159-01	.42816-02	.85766-01	.17772-01		.27292-01	.66185-01
83, 88	19/ 3	.1360+01	.36151-00	.94128-02	.66159-01	.42816-02	.85766-01	.17778-01		.27289-01	.66185-01
88, 93	20/ 3	.1360+01	.36151-00	.94013-02	.66159-01	.42816-02	.85766-01	.17783-01		.27287-01	.66185-01
93, 97	21/ 3	.1360+01	.36151-00	.93908-02	.66159-01	.42816-02	.85766-01	.17793-01		.27284-01	.66185-01
97, 101	22/ 3	.1360+01	.36151-00	.93813-02	.66159-01	.42816-02	.85766-01	.17796-01		.27282-01	.66185-01
101, 105	23/ 3	.1360+01	.36151-00	.93725-02	.66159-01	.42816-02	.85766-01	.17803-01		.27280-01	.66185-01
105, 109	24/ 3	.1360+01	.36151-00	.93643-02	.66159-01	.42816-02	.85766-01	.17810-01		.27280-01	.66185-01
109, 113	25/ 3	.1360+01	.36151-00	.93553-02	.66159-01	.42816-02	.85766-01	.17816-01		.27278-01	.66185-01
113, 118	26/ 3	.1360+01	.36151-00	.93435-02	.66159-01	.42816-02	.85766-01	.17823-01		.27276-01	.66185-01
118, 123	27/ 3	.1360+01	.36151-00	.93305-02	.66159-01	.42816-02	.85766-01	.17832-01		.27274-01	.66185-01
123, 127	28/ 3	.1360+01	.36151-00	.93185-02	.66159-01	.42816-02	.85766-01	.17842-01		.27271-01	.66185-01
127, 131	29/ 3	.1360+01	.36151-00	.93075-02	.66159-01	.42816-02	.85766-01	.17852-01		.27268-01	.66185-01
131, 135	30/ 3	.1360+01	.36151-00	.93018-02	.66159-01	.42816-02	.85766-01	.17860-01		.27265-01	.66185-01
135, 140	31/ 4	.17373+01	.23565-00	.32680-03	.10360-01	.00000	.00000	.35636-01		.36087-01	.10377-01
TOTAL OF ALL REGIONS											
		2.01670200+24	5.48677410+23	2.60800950+24	7.08694570+23	1.47201916+20	-2.54858700+19				

STIT BNWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 538.452 SEC

TIME STEP NO. 431 TIME .3740+01 DELTA T = .5000-01

REACTIVITY (TIME STEP 430) = -.1533-02

ROD-TRAVEL-DISTANCE = .1233+02

RELATIVE POWER (TIME STEP 430) = .1707+06

P SQRD WT DOP COEF FLUX SQR WTD DOP COEF VOL WTD TEMP SUM OF POWER*VOL SUM OF VOLUMES
2.2139729+00 2.1859592+00 2.8967428+00 4.5247660+15 2.0681639+04

PEAK TO AVERAGE POWER (TIME STEP 430)
.5070+01 .4353+01 .4137+01 .2334+01 .2548+01 .2318+01 .2168+01 .2045+01
.1941+01 .1851+01 .1754+01 .1564+01 .1414+01 .1348+01 .1258+01 .1150+01
.1054+01 .9645-00 .8827-00 .7211-00 .6087-00 .4840-00 .3688-00 .2627-00
.0000

IODINE CONCENTRATION
-.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
-.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
-.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
-.0000

XENON CONCENTRATION
.0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
.0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
.0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
.0000

COOLANT TEMPERATURE
.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
.0000

FUEL TEMPERATURE
.1511+04 .1382+04 .1345+04 .1256+04 .1055+04 .1010+04 .9796+03 .9548+03
.8952+03 .8741+03 .8557+03 .8394+03 .8244+03 .8106+03 .7920+03 .7698+03
.7300+03 .7155+03 .7002+03 .6836+03 .6618+03 .6381+03 .5969+03 .5867+03
.0000

POINTS(S) (1 TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 18	1/ 1	.13380+01	.35723-00	.84340+02	.55335-01	.42778-02	.78356-01	.19049-01		.27581-01	.55361-01
18, 25	2/ 2	.13380+01	.35739-00	.84211+02	.55685-01	.42777-02	.78598-01	.19043-01		.27581-01	.55711-01
25, 30	3/ 3	.13380+01	.35739-00	.84122-02	.55685-01	.42777-02	.78598-01	.19050-01		.27559-01	.55711-01
30, 34	4/ 2	.13380+01	.35739-00	.84045+02	.55685-01	.42777-02	.78598-01	.19055-01		.27557-01	.55711-01
34, 39	5/ 3	.13603+01	.36154-00	.96525+02	.66224-01	.42817-02	.85810-01	.17591-01		.27341-01	.66250-01
39, 43	6/ 3	.13603+01	.36154-00	.95932+02	.66224-01	.42817-02	.85810-01	.17637-01		.27328-01	.66250-01
43, 47	7/ 3	.13603+01	.36154-00	.95578+02	.66224-01	.42817-02	.85810-01	.17664-01		.27320-01	.66250-01
47, 51	8/ 3	.13603+01	.36154-00	.95359+02	.66224-01	.42817-02	.85810-01	.17681-01		.27315-01	.66250-01
51, 54	9/ 3	.13603+01	.36154-00	.95211+02	.66224-01	.42817-02	.85810-01	.17692-01		.27311-01	.66250-01
54, 57	10/ 3	.13603+01	.36154-00	.94981+02	.66224-01	.42817-02	.85810-01	.17702-01		.27308-01	.66250-01
57, 60	11/ 3	.13603+01	.36154-00	.94887+02	.66224-01	.42817-02	.85810-01	.17710-01		.27306-01	.66250-01
60, 63	12/ 3	.13603+01	.36154-00	.94785+02	.66224-01	.42817-02	.85810-01	.17717-01		.27304-01	.66250-01
63, 67	13/ 3	.13603+01	.36154-00	.94676+02	.66224-01	.42817-02	.85810-01	.17725-01		.27301-01	.66250-01
67, 71	14/ 3	.13603+01	.36154-00	.94582+02	.66224-01	.42817-02	.85810-01	.17734-01		.27299-01	.66250-01
71, 74	15/ 3	.13603+01	.36154-00	.94496+02	.66224-01	.42817-02	.85810-01	.17741-01		.27297-01	.66250-01
74, 77	16/ 3	.13603+01	.36154-00	.94418+02	.66224-01	.42817-02	.85810-01	.17748-01		.27295-01	.66250-01
77, 80	17/ 3	.13603+01	.36154-00	.94345+02	.66224-01	.42817-02	.85810-01	.17754-01		.27293-01	.66250-01
80, 83	18/ 3	.13603+01	.36154-00	.94247+02	.66224-01	.42817-02	.85810-01	.17759-01		.27291-01	.66250-01
83, 88	19/ 3	.13603+01	.36154-00	.94128+02	.66224-01	.42817-02	.85810-01	.17767-01		.27289-01	.66250-01
88, 93	20/ 3	.13603+01	.36154-00	.94021+02	.66224-01	.42817-02	.85810-01	.17776-01		.27286-01	.66250-01
93, 97	21/ 3	.13603+01	.36154-00	.93923+02	.66224-01	.42817-02	.85810-01	.17784-01		.27284-01	.66250-01
97, 101	22/ 3	.13603+01	.36154-00	.93833+02	.66224-01	.42817-02	.85810-01	.17792-01		.27282-01	.66250-01
101, 105	23/ 3	.13603+01	.36154-00	.93748+02	.66224-01	.42817-02	.85810-01	.17799-01		.27280-01	.66250-01
105, 109	24/ 3	.13603+01	.36154-00	.93656+02	.66224-01	.42817-02	.85810-01	.17805-01		.27278-01	.66250-01
109, 113	25/ 3	.13603+01	.36154-00	.93534+02	.66224-01	.42817-02	.85810-01	.17812-01		.27276-01	.66250-01
113, 118	26/ 3	.13603+01	.36154-00	.93400+02	.66224-01	.42817-02	.85810-01	.17822-01		.27273-01	.66250-01
118, 123	27/ 3	.13603+01	.36154-00	.93277+02	.66224-01	.42817-02	.85810-01	.17832-01		.27270-01	.66250-01
123, 127	28/ 3	.13603+01	.36154-00	.93163+02	.66224-01	.42817-02	.85810-01	.17841-01		.27267-01	.66250-01
127, 131	29/ 3	.13603+01	.36154-00	.93105+02	.66224-01	.42817-02	.85810-01	.17850-01		.27264-01	.66250-01
131, 135	30/ 3	.13603+01	.36154-00	.92680+03	.10360-01	.42817-02	.85810-01	.17855-01		.27263-01	.66250-01
135, 140	31/ 4	.17373+01	.23565-00			.00000	.00000	.35636-01		.36087-01	.10377-01
TOTAL OF ALL REGIONS		1.59135330+24	4.32357550+23	2.05856010+24	5.58446150+23	1.16210116+20	-2.02720110+19				

POINT(S) (1 TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	2	GROUP 1	GROUP 2
0, 18	1/ 1	.1380+01	.35723+00	.84432-02	.55335-01	.42778-02	.78356-01	.19042-01		.27583-01	.55361-01
18, 25	2/ 2	.13381+01	.35755+00	.84780-02	.56084-01	.42779-02	.78869-01	.18980-01		.27555-01	.56110-01
25, 30	3/ 2	.13381+01	.35755+00	.84690-02	.56084-01	.42779-02	.78869-01	.18980-01		.27553-01	.56110-01
30, 34	4/ 2	.13381+01	.35755+00	.84611-02	.56084-01	.42779-02	.78869-01	.18993-01		.27551-01	.56110-01
34, 39	5/ 3	.1350+01	.36161+00	.96805-02	.66396-01	.42817-02	.85928-01	.17561-01		.27340-01	.66422-01
39, 43	6/ 3	.1360+01	.36161+00	.96201-02	.66396-01	.42817-02	.85928-01	.17608-01		.27326-01	.66422-01
43, 47	7/ 3	.1360+01	.36161+00	.95841-02	.66396-01	.42817-02	.85928-01	.17636-01		.27317-01	.66422-01
47, 51	8/ 3	.1360+01	.36161+00	.95617-02	.66396-01	.42817-02	.85928-01	.17653-01		.27312-01	.66422-01
51, 54	9/ 3	.1360+01	.36161+00	.95466-02	.66396-01	.42817-02	.85928-01	.17663-01		.27309-01	.66422-01
54, 57	10/ 3	.1360+01	.36161+00	.95341-02	.66396-01	.42817-02	.85928-01	.17674-01		.27306-01	.66422-01
57, 60	11/ 3	.1360+01	.36161+00	.95232-02	.66396-01	.42817-02	.85928-01	.17683-01		.27304-01	.66422-01
60, 63	12/ 3	.1360+01	.36161+00	.95138-02	.66396-01	.42817-02	.85928-01	.17680-01		.27301-01	.66422-01
63, 67	13/ 3	.1360+01	.36161+00	.95033-02	.66396-01	.42817-02	.85928-01	.17698-01		.27299-01	.66422-01
67, 71	14/ 3	.1360+01	.36161+00	.94923-02	.66396-01	.42817-02	.85928-01	.17708-01		.27296-01	.66422-01
71, 74	15/ 3	.1360+01	.36161+00	.94826-02	.66396-01	.42817-02	.85928-01	.17714-01		.27294-01	.66422-01
74, 77	16/ 3	.1360+01	.36161+00	.94740-02	.66396-01	.42817-02	.85928-01	.17721-01		.27292-01	.66422-01
77, 80	17/ 3	.1360+01	.36161+00	.94650-02	.66396-01	.42817-02	.85928-01	.17723-01		.27290-01	.66422-01
80, 83	18/ 3	.1360+01	.36161+00	.94586-02	.66396-01	.42817-02	.85928-01	.17732-01		.27289-01	.66422-01
83, 88	19/ 3	.1360+01	.36161+00	.94485-02	.66396-01	.42817-02	.85928-01	.17740-01		.27286-01	.66422-01
88, 93	20/ 3	.1360+01	.36161+00	.94364-02	.66396-01	.42817-02	.85928-01	.17743-01		.27284-01	.66422-01
93, 97	21/ 3	.1360+01	.36161+00	.94255-02	.66396-01	.42817-02	.85928-01	.17758-01		.27281-01	.66422-01
97, 101	22/ 3	.1360+01	.36161+00	.94156-02	.66396-01	.42817-02	.85928-01	.17766-01		.27279-01	.66422-01
101, 105	23/ 3	.1360+01	.36161+00	.94053-02	.66396-01	.42817-02	.85928-01	.17773-01		.27277-01	.66422-01
105, 109	24/ 3	.1360+01	.36161+00	.93977-02	.66396-01	.42817-02	.85928-01	.17779-01		.27275-01	.66422-01
109, 113	25/ 3	.1360+01	.36161+00	.93883-02	.66396-01	.42817-02	.85928-01	.17787-01		.27273-01	.66422-01
113, 118	26/ 3	.1360+01	.36161+00	.93759-02	.66396-01	.42817-02	.85928-01	.17796-01		.27270-01	.66422-01
118, 123	27/ 3	.1360+01	.36161+00	.93622-02	.66396-01	.42817-02	.85928-01	.17807-01		.27267-01	.66422-01
123, 127	28/ 3	.1360+01	.36161+00	.93496-02	.66396-01	.42817-02	.85928-01	.17815-01		.27264-01	.66422-01
127, 131	29/ 3	.1360+01	.36161+00	.93380-02	.66396-01	.42817-02	.85928-01	.17825-01		.27261-01	.66422-01
131, 135	30/ 3	.1360+01	.36161+00	.93320-02	.66396-01	.42817-02	.85928-01	.17830-01		.27260-01	.66422-01
135, 140	31/ 4	.17373+01	.23565+00	.32680-03	.10360-01	.00000	.00000	.35636-01		.36087-01	.10377-01
TOTAL OF ALL REGIONS											
		1.14095920+24	3.08699290+23	1.47501570+24	3.98718370+23	8.23209450+19	-1.51020720+19				

STIT BNWGL ***SAMPLE CASE***** ELAPSED TIME FROM START OF CASE 559.003 SEC

TIME STEP NO. 447 TIME .4540+01 DELTA T = .5000-01

REACTIVITY (TIME STEP 446) = -.6766-02

ROD-TRAVEL-DISTANCE = -.5327+02

RELATIVE POWER (TIME STEP 446) = .8056+05

P SORD WT DOP COEF = LUX SQR WTD DOP COEF VOL WTD TEMP SUM OF POWER*VOL SUM OF VOLUMES
 2.2327389+00 2.2029394+00 3.0248127+00 2.1357648+15 2.3681639+04
 PEAK TO AVERAGE POWER (TIME STEP 446)
 .5215+01 .4472+01 .4145+01 .4243+01 .3689+01 .2971+01 .2571+01 .2334+01 .2179+01 .2053+01
 .1947+01 .1855+01 .1755+01 .1651+01 .1562+01 .1482+01 .1410+01 .1343+01 .1253+01 .1144+01
 .1047+01 .9583-00 .8761-00 .7992-00 .7151-00 .6033-00 .4795-00 .3653-00 .2603-00 .2063-00
 .0000

IODINE CONCENTRATION

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 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000
 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000 -.0000

XENON CONCENTRATION

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COOLANT TEMPERATURE

.5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03
 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03 .5490+03

FUEL TEMPERATURE

.1557+04 .1421+04 .1382+04 .1289+04 .1155+04 .1077+04 .1030+04 .9989+03 .9730+03 .9730+03
 .9510+03 .9317+03 .8887+03 .8696+03 .8526+03 .8369+03 .8268+03 .8032+03 .7800+03 .7800+03
 .7593+03 .7405+03 .7233+03 .7073+03 .6672+03 .6424+03 .6198+03 .5992+03 .5886+03 .5886+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)	REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2		1 INTO 2	GROUP 1	GROUP 2	
0, 18	1	1.3580+01	3.5723+00	8.4495+02	5.5335+01	4.2778-02	7.8356+01	1.9037-01	2.7584+01	5.5361+01
18, 25	2	1.3583+01	3.5783+00	8.5706+02	5.6796+01	4.2781-02	7.9356+01	1.8874-01	2.7543+01	5.6821+01
25, 30	3	1.3583+01	3.5783+00	8.5613+02	5.6796+01	4.2781-02	7.9356+01	1.8882-01	2.7540+01	5.6821+01
30, 34	4	1.3583+01	3.5783+00	8.5543+02	5.6796+01	4.2781-02	7.9356+01	1.8888-01	2.7533+01	5.6821+01
34, 39	5	1.3504+01	3.5173+00	9.7227+02	6.6702+01	4.2618-02	8.6137+01	1.7514-01	2.7333+01	6.6728+01
39, 43	6	1.3504+01	3.5173+00	9.6615+02	6.6702+01	4.2618-02	8.6137+01	1.7561-01	2.7321+01	6.6728+01
43, 47	7	1.3504+01	3.5173+00	9.6250+02	6.6702+01	4.2618-02	8.6137+01	1.7590-01	2.7315+01	6.6728+01
47, 51	8	1.3504+01	3.5173+00	9.6024+02	6.6702+01	4.2618-02	8.6137+01	1.7607-01	2.7307+01	6.6728+01
51, 54	9	1.3504+01	3.5173+00	9.5871+02	6.6702+01	4.2618-02	8.6137+01	1.7619-01	2.7304+01	6.6728+01
54, 57	10	1.3504+01	3.5173+00	9.5744+02	6.6702+01	4.2618-02	8.6137+01	1.7629-01	2.7301+01	6.6728+01
57, 60	11	1.3504+01	3.5173+00	9.5635+02	6.6702+01	4.2618-02	8.6137+01	1.7637-01	2.7298+01	6.6728+01
60, 63	12	1.3504+01	3.5173+00	9.5539+02	6.6702+01	4.2618-02	8.6137+01	1.7644-01	2.7295+01	6.6728+01
63, 67	13	1.3504+01	3.5173+00	9.5433+02	6.6702+01	4.2618-02	8.6137+01	1.7653-01	2.7293+01	6.6728+01
67, 71	14	1.3504+01	3.5173+00	9.5321+02	6.6702+01	4.2618-02	8.6137+01	1.7663-01	2.7291+01	6.6728+01
71, 74	15	1.3504+01	3.5173+00	9.5224+02	6.6702+01	4.2618-02	8.6137+01	1.7669-01	2.7288+01	6.6728+01
74, 77	16	1.3504+01	3.5173+00	9.5136+02	6.6702+01	4.2618-02	8.6137+01	1.7675-01	2.7287+01	6.6728+01
77, 80	17	1.3504+01	3.5173+00	9.5055+02	6.6702+01	4.2618-02	8.6137+01	1.7682-01	2.7285+01	6.6728+01
80, 83	18	1.3504+01	3.5173+00	9.4980+02	6.6702+01	4.2618-02	8.6137+01	1.7687-01	2.7283+01	6.6728+01
83, 88	19	1.3504+01	3.5173+00	9.4879+02	6.6702+01	4.2618-02	8.6137+01	1.7695-01	2.7281+01	6.6728+01
88, 93	20	1.3504+01	3.5173+00	9.4756+02	6.6702+01	4.2618-02	8.6137+01	1.7705-01	2.7278+01	6.6728+01
93, 97	21	1.3504+01	3.5173+00	9.4646+02	6.6702+01	4.2618-02	8.6137+01	1.7713-01	2.7275+01	6.6728+01
97, 101	22	1.3504+01	3.5173+00	9.4545+02	6.6702+01	4.2618-02	8.6137+01	1.7721-01	2.7273+01	6.6728+01
101, 105	23	1.3504+01	3.5173+00	9.4451+02	6.6702+01	4.2618-02	8.6137+01	1.7728-01	2.7271+01	6.6728+01
105, 109	24	1.3504+01	3.5173+00	9.4364+02	6.6702+01	4.2618-02	8.6137+01	1.7735-01	2.7269+01	6.6728+01
109, 113	25	1.3504+01	3.5173+00	9.4269+02	6.6702+01	4.2618-02	8.6137+01	1.7742-01	2.7267+01	6.6728+01
113, 118	26	1.3504+01	3.5173+00	9.4143+02	6.6702+01	4.2618-02	8.6137+01	1.7752-01	2.7264+01	6.6728+01
118, 123	27	1.3504+01	3.5173+00	9.4004+02	6.6702+01	4.2618-02	8.6137+01	1.7763-01	2.7261+01	6.6728+01
123, 127	28	1.3504+01	3.5173+00	9.3876+02	6.6702+01	4.2618-02	8.6137+01	1.7773-01	2.7258+01	6.6728+01
127, 131	29	1.3504+01	3.5173+00	9.3759+02	6.6702+01	4.2618-02	8.6137+01	1.7782-01	2.7255+01	6.6728+01
131, 135	30	1.3504+01	3.5173+00	9.3697+02	6.6702+01	4.2618-02	8.6137+01	1.7786-01	2.7253+01	6.6728+01
135, 140	31	1.7373+01	2.3565+00	3.2680+03	1.0360+01	0.0000	1.00000	3.5636+01	3.6087+01	1.0377+01
TOTAL OF ALL REGIONS 7.57050200+23 2.03687330+23 9.79284960+23 2.63076080+23 5.32652570+19 1.07942080+19										

TOTAL OF ALL REGIONS 7,570,50200+23 2,036,87330+23 9,792,84960+23 2,630,76080+23 5,326,52570+19 -1,079,42080+19

STIT BNWGL ***SAMPLE CASE***

ELAPSED TIME FROM START OF CASE 569.251 SEC

TIME STEP NO, 455 TIME .4940*01 DELTA T = .5000-01

REACTIVITY (TIME STEP 454) = -.1222-01

ROD-TRAVEL-DISTANCE = -.1011+03

RELATIVE POWER (TIME STEP 454) = .4997*05

P	SORD	WT	DOP	COEF	LUX	SQR	WTD	DOP	COEF	VOL	WTD	TEMP	SUM	OF	POWER*VOL	SUM	OF	VOLUMES
2.2511599+00					2.2288930+00					3.0579358+00					1.3249483+15			2.0681639+04
PEAK TO AVERAGE POWER (TIME STEP 454)																		
.538+01		.4613+01		.4477+01	.4368+01					.3766+01					.3017+01			.2354+01
.1954+01		.1959+01		.1757+01	.1651+01					.1560+01					.1479+01			.1338+01
.1039+01		.9504-00		.8681-00	.7914-00					.7076-00					.5966-00			.3608-00
.0000																		.2571-00
																		.2194+01
																		.1246+01
																		.1137+01
																		.2042-00

IODINE CONCENTRATION

-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000
-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000	-.0000

XENON CONCENTRATION

.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
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.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000

COOLANT TEMPERATURE

.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03
.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03	.5490+03

FUEL TEMPERATURE

.1569+04	.1432+04	.1410+04	.1392+04	.1297+04	.1162+04	.1083+04	.1036+04	.1004+04	.9778+03	.7826+03	.8061+03	.5998+03	.6200+03	.8257+03	.8402+03	.6435+03	.6686+03	.8560+03
.9554+03	.9360+03	.9145+03	.8925+03	.8732+03	.8560+03	.8402+03	.8257+03	.8061+03	.7826+03	.7617+03	.7428+03	.7253+03	.7091+03	.6916+03	.6732+03	.6560+03	.6386+03	.6200+03
.7617+03	.7428+03	.7253+03	.7091+03	.6916+03	.6732+03	.6560+03	.6386+03	.6200+03	.6015+03	.5830+03	.5645+03	.5460+03	.5275+03	.5090+03	.4905+03	.4720+03	.4535+03	.4350+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	1	INTO 2	GROUP 1	GROUP 2
0, 16	1/ 1	.1358+01	.35723+00	.84536-02	.55335-01	.42778-02	.78356-01	.19034-01	.27585-01	.55361-01	
18, 25	2/ 2	.1358+01	.35832+00	.87264-02	.58041-01	.42780-02	.80309-01	.18695-01	.27519-01	.58067-01	
25, 30	3/ 2	.1358+01	.35832+00	.87171-02	.58041-01	.42780-02	.80309-01	.18702-01	.27517-01	.58067-01	
30, 34	4/ 2	.1358+01	.35832+00	.87091-02	.58041-01	.42780-02	.80309-01	.18700-01	.27515-01	.58067-01	
34, 39	5/ 3	.1350+01	.36194+00	.97912-02	.67237-01	.42821-02	.86504-01	.17436-01	.27325-01	.67263-01	
39, 43	6/ 3	.1350+01	.36194+00	.97295-02	.67237-01	.42821-02	.86504-01	.17483-01	.27311-01	.67263-01	
43, 47	7/ 3	.1350+01	.36194+00	.96928-02	.67237-01	.42821-02	.86504-01	.17512-01	.27302-01	.67263-01	
47, 51	8/ 3	.1350+01	.36194+00	.96700-02	.67237-01	.42821-02	.86504-01	.17521-01	.27297-01	.67263-01	
51, 54	9/ 3	.1350+01	.36194+00	.96546-02	.67237-01	.42821-02	.86504-01	.17541-01	.27293-01	.67263-01	
54, 57	10/ 3	.1350+01	.36194+00	.96417-02	.67237-01	.42821-02	.86504-01	.17551-01	.27290-01	.67263-01	
57, 60	11/ 3	.1350+01	.36194+00	.96307-02	.67237-01	.42821-02	.86504-01	.17560-01	.27288-01	.67263-01	
60, 63	12/ 3	.1350+01	.36194+00	.96210-02	.67237-01	.42821-02	.86504-01	.17567-01	.27286-01	.67263-01	
63, 67	13/ 3	.1350+01	.36194+00	.96104-02	.67237-01	.42821-02	.86504-01	.17573-01	.27283-01	.67263-01	
67, 71	14/ 3	.1350+01	.36194+00	.95992-02	.67237-01	.42821-02	.86504-01	.17584-01	.27281-01	.67263-01	
71, 74	15/ 3	.1350+01	.36194+00	.95893-02	.67237-01	.42821-02	.86504-01	.17591-01	.27278-01	.67263-01	
74, 77	16/ 3	.1350+01	.36194+00	.95805-02	.67237-01	.42821-02	.86504-01	.17598-01	.27276-01	.67263-01	
77, 80	17/ 3	.1350+01	.36194+00	.95723-02	.67237-01	.42821-02	.86504-01	.17603-01	.27275-01	.67263-01	
80, 83	18/ 3	.1350+01	.36194+00	.95648-02	.67237-01	.42821-02	.86504-01	.17610-01	.27273-01	.67263-01	
83, 88	19/ 3	.1350+01	.36194+00	.95545-02	.67237-01	.42821-02	.86504-01	.17618-01	.27270-01	.67263-01	
88, 93	20/ 3	.1350+01	.36194+00	.95432-02	.67237-01	.42821-02	.86504-01	.17628-01	.27268-01	.67263-01	
93, 97	21/ 3	.1350+01	.36194+00	.95311-02	.67237-01	.42821-02	.86504-01	.17638-01	.27265-01	.67263-01	
97, 101	22/ 3	.1350+01	.36194+00	.95209-02	.67237-01	.42821-02	.86504-01	.17644-01	.27263-01	.67263-01	
101, 105	23/ 3	.1350+01	.36194+00	.95115-02	.67237-01	.42821-02	.86504-01	.17651-01	.27261-01	.67263-01	
105, 109	24/ 3	.1350+01	.36194+00	.95027-02	.67237-01	.42821-02	.86504-01	.17658-01	.27259-01	.67263-01	
109, 113	25/ 3	.1350+01	.36194+00	.94931-02	.67237-01	.42821-02	.86504-01	.17666-01	.27256-01	.67263-01	
113, 118	26/ 3	.1350+01	.36194+00	.94804-02	.67237-01	.42821-02	.86504-01	.17673-01	.27253-01	.67263-01	
118, 123	27/ 3	.1350+01	.36194+00	.94663-02	.67237-01	.42821-02	.86504-01	.17686-01	.27250-01	.67263-01	
123, 127	28/ 3	.1350+01	.36194+00	.94534-02	.67237-01	.42821-02	.86504-01	.17699-01	.27247-01	.67263-01	
127, 131	29/ 3	.1350+01	.36194+00	.94415-02	.67237-01	.42821-02	.86504-01	.17705-01	.27245-01	.67263-01	
131, 135	30/ 3	.1350+01	.36194+00	.94354-02	.67237-01	.42821-02	.86504-01	.17710-01	.27243-01	.67263-01	
135, 140	31/ 4	.1737+01	.23565+00	.32680-03	.10360-01	.00000	.00000	.35636-01	.36087-01	.10377-01	
TOTAL OF ALL REGIONS		4.73715550+23	1.26146183+23	6.12781910+23	1.62917790+23	3.18657910+19	-7.56337270+18				

***** END OF PROBLEM *****

ENERGY DEPOSITION IN CAL/CC	
TIME (SEC.)	TOTAL ENERGY DEPOSITION (CAL/CC)
A.1630-01	1.0442-01
A.1830-01	1.1956-01
A.2030-01	1.3698-01
A.2230-01	1.5701-01
A.2430-01	1.8007-01
A.2630-01	2.0660-01
A.2830-01	2.3712-01
A.3030-01	2.7225-01
A.3230-01	3.1263-01
A.3430-01	3.5904-01
A.3630-01	4.1233-01
A.3830-01	4.7342-01
A.4030-01	5.4337-01
A.4230-01	6.2330-01
A.4430-01	7.1443-01
A.4630-01	8.1804-01
A.4830-01	9.3544-01
A.5030-01	1.0680+00
A.5230-01	1.2169+00
A.5430-01	1.3834+00
A.5630-01	1.5686+00
A.5830-01	1.7731+00
A.6030-01	1.9973+00
A.6230-01	2.2413+00
A.6430-01	2.5044+00
A.6630-01	2.7857+00
A.6830-01	3.0833+00
A.7030-01	3.3951+00
A.7230-01	3.7181+00
A.7430-01	4.0492+00
A.7630-01	4.3849+00
A.7830-01	4.7215+00
A.8030-01	5.0554+00
A.8230-01	5.3831+00
A.8430-01	5.7015+00
A.8630-01	6.0079+00
A.8830-01	6.3001+00
A.9030-01	6.5765+00
A.9230-01	6.8358+00
A.9430-01	7.0775+00
A.9630-01	7.3014+00
A.9830-01	7.5077+00
9.0030-01	7.6966+00
9.0230-01	7.8695+00
9.0430-01	8.0267+00

9.0600-01	8.1695+00
9.0800-01	8.2988+00
9.1000-01	8.4158+00
9.1200-01	8.5216+00
9.1400-01	8.6172+00
9.1600-01	8.7037+00
9.1800-01	8.7819+00
9.2000-01	8.8528+00
9.2200-01	8.9172+00
9.2400-01	8.9757+00
9.2600-01	9.0291+00
9.2800-01	9.0780+00
9.3000-01	9.1228+00
9.3200-01	9.1641+00
9.3400-01	9.2023+00
9.3600-01	9.2378+00
9.3800-01	9.2708+00
9.4000-01	9.3018+00
9.4200-01	9.3309+00
9.4400-01	9.3584+00
9.4600-01	9.3845+00
9.4800-01	9.4094+00
9.5000-01	9.4331+00
9.5200-01	9.4560+00
9.5400-01	9.4780+00
9.5600-01	9.4993+00
9.5800-01	9.5200+00
9.6000-01	9.5401+00
9.6200-01	9.5598+00
9.6400-01	9.5790+00
9.6600-01	9.5979+00
9.6800-01	9.6166+00
9.7000-01	9.6349+00
9.7200-01	9.6530+00
9.7400-01	9.6709+00
9.7600-01	9.6886+00
9.7800-01	9.7061+00
9.8000-01	9.7234+00
9.8200-01	9.7406+00
9.8400-01	9.7577+00
9.8600-01	9.7746+00
9.8800-01	9.7915+00
9.9000-01	9.8082+00
9.9200-01	9.8249+00
9.9400-01	9.8414+00
9.9600-01	9.8579+00
9.9800-01	9.8743+00
1.0000+00	9.8907+00

1.0020+00	9.9070+00
1.0040+00	9.9232+00
1.0050+00	9.9394+00
1.0080+00	9.9555+00
1.0120+00	9.9716+00
1.0120+00	9.9876+00
1.0140+00	1.0004+01
1.0160+00	1.0020+01
1.0180+00	1.0035+01
1.0200+00	1.0051+01
1.0220+00	1.0067+01
1.0240+00	1.0083+01
1.0250+00	1.0099+01
1.0250+00	1.0114+01
1.0320+00	1.0130+01
1.0320+00	1.0146+01
1.0340+00	1.0161+01
1.0350+00	1.0177+01
1.0380+00	1.0193+01
1.0400+00	1.0208+01
1.0420+00	1.0224+01
1.0440+00	1.0239+01
1.0450+00	1.0255+01
1.0480+00	1.0270+01
1.0520+00	1.0286+01
1.0520+00	1.0301+01
1.0540+00	1.0316+01
1.0550+00	1.0332+01
1.0580+00	1.0347+01
1.0620+00	1.0362+01
1.0620+00	1.0378+01
1.0640+00	1.0393+01
1.0650+00	1.0408+01
1.0680+00	1.0423+01
1.0720+00	1.0438+01
1.0720+00	1.0454+01
1.0740+00	1.0469+01
1.0750+00	1.0484+01
1.0750+00	1.0499+01
1.0820+00	1.0514+01
1.0820+00	1.0529+01
1.0840+00	1.0544+01
1.0850+00	1.0559+01
1.0890+00	1.0574+01
1.0920+00	1.0589+01
1.0920+00	1.0604+01
1.0940+00	1.0619+01
1.0950+00	1.0634+01

1.0980+00	1.0649+01
1.1030+00	1.0663+01
1.1020+00	1.0678+01
1.1040+00	1.0693+01
1.1050+00	1.0708+01
1.1060+00	1.0723+01
1.1100+00	1.0738+01
1.1120+00	1.0752+01
1.1140+00	1.0767+01
1.1160+00	1.0782+01
1.1180+00	1.0796+01
1.1200+00	1.0811+01
1.1220+00	1.0826+01
1.1240+00	1.0840+01
1.1250+00	1.0855+01
1.1260+00	1.0870+01
1.1300+00	1.0884+01
1.1320+00	1.0899+01
1.1340+00	1.0913+01
1.1360+00	1.0928+01
1.1380+00	1.0943+01
1.1400+00	1.0957+01
1.1420+00	1.0972+01
1.1440+00	1.0986+01
1.1450+00	1.1000+01
1.1480+00	1.1015+01
1.1500+00	1.1029+01
1.1520+00	1.1044+01
1.1540+00	1.1058+01
1.1560+00	1.1073+01
1.1580+00	1.1087+01
1.1600+00	1.1101+01
1.1620+00	1.1116+01
1.1640+00	1.1130+01
1.1660+00	1.1144+01
1.1680+00	1.1159+01
1.1700+00	1.1173+01
1.1720+00	1.1187+01
1.1740+00	1.1201+01
1.1750+00	1.1216+01
1.1780+00	1.1230+01
1.1800+00	1.1244+01
1.1820+00	1.1258+01
1.1840+00	1.1272+01
1.1860+00	1.1287+01
1.1880+00	1.1301+01
1.1900+00	1.1315+01
1.1920+00	1.1329+01

1.1940+00	1.1343+01
1.1960+00	1.1357+01
1.1980+00	1.1371+01
1.2000+00	1.1385+01
1.2020+00	1.1400+01
1.2040+00	1.1414+01
1.2060+00	1.1428+01
1.2080+00	1.1442+01
1.2100+00	1.1456+01
1.2120+00	1.1470+01
1.2140+00	1.1484+01
1.2160+00	1.1498+01
1.2180+00	1.1512+01
1.2200+00	1.1526+01
1.2220+00	1.1540+01
1.2240+00	1.1553+01
1.2260+00	1.1567+01
1.2280+00	1.1581+01
1.2300+00	1.1595+01
1.2320+00	1.1609+01
1.2340+00	1.1623+01
1.2360+00	1.1637+01
1.2380+00	1.1651+01
1.2400+00	1.1665+01
1.2420+00	1.1678+01
1.2440+00	1.1692+01
1.2460+00	1.1706+01
1.2480+00	1.1720+01
1.2500+00	1.1734+01
1.2520+00	1.1747+01
1.2540+00	1.1761+01
1.2560+00	1.1775+01
1.2580+00	1.1789+01
1.2600+00	1.1803+01
1.2620+00	1.1816+01
1.2640+00	1.1830+01
1.2660+00	1.1844+01
1.2680+00	1.1857+01
1.2700+00	1.1871+01
1.2720+00	1.1885+01
1.2740+00	1.1899+01
1.2760+00	1.1912+01
1.2780+00	1.1926+01
1.2800+00	1.1940+01
1.2820+00	1.1953+01
1.2840+00	1.1967+01
1.2860+00	1.1981+01
1.2880+00	1.1994+01

1.2930+00	1.2008+01
1.2920+00	1.2021+01
1.2910+00	1.2035+01
1.2900+00	1.2049+01
1.2890+00	1.2062+01
1.2880+00	1.2076+01
1.2870+00	1.2089+01
1.2860+00	1.2103+01
1.2850+00	1.2116+01
1.2840+00	1.2130+01
1.2830+00	1.2143+01
1.2820+00	1.2157+01
1.2810+00	1.2170+01
1.2800+00	1.2184+01
1.2790+00	1.2197+01
1.2780+00	1.2210+01
1.2770+00	1.2224+01
1.2760+00	1.2237+01
1.2750+00	1.2250+01
1.2740+00	1.2263+01
1.2730+00	1.2277+01
1.2720+00	1.2290+01
1.2710+00	1.2303+01
1.2700+00	1.2316+01
1.2690+00	1.2329+01
1.2680+00	1.2342+01
1.2670+00	1.2669+01
1.2660+00	1.2979+01
1.2650+00	1.3275+01
1.2640+00	1.3560+01
1.2630+00	1.3834+01
1.2620+00	1.4098+01
1.2610+00	1.4349+01
1.2600+00	1.4590+01
1.2590+00	1.4822+01
1.2580+00	1.5045+01
1.2570+00	1.5261+01
1.2560+00	1.5470+01
1.2550+00	1.5674+01
1.2540+00	1.5874+01
1.2530+00	1.6070+01
1.2520+00	1.6262+01
1.2510+00	1.6451+01
1.2500+00	1.6637+01
2.2490+00	1.6818+01
2.2480+00	1.6997+01
2.2470+00	1.7171+01
2.2460+00	1.7342+01

2.4930+00	1.7510+01
2.5430+00	1.7675+01
2.5930+00	1.7837+01
2.6430+00	1.7996+01
2.6930+00	1.8151+01
2.7430+00	1.8303+01
2.7930+00	1.8452+01
2.8430+00	1.8597+01
2.8930+00	1.8736+01
2.9430+00	1.8869+01
2.9930+00	1.8998+01
3.0430+00	1.9122+01
3.0930+00	1.9242+01
3.1430+00	1.9358+01
3.1930+00	1.9470+01
3.2430+00	1.9578+01
3.2930+00	1.9683+01
3.3430+00	1.9784+01
3.3930+00	1.9883+01
3.4430+00	1.9978+01
3.4930+00	2.0071+01
3.5430+00	2.0161+01
3.5930+00	2.0249+01
3.6430+00	2.0334+01
3.6930+00	2.0416+01
3.7430+00	2.0497+01
3.7930+00	2.0575+01
3.8430+00	2.0650+01
3.8930+00	2.0722+01
3.9430+00	2.0793+01
3.9930+00	2.0855+01
4.0430+00	2.0917+01
4.0930+00	2.0976+01
4.1430+00	2.1032+01
4.1930+00	2.1087+01
4.2430+00	2.1139+01
4.2930+00	2.1188+01
4.3430+00	2.1235+01
4.3930+00	2.1280+01
4.4430+00	2.1321+01
4.4930+00	2.1360+01
4.5430+00	2.1397+01
4.5930+00	2.1432+01
4.6430+00	2.1465+01
4.6930+00	2.1496+01
4.7430+00	2.1526+01
4.7930+00	2.1554+01
4.8430+00	2.1581+01

4.8930+00	2.1605+01
4.9430+00	2.1627+01
4.9930+00	2.1648+01
5.0430+00	2.1667+01
5.0930+00	2.1685+01

REGION NUMBER	ENERGY (CAL/CC)
1	1.0866+02
2	9.4040+01
3	9.1734+01
4	8.9766+01
5	7.9729+01
6	6.5250+01
7	5.6908+01
8	5.1835+01
9	4.8455+01
10	4.5665+01
11	4.3288+01
12	4.1217+01
13	3.8959+01
14	3.6589+01
15	3.4532+01
16	3.2695+01
17	3.1011+01
18	2.9470+01
19	2.7381+01
20	2.4885+01
21	2.2657+01
22	2.0637+01
23	1.8780+01
24	1.7057+01
25	1.5190+01
26	1.2740+01
27	1.0062+01
28	7.8260+00
29	5.4106+00
30	4.2658+00
31	0.0000

APPENDIX D

SAMPLE CASE INPUT AND OUTPUT

FOR UNIWIGL - THE CDC 6600 VERSION OF NEWIGL

* ELT NEW/DECK,1,740530, 33608 ,12

```

000001      *      5      1      1
000002      $WIG  V1=8.453-08,  V2=2.5349-06,  NPRT=1,
000003      IN(1)=151,5,9,15,1,1,1,0,6,  WZERO=8,5*07,  TIN=395,0,  TOUT=560,0,
000004      PZERO=3865,0,  CSAREA=1020656.,  NPASS=1,  NK1=15,  HIGH=1014,73,
000005      WIDE=1005.84,  HIGH2=1005.84,  ITRIP=-1, NPUN=3, NTSTP=510,
000006      PRES=0.0,
000007      NPUN=0,
000008      $END
000009      $TIT  FRONT TO REAR SCRAM TRANSIENT WITH SECOND ROD BANK
000010      $TIME 0.001 P1*1 0.1 A10*50
000011      $GEOM N5 7.036*10 N4 8.331*10 N3 8.128*10 N2 8.128*10 N1 T5 8.128*10
000012      T6*10 T7*10 T8*10 T9*10 T10*10 T11*10 N2 8.128*10 N3 8.128*10
000013      N4 8.331*10 N5 7.036*10
000014      $ADJ
000015      .38739013+02, .20600525+10, .42917392+10, .68731445+10, .99929442+10, .13850412+11
000016      .18645695+11, .24560457+11, .31696152+11, .39985504+11, .49010327+11, .57671674+11
000017      .66738456+11, .75991058+11, .85311319+11, .94634201+11, .10392248+12, .11315354+12
000018      .12231239+12, .13138812+12, .14037197+12, .14904103+12, .15760894+12, .16606960+12
000019      .17441711+12, .18264577+12, .19074999+12, .19872429+12, .20656332+12, .21426182+12
000020      .22181465+12, .22921680+12, .23646335+12, .24354959+12, .25047096+12, .25722320+12
000021      .26380245+12, .27020555+12, .27643049+12, .28247735+12, .28835008+12, .29405972+12
000022      .29961779+12, .30502929+12, .31029577+12, .31541700+12, .32039182+12, .32521860+12
000023      .32983553+12, .33442068+12, .33879215+12, .34300801+12, .34706645+12, .35096564+12
000024      .35473399+12, .35827952+12, .36169095+12, .36493666+12, .36801521+12, .37092525+12
000025      .37365546+12, .37623464+12, .37863162+12, .38085536+12, .38290487+12, .38477922+12
000026      .38647760+12, .38799923+12, .38934344+12, .39050964+12, .39149729+12, .39230598+12
000027      .39293533+12, .39338506+12, .39365499+12, .39374497+12, .39365498+12, .39338505+12
000028      .39293531+12, .39230594+12, .39149725+12, .39050958+12, .38934337+12, .38799915+12
000029      .38647752+12, .38290477+12, .38085525+12, .37863150+12, .37623452+12, .37092525+12
000030      .37365533+12, .37092511+12, .36801507+12, .36493649+12, .36169077+12, .35827933+12
000031      .35473369+12, .35096543+12, .34706622+12, .34300778+12, .33879191+12, .33442044+12
000032      .32983527+12, .32521834+12, .32039154+12, .31541672+12, .31029548+12, .30502899+12
000033      .29961749+12, .29405942+12, .28834977+12, .28247704+12, .27643017+12, .27020524+12
000034      .26380213+12, .25722288+12, .25047063+12, .24354926+12, .23646303+12, .22921647+12
000035      .22181434+12, .21426151+12, .20656300+12, .19872399+12, .19074968+12, .18264547+12
000036      .17441682+12, .16606931+12, .15760867+12, .14904077+12, .14037170+12, .13138787+12
000037      .12231216+12, .11315332+12, .10392229+12, .94634026+11, .85311164+11, .75990923+11
000038      .66738342+11, .57671579+11, .49010250+11, .39985445+11, .31696109+11, .24560428+11
000039      .18645676+11, .13850400+11, .99929367+10, .68731402+10, .42917370+10, .20600515+10
000040      .38739013+02,
000041      .12011360+02, .10952494+10, .23292005+10, .39582679+10, .58761885+10, .86386386+10
000042      .12495629+11, .17935850+11, .25648594+11, .36611085+11, .52212304+11, .65972602+11
000043      .78645542+11, .90717752+11, .10243987+12, .11393922+12, .12527856+12, .13648693+12
000044      .14757575+12, .15854727+12, .16939899+12, .17986605+12, .19020864+12, .20042049+12
000045      .21049508+12, .22042583+12, .23020615+12, .23982955+12, .24928956+12, .25857986+12
000046      .26769420+12, .27662644+12, .28537050+12, .29392035+12, .30226986+12, .31041272+12

```

000047 .31834204+12..32604980+12..33352569+12..34075496+12..34771435+12..35447387+12
 000048 .36110700+12..36759342+12..37392097+12..38008192+12..38607094+12..39188398+12
 000049 .39751773+12..40296926+12..40823596+12..41331539+12..41820522+12..42290325+12
 000050 .42740738+12..43171559+12..43582596+12..43973667+12..44344598+12..44695224+12
 000051 .45025388+12..45333495+12..45623755+12..45891692+12..46138634+12..46364473+12
 000052 .46569107+12..46752448+12..46914411+12..47054925+12..47173927+12..47271365+12
 000053 .47347194+12..47401383+12..47433905+12..47444747+12..47433904+12..47401380+12
 000054 .47347191+12..47271360+12..47173921+12..47054917+12..46914402+12..46752439+12
 000055 .46569098+12..46364462+12..46138623+12..45891678+12..45623741+12..45334930+12
 000056 .45025373+12..44695207+12..44344579+12..43973647+12..43582574+12..43171535+12
 000057 .42740713+12..42290299+12..41820495+12..41331511+12..40823567+12..40296896+12
 000058 .39751741+12..39188367+12..38607062+12..38008159+12..37392062+12..36759306+12
 000059 .36110664+12..35447349+12..34771398+12..34075458+12..33352532+12..32604942+12
 000060 .31834166+12..31041232+12..30226947+12..29391995+12..28537011+12..27662605+12
 000061 .26769381+12..25857947+12..24928918+12..23982918+12..23020579+12..22042546+12
 000062 .21049473+12..20042014+12..19020831+12..17986573+12..16939868+12..15854698+12
 000063 .14757548+12..13648668+12..12527833+12..11393901+12..10243969+12..9017593+11
 000064 .78645426+11..65972493+11..52212223+11..36611036+11..25648564+11..17935833+11
 000065 .12495619+11..85386338+10..58761861+10..38582668+10..23292001+10..10952492+10
 000066 .12011366+02.
 000067 \$FLUX
 000068 .19841954+04..10552227+12..22932386+12..39287039+12..62450673+12..96437866+12
 000069 .14713906+13..22334146+13..33825199+13..51178622+13..77402000+13..10446157+14
 000070 .12767704+14..14882841+14..16884063+14..18819129+14..20712391+14..22575960+14
 000071 .24413547+14..26233524+14..28030518+14..29763238+14..31475041+14..33165027+14
 000072 .34332191+14..36475479+14..38093819+14..39686138+14..41251377+14..42788488+14
 000073 .44295445+14..46774242+14..47220900+14..48635472+14..50017048+14..51364776+14
 000074 .52677885+14..53955738+14..55197938+14..56404500+14..57576209+14..58715270+14
 000075 .59823979+14..60903336+14..61953654+14..62974891+14..63966619+14..64929124+14
 000076 .65861445+14..66763410+14..67634641+14..68474769+14..69283433+14..70060285+14
 000077 .70804990+14..71517227+14..72196686+14..72843076+14..73456119+14..74035549+14
 000078 .74581118+14..75092592+14..75569750+14..76012386+14..76420313+14..76993356+14
 000079 .77131352+14..77434160+14..77701648+14..77933703+14..78150226+14..78291131+14
 000080 .78416350+14..78505831+14..78559534+14..78577437+14..78559533+14..78505828+14
 000081 .78416345+14..78291123+14..78130214+14..77933691+14..77701633+14..77434142+14
 000082 .77131332+14..76793333+14..76420289+14..76012359+14..75569721+14..75092561+14
 000083 .74581084+14..74035513+14..73456082+14..72843038+14..72196645+14..71517184+14
 000084 .70804945+14..70060239+14..69283385+14..68474719+14..67634590+14..66763357+14
 000085 .65861323+14..64929070+14..63966765+14..62974834+14..61953598+14..60903279+14
 000086 .59823920+14..58715209+14..57576148+14..56404437+14..55197875+14..53955675+14
 000087 .52677821+14..51364712+14..50016984+14..48635408+14..47220837+14..45774179+14
 000088 .44296381+14..42788426+14..41251315+14..39686077+14..38093758+14..36475419+14
 000089 .34832133+14..33164971+14..31474986+14..29763185+14..28030467+14..26233476+14
 000090 .24413503+14..22575918+14..20712353+14..18819095+14..16884033+14..14882814+14
 000091 .12767681+14..10446140+14..77401880+13..51178554+13..33825162+13..22334127+13
 000092 .14713897+13..96437823+12..62450659+12..39287037+12..22932387+12..10952228+12
 000093 .19841969+04.
 000094 .56694833+04..51695346+12..10687754+13..16894840+13..24102776+13..52552817+13

000095	.42329592+13, .53200925+13, .64333509+13, .73804150+13, .7778327+13, .80222192+13
000096	.47097099+13, .96258142+13, .10657897+14, .11746621+14, .12860544+14, .13982824+14
000097	.15104260+14, .16219656+14, .17325917+14, .18394436+14, .19451165+14, .20494855+14
000098	.21524812+14, .22540127+14, .23540110+14, .24524058+14, .25491294+14, .26441159+14
000099	.27373005+14, .28286201+14, .29180120+14, .30054142+14, .30907639+14, .31739964+14
000100	.32553410+14, .33338156+14, .34102147+14, .34840673+14, .35551956+14, .36242551+14
000101	.36920176+14, .37582748+14, .38229027+14, .38858226+14, .39469800+14, .40063341+14
000102	.40639510+14, .41195017+14, .41732597+14, .42251005+14, .42750008+14, .43229388+14
000103	.43683935+14, .44126447+14, .44547735+14, .44946618+14, .45324922+14, .45682486+14
000104	.46019155+14, .46334782+14, .46629235+14, .46902386+14, .47154117+14, .47384322+14
000105	.47592899+14, .47797621+14, .47944829+14, .48098030+14, .48209304+14, .48308599+14
000106	.48385873+14, .48441092+14, .48474232+14, .48484580+14, .48474231+14, .48441089+14
000107	.48385868+14, .48308595+14, .48209297+14, .48088022+14, .47944819+14, .47779752+14
000108	.47592887+14, .47384308+14, .47154102+14, .46902369+14, .46629217+14, .46334763+14
000109	.46019133+14, .45682464+14, .45324899+14, .44946594+14, .44547711+14, .44128421+14
000110	.43689917+14, .43229360+14, .42749979+14, .42250974+14, .41732566+14, .41194984+14
000111	.40639477+14, .40633307+14, .39469767+14, .38858191+14, .38228991+14, .37582711+14
000112	.36920139+14, .36242514+14, .35551918+14, .34840834+14, .34102108+14, .3338118+14
000113	.32553371+14, .31739924+14, .30907600+14, .30054101+14, .29180080+14, .28286162+14
000114	.27372967+14, .26441120+14, .25491256+14, .24524020+14, .23540073+14, .22540091+14
000115	.21524776+14, .20494860+14, .19451131+14, .18394463+14, .17325885+14, .16219626+14
000116	.15104232+14, .13982798+14, .12860520+14, .11746600+14, .10657878+14, .96257980+13
000117	.87096959+13, .83222068+13, .77778208+13, .73804040+13, .64333420+13, .53200859+13
000118	.42329545+13, .32552787+13, .24102757+13, .16894829+13, .10687747+13, .51695315+12
000119	.56694831+04,
000120	\$DOP
000121	0.0000032 0.0 -0.0000017 1210. 1
000122	0.0000032 0.0 -0.0000017 1175. 2
000123	0.0000032 0.0 -0.0000017 1121. 3
000124	0.0000032 0.0 -0.0000017 1058. 4
000125	0.0 0.0 0.0 0.0 5
000126	\$C00-
000127	.0000357 -.00000017 .00000197 .0000318 1
000128	.0000357 -.00000017 .00000197 .0000318 2
000129	.0000357 -.00000017 .00000197 .0000318 3
000130	.0000357 -.00000017 .00000197 .0000318 4
000131	0. 0. 0. 0. 5
000132	.001704 .00000938 .00000478 .0. 1
000133	.001704 .00000938 .00000478 .0. 2
000134	.001704 .00000938 .00000478 .0. 3
000135	.001704 .00000938 .00000478 .0. 4
000136	0. 0. 0. 0. 5
000137	\$XSEC
000138	UNRD-9
000139	2.554
000140	2.430
000141	1.8833
000142	.0065148
	0.000385 0.001269 1.8603 0.003336
	0.002681 0.002704 1.3081 0.0
	.001654 .00098329 .003336 1.3081
	.005385

000143	UNRD-7	0.000385	0.001269	1.8803	0.003336	
000144	2.554	0.002681	0.002704	1.3081	0.0	
000145	2.430	.001654	.00098329	.003336	1.3081	.005385
000146	1.8803					
000147	.0065148					
000148	UNRD-5	0.000385	0.001269	1.8803	0.003336	
000149	2.554	0.002681	0.002704	1.3081	0.0	
000150	2.430	.001654	.00098329	.003336	1.3081	.005385
000151	1.8803					
000152	.0065148					
000153	UNRD	0.000385	0.001269	1.8803	0.003336	
000154	2.554	0.002681	0.002704	1.3081	0.0	
000155	2.430	.001654	.00098329	.003336	1.3081	.005385
000156	1.8803					
000157	.0065148					
000158	HOT GRAPHITE WITH SPACER-REAR TEMPERATURES					
000159	0.0	0.0	0.000123	1.4799	0.005058	
000160	0.0	0.0	0.002209	0.8631	0.0	
000161	1.4799	.000123	0.0	.005058	.8631	.002209
000162	0.0					
000163	BETA					
000164	.0124	.03043	.11320	.3048	1.134	2.959
000165	1					
000166	.000163	.00113	.000969	.001876	.000539	.000207
000167	2					
000168	.000163	.00113	.000969	.001876	.000539	.000207
000169	3					
000170	.000163	.00113	.000969	.001876	.000539	.000207
000171	4					
000172	.000166	.001152	.000991	.001926	.000554	.000212
000173	5					
000174	.000163	.00113	.000969	.001876	.000539	.000207
000175	6					
000176	0.	0.	0.	0.	0.	0.
000177	7					
000178	0.	0.	0.	0.	0.	0.
000179	8					
000180	.000163	.00113	.000969	.001876	.000539	.000207
000181	9					
000182	.000163	.00113	.000969	.001876	.000539	.000207
000183	10					
000184	.000166	.001152	.000991	.001926	.000554	.000212
000185	11					
000186	.000163	.00113	.000969	.001876	.000539	.000207
000187	12					
000188	0.	0.	0.	0.	0.	0.
000189	13					
000190	0.	0.	0.	0.	0.	0.

000191	\$TROJ	0.000237	0.000009	-0.000048	5.0	1
000192	0.00242	0.000223	0.000008	-0.000045	5.0	2
000193	0.00227	0.000121	0.000006	-0.000024	5.0	3
000194	0.00123	0.0	0.0	0.0	0.0	4
000195	0.0	0.0	0.0	0.0	0.0	5
000196	0.0	0.000304	0.000025	1005.84	-670.56	1
000197	0.01098	0.000286	0.000023	1005.84	-670.56	2
000198	0.01032	0.000155	0.000013	1005.84	-670.56	3
000199	0.00560	0.0	0.0	0.0	0.0	4
000200	0.0	0.0	0.0	0.0	0.0	5
000201	0.0	2				
000202	0.0	.25	.50	.75	1.0	
000203	0.0	.25	.50	.75	1.0	
000204	0.0					
000205	\$THPR	2116.38	11105.6	1.1884		1
000206	42.729	2116.38	11105.6	1.1884		2
000207	42.729	2116.38	11105.6	1.1884		3
000208	42.729	2116.38	11105.6	1.1884		4
000209	42.729	2116.38	11105.6	1.1884		5
000210	42.729	2116.38	11105.6	1.1884		1
000211	0.0	56.891	0.4047	57.6784		2
000212	0.0	56.891	0.4047	57.6784		3
000213	0.0	56.891	0.4047	57.6784		4
000214	0.0	56.891	0.4047	57.6784		5
000215	0.0	56.891	0.4047	57.6784		
000216	\$SOR					
000217	1.00	+4 1.00	+4			1
000218	1.00	+4 1.00	+4			2
000219	1.00	+4 1.00	+4			3
000220	1.00	+4 1.00	+4			4
000221	0.0	0.0				5

THIS WIGL2 RUN WAS MADE ON 05/29/74 AT 06.32.37.11

STRT FRONT TO REAR SCRAM TRANSIENT WITH SECOND WCD BANK

```

3WIG2
PRES = 0.0,
V1 = 0.8453E-07,
V2 = 0.25349E-05,
NPTS = 151,
NCMP = 5,
NREG = 9,
NTREG = 15,
NLBDY = 1,
NRBDY = 1,
NTYPE = 1,
NGEOM = 0,
NBETA = 6,
NPUN = 0,
NTSTP = 510,
NPERT = -1,
TALTS = 0.0,
ALPHAS = 0.0,
TALTM = 0.0,
ALPHAW = 0.0,
TALTIN = 0.0,
ALPHIN = 0.0,
TROO = 0.0,
WTEPO = 0.85E+08,
TIN = 0.395E+03,
TOUT = 0.56E+03,
RZERO = 0.0,
RZDOT = 0.0,
ALPHR1 = 0.0,
ALPHR2 = 0.0,
ALPHR3 = 0.0,
ALPHR4 = 0.0,
P7EPO = 0.3865E+04,

```

CSARE1 = 0.1020656E+07,
 NPASS = 1,
 NK1 = 15,
 NRBEAR = 0,
 HIGH = 0.101473E+04,
 WIDE = 0.105844E+04,
 NTIME = 0,
 TIME = 0.0,
 HIGH2 = 0.105844E+04,
 ITRIP = -1,
 SEND
 THERE ARE 2 TIME ZONES,
 ZONE NO. 1 RUNS BETWEEN 0.000 AND .001SEC. WITH TIME STEPS OF .00100 SEC.; PRINTING A TYPE "P" OUTPUT EVERY 1STEPS
 ZONE NO. 2 RUNS BETWEEN .001 AND 5.001SEC. WITH TIME STEPS OF .10000 SEC.; PRINTING A TYPE "A" OUTPUT EVERY 10STEPS

CROSS SECTION INPUT

COMP.# 1 COMP. ID UNR0-3
 DIFF COEFF TRANSPORT CAPTURE FISSION ABSORPTION NU NU*FISSION SCATTERING (N,2N)
 GROUP=1 1.843E+00 1.772E-01 1.2590E-03 3.8500E-04 1.6540E-03 2.5540E+00 9.8329E-04 3.3360E-03
 GROUP=2 1.3081E+00 2.5482E-01 2.7040E-03 2.6810E-03 5.3850E-03 2.4300E+00 6.5148E-03 0.
 COMP.# 2 COMP. ID UNR0-7
 DIFF COEFF TRANSPORT CAPTURE FISSION ABSORPTION NU NU*FISSION SCATTERING (N,2N)
 GROUP=1 1.843E+00 1.772E-01 1.2590E-03 3.8500E-04 1.6540E-03 2.5540E+00 9.8329E-04 3.3360E-03
 GROUP=2 1.3081E+00 2.5482E-01 2.7040E-03 2.6810E-03 5.3850E-03 2.4300E+00 6.5148E-03 0.
 COMP.# 3 COMP. ID UNR0-5
 DIFF COEFF TRANSPORT CAPTURE FISSION ABSORPTION NU NU*FISSION SCATTERING (N,2N)
 GROUP=1 1.843E+00 1.772E-01 1.2590E-03 3.8500E-04 1.6540E-03 2.5540E+00 9.8329E-04 3.3360E-03
 GROUP=2 1.3081E+00 2.5482E-01 2.7040E-03 2.6810E-03 5.3850E-03 2.4300E+00 6.5148E-03 0.
 COMP.# 4 COMP. ID UNR0
 DIFF COEFF TRANSPORT CAPTURE FISSION ABSORPTION NU NU*FISSION SCATTERING (N,2N)
 GROUP=1 1.843E+00 1.772E-01 1.2590E-03 3.8500E-04 1.6540E-03 2.5540E+00 9.8329E-04 3.3360E-03
 GROUP=2 1.3081E+00 2.5482E-01 2.7040E-03 2.6810E-03 5.3850E-03 2.4300E+00 6.5148E-03 0.
 COMP.# 5 COMP. ID HOT GRAPHITE
 DIFF COEFF TRANSPORT CAPTURE FISSION ABSORPTION NU NU*FISSION SCATTERING (N,2N)

G30UP=	1.479E+00	2.2524E-01	1.2330E-04	0.	1.210E-04	0.	5.0580E-03
GROUP=	2	6.631E-01	3.8620E-01	2.2593E-03	0.	2.2090E-03	0.

[illegible]

STRT FRONT TO PEAK SCRAM TRANSIENT WITH SECOND ROD BANK ELAPSED TIME FROM START OF CASE .998 SEC

INPUT DATA

BOUNDARY CONDITIONS - ZERO FLUX, ZERO FLUX GEOMETRY - AXIAL, CYL

151 POINTS 5 COMPOSITIONS 9 NUCLEAR REGIONS 15 T-H REGIONS 516 TIME STEPS

CROSS SECTIONAL AREA OF CORE .10207E+07

RECIPROCAL OF NEUTRON VELOCITY .845300E-07 .253490E-05

TIME AT WHICH SOURCE BEGINS TO CHANGE WITH TIME 0.

PARAMETER EFFECTING RATE OF CHANGE OF SOURCE 0.

INITIAL FLOW INTO CORE .45000E+04

TIME AT WHICH FLOW BEGINS TO CHANGE WITH TIME 0.

PARAMETER EFFECTING RATE OF CHANGE OF FLOW 0.

CORE INLET TEMPERATURE .39500E+03 DESIRED COOLANT TEMPERATURE .50000E+03

TIME AT WHICH INLET TEMPERATURE BEGINS TO CHANGE WITH TIME 0.

PARAMETER EFFECTING RATE OF CHANGE OF INLET TEMPERATURE 0.

TIME AT WHICH ROD POSITION BEGINS TO CHANGE DUE TO EXTERNAL CONTROL 0.

6 CONTROL-ROD-POSITION COMPOSITION(S)

INITIAL ROD WITHDRAWAL 0.

RATE OF ROD BANK MOTION DUE TO EXTERNAL CONTROL 0.

PARAMETERS SPECIFYING RESPONSE TO CONTROL SYSTEM 0. 0. 0. 0.

DESIRED POWER IN MEGAWATTS .386500E+04

TIME

100% CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

AXENON CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

COOLANT TEMPERATURE

.39500E+03 .39500E+03 .40400E+03 .40980E+03 .42010E+03 .43030E+03 .44050E+03 .45070E+03 .46090E+03 .47110E+03

FUEL TEMPERATURE

.39500E+03 .44400E+03 .49200E+03 .53730E+03 .57650E+03 .60960E+03 .63630E+03 .65400E+03 .66470E+03 .66470E+03

POINT(S) (I TO J)	REGION T-4/FUEL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		MU * SIGMA(FISS)	REMOVAL		TOTAL CROSS SECTIONS		
		GROUP 1	GROUP 2	GROUP 1	GROUP 2		1	2	GROUP 1	GROUP 2	
9, 10	1/ 1	.1440E+01	.2531E+02	.1270E-03	.2233E-12	0.	.9833E-03	.5514E-02	.5181E-02	.22090E-02	
10, 20	2/ 2	.1840E+01	.1308E+01	.1270E-03	.5145E-12	0.	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
20, 30	3/ 3	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
30, 40	4/ 4	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
40, 50	5/ 5	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
50, 60	6/ 6	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
60, 70	7/ 7	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
70, 80	8/ 8	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
80, 90	9/ 9	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
90, 100	10/ 10	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
100, 110	11/ 11	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
110, 120	12/ 12	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
120, 130	13/ 13	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
130, 140	14/ 14	.1840E+01	.1308E+01	.1651E-03	.5785E-12	.9833E-03	.9833E-03	.5514E-02	.4930E-02	.53850E-02	
140, 150	15/ 15	.1840E+01	.1308E+01	.1651E-03	.5785E-12	0.	.9833E-03	.5514E-02	.5181E-02	.22090E-02	

PT	DEL X	OIST	FLUX GR1	FLUX GR2	ADJ GR1	ADJ GR2	PD40	PCNT	PCW1
1	9.000 0.		1.9845E+03	5.6095E+03	3.7737E+01	1.2011E+01	0.	0.	0.
2	7.036 7.936E+00		1.9555E+11	5.1695E+11	2.0611E+09	1.0452E+09	0.	0.	0.
3	7.036 1.4072E+01		2.2322E+11	1.0688E+12	4.2917E+09	3.3222E+09	0.	0.	0.
4	7.036 2.1108E+01		3.9287E+11	1.6895E+12	5.8731E+09	3.8633E+09	0.	0.	0.
5	7.036 2.8144E+01		6.2451E+11	2.4103E+12	9.9929E+09	6.8762E+09	0.	0.	0.
6	7.036 3.5180E+01		9.6432E+11	3.2553E+12	1.3850E+10	9.6366E+09	0.	0.	0.
7	7.036 4.2216E+01		1.4711E+12	4.2330E+12	1.8547E+10	1.2496E+10	0.	0.	0.
8	7.036 4.9252E+01		2.2332E+12	5.3201E+12	2.6560E+10	1.7936E+10	0.	0.	0.
9	7.036 5.6288E+01		3.3925E+12	6.4342E+12	3.6897E+10	2.5543E+10	0.	0.	0.
10	7.036 6.3324E+01		5.1179E+12	7.3894E+12	5.3945E+10	3.5011E+10	0.	0.	0.
11	7.036 7.036E+01		5.4179E+12	7.3804E+12	5.8446E+10	3.5611E+10	0.	0.	0.
12	9.331 7.036E+01		7.7409E+12	7.7779E+12	4.0810E+10	5.2212E+10	6.4282E+10	1.0001E+00	0.
13	9.331 7.8691E+01		1.0465E+13	8.0222E+12	5.7573E+10	6.5973E+10	6.2535E+10	1.0001E+00	0.
14	9.331 8.7022E+01		1.2764E+13	8.7697E+12	6.7731E+10	7.8366E+10	6.9295E+10	1.0001E+00	0.
15	9.331 9.5353E+01		1.4883E+13	9.6286E+12	7.5391E+10	9.0716E+10	7.7344E+10	1.0001E+00	0.
16	9.331 1.0368E+02		1.6887E+13	1.0658E+13	8.5411E+10	1.0324E+11	8.6733E+10	1.0001E+00	0.
17	9.331 1.1202E+02		1.8813E+13	1.1775E+13	9.6335E+10	1.1394E+11	9.5032E+10	1.0001E+00	0.
18	9.331 1.2035E+02		2.0712E+13	1.3761E+13	1.0391E+11	1.2628E+11	1.0415E+11	1.0001E+00	0.
19	9.331 1.2868E+02		2.2576E+13	1.5885E+13	1.1315E+11	1.3549E+11	1.1325E+11	1.0001E+00	0.
20	9.331 1.3701E+02		2.4416E+13	1.8104E+13	1.2312E+11	1.4758E+11	1.2241E+11	1.0001E+00	0.
21	9.331 1.4534E+02		2.6233E+13	1.6220E+13	1.3135E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
22	9.331 1.5367E+02		2.8032E+13	1.8220E+13	1.4133E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
23	9.331 1.6200E+02		2.9787E+13	1.8394E+13	1.5037E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
24	9.331 1.7033E+02		3.1585E+13	2.0455E+13	1.6071E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
25	9.331 1.7866E+02		3.3432E+13	2.1575E+13	1.7449E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
26	9.331 1.8699E+02		3.5475E+13	2.2540E+13	1.8267E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
27	9.331 1.9532E+02		3.7596E+13	2.3500E+13	1.8775E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
28	9.331 2.0365E+02		3.9887E+13	2.4524E+13	1.9672E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
29	9.331 2.1198E+02		4.1951E+13	2.5501E+13	2.0556E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
30	9.331 2.2031E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
31	9.331 2.2864E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
32	9.331 2.3697E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
33	9.331 2.4530E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
34	9.331 2.5363E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
35	9.331 2.6196E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
36	9.331 2.7029E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
37	9.331 2.7862E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
38	9.331 2.8695E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
39	9.331 2.9528E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
40	9.331 3.0361E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
41	9.331 3.1194E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
42	9.331 3.2027E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
43	9.331 3.2860E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
44	9.331 3.3693E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
45	9.331 3.4526E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
46	9.331 3.5359E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
47	9.331 3.6192E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
48	9.331 3.7025E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
49	9.331 3.7858E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
50	9.331 3.8691E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
51	9.331 3.9524E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
52	9.331 4.0357E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
53	9.331 4.1190E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
54	9.331 4.2023E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
55	9.331 4.2856E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
56	9.331 4.3689E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
57	9.331 4.4522E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
58	9.331 4.5355E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
59	9.331 4.6188E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
60	9.331 4.7021E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
61	9.331 4.7854E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
62	9.331 4.8687E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
63	9.331 4.9520E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
64	9.331 5.0353E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
65	9.331 5.1186E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
66	9.331 5.2019E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
67	9.331 5.2852E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
68	9.331 5.3685E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
69	9.331 5.4518E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
70	9.331 5.5351E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
71	9.331 5.6184E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
72	9.331 5.7017E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
73	9.331 5.7850E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
74	9.331 5.8683E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
75	9.331 5.9516E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
76	9.331 6.0349E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
77	9.331 6.1182E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
78	9.331 6.2015E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
79	9.331 6.2848E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
80	9.331 6.3681E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
81	9.331 6.4514E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
82	9.331 6.5347E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
83	9.331 6.6180E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
84	9.331 6.7013E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
85	9.331 6.7846E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
86	9.331 6.8679E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
87	9.331 6.9512E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
88	9.331 7.0345E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
89	9.331 7.1178E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
90	9.331 7.2011E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
91	9.331 7.2844E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
92	9.331 7.3677E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	0.
93	9.331 7.4510E+02		4.2743E+13	2.6441E+13	2.1423E+11	1.5855E+11	1.3144E+11	1.0001E+00	

50	8.128	3.8038E+02	6.6763E+13	4.1195E+13	3.3642E+11	4.0297E+11	3.3403E+11	1.0000E+00	0.
51	8.128	3.9751E+02	6.7635E+13	4.1735E+13	3.375E+11	4.0828E+11	3.3838E+11	1.0000E+00	
52	8.128	4.0564E+02	6.8475E+13	4.2251E+13	3.4301E+11	4.1332E+11	3.4259E+11	1.0000E+00	
53	8.128	4.1377E+02	6.9283E+13	4.2750E+13	3.4707E+11	4.1821E+11	3.4663E+11	1.0000E+00	
54	8.128	4.2195E+02	7.0060E+13	4.3229E+13	3.5097E+11	4.2290E+11	3.5052E+11	1.0000E+00	
55	8.128	4.3002E+02	7.0805E+13	4.3689E+13	3.5470E+11	4.2741E+11	3.5425E+11	1.0000E+00	
56	8.128	4.3815E+02	7.1517E+13	4.4126E+13	3.5828E+11	4.3172E+11	3.5781E+11	1.0000E+00	
57	8.128	4.4628E+02	7.2197E+13	4.4548E+13	3.6169E+11	4.3583E+11	3.6121E+11	1.0000E+00	
58	8.128	4.5441E+02	7.2943E+13	4.4947E+13	3.6494E+11	4.3976E+11	3.6444E+11	1.0000E+00	
59	8.128	4.6253E+02	7.3686E+13	4.5325E+13	3.6802E+11	4.4385E+11	3.6751E+11	1.0000E+00	
60	8.128	4.7066E+02	7.4435E+13	4.5693E+13	3.7093E+11	4.4795E+11	3.7041E+11	1.0000E+00	
61	8.128	4.7879E+02	7.5196E+13	4.6052E+13	3.7369E+11	4.5195E+11	3.7314E+11	1.0000E+00	
62	8.128	4.8692E+02	7.5935E+13	4.6395E+13	3.7623E+11	4.5585E+11	3.7570E+11	1.0000E+00	
63	8.128	4.9505E+02	7.6675E+13	4.6725E+13	3.7863E+11	4.5962E+11	3.7809E+11	1.0000E+00	
64	8.128	5.0317E+02	7.7412E+13	4.7045E+13	3.8086E+11	4.6329E+11	3.8030E+11	1.0000E+00	
65	8.128	5.1130E+02	7.8142E+13	4.7355E+13	3.8290E+11	4.6685E+11	3.8234E+11	1.0000E+00	
66	8.128	5.1943E+02	7.8865E+13	4.7655E+13	3.8478E+11	4.7036E+11	3.8421E+11	1.0000E+00	
67	8.128	5.2756E+02	7.9581E+13	4.7945E+13	3.8643E+11	4.7375E+11	3.8590E+11	1.0000E+00	
68	8.128	5.3569E+02	8.0294E+13	4.8225E+13	3.8790E+11	4.7702E+11	3.8742E+11	1.0000E+00	
69	8.128	5.4381E+02	8.1005E+13	4.8495E+13	3.8925E+11	4.8018E+11	3.8875E+11	1.0000E+00	
70	8.128	5.5194E+02	8.1715E+13	4.8755E+13	3.9051E+11	4.8325E+11	3.8992E+11	1.0000E+00	
71	8.128	5.5997E+02	8.2425E+13	4.9005E+13	3.9150E+11	4.8625E+11	3.8992E+11	1.0000E+00	
72	8.128	5.6802E+02	8.3135E+13	4.9245E+13	3.9235E+11	4.8915E+11	3.9090E+11	1.0000E+00	
73	8.128	5.7605E+02	8.3845E+13	4.9475E+13	3.9315E+11	4.9205E+11	3.9170E+11	1.0000E+00	
74	8.128	5.8408E+02	8.4555E+13	4.9695E+13	3.9395E+11	4.9485E+11	3.9235E+11	1.0000E+00	
75	8.128	5.9211E+02	8.5265E+13	4.9905E+13	3.9465E+11	4.9755E+11	3.9305E+11	1.0000E+00	
76	8.128	6.0014E+02	8.5975E+13	5.0115E+13	3.9535E+11	5.0025E+11	3.9315E+11	1.0000E+00	
77	8.128	6.0817E+02	8.6685E+13	5.0325E+13	3.9605E+11	5.0295E+11	3.9385E+11	1.0000E+00	
78	8.128	6.1620E+02	8.7395E+13	5.0535E+13	3.9675E+11	5.0565E+11	3.9455E+11	1.0000E+00	
79	8.128	6.2423E+02	8.8105E+13	5.0745E+13	3.9745E+11	5.0835E+11	3.9525E+11	1.0000E+00	
80	8.128	6.3226E+02	8.8815E+13	5.0955E+13	3.9815E+11	5.1105E+11	3.9595E+11	1.0000E+00	
81	8.128	6.4029E+02	8.9525E+13	5.1165E+13	3.9885E+11	5.1375E+11	3.9665E+11	1.0000E+00	
82	8.128	6.4832E+02	9.0235E+13	5.1375E+13	3.9955E+11	5.1645E+11	3.9735E+11	1.0000E+00	
83	8.128	6.5635E+02	9.0945E+13	5.1585E+13	3.9995E+11	5.1915E+11	3.9805E+11	1.0000E+00	
84	8.128	6.6438E+02	9.1655E+13	5.1795E+13	4.0065E+11	5.2185E+11	3.9875E+11	1.0000E+00	
85	8.128	6.7241E+02	9.2365E+13	5.2005E+13	4.0135E+11	5.2455E+11	3.9945E+11	1.0000E+00	
86	8.128	6.8044E+02	9.3075E+13	5.2215E+13	4.0205E+11	5.2725E+11	4.0015E+11	1.0000E+00	
87	8.128	6.8847E+02	9.3785E+13	5.2425E+13	4.0275E+11	5.2995E+11	4.0085E+11	1.0000E+00	
88	8.128	6.9650E+02	9.4495E+13	5.2635E+13	4.0345E+11	5.3265E+11	4.0155E+11	1.0000E+00	
89	8.128	7.0453E+02	9.5205E+13	5.2845E+13	4.0415E+11	5.3535E+11	4.0225E+11	1.0000E+00	
90	8.128	7.1256E+02	9.5915E+13	5.3055E+13	4.0485E+11	5.3805E+11	4.0295E+11	1.0000E+00	
91	8.128	7.2059E+02	9.6625E+13	5.3265E+13	4.0555E+11	5.4075E+11	4.0365E+11	1.0000E+00	
92	8.128	7.2862E+02	9.7335E+13	5.3475E+13	4.0625E+11	5.4345E+11	4.0435E+11	1.0000E+00	
93	8.128	7.3665E+02	9.8045E+13	5.3685E+13	4.0695E+11	5.4615E+11	4.0505E+11	1.0000E+00	
94	8.128	7.4468E+02	9.8755E+13	5.3895E+13	4.0765E+11	5.4885E+11	4.0575E+11	1.0000E+00	
95	8.128	7.5271E+02	9.9465E+13	5.4105E+13	4.0835E+11	5.5155E+11	4.0645E+11	1.0000E+00	
96	8.128	7.6074E+02	10.0175E+13	5.4315E+13	4.0905E+11	5.5425E+11	4.0715E+11	1.0000E+00	
97	8.128	7.6877E+02	10.0885E+13	5.4525E+13	4.0975E+11	5.5695E+11	4.0785E+11	1.0000E+00	
98	8.128	7.7680E+02	10.1595E+13	5.4735E+13	4.1045E+11	5.5965E+11	4.0855E+11	1.0000E+00	
99	8.128	7.8483E+02	10.2305E+13	5.4945E+13	4.1115E+11	5.6235E+11	4.0925E+11	1.0000E+00	
100	8.128	7.9286E+02	10.3015E+13	5.5155E+13	4.1185E+11	5.6505E+11	4.0995E+11	1.0000E+00	

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100 8.128 7.9578E+02 6.8475E+13 4.2251E+13 3.4301E+11 4.1333E+11 3.4259E+11 1.0300E+03 0.
101 8.128 8.0391E+02 6.7635E+13 4.1733E+13 3.3879E+11 4.0245E+11 3.3838E+11 1.0300E+03
102 8.128 8.1204E+02 6.6763E+13 4.1195E+13 3.3442E+11 3.9237E+11 3.3402E+11 1.0300E+03
103 8.128 8.2017E+02 6.5861E+13 4.0638E+13 3.2990E+11 3.7593E+11 3.2951E+11 1.0300E+03
104 8.128 8.2829E+02 6.4939E+13 4.0083E+13 3.2522E+11 3.6188E+11 3.2405E+11 1.0300E+03
105 8.128 8.3642E+02 6.3975E+13 3.9476E+13 3.2033E+11 3.4637E+11 3.2004E+11 1.0300E+03
106 8.128 8.4455E+02 6.2975E+13 3.8858E+13 3.1547E+11 3.3083E+11 3.1508E+11 1.0300E+03
107 8.128 8.5268E+02 6.1944E+13 3.8229E+13 3.1038E+11 3.1592E+11 3.0997E+11 1.0300E+03
108 8.128 8.6081E+02 6.0903E+13 3.7584E+13 3.0503E+11 3.0759E+11 3.0473E+11 1.0300E+03
109 8.128 8.6893E+02 5.9849E+13 3.6926E+13 2.9962E+11 3.0111E+11 2.9935E+11 1.0300E+03
110 8.128 8.7706E+02 5.8715E+13 3.6247E+13 2.9406E+11 2.9447E+11 2.9385E+11 1.0300E+03
***** END OF NUCLEAR REGION NO. 5 AND THERMAL HYD REGION NO.11 *****
111 8.128 8.7705E+02 5.9715E+13 3.6243E+13 2.9406E+11 3.0447E+11 2.9385E+11 1.0300E+03
112 8.128 8.8519E+02 5.8757E+13 3.5593E+13 2.8835E+11 3.0771E+11 2.8823E+11 1.0300E+03
113 8.128 8.9332E+02 5.7804E+13 3.4844E+13 2.8244E+11 3.0673E+11 2.8244E+11 1.0300E+03
114 8.128 9.0145E+02 5.6851E+13 3.4032E+13 2.7643E+11 3.0553E+11 2.7644E+11 1.0300E+03
115 8.128 9.0957E+02 5.5906E+13 3.3188E+13 2.7021E+11 3.0435E+11 2.7025E+11 1.0300E+03
116 8.128 9.1770E+02 5.4963E+13 3.2330E+13 2.6380E+11 3.0318E+11 2.6386E+11 1.0300E+03
117 8.128 9.2583E+02 5.4017E+13 3.1474E+13 2.5722E+11 3.0204E+11 2.5729E+11 1.0300E+03
118 8.128 9.3396E+02 5.3072E+13 3.0584E+13 2.5075E+11 3.0093E+11 2.5075E+11 1.0300E+03
119 8.128 9.4209E+02 5.2037E+13 2.9654E+13 2.4355E+11 2.9393E+11 2.4352E+11 1.0300E+03
120 8.128 9.5021E+02 5.0992E+13 2.8695E+13 2.3606E+11 2.8537E+11 2.3653E+11 1.0300E+03
***** END OF NUCLEAR REGION NO. 6 AND THERMAL HYD REGION NO.12 *****
121 8.128 9.5834E+02 4.9745E+13 2.8258E+13 2.2824E+11 2.7663E+11 2.2829E+11 1.0300E+03
122 8.128 9.6647E+02 4.8665E+13 2.7473E+13 2.2161E+11 2.7663E+11 2.2169E+11 1.0300E+03
123 8.128 9.7461E+02 4.7585E+13 2.6641E+13 2.1426E+11 2.7654E+11 2.1433E+11 1.0300E+03
124 8.128 9.8273E+02 4.6512E+13 2.5814E+13 2.0696E+11 2.7642E+11 2.0693E+11 1.0300E+03
125 8.128 9.9085E+02 4.5446E+13 2.4924E+13 1.9872E+11 2.7630E+11 1.9879E+11 1.0300E+03
126 8.128 9.9897E+02 4.4389E+13 2.4024E+13 1.9075E+11 2.7618E+11 1.9082E+11 1.0300E+03
127 8.128 1.0071E+03 4.3343E+13 2.3046E+13 1.8265E+11 2.7606E+11 1.8271E+11 1.0300E+03
128 8.128 1.0145E+03 4.2307E+13 2.2025E+13 1.7442E+11 2.7594E+11 1.7449E+11 1.0300E+03
129 8.128 1.0219E+03 4.1284E+13 2.0993E+13 1.6607E+11 2.7582E+11 1.6613E+11 1.0300E+03
130 8.128 1.0293E+03 4.0263E+13 1.9955E+13 1.5761E+11 2.7570E+11 1.5767E+11 1.0300E+03
131 8.128 1.0366E+03 3.9242E+13 1.8916E+13 1.4904E+11 2.7558E+11 1.4910E+11 1.0300E+03
***** END OF NUCLEAR REGION NO. 7 AND THERMAL HYD REGION NO.13 *****
132 8.128 1.0395E+03 3.8221E+13 1.8394E+13 1.4042E+11 2.7546E+11 1.4910E+11 1.0300E+03
133 8.128 1.0470E+03 3.7200E+13 1.7325E+13 1.3177E+11 2.7534E+11 1.4042E+11 1.0300E+03
134 8.128 1.0544E+03 3.6099E+13 1.6228E+13 1.2313E+11 2.7522E+11 1.3145E+11 1.0300E+03
135 8.128 1.0618E+03 3.5008E+13 1.5104E+13 1.1455E+11 2.7510E+11 1.2241E+11 1.0300E+03
136 8.128 1.0692E+03 3.3927E+13 1.3983E+13 1.0592E+11 2.7498E+11 1.1329E+11 1.0300E+03
137 8.128 1.0766E+03 3.2846E+13 1.2865E+13 9.7824E+10 2.7486E+11 1.0415E+11 1.0300E+03
138 8.128 1.0840E+03 3.1765E+13 1.1748E+13 8.9713E+10 2.7474E+11 9.531E+10 1.0300E+03
139 8.128 1.0914E+03 3.0684E+13 1.0632E+13 8.1593E+10 2.7462E+11 8.633E+10 1.0300E+03
140 8.128 1.0988E+03 2.9603E+13 9.5202E+12 7.3472E+10 2.7450E+11 7.7344E+10 1.0300E+03
***** END OF NUCLEAR REGION NO. 8 AND THERMAL HYD REGION NO.14 *****
141 8.128 1.1062E+03 2.8522E+13 8.4022E+12 6.5352E+10 2.7438E+11 6.9296E+10 1.0300E+03
142 8.128 1.1136E+03 2.7441E+13 7.2773E+12 5.7242E+10 2.7426E+11 6.2535E+10 1.0300E+03
143 8.128 1.1210E+03 2.6360E+13 6.1512E+12 4.9101E+10 2.7414E+11 5.5212E+10 1.0300E+03
144 8.128 1.1284E+03 2.5279E+13 5.0262E+12 4.0951E+10 2.7402E+11 4.7952E+10 1.0300E+03
145 8.128 1.1358E+03 4.9173E+12 3.8035E+12 3.2805E+10 2.7390E+11 4.0682E+10 1.0300E+03
146 8.128 1.1432E+03 3.8063E+12 2.6883E+12 2.4650E+10 2.7378E+11 3.3412E+10 1.0300E+03
147 8.128 1.1506E+03 2.6952E+12 1.5733E+12 1.6495E+10 2.7366E+11 2.6162E+10 1.0300E+03
148 8.128 1.1580E+03 1.5841E+12 4.2415E+11 8.2958E+09 2.7354E+11 1.8912E+09 1.0300E+03
149 8.128 1.1654E+03 4.9287E+11 1.0689E+12 6.8731E+09 2.7342E+11 1.1689E+09 1.0300E+03
150 8.128 1.1728E+03 2.8232E+11 5.1695E+11 2.2917E+09 2.7330E+11 2.2922E+09 1.0300E+03
***** END OF NUCLEAR REGION NO. 9 AND THERMAL HYD REGION NO.15 *****
151 8.128 1.1802E+03 1.0522E+11 1.0522E+11 2.0561E+09 2.7318E+11 2.0522E+09 1.0300E+03
152 8.128 1.1876E+03 1.9842E+03 5.6695E+03 3.8734E+01 2.7306E+11 1.9822E+03 1.0300E+03

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INIT FRONT TO PEAK SCRAM TRANSIENT WITH SECOND ROD BANK ELAPSED TIME FROM START OF CASE 1.872 SEC

TIME STEP NO.	1	TIME	.1000E+02	DELTA T =	.1000E+02
-ACTIVITY (TIME STEP 0) = .1495E+02					
-OD WITHDRAWAL DISTANCE = 0.					
RELATIVE POWER (TIME STEP 0) = .9012E+00					
PEAK TO AVERAGE POWER (TIME STEP 0)					
0.	.1175E+01	.9359E+00	.6647E+00	.3359E+00	.1147E+01
0.	0.	0.	0.	0.	0.
IODINE CONCENTRATION					
0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.
XENON CONCENTRATION					
0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.
INLET TEMPERATURE = .3950E+03					
COOLANT TEMPERATURE					
.3950E+03	.4938E+03	.5176E+03	.5227E+03	.5231E+03	.5244E+03
.4938E+03	.5096E+03	.5176E+03	.5227E+03	.5231E+03	.5244E+03
OUTLET TEMPERATURE = .5244E+03					
FUEL TEMPERATURE					
.3950E+03	.4446E+03	.5176E+03	.5227E+03	.5231E+03	.5244E+03
.4446E+03	.5176E+03	.5227E+03	.5231E+03	.5244E+03	.5244E+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)	REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2		1 INTO 2	GROUP 1	GROUP 2	
0, 10	1/ 1	.1440E+01	.86310E+00	.1230E-03	.22090E-02	0.	J.	.5058E-02	.5181E-02	.22090E-02
10, 20	2/ 2	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
20, 30	3/ 3	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
30, 40	4/ 4	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
40, 50	5/ 5	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
50, 60	6/ 6	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
60, 70	7/ 7	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
70, 80	8/ 8	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
80, 90	9/ 9	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
90, 100	10/ 10	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
100, 110	11/ 11	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
110, 120	12/ 12	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
120, 130	13/ 13	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
130, 140	14/ 14	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
140, 150	15/ 15	.1840E+01	.13041E+01	.1654E-02	.53850E-02	.9833E-03	.65148E-02	.3336E-02	.4990E-02	.53850E-02
RHO=(-COI*(A1*(F1 -^(D2*A2*(F2 -^(SIG T1-NU SIG F1) *A1*(F1 -^(NU SIG F2)*A1*(F2 -^(SIG T2)*A2*(F2 -^(SIG R1)*A2*(F1) /Q										
Q=(^ (NU SIG F1)*A1*(F1 -^(NU SIG F2)*A1*(F2)										
PO-H	A1*(F1	A2*(F1	A1*(F2	A2*(F2	A1*(F1	A2*(F2	A1*(F1	A2*(F2	A1*(F1	A2*(F2
0, 10	1/ 1	4.27108E+20	2.4	6.93503E+24	3.26138E+24	5.89921E+10E+24	7.97874013E+21	5.80426419E+21	4.990E-02	.53850E-02
10, 20	2/ 2	1.59153E+26	26	1.0106117E+26	1.91466795E+26	1.20869704E+26	2.22096717E+22	1.31605426E+22	.4990E-02	.53850E-02
20, 30	3/ 3	5.47533E+26	26	3.1835683E+26	6.60786534E+26	4.08342961E+26	1.63300334E+22	1.2173777E+22	.4990E-02	.53850E-02
30, 40	4/ 4	1.07390E+27	27	6.632338E+26	1.2958193E+27	3.00634677E+26	1.09301044E+22	8.11145435E+21	.4990E-02	.53850E-02
40, 50	5/ 5	1.116027E+27	27	9.9450323E+26	1.94244927E+27	1.19848010E+27	6.28670000E+21	4.63150394E+21	.4990E-02	.53850E-02
50, 60	6/ 6	2.07623194E+27	27	1.28110254E+27	2.50179491E+27	1.54368871E+27	3.03491662E+21	2.25647534E+21	.4990E-02	.53850E-02
60, 70	7/ 7	2.39283409E+27	27	1.47646628E+27	2.88327686E+27	1.77908745E+27	9.41100376E+20	6.25387471E+20	.4990E-02	.53850E-02
70, 80	8/ 8	2.50502716E+27	27	1.54569712E+27	3.11446125E+27	1.86250549E+27	6.52763805E+19	4.85356944E+19	.4990E-02	.53850E-02
80, 90	9/ 9	2.39283409E+27	27	1.47646628E+27	2.88327686E+27	1.77908745E+27	8.41109025E+20	6.25393910E+20	.4990E-02	.53850E-02
90, 100	10/ 10	2.07623194E+27	27	1.28110254E+27	2.50179491E+27	1.54368871E+27	3.03491662E+21	2.25647534E+21	.4990E-02	.53850E-02
100, 110	11/ 11	1.61159988E+27	27	9.9450323E+26	1.94244927E+27	1.19848010E+27	6.28670000E+21	4.63150394E+21	.4990E-02	.53850E-02
110, 120	12/ 12	1.07390E+27	27	6.632338E+26	1.2958193E+27	3.00634677E+26	1.09301044E+22	8.11145435E+21	.4990E-02	.53850E-02
120, 130	13/ 13	5.47533E+26	26	3.1835683E+26	6.60786534E+26	4.08342961E+26	1.63300334E+22	1.2173777E+22	.4990E-02	.53850E-02
130, 140	14/ 14	1.59153E+26	26	1.0106117E+26	1.91466795E+26	1.20869704E+26	2.22096717E+22	1.31605426E+22	.4990E-02	.53850E-02
140, 150	15/ 15	4.27108E+20	24	6.93503E+24	3.26138E+24	5.89921E+10E+24	7.97874013E+21	5.80426419E+21	.4990E-02	.53850E-02
TOTAL OF ALL REGIONS 1.823650916E+28 1.12690778E+28 2.13759173E+28 1.35765026E+28 1.35287713E+23 9.35555074E+22										

PT	DEL X	CIST	FLUX 431	FLUX 622	ADJ GRI	ADJ GR2	POW0	POW3	POW1
1	0.000	0.	0.	0.	3.733E+01	1.2011E+01	0.	0.	0.
2	7.036	7.036E+00	0.0649E+11	5.1643E+11	2.0501E+03	1.8952E+09	0.	0.	0.
3	7.036	1.075E+01	2.2827E+11	1.0647E+12	4.2517E+03	2.3282E+09	0.	0.	0.
4	7.036	2.1168E+01	3.9277E+11	1.6848E+12	5.8731E+03	3.8583E+09	0.	0.	0.
5	7.036	2.8144E+01	5.2847E+11	2.4100E+12	7.9323E+03	5.8762E+09	0.	0.	0.
6	7.036	3.5140E+01	6.6415E+11	3.2545E+12	1.3450E+04	8.6385E+09	0.	0.	0.
7	7.036	4.2116E+01	8.0040E+11	4.2325E+12	1.8647E+04	1.2496E+10	0.	0.	0.
8	7.036	4.9252E+01	9.3723E+11	5.3194E+12	2.4560E+04	1.7935E+10	0.	0.	0.
9	7.036	5.6285E+01	1.0631E+12	6.4325E+12	3.1595E+04	2.5643E+10	0.	0.	0.
10	7.036	6.3326E+01	1.1865E+12	7.3754E+12	3.9386E+04	3.6611E+10	0.	0.	0.
11	7.036	7.036E+01	1.3100E+12	8.3183E+12	4.7377E+04	4.5471E+10	0.	0.	0.
12	7.036	7.7403E+01	1.4344E+12	9.2610E+12	5.5473E+04	5.2212E+10	5.8285E+10	9.9984E+01	9.9984E+01
13	7.036	8.4443E+01	1.5588E+12	1.0204E+13	6.3573E+04	5.8946E+10	6.2535E+10	9.9944E+01	9.9944E+01
14	7.036	9.1483E+01	1.6833E+12	1.1165E+13	7.1673E+04	6.5619E+10	6.9296E+10	9.9883E+01	9.9883E+01
15	7.036	9.8523E+01	1.8078E+12	1.2126E+13	7.9763E+04	7.2291E+10	7.5344E+10	9.9843E+01	9.9843E+01
16	7.036	1.0573E+02	1.9323E+12	1.3087E+13	8.7853E+04	7.8916E+10	8.3038E+10	9.9802E+01	9.9802E+01
17	7.036	1.1323E+02	2.0568E+12	1.4048E+13	9.5943E+04	8.5517E+10	8.9328E+10	9.9761E+01	9.9761E+01
18	7.036	1.2073E+02	2.1813E+12	1.5009E+13	1.0392E+05	9.2044E+10	9.5328E+10	9.9720E+01	9.9720E+01
19	7.036	1.2823E+02	2.3058E+12	1.5970E+13	1.1145E+05	9.8135E+10	1.0115E+11	9.9679E+01	9.9679E+01
20	7.036	1.3573E+02	2.4303E+12	1.6931E+13	1.1898E+05	1.0326E+11	1.0636E+11	9.9638E+01	9.9638E+01
21	7.036	1.4323E+02	2.5548E+12	1.7892E+13	1.2651E+05	1.0907E+11	1.1157E+11	9.9597E+01	9.9597E+01
22	7.036	1.5073E+02	2.6793E+12	1.8853E+13	1.3404E+05	1.1488E+11	1.1678E+11	9.9556E+01	9.9556E+01
23	7.036	1.5823E+02	2.8038E+12	1.9814E+13	1.4157E+05	1.2069E+11	1.2199E+11	9.9515E+01	9.9515E+01
24	7.036	1.6573E+02	2.9283E+12	2.0775E+13	1.4910E+05	1.2650E+11	1.2720E+11	9.9474E+01	9.9474E+01
25	7.036	1.7323E+02	3.0528E+12	2.1736E+13	1.5663E+05	1.3231E+11	1.3241E+11	9.9433E+01	9.9433E+01
26	7.036	1.8073E+02	3.1773E+12	2.2697E+13	1.6416E+05	1.3812E+11	1.3822E+11	9.9392E+01	9.9392E+01
27	7.036	1.8823E+02	3.3018E+12	2.3658E+13	1.7169E+05	1.4393E+11	1.4403E+11	9.9351E+01	9.9351E+01
28	7.036	1.9573E+02	3.4263E+12	2.4619E+13	1.7922E+05	1.4974E+11	1.4984E+11	9.9310E+01	9.9310E+01
29	7.036	2.0323E+02	3.5508E+12	2.5580E+13	1.8675E+05	1.5555E+11	1.5565E+11	9.9269E+01	9.9269E+01
30	7.036	2.1073E+02	3.6753E+12	2.6541E+13	1.9428E+05	1.6136E+11	1.6146E+11	9.9228E+01	9.9228E+01
31	7.036	2.1823E+02	3.8008E+12	2.7502E+13	2.0181E+05	1.6717E+11	1.6727E+11	9.9187E+01	9.9187E+01
32	7.036	2.2573E+02	3.9253E+12	2.8463E+13	2.0934E+05	1.7298E+11	1.7308E+11	9.9146E+01	9.9146E+01
33	7.036	2.3323E+02	4.0508E+12	2.9424E+13	2.1687E+05	1.7879E+11	1.7889E+11	9.9105E+01	9.9105E+01
34	7.036	2.4073E+02	4.1753E+12	3.0385E+13	2.2440E+05	1.8460E+11	1.8470E+11	9.9064E+01	9.9064E+01
35	7.036	2.4823E+02	4.3008E+12	3.1346E+13	2.3193E+05	1.9041E+11	1.9051E+11	9.9023E+01	9.9023E+01
36	7.036	2.5573E+02	4.4253E+12	3.2307E+13	2.3946E+05	1.9622E+11	1.9632E+11	9.8982E+01	9.8982E+01
37	7.036	2.6323E+02	4.5508E+12	3.3268E+13	2.4699E+05	2.0203E+11	2.0213E+11	9.8941E+01	9.8941E+01
38	7.036	2.7073E+02	4.6753E+12	3.4229E+13	2.5452E+05	2.0784E+11	2.0794E+11	9.8900E+01	9.8900E+01
39	7.036	2.7823E+02	4.8008E+12	3.5190E+13	2.6205E+05	2.1365E+11	2.1375E+11	9.8859E+01	9.8859E+01
40	7.036	2.8573E+02	4.9253E+12	3.6151E+13	2.6958E+05	2.1946E+11	2.1956E+11	9.8818E+01	9.8818E+01
41	7.036	2.9323E+02	5.0508E+12	3.7112E+13	2.7711E+05	2.2527E+11	2.2537E+11	9.8777E+01	9.8777E+01
42	7.036	3.0073E+02	5.1753E+12	3.8073E+13	2.8464E+05	2.3108E+11	2.3118E+11	9.8736E+01	9.8736E+01
43	7.036	3.0823E+02	5.3008E+12	3.9034E+13	2.9217E+05	2.3689E+11	2.3699E+11	9.8695E+01	9.8695E+01
44	7.036	3.1573E+02	5.4253E+12	4.0005E+13	2.9970E+05	2.4270E+11	2.4280E+11	9.8654E+01	9.8654E+01
45	7.036	3.2323E+02	5.5508E+12	4.0966E+13	3.0723E+05	2.4851E+11	2.4861E+11	9.8613E+01	9.8613E+01
46	7.036	3.3073E+02	5.6753E+12	4.1927E+13	3.1476E+05	2.5432E+11	2.5442E+11	9.8572E+01	9.8572E+01
47	7.036	3.3823E+02	5.8008E+12	4.2888E+13	3.2229E+05	2.6013E+11	2.6023E+11	9.8531E+01	9.8531E+01
48	7.036	3.4573E+02	5.9253E+12	4.3849E+13	3.2982E+05	2.6594E+11	2.6604E+11	9.8490E+01	9.8490E+01
49	7.036	3.5323E+02	6.0508E+12	4.4810E+13	3.3735E+05	2.7175E+11	2.7185E+11	9.8449E+01	9.8449E+01
50	7.036	3.6073E+02	6.1753E+12	4.5771E+13	3.4488E+05	2.7756E+11	2.7766E+11	9.8408E+01	9.8408E+01

NC. 2 *****
3.2644E+12

NC. 3 *****
6.0357E+12

NC. 4 *****
8.4988E+12

END OF THERMAL-HYD REG. NO. 5
END OF THERMAL-HYD REG. NO. 5

100	8.128	7.3578E+02	6.877E+13	4.2403E+13	5.4304E+11	4.1332E+11	3.4259E+11	1.2045E+00	1.1811E+13
101	8.128	8.0381E+02	6.7927E+13	4.1920E+13	5.3879E+11	4.0245E+11	3.3836E+11	1.0045E+00	
102	8.128	8.1294E+02	6.7347E+13	4.1787E+13	5.3444E+11	4.0247E+11	3.3402E+11	1.0044E+00	
103	8.128	8.2073E+02	6.6135E+13	4.0817E+13	5.2999E+11	3.9752E+11	3.2951E+11	1.0043E+00	
104	8.128	8.2689E+02	6.5194E+13	4.0236E+13	5.2522E+11	3.9189E+11	3.2485E+11	1.0043E+00	
105	8.128	8.3642E+02	6.4213E+13	3.9636E+13	5.2033E+11	3.8637E+11	3.2004E+11	1.0042E+00	
106	8.128	8.4495E+02	6.3213E+13	3.9017E+13	5.1542E+11	3.8088E+11	3.1508E+11	1.0040E+00	
107	8.128	8.5248E+02	6.2175E+13	3.8379E+13	5.1036E+11	3.7592E+11	3.0997E+11	1.0039E+00	
108	8.128	8.6017E+02	6.1104E+13	3.7733E+13	5.0503E+11	3.7093E+11	3.0473E+11	1.0037E+00	
109	8.128	8.6803E+02	6.0017E+13	3.7088E+13	5.0000E+11	3.6593E+11	2.9955E+11	1.0034E+00	
110	8.128	8.7776E+02	5.8940E+13	3.6354E+13	4.9438E+11	3.6111E+11	2.9385E+11	1.0030E+00	
111	8.128	8.8776E+02	5.8880E+13	3.6342E+13	4.9402E+11	3.6071E+11	2.9369E+11	1.0030E+00	
112	8.128	8.9819E+02	5.7717E+13	3.5641E+13	4.8835E+11	3.5471E+11	2.8823E+11	1.0025E+00	
113	8.128	9.0932E+02	5.6523E+13	3.4907E+13	4.8243E+11	3.4907E+11	2.8244E+11	1.0019E+00	
114	8.128	9.2105E+02	5.5296E+13	3.4153E+13	4.7643E+11	3.4353E+11	2.7644E+11	1.0016E+00	
115	8.128	9.3347E+02	5.4036E+13	3.3378E+13	4.7021E+11	3.3655E+11	2.7025E+11	1.0013E+00	
116	8.128	9.4653E+02	5.2743E+13	3.2582E+13	4.6389E+11	3.3034E+11	2.6386E+11	1.0010E+00	
117	8.128	9.6023E+02	5.1417E+13	3.1765E+13	4.5726E+11	3.2384E+11	2.5729E+11	1.0008E+00	
118	8.128	9.7459E+02	5.0059E+13	3.0928E+13	4.5047E+11	3.1645E+11	2.5054E+11	1.0007E+00	
119	8.128	9.8961E+02	4.8663E+13	3.0071E+13	4.4357E+11	3.0932E+11	2.4362E+11	1.0006E+00	
120	8.128	10.0534E+02	4.7246E+13	2.9192E+13	4.3645E+11	3.0215E+11	2.3653E+11	1.0004E+00	
121	8.128	10.2184E+02	4.5794E+13	2.8296E+13	4.2920E+11	2.9537E+11	2.2929E+11	1.0004E+00	
122	8.128	10.3904E+02	4.4311E+13	2.7390E+13	4.2181E+11	2.8799E+11	2.2189E+11	1.0003E+00	
123	8.128	10.5694E+02	4.2799E+13	2.6465E+13	4.1425E+11	2.8038E+11	2.1433E+11	1.0002E+00	
124	8.128	10.7553E+02	4.1258E+13	2.5548E+13	4.0656E+11	2.7256E+11	2.0668E+11	1.0001E+00	
125	8.128	10.9484E+02	3.9696E+13	2.4526E+13	3.9879E+11	3.6433E+11	1.9879E+11	1.0001E+00	
126	8.128	11.1491E+02	3.8063E+13	2.3451E+13	3.9071E+11	3.5621E+11	1.9082E+11	1.0001E+00	
127	8.128	11.3573E+02	3.6476E+13	2.2314E+13	3.8235E+11	3.4769E+11	1.8271E+11	1.0000E+00	
128	8.128	11.5734E+02	3.4831E+13	2.1125E+13	3.7374E+11	3.3889E+11	1.7448E+11	9.9998E-01	
129	8.128	11.7974E+02	3.3133E+13	1.9984E+13	3.6467E+11	3.2982E+11	1.6613E+11	9.9996E-01	
130	8.128	12.0294E+02	3.1472E+13	1.8795E+13	3.5535E+11	3.2051E+11	1.5767E+11	9.9994E-01	
131	8.128	12.2694E+02	2.9760E+13	1.7553E+13	3.4584E+11	3.1097E+11	1.4910E+11	9.9992E-01	
132	8.128	12.5174E+02	2.8024E+13	1.6284E+13	3.3524E+11	3.0124E+11	1.4044E+11	9.9990E-01	
133	8.128	12.7724E+02	2.6229E+13	1.5024E+13	3.2454E+11	2.9139E+11	1.3146E+11	9.9989E-01	
134	8.128	13.0344E+02	2.4411E+13	1.3784E+13	3.1284E+11	2.8139E+11	1.2241E+11	9.9987E-01	
135	8.128	13.3024E+02	2.2571E+13	1.2584E+13	3.0114E+11	2.7139E+11	1.1329E+11	9.9986E-01	
136	8.128	13.5764E+02	2.0704E+13	1.1394E+13	2.8944E+11	2.6139E+11	1.0415E+11	9.9985E-01	
137	8.128	13.8564E+02	1.8844E+13	1.0244E+13	2.7744E+11	2.5139E+11	9.5031E+10	9.9984E-01	
138	8.128	14.1424E+02	1.6974E+13	9.1444E+12	2.6544E+11	2.4139E+11	8.6034E+10	9.9983E-01	
139	8.128	14.4344E+02	1.5104E+13	8.0444E+12	2.5344E+11	2.3139E+11	7.7344E+10	9.9982E-01	
140	8.128	14.7324E+02	1.3234E+13	6.9444E+12	2.4144E+11	2.2139E+11	6.8294E+10	9.9981E-01	
141	8.128	15.0364E+02	1.1364E+13	5.8444E+12	2.2944E+11	2.1139E+11	5.9244E+10	9.9980E-01	
142	8.128	15.3464E+02	1.0494E+13	5.1444E+12	2.1744E+11	2.0139E+11	5.0194E+10	9.9979E-01	
143	8.128	15.6624E+02	9.3444E+12	4.4444E+12	2.0544E+11	1.9139E+11	4.1144E+10	9.9978E-01	
144	8.128	15.9844E+02	8.2444E+12	3.7444E+12	1.9344E+11	1.8139E+11	3.2144E+10	9.9977E-01	
145	8.128	16.3124E+02	7.1444E+12	3.0444E+12	1.8144E+11	1.7139E+11	2.3144E+10	9.9976E-01	
146	8.128	16.6464E+02	6.0444E+12	2.3444E+12	1.6944E+11	1.6139E+11	1.4144E+10	9.9975E-01	
147	8.128	16.9864E+02	4.9444E+12	1.6444E+12	1.5744E+11	1.5139E+11	9.5031E+09	9.9974E-01	
148	8.128	17.3324E+02	3.8444E+12	9.9444E+11	1.4544E+11	1.4139E+11	8.6034E+09	9.9973E-01	
149	8.128	17.6844E+02	2.7444E+12	7.2444E+11	1.3344E+11	1.2939E+11	7.7344E+09	9.9972E-01	
150	8.128	18.0424E+02	1.6444E+12	4.5444E+11	1.2144E+11	1.1739E+11	6.8294E+09	9.9971E-01	
151	8.128	18.4064E+02	5.4444E+11	2.4444E+11	1.0944E+11	1.0539E+11	5.9244E+09	9.9970E-01

[illegible][illegible]

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*+-----A A AA*
*ADD6664C-----0.00-1      1      1      1      1      1      1
*-----0.00-1      0      10     20     30     40     50     60     70     80     90    100
INDEPENDENT VARIABLE RANGE ON Y-AX TO ONE PLOT IS 0. TO 1.00E+02. PLOT ERROR IS .50 PERCENT OF FULL SCALE.
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GROUP 1 FLUX		1.054910E+11	3.927740E+11	6.243557E+11	9.644163E+11	1.471036E+12	2.232875E+12	3.331701E+12	5.116619E+12
0.	7.738314E+12	1.275462E+13	1.479932E+13	1.685017E+13	1.891495E+13	2.070801E+13	2.251714E+13	2.441110E+13	2.629918E+13
1.	2.802645E+13	3.167294E+13	3.316287E+13	3.423112E+13	3.547284E+13	3.609595E+13	3.659048E+13	3.712584E+13	3.769808E+13
2.	4.311033E+13	4.579369E+13	4.724638E+13	4.866595E+13	5.005905E+13	5.141701E+13	5.274297E+13	5.403591E+13	5.529596E+13
3.	5.771708E+13	6.000991E+13	6.110877E+13	6.217661E+13	6.321294E+13	6.421836E+13	6.519260E+13	6.613552E+13	6.704693E+13
4.	7.926653E+13	8.093002E+13	8.203713E+13	8.312367E+13	8.419420E+13	8.525253E+13	8.629665E+13	8.732665E+13	8.834365E+13
5.	7.932595E+13	7.592081E+13	7.636512E+13	7.677651E+13	7.715191E+13	7.749194E+13	7.779455E+13	7.806563E+13	7.830906E+13
6.	7.892674E+13	7.855859E+13	7.867452E+13	7.878972E+13	7.890423E+13	7.892856E+13	7.894592E+13	7.896452E+13	7.898336E+13
7.	7.925914E+13	7.829095E+13	7.737637E+13	7.625543E+13	7.494166E+13	7.341262E+13	7.037314E+13	6.598998E+13	6.077438E+13
8.	6.792660E+13	6.704618E+13	6.512555E+13	6.242131E+13	5.821293E+13	5.274297E+13	4.616715E+13	3.800985E+13	2.879544E+13
9.	5.771708E+13	5.652301E+13	5.522590E+13	5.403591E+13	5.284297E+13	5.165895E+13	5.048195E+13	4.931260E+13	4.815199E+13
0.	4.311033E+13	4.270384E+13	4.126819E+13	3.969042E+13	3.809595E+13	3.647578E+13	3.483108E+13	3.316287E+13	3.147199E+13
1.	2.802645E+13	2.522314E+13	2.441110E+13	2.357144E+13	2.270738E+13	2.181492E+13	2.088014E+13	1.990474E+13	1.888014E+13
2.	7.738314E+12	5.116619E+12	3.331701E+12	2.232875E+12	1.471036E+12	9.644163E+11	6.243557E+11	3.927740E+11	2.232875E+11
3.	1.054910E+11	3.927740E+11	6.243557E+11	9.644163E+11	1.471036E+12	2.232875E+12	3.331701E+12	5.116619E+12	7.738314E+12
GROUP 2 FLUX		1.064866E+12	1.669315E+12	2.410023E+12	3.254288E+12	4.232470E+12	5.319438E+12	6.432506E+12	7.379336E+12
0.	7.776696E+12	8.021021E+12	8.273891E+12	8.526761E+12	8.779631E+12	9.032501E+12	9.285371E+12	9.538241E+12	9.791111E+12
1.	7.324440E+12	1.839310E+13	1.945015E+13	2.049424E+13	2.152472E+13	2.254450E+13	2.354501E+13	2.452640E+13	2.549497E+13
2.	7.380126E+12	2.829653E+13	2.919237E+13	3.005945E+13	3.092759E+13	3.176518E+13	3.258222E+13	3.337490E+13	3.415351E+13
3.	5.664065E+12	3.635179E+13	3.747711E+13	3.772284E+13	3.801701E+13	3.836359E+13	3.867591E+13	3.895823E+13	3.921673E+13
4.	4.320313E+12	4.244709E+13	4.295941E+13	4.342880E+13	4.384917E+13	4.423007E+13	4.457555E+13	4.488235E+13	4.515755E+13
5.	4.236670E+12	4.555421E+13	4.585048E+13	4.612534E+13	4.638332E+13	4.662855E+13	4.686213E+13	4.708452E+13	4.729581E+13
6.	4.843950E+12	4.831734E+13	4.817358E+13	4.801753E+13	4.784911E+13	4.767831E+13	4.750591E+13	4.733191E+13	4.715712E+13
7.	4.623668E+12	4.595797E+13	4.564824E+13	4.531751E+13	4.497562E+13	4.463340E+13	4.429077E+13	4.394758E+13	4.360388E+13
8.	4.192072E+12	4.137829E+13	4.081568E+13	4.023584E+13	3.963585E+13	3.901698E+13	3.837925E+13	3.772781E+13	3.706767E+13
9.	3.564051E+12	3.440746E+13	3.415347E+13	3.387837E+13	3.358213E+13	3.326495E+13	3.292755E+13	3.258081E+13	3.222433E+13
0.	2.779038E+12	2.644634E+13	2.549497E+13	2.482647E+13	2.354156E+13	2.254066E+13	2.152468E+13	2.049424E+13	1.945015E+13
1.	7.324440E+12	1.839310E+13	1.945015E+13	2.049424E+13	2.152472E+13	2.254450E+13	2.354501E+13	2.452640E+13	2.549497E+13
2.	7.776696E+12	7.379375E+12	6.432496E+12	5.319438E+12	4.232470E+12	3.254288E+12	2.410023E+12	1.669315E+12	1.064866E+12
3.	1.064866E+12	1.669315E+12	2.410023E+12	3.254288E+12	4.232470E+12	5.319438E+12	6.432506E+12	7.379336E+12	8.021021E+12
DELAYED GROUP 1		0.	0.	0.	0.	0.	0.	0.	0.
0.	4.229880E+04	9.371598E+04	9.276773E+04	1.035417E+05	1.151772E+05	1.272137E+05	1.394268E+05	1.516678E+05	1.638698E+05
1.	3.632651E+04	1.959975E+05	2.072592E+05	2.181813E+05	2.293356E+05	2.401753E+05	2.508312E+05	2.613157E+05	2.716221E+05
2.	3.167261E+04	3.014312E+05	3.103284E+05	3.202419E+05	3.293367E+05	3.382066E+05	3.468431E+05	3.552421E+05	3.633904E+05
3.	7.88803E+03	3.462664E+05	3.936029E+05	4.057212E+05	4.172727E+05	4.286922E+05	4.399622E+05	4.511915E+05	4.623497E+05
4.	4.681122E+03	4.033671E+05	4.535533E+05	4.667617E+05	4.796291E+05	4.921625E+05	5.044162E+05	5.164676E+05	5.283098E+05
5.	4.904982E+03	4.838327E+05	4.993135E+05	5.157245E+05	5.326633E+05	5.500966E+05	5.672727E+05	5.842442E+05	6.010808E+05
6.	5.133426E+03	5.149003E+05	5.153130E+05	5.166633E+05	5.176840E+05	5.184663E+05	5.190863E+05	5.195724E+05	5.199808E+05
7.	5.138425E+03	5.125494E+05	5.110236E+05	5.092642E+05	5.072756E+05	5.050495E+05	5.025958E+05	4.999126E+05	4.970014E+05
8.	4.904989E+03	4.860134E+05	4.830995E+05	4.793671E+05	4.748159E+05	4.693470E+05	4.630625E+05	4.560764E+05	4.485555E+05
9.	4.448109E+03	4.390815E+05	4.331494E+05	4.270185E+05	4.206919E+05	4.141723E+05	4.074640E+05	4.005718E+05	3.935025E+05
0.	3.788799E+13	3.712759E+13	3.633904E+13	3.552417E+13	3.468439E+13	3.382062E+13	3.293363E+13	3.202413E+13	3.109280E+13
1.	3.167222E+09	2.917429E+09	2.716217E+09	2.513115E+09	2.308308E+09	2.103175E+09	1.894155E+09	1.681754E+09	1.459971E+09
2.	1.632522E+04	1.759304E+09	1.638695E+09	1.516675E+09	1.394268E+09	1.272137E+09	1.151770E+09	1.035415E+09	9.276757E+08
3.	4.229873E+08	0.	0.	0.	0.	0.	0.	0.	0.

DELAYED GROUP 2
 0.
 1.196168E+03 2.367402E+03 0. 2.623370E+03 0. 2.928055E+03 0. 3.257097E+03 0. 3.597645E+03 0. 3.942824E+03 0. 4.289014E+03 0. 4.634876E+03 0. 4.976844E+03 0.
 5.326437E+03 5.564438E+03 5.801755E+03 6.039175E+03 6.276595E+03 6.514015E+03 6.751435E+03 6.988855E+03 7.226275E+03 7.463695E+03 7.701115E+03 7.938535E+03 8.175955E+03 8.413375E+03 8.650795E+03 8.888215E+03 9.125635E+03 9.363055E+03 9.600475E+03 9.837895E+03 1.007515E+04 1.031135E+04 1.054755E+04 1.078375E+04 1.102000E+04 1.125625E+04 1.149250E+04 1.172875E+04 1.196500E+04 1.220125E+04 1.243750E+04 1.267375E+04 1.291000E+04 1.314625E+04 1.338250E+04 1.361875E+04 1.385500E+04 1.409125E+04 1.432750E+04 1.456375E+04 1.480000E+04 1.503625E+04 1.527250E+04 1.550875E+04 1.574500E+04 1.598125E+04 1.621750E+04 1.645375E+04 1.669000E+04 1.692625E+04 1.716250E+04 1.739875E+04 1.763500E+04 1.787125E+04 1.810750E+04 1.834375E+04 1.858000E+04 1.881625E+04 1.905250E+04 1.928875E+04 1.952500E+04 1.976125E+04 2.000000E+04 2.023625E+04 2.047250E+04 2.070875E+04 2.094500E+04 2.118125E+04 2.141750E+04 2.165375E+04 2.189000E+04 2.212625E+04 2.236250E+04 2.259875E+04 2.283500E+04 2.307125E+04 2.330750E+04 2.354375E+04 2.378000E+04 2.401625E+04 2.425250E+04 2.448875E+04 2.472500E+04 2.496125E+04 2.519750E+04 2.543375E+04 2.567000E+04 2.590625E+04 2.614250E+04 2.637875E+04 2.661500E+04 2.685125E+04 2.708750E+04 2.732375E+04 2.756000E+04 2.779625E+04 2.803250E+04 2.826875E+04 2.850500E+04 2.874125E+04 2.897750E+04 2.921375E+04 2.945000E+04 2.968625E+04 2.992250E+04 3.015875E+04 3.039500E+04 3.063125E+04 3.086750E+04 3.110375E+04 3.134000E+04 3.157625E+04 3.181250E+04 3.204875E+04 3.228500E+04 3.252125E+04 3.275750E+04 3.299375E+04 3.323000E+04 3.346625E+04 3.370250E+04 3.393875E+04 3.417500E+04 3.441125E+04 3.464750E+04 3.488375E+04 3.512000E+04 3.535625E+04 3.559250E+04 3.582875E+04 3.606500E+04 3.630125E+04 3.653750E+04 3.677375E+04 3.701000E+04 3.724625E+04 3.748250E+04 3.771875E+04 3.795500E+04 3.819125E+04 3.842750E+04 3.866375E+04 3.890000E+04 3.913625E+04 3.937250E+04 3.960875E+04 3.984500E+04 4.008125E+04 4.031750E+04 4.055375E+04 4.079000E+04 4.102625E+04 4.126250E+04 4.149875E+04 4.173500E+04 4.197125E+04 4.220750E+04 4.244375E+04 4.268000E+04 4.291625E+04 4.315250E+04 4.338875E+04 4.362500E+04 4.386125E+04 4.409750E+04 4.433375E+04 4.457000E+04 4.480625E+04 4.504250E+04 4.527875E+04 4.551500E+04 4.575125E+04 4.598750E+04 4.622375E+04 4.646000E+04 4.669625E+04 4.693250E+04 4.716875E+04 4.740500E+04 4.764125E+04 4.787750E+04 4.811375E+04 4.835000E+04 4.858625E+04 4.882250E+04 4.905875E+04 4.929500E+04 4.953125E+04 4.976750E+04 5.000375E+04 5.024000E+04 5.047625E+04 5.071250E+04 5.094875E+04 5.118500E+04 5.142125E+04 5.165750E+04 5.189375E+04 5.213000E+04 5.236625E+04 5.260250E+04 5.283875E+04 5.307500E+04 5.331125E+04 5.354750E+04 5.378375E+04 5.402000E+04 5.425625E+04 5.449250E+04 5.472875E+04 5.496500E+04 5.520125E+04 5.543750E+04 5.567375E+04 5.591000E+04 5.614625E+04 5.638250E+04 5.661875E+04 5.685500E+04 5.709125E+04 5.732750E+04 5.756375E+04 5.780000E+04 5.803625E+04 5.827250E+04 5.850875E+04 5.874500E+04 5.898125E+04 5.921750E+04 5.945375E+04 5.969000E+04 5.992625E+04 6.016250E+04 6.039875E+04 6.063500E+04 6.087125E+04 6.110750E+04 6.134375E+04 6.158000E+04 6.181625E+04 6.205250E+04 6.228875E+04 6.252500E+04 6.276125E+04 6.299750E+04 6.323375E+04 6.347000E+04 6.370625E+04 6.394250E+04 6.417875E+04 6.441500E+04 6.465125E+04 6.488750E+04 6.512375E+04 6.536000E+04 6.559625E+04 6.583250E+04 6.606875E+04 6.630500E+04 6.654125E+04 6.677750E+04 6.701375E+04 6.725000E+04 6.748625E+04 6.772250E+04 6.795875E+04 6.819500E+04 6.843125E+04 6.866750E+04 6.890375E+04 6.914000E+04 6.937625E+04 6.961250E+04 6.984875E+04 7.008500E+04 7.032125E+04 7.055750E+04 7.079375E+04 7.103000E+04 7.126625E+04 7.150250E+04 7.173875E+04 7.197500E+04 7.221125E+04 7.244750E+04 7.268375E+04 7.292000E+04 7.315625E+04 7.339250E+04 7.362875E+04 7.386500E+04 7.410125E+04 7.433750E+04 7.457375E+04 7.481000E+04 7.504625E+04 7.528250E+04 7.551875E+04 7.575500E+04 7.599125E+04 7.622750E+04 7.646375E+04 7.670000E+04 7.693625E+04 7.717250E+04 7.740875E+04 7.764500E+04 7.788125E+04 7.811750E+04 7.835375E+04 7.859000E+04 7.882625E+04 7.906250E+04 7.929875E+04 7.953500E+04 7.977125E+04 8.000750E+04 8.024375E+04 8.048000E+04 8.071625E+04 8.095250E+04 8.118875E+04 8.142500E+04 8.166125E+04 8.189750E+04 8.213375E+04 8.237000E+04 8.260625E+04 8.284250E+04 8.307875E+04 8.331500E+04 8.355125E+04 8.378750E+04 8.402375E+04 8.426000E+04 8.449625E+04 8.473250E+04 8.496875E+04 8.520500E+04 8.544125E+04 8.567750E+04 8.591375E+04 8.615000E+04 8.638625E+04 8.662250E+04 8.685875E+04 8.709500E+04 8.733125E+04 8.756750E+04 8.780375E+04 8.804000E+04 8.827625E+04 8.851250E+04 8.874875E+04 8.898500E+04 8.922125E+04 8.945750E+04 8.969375E+04 8.993000E+04 9.016625E+04 9.040250E+04 9.063875E+04 9.087500E+04 9.111125E+04 9.134750E+04 9.158375E+04 9.182000E+04 9.205625E+04 9.229250E+04 9.252875E+04 9.276500E+04 9.300125E+04 9.323750E+04 9.347375E+04 9.371000E+04 9.394625E+04 9.418250E+04 9.441875E+04 9.465500E+04 9.489125E+04 9.512750E+04 9.536375E+04 9.560000E+04 9.583625E+04 9.607250E+04 9.630875E+04 9.654500E+04 9.678125E+04 9.701750E+04 9.725375E+04 9.749000E+04 9.772625E+04 9.796250E+04 9.819875E+04 9.843500E+04 9.867125E+04 9.890750E+04 9.914375E+04 9.938000E+04 9.961625E+04 9.985250E+04 1.008875E+05 1.032500E+05 1.056125E+05 1.079750E+05 1.103375E+05 1.127000E+05 1.150625E+05 1.174250E+05 1.197875E+05 1.221500E+05 1.245125E+05 1.268750E+05 1.292375E+05 1.316000E+05 1.339625E+05 1.363250E+05 1.386875E+05 1.410500E+05 1.434125E+05 1.457750E+05 1.481375E+05 1.505000E+05 1.528625E+05 1.552250E+05 1.575875E+05 1.599500E+05 1.623125E+05 1.646750E+05 1.670375E+05 1.694000E+05 1.717625E+05 1.741250E+05 1.764875E+05 1.788500E+05 1.812125E+05 1.835750E+05 1.859375E+05 1.883000E+05 1.906625E+05 1.930250E+05 1.953875E+05 1.977500E+05 2.001125E+05 2.024750E+05 2.048375E+05 2.072000E+05 2.095625E+05 2.119250E+05 2.142875E+05 2.166500E+05 2.190125E+05 2.213750E+05 2.237375E+05 2.261000E+05 2.284625E+05 2.308250E+05 2.331875E+05 2.355500E+05 2.379125E+05 2.402750E+05 2.426375E+05 2.450000E+05 2.473625E+05 2.497250E+05 2.520875E+05 2.544500E+05 2.568125E+05 2.591750E+05 2.615375E+05 2.639000E+05 2.662625E+05 2.686250E+05 2.709875E+05 2.733500E+05 2.757125E+05 2.780750E+05 2.804375E+05 2.828000E+05 2.851625E+05 2.875250E+05 2.898875E+05 2.922500E+05 2.946125E+05 2.969750E+05 2.993375E+05 3.017000E+05 3.040625E+05 3.064250E+05 3.087875E+05 3.111500E+05 3.135125E+05 3.158750E+05 3.182375E+05 3.206000E+05 3.229625E+05 3.253250E+05 3.276875E+05 3.300500E+05 3.324125E+05 3.347750E+05 3.371375E+05 3.395000E+05 3.418625E+05 3.442250E+05 3.465875E+05 3.489500E+05 3.513125E+05 3.536750E+05 3.560375E+05 3.584000E+05 3.607625E+05 3.631250E+05 3.654875E+05 3.678500E+05 3.702125E+05 3.725750E+05 3.749375E+05 3.773000E+05 3.796625E+05 3.820250E+05 3.843875E+05 3.867500E+05 3.891125E+05 3.914750E+05 3.938375E+05 3.962000E+05 3.985625E+05 4.009250E+05 4.032875E+05 4.056500E+05 4.080125E+05 4.103750E+05 4.127375E+05 4.151000E+05 4.174625E+05 4.198250E+05 4.221875E+05 4.245500E+05 4.269125E+05 4.292750E+05 4.316375E+05 4.340000E+05 4.363625E+05 4.387250E+05 4.410875E+05 4.434500E+05 4.458125E+05 4.481750E+05 4.505375E+05 4.529000E+05 4.552625E+05 4.576250E+05 4.600000E+05 4.623625E+05 4.647250E+05 4.670875E+05 4.694500E+05 4.718125E+05 4.741750E+05 4.765375E+05 4.789000E+05 4.812625E+05 4.836250E+05 4.859875E+05 4.883500E+05 4.907125E+05 4.930750E+05 4.954375E+05 4.978000E+05 5.001625E+05 5.025250E+05 5.048875E+05 5.072500E+05 5.096125E+05 5.119750E+05 5.143375E+05 5.167000E+05 5.190625E+05 5.214250E+05 5.237875E+05 5.261500E+05 5.285125E+05 5.308750E+05 5.332375E+05 5.356000E+05 5.379625E+05 5.403250E+05 5.426875E+05 5.450500E+05 5.474125E+05 5.497750E+05 5.521375E+05 5.545000E+05 5.568625E+05 5.592250E+05 5.615875E+05 5.639500E+05 5.663125E+05 5.686750E+05 5.710375E+05 5.734000E+05 5.757625E+05 5.781250E+05 5.804875E+05 5.828500E+05 5.852125E+05 5.875750E+05 5.899375E+05 5.923000E+05 5.946625E+05 5.970250E+05 5.993875E+05 6.017500E+05 6.041125E+05 6.064750E+05 6.088375E+05 6.112000E+05 6.135625E+05 6.159250E+05 6.182875E+05 6.206500E+05 6.230125E+05 6.253750E+05 6.277375E+05 6.301000E+05 6.324625E+05 6.348250E+05 6.371875E+05 6.395500E+05 6.419125E+05 6.442750E+05 6.466375E+05 6.490000E+05 6.513625E+05 6.537250E+05 6.560875E+05 6.584500E+05 6.608125E+05 6.631750E+05 6.655375E+05 6.679000E+05 6.702625E+05 6.726250E+05 6.749875E+05 6.773500E+05 6.797125E+05 6.820750E+05 6.844375E+05 6.868000E+05 6.891625E+05 6.915250E+05 6.938875E+05 6.962500E+05 6.986125E+05 7.009750E+05 7.033375E+05 7.057000E+05 7.080625E+05 7.104250E+05 7.127875E+05 7.151500E+05 7.175125E+05 7.198750E+05 7.222375E+05 7.246000E+05 7.269625E+05 7.293250E+05 7.316875E+05 7.340500E+05 7.364125E+05 7.387750E+05 7.411375E+05 7.435000E+05 7.458625E+05 7.482250E+05 7.505875E+05 7.529500E+05 7.553125E+05 7.576750E+05 7.600375E+05 7.624000E+05 7.647625E+05 7.671250E+05 7.694875E+05 7.718500E+05 7.742125E+05 7.765750E+05 7.789375E+05 7.813000E+05 7.836625E+05 7.860250E+05 7.883875E+05 7.907500E+05 7.931125E+05 7.954750E+05 7.978375E+05 8.002000E+05 8.025625E+05 8.049250E+05 8.072875E+05 8.096500E+05 8.120125E+05 8.143750E+05 8.167375E+05 8.191000E+05 8.214625E+05 8.238250E+05 8.261875E+05 8.285500E+05 8.309125E+05 8.332750E+05 8.356375E+05 8.380000E+05 8.403625E+05 8.427250E+05 8.450875E+05 8.474500E+05 8.498125E+05 8.521750E+05 8.545375E+05 8.569000E+05 8.592625E+05 8.616250E+05 8.639875E+05 8.663500E+05 8.687125E+05 8.710750E+05 8.734375E+05 8.758000E+05 8.781625E+05 8.805250E+05 8.828875E+05 8.852500E+05 8.876125E+05 8.900000E+05 8.923625E+05 8.947250E+05 8.970875E+05 8.994500E+05 9.018125E+05 9.041750E+05 9.065375E+05 9.089000E+05 9.112625E+05 9.136250E+05 9.159875E+05 9.183500E+05 9.207125E+05 9.230750E+05 9.254375E+05 9.278000E+05 9.301625E+05 9.325250E+05 9.348875E+05 9.372500E+05 9.396125E+05 9.419750E+05 9.443375E+05 9.467000E+05 9.490625E+05 9.514250E+05 9.537875E+05 9.561500E+05 9.585125E+05 9.608750E+05 9.632375E+05 9.656000E+05 9.679625E+05 9.703250E+05 9.726875E+05 9.750500E+05 9.774125E+05 9.797750E+05 9.821375E+05 9.845000E+05 9.868625E+05 9.892250E+05 9.915875E+05 9.939500E+05 9.963125E+05 9.986750E+05 1.010375E+06 1.034000E+06 1.057625E+06 1.081250E+06 1.104875E+06 1.128500E+06 1.152125E+06 1.175750E+06 1.199375E+06 1.223000E+06 1.246625E+06 1.270250E+06 1.293875E+06 1.317500E+06 1.341125E+06 1.364750E+06 1.388375E+06 1.412000E+06 1.435625E+06 1.459250E+06 1.482875E+06 1.506500E+06 1.530125E+06 1.553750E+06 1.577375E+06 1.601000E+06 1.624625E+06 1.648250E+06 1.671875E+06 1.695500E+06 1.719125E+06 1.742750E+06 1.766375E+06 1.790000E+06 1.813625E+06 1.837250E+06 1.860875E+06 1.884500E+06 1.908125E+06 1.931750E+06 1.955375E+06 1.979000E+06 2.002625E+06 2.026250E+06 2.049875E+06 2.073500E+06 2.097125E+06 2.120750E+06 2.144375E+06 2.168000E+06 2.191625E+06 2.215250E+06 2.238875E+06 2.262500E+06 2.286125E+06 2.309750E+06 2.333375E+06 2.357000E+06 2.380625E+06 2.404250E+06 2.427875E+06 2.451500E+06 2.475125E+06 2.498750E+06 2.522375E+06 2.546000E+06 2.569625E+06 2.593250E+06 2.616875E+06 2.640500E+06 2.664125E+06 2.687750E+06 2.711375E+06 2.735000E+06 2.758625E+06 2.782250E+06 2.805875E+06 2.829500E+06 2.853125E+06 2.876750E+06 2.900375E+06 2.924000E+06 2.947625E+06 2.971250E+06 2.994875E+06 3.018500E+06 3.042125E+06 3.065750E+06 3.089375E+06 3.113000E+06 3.136625E+06 3.160250E+06 3.183875E+06 3.207500E+06 3.231125E+06 3.254750E+06 3.278375E+06 3.302000E+06 3.325625E+06 3.349250E+06 3.372875E+06 3.396500E+06 3.420125E+06 3.443750E+06 3.467375E+06 3.491000E+06 3.514625E+06 3.538250E+06 3.561875E+06 3.585500E+06 3.609125E+06 3.632750E+06 3.656375E+06 3.680000E+06 3.703625E+06 3.727250E+06 3.750875E+06 3.774500E+06 3.798125E+06 3.821750E+06 3.845375E+06 3.869000E+06 3.892625E+06 3.916250E+06 3.939875E+06 3.963500E+06 3.987125E+06 4.010750E+06 4.034375E+06 4.058000E+06 4.081625E+06 4.105250E+06 4.128875E+06 4.152500E+06 4.176125E+06 4.199750E+06 4.223375E+06 4.247000E+06 4.270625E+06 4.294250E+06 4.317875E+06 4.341500E+06 4.365125E+06 4.388750E+06 4.412375E+06 4.436000E+06 4.459625E+06 4.483250E+06 4.506875E+06 4.530500E+06 4.554125E+06 4.577750E

STAY FROM TO PEAK SCRAM TRANSIENT WITH SECOND ROD BANK ELAPSED TIME FROM START OF CASE 8.093 SEC

TIME STEP NO. 11 TIME .1001E+01 DELTA T = .1000E+00

REACTIVITY (TIME STEP 10) = .1302E-02

ROD WITHDRAWAL DISTANCE = 0.

RELATIVE POWER (TIME STEP 10) = .1475E+01

PEAK TO AVERAGE POWER (TIME STEP 10)

0. .3365E+00 .6431E+00 .9188E+03 .1147E+01 .1318E+01 .1424E+01 .1459E+01 .1475E+01 .1318E+01

.1147E+01 .9188E+03 .6431E+00 .3365E+00

IODINE CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

XENON CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

INLET TEMPERATURE = .3950E+03

COOLANT TEMPERATURE

.3950E+03 .3950E+03 .4025E+03 .4110E+03 .4200E+03 .4290E+03 .4380E+03 .4470E+03 .4560E+03 .4632E+03 .4724E+03 .4908E+03

OUTLET TEMPERATURE = .5252E+03

FUEL TEMPERATURE

.3950E+03 .4497E+03 .5025E+03 .5524E+03 .5961E+03 .6330E+03 .6618E+03 .6810E+03 .6899E+03 .6880E+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS	ABSORPTION		NU * SIGMA(FISS)	REMOVAL		TOTAL CROSS SECTIONS
			GROUP 1	GROUP 2		GROUP 1	GROUP 2	
0, 10	1/ 1	1.4E+01	4.6310E+00	1.233E-03	2.2090E-02	0.	5.058E-02	5.161E-02
10, 20	2/ 2	1.840E+01	1.3708E+01	1.656E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
20, 30	3/ 3	1.880E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
30, 40	4/ 4	1.860E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
40, 50	5/ 5	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
50, 60	6/ 6	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
60, 70	7/ 7	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
70, 80	8/ 8	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
80, 90	9/ 9	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
90, 100	10/ 10	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
100, 110	11/ 11	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
110, 120	12/ 12	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
120, 130	13/ 13	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
130, 140	14/ 14	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
140, 150	15/ 15	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
150, 160	16/ 16	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
160, 170	17/ 17	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
170, 180	18/ 18	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
180, 190	19/ 19	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
190, 200	20/ 20	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
200, 210	21/ 21	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
210, 220	22/ 22	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
220, 230	23/ 23	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
230, 240	24/ 24	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
240, 250	25/ 25	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
250, 260	26/ 26	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
260, 270	27/ 27	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
270, 280	28/ 28	1.840E+01	1.3081E+01	1.655E-02	5.3850E-02	9.833E-03	6.514E-02	4.990E-02
280, 290	29/ 29	1.840E+01	1.3					

PT DEL X	CIST	FLUX GRI	FLUX G22	ADJ GRI	ADJ G22	POW3	POW4
1	0.000	0.	0.	0.	0.	0.	0.
2	7.036	7.9366f+03	1.50595e+11	7.37452e+11	2.0311e+11	0.	0.
3	7.036	1.6772e+01	2.2729e+11	1.52555e+12	2.2171f+03	2.3292e+09	0.
4	7.036	2.1108e+01	5.6070e+11	1.44115e+12	6.8731f+09	3.8543E+09	0.
5	7.036	2.6146f+01	8.9129e+11	3.44342e+12	9.9293f+09	8.8762E+09	0.
6	7.036	3.1182e+01	1.3764e+12	4.6466f+12	1.3450f+10	8.6336E+09	0.
7	7.036	4.2214e+01	2.1005e+12	6.0422E+12	1.8678e+10	1.2496E+10	0.
8	7.036	5.9252e+01	3.1875e+12	7.5932E+12	2.4560f+10	1.7936E+10	0.
9	7.036	6.5298e+01	4.8275e+12	1.1837E+13	1.1895e+10	2.5689E+10	0.
10	7.036	6.3324e+01	7.3342e+12	1.0536E+13	1.9865e+10	3.6611E+10	0.
11	7.036	6.3324e+01	7.3342e+12	1.0536E+13	1.9865e+10	3.6611E+10	0.
12	7.036	7.3605e+01	1.1847e+13	1.11105f+13	4.9013f+10	5.2212f+10	5.8202e+10
13	7.036	7.9691f+01	1.4710e+13	1.1456E+13	6.5973E+10	6.2935E+10	1.4279f+00
14	7.036	8.7822f+01	1.8243e+13	1.2440E+13	6.673E+10	7.4646E+10	6.9296f+10
15	7.036	9.5353e+01	2.1354e+13	1.3733E+13	7.5391f+10	9.0718E+10	7.7344f+10
16	7.036	1.0368E+02	2.4422e+13	1.5234E+13	9.5311f+10	1.0244E+11	8.6036E+10
17	7.036	1.1202f+02	2.6995e+13	1.6739E+13	1.1394E+11	1.1394E+11	9.5032E+10
18	7.036	1.2035f+02	2.9420E+13	1.8401E+13	1.0792e+11	1.2503E+11	1.0415E+11
19	7.036	1.2869f+02	3.2005E+13	2.0018E+13	1.1315e+11	1.3663E+11	1.1329E+11
20	7.036	1.3706f+02	3.4599E+13	2.1538E+13	1.2313e+11	1.4793E+11	1.2241E+11
21	7.036	1.4534E+02	3.7869f+13	2.3222E+13	1.3139f+11	1.5835E+11	1.3146E+11
22	7.036	1.5368E+02	4.0953E+13	2.5222E+13	1.4139f+11	1.6855E+11	1.3146E+11
23	7.036	1.6202E+02	4.4195E+13	2.6457E+13	1.4373e+11	1.6940E+11	1.4044E+11
24	7.036	1.7036E+02	4.7514E+13	2.8412E+13	1.4904e+11	1.7987E+11	1.4910E+11
25	7.036	1.7869E+02	5.0741E+13	3.0793E+13	1.5761e+11	1.9301E+11	1.5761E+11
26	7.036	1.8703E+02	5.4068E+13	3.2948E+13	1.6607e+11	2.1004E+11	1.6613E+11
27	7.036	1.9537E+02	5.7395E+13	3.5093E+13	1.7445e+11	2.2042E+11	1.7445E+11
28	7.036	2.0371E+02	6.0722E+13	3.7248E+13	1.8285e+11	2.3083E+11	1.8271E+11
29	7.036	2.1205E+02	6.4049E+13	3.9398E+13	1.9125e+11	2.4124E+11	1.9125E+11
30	7.036	2.2039E+02	6.7376E+13	4.1503E+13	1.9965e+11	2.5165E+11	1.9965E+11
31	7.036	2.2873E+02	7.0703E+13	4.3608E+13	2.0805e+11	2.6206E+11	2.0805E+11
32	7.036	2.3707E+02	7.4030E+13	4.5713E+13	2.1645e+11	2.7247E+11	2.1645E+11
33	7.036	2.4541E+02	7.7357E+13	4.7818E+13	2.2485e+11	2.8288E+11	2.2485E+11
34	7.036	2.5375E+02	8.0684E+13	4.9913E+13	2.3325e+11	2.9329E+11	2.3325E+11
35	7.036	2.6209E+02	8.4011E+13	5.2008E+13	2.4165e+11	3.0370E+11	2.4165E+11
36	7.036	2.7043E+02	8.7338E+13	5.4103E+13	2.5005e+11	3.1411E+11	2.5005E+11
37	7.036	2.7877E+02	9.0665E+13	5.6198E+13	2.5845e+11	3.2452E+11	2.5845E+11
38	7.036	2.8711E+02	9.4011E+13	5.8293E+13	2.6685e+11	3.3493E+11	2.6685E+11
39	7.036	2.9545E+02	9.7357E+13	6.0388E+13	2.7525e+11	3.4534E+11	2.7525E+11
40	7.036	3.0379E+02	1.0062E+14	6.2483E+13	2.8367e+11	3.5575E+11	2.8367E+11
41	7.036	3.1213E+02	1.0387E+14	6.4578E+13	2.9200e+11	3.6616E+11	2.9200E+11
42	7.036	3.2047E+02	1.0712E+14	6.6689E+13	3.0033e+11	3.7657E+11	3.0033E+11
43	7.036	3.2881E+02	1.1037E+14	6.8800E+13	3.0865e+11	3.8698E+11	3.0865E+11
44	7.036	3.3715E+02	1.1362E+14	7.0911E+13	3.1698e+11	3.9739E+11	3.1698E+11
45	7.036	3.4549E+02	1.1687E+14	7.2962E+13	3.2530e+11	4.0780E+11	3.2530E+11
46	7.036	3.5383E+02	1.2012E+14	7.5013E+13	3.3363e+11	4.1821E+11	3.3363E+11
47	7.036	3.6217E+02	1.2337E+14	7.7064E+13	3.4195e+11	4.2862E+11	3.4195E+11
48	7.036	3.7051E+02	1.2662E+14	7.9115E+13	3.5028e+11	4.3903E+11	3.5028E+11
49	7.036	3.7885E+02	1.2987E+14	8.1166E+13	3.5860e+11	4.4944E+11	3.5860E+11
50	7.036	3.8719E+02	1.3312E+14	8.3217E+13	3.6693e+11	4.5985E+11	3.6693E+11

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50 8.128 3.4938E+02 9.3973E+13 6.1747E+13 3.3442E+11 4.0297E+11 3.3403E+11 1.4383E+00 1.5496E+13
51 8.128 3.9751E+02 1.0130E+14 6.2627E+13 3.3474E+11 4.0824E+11 3.3335E+11 1.5016E+00 1.5016E+00
52 8.128 4.0544E+02 1.0967E+14 6.3475E+13 3.3301E+11 4.1332E+11 3.4259E+11 1.5017E+00 1.5017E+00
53 8.128 4.1377E+02 1.3393E+14 6.4291E+13 3.3705E+11 4.1821E+11 3.4665E+11 1.5033E+00 1.5033E+00
54 8.128 4.2199E+02 1.3526E+14 6.5076E+13 3.5097E+11 4.2741E+11 3.5428E+11 1.5062E+00 1.5062E+00
55 8.128 4.3045E+02 1.0647E+14 6.5849E+13 3.5471E+11 4.3172E+11 3.5781E+11 1.5075E+00 1.5075E+00
56 8.128 4.3845E+02 1.0764E+14 6.6594E+13 3.6221E+11 4.3543E+11 3.6121E+11 1.5097E+00 1.5097E+00
57 8.128 4.4628E+02 1.0875E+14 6.7245E+13 3.6164E+11 4.3543E+11 3.6121E+11 1.5097E+00 1.5097E+00
58 8.128 4.5441E+02 1.0941E+14 6.7949E+13 3.6494E+11 4.3974E+11 3.6444E+11 1.5098E+00 1.5098E+00
59 8.128 4.6233E+02 1.1081E+14 6.8597E+13 3.6902E+11 4.4345E+11 3.6751E+11 1.5098E+00 1.5098E+00
60 8.128 4.7056E+02 1.1175E+14 6.9032E+13 3.7093E+11 4.4635E+11 3.7041E+11 1.5119E+00 1.5119E+00
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60 3.128 4.7056E+02 1.1175E+14 6.9032E+13 3.7093E+11 4.4635E+11 3.7041E+11 1.5119E+00 1.5119E+00
61 3.128 4.7879E+02 1.1255E+14 6.9644E+13 3.7367E+11 4.5025E+11 3.7314E+11 1.5129E+00 1.5129E+00
62 3.128 4.8692E+02 1.1348E+14 7.0161E+13 3.7528E+11 4.5335E+11 3.7570E+11 1.5135E+00 1.5135E+00
63 3.128 4.9505E+02 1.1426E+14 7.0644E+13 3.7851E+11 4.5624E+11 3.7809E+11 1.5144E+00 1.5144E+00
64 3.128 5.0317E+02 1.1493E+14 7.1091E+13 3.8435E+11 4.5892E+11 3.8030E+11 1.5151E+00 1.5151E+00
65 3.128 5.1130E+02 1.1565E+14 7.1504E+13 3.8294E+11 4.6139E+11 3.8234E+11 1.5158E+00 1.5158E+00
66 3.128 5.1943E+02 1.1635E+14 7.1841E+13 3.8473E+11 4.6164E+11 3.8421E+11 1.5164E+00 1.5164E+00
67 3.128 5.2756E+02 1.1682E+14 7.2233E+13 3.8643E+11 4.6592E+11 3.8596E+11 1.5169E+00 1.5169E+00
68 3.128 5.3569E+02 1.1741E+14 7.2530E+13 3.8803E+11 4.6725E+11 3.8742E+11 1.5174E+00 1.5174E+00
69 3.128 5.4381E+02 1.1775E+14 7.2891E+13 3.8934E+11 4.6944E+11 3.8875E+11 1.5178E+00 1.5178E+00
70 3.128 5.5194E+02 1.1813E+14 7.3036E+13 3.9051E+11 4.7055E+11 3.8992E+11 1.5182E+00 1.5182E+00
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70 3.128 5.5194E+02 1.1813E+14 7.3036E+13 3.9051E+11 4.7055E+11 3.8992E+11 1.5182E+00 1.5182E+00
71 3.128 5.6007E+02 1.1845E+14 7.3235E+13 3.9153E+11 4.7174E+11 3.9090E+11 1.5185E+00 1.5185E+00
72 3.128 5.6820E+02 1.1872E+14 7.3384E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.5188E+00 1.5188E+00
73 3.128 5.7633E+02 1.1892E+14 7.3525E+13 3.9294E+11 4.7347E+11 3.9233E+11 1.5190E+00 1.5190E+00
74 3.128 5.8445E+02 1.1907E+14 7.3566E+13 3.9334E+11 4.7431E+11 3.9276E+11 1.5191E+00 1.5191E+00
75 3.128 5.9258E+02 1.1916E+14 7.3673E+13 3.9365E+11 4.7434E+11 3.9305E+11 1.5192E+00 1.5192E+00
76 3.128 6.0071E+02 1.1919E+14 7.3694E+13 3.9374E+11 4.7445E+11 3.9314E+11 1.5192E+00 1.5192E+00
77 3.128 6.0884E+02 1.1916E+14 7.3671E+13 3.9365E+11 4.7434E+11 3.9305E+11 1.5191E+00 1.5191E+00
78 3.128 6.1697E+02 1.1907E+14 7.3584E+13 3.9339E+11 4.7431E+11 3.9276E+11 1.5191E+00 1.5191E+00
79 3.128 6.2509E+02 1.1933E+14 7.3529E+13 3.9294E+11 4.7347E+11 3.9233E+11 1.5190E+00 1.5190E+00
80 3.128 6.3322E+02 1.1922E+14 7.3492E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.5188E+00 1.5188E+00
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80 3.128 6.3322E+02 1.1922E+14 7.3492E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.5188E+00 1.5188E+00
81 3.128 6.4135E+02 1.1922E+14 7.3492E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.5188E+00 1.5188E+00
82 3.128 6.4948E+02 1.1914E+14 7.3404E+13 3.9153E+11 4.7174E+11 3.9090E+11 1.5186E+00 1.5186E+00
83 3.128 6.5761E+02 1.1776E+14 7.2407E+13 3.8934E+11 4.6752E+11 3.8742E+11 1.5176E+00 1.5176E+00
84 3.128 6.6573E+02 1.1733E+14 7.2538E+13 3.8803E+11 4.6592E+11 3.8596E+11 1.5171E+00 1.5171E+00
85 3.128 6.7386E+02 1.1683E+14 7.2232E+13 3.8643E+11 4.6364E+11 3.8421E+11 1.5166E+00 1.5166E+00
86 3.128 6.8199E+02 1.1623E+14 7.1891E+13 3.8473E+11 4.6139E+11 3.8234E+11 1.5160E+00 1.5160E+00
87 3.128 6.9012E+02 1.1567E+14 7.1514E+13 3.8294E+11 4.6139E+11 3.8234E+11 1.5154E+00 1.5154E+00
88 3.128 6.9825E+02 1.1505E+14 7.1102E+13 3.8094E+11 4.5892E+11 3.8030E+11 1.5147E+00 1.5147E+00
89 3.128 7.0637E+02 1.1424E+14 7.0656E+13 3.7963E+11 4.5624E+11 3.7909E+11 1.5147E+00 1.5147E+00
90 3.128 7.1450E+02 1.1350E+14 7.0174E+13 3.7823E+11 4.5355E+11 3.7570E+11 1.5139E+00 1.5139E+00
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90 3.128 7.1450E+02 1.1350E+14 7.0174E+13 3.7823E+11 4.5355E+11 3.7570E+11 1.5139E+00 1.5139E+00
91 3.128 7.2263E+02 1.1267E+14 6.9659E+13 3.7367E+11 4.5025E+11 3.7314E+11 1.5131E+00 1.5131E+00
92 3.128 7.3076E+02 1.1173E+14 6.9137E+13 3.7093E+11 4.4635E+11 3.7041E+11 1.5122E+00 1.5122E+00
93 3.128 7.3889E+02 1.1043E+14 6.8522E+13 3.6902E+11 4.4345E+11 3.6751E+11 1.5112E+00 1.5112E+00
94 3.128 7.4701E+02 1.0943E+14 6.7903E+13 3.6494E+11 4.3974E+11 3.6444E+11 1.5102E+00 1.5102E+00
95 3.128 7.5514E+02 1.0843E+14 6.7251E+13 3.6164E+11 4.3543E+11 3.6121E+11 1.5098E+00 1.5098E+00
96 3.128 7.6327E+02 1.0765E+14 6.6566E+13 3.5823E+11 4.3172E+11 3.5781E+11 1.5076E+00 1.5076E+00
97 3.128 7.7140E+02 1.0650E+14 6.5845E+13 3.5471E+11 4.2741E+11 3.5428E+11 1.5062E+00 1.5062E+00
98 3.128 7.7953E+02 1.0529E+14 6.5093E+13 3.5097E+11 4.2290E+11 3.5052E+11 1.5052E+00 1.5052E+00
99 3.128 7.8765E+02 1.0402E+14 6.4359E+13 3.4707E+11 4.1820E+11 3.4635E+11 1.5037E+00 1.5037E+00
100 3.128 7.9578E+02 1.0270E+14 6.3433E+13 3.4301E+11 4.1332E+11 3.4259E+11 1.5022E+00 1.5022E+00
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100	9.128	7.9578E+02	1.0276E+14	6.3493E+13	1.4301E+11	4.1332E+11	3.4259E+11	1.5022E+00	1.7810E+13
101	3.128	8.0391E+02	1.0133E+14	6.2654E+13	3.3875E+11	4.3884E+11	3.3934E+11	1.5022E+00	1.5005E+00
102	9.128	8.1204E+02	9.9903E+13	6.1766E+13	3.3442E+11	4.0297E+11	3.3402E+11	1.4988E+00	1.4988E+00
103	9.128	8.2017E+02	9.8431E+13	6.0836E+13	3.2990E+11	3.3732E+11	3.2951E+11	1.4969E+00	1.4969E+00
104	8.128	8.2820E+02	9.6910E+13	5.9915E+13	3.2322E+11	3.1983E+11	3.2085E+11	1.4949E+00	1.4949E+00
105	4.128	8.3642E+02	9.5339E+13	5.8944E+13	3.1633E+11	3.1617E+11	3.2001E+11	1.4928E+00	1.4928E+00
106	3.128	8.4455E+02	9.3721E+13	5.7931E+13	3.1562E+11	3.1008E+11	3.1508E+11	1.4906E+00	1.4906E+00
107	8.128	8.5268E+02	9.2055E+13	5.6915E+13	3.1130E+11	3.0792E+11	3.0997E+11	1.4882E+00	1.4882E+00
108	4.128	8.6081E+02	9.0343E+13	5.5850E+13	3.0593E+11	3.0759E+11	3.0793E+11	1.4856E+00	1.4856E+00
109	8.128	8.6893E+02	8.8685E+13	5.4768E+13	2.9962E+11	3.0111E+11	2.9935E+11	1.4839E+00	1.4839E+00
110	9.128	8.7705E+02	8.6982E+13	5.3653E+13	2.9405E+11	3.0472E+11	2.9355E+11	1.4799E+00	1.4799E+00
111	3.128	8.8519E+02	8.5272E+13	5.2545E+13	2.9005E+11	3.0472E+11	2.9355E+11	1.4799E+00	1.4799E+00
112	3.128	8.9332E+02	8.3665E+13	5.1433E+13	2.8493E+11	3.0472E+11	2.8823E+11	1.4767E+00	1.4767E+00
113	3.128	9.0145E+02	8.1113E+13	5.0197E+13	2.7833E+11	3.0335E+11	2.8247E+11	1.4734E+00	1.4734E+00
114	3.128	9.0957E+02	7.9139E+13	4.8928E+13	2.7021E+11	3.0205E+11	2.7025E+11	1.4697E+00	1.4697E+00
115	3.128	9.1770E+02	7.7124E+13	4.7682E+13	2.6300E+11	3.0084E+11	2.6386E+11	1.4667E+00	1.4667E+00
116	3.128	9.2583E+02	7.5070E+13	4.6442E+13	2.5722E+11	3.0011E+11	2.5729E+11	1.4631E+00	1.4631E+00
117	3.128	9.3396E+02	7.2975E+13	4.5118E+13	2.5047E+11	3.0227E+11	2.5054E+11	1.4593E+00	1.4593E+00
118	3.128	9.4209E+02	7.0845E+13	4.3800E+13	2.4355E+11	2.9332E+11	2.4362E+11	1.4572E+00	1.4572E+00
119	3.128	9.5021E+02	6.8675E+13	4.2480E+13	2.3646E+11	2.8517E+11	2.3653E+11	1.4550E+00	1.4550E+00
120	3.128	9.5834E+02	6.6475E+13	4.1198E+13	2.2925E+11	2.7653E+11	2.2925E+11	1.4528E+00	1.4528E+00
121	3.128	9.6647E+02	6.4275E+13	3.9983E+13	2.2222E+11	2.7653E+11	2.2925E+11	1.4528E+00	1.4528E+00
122	3.128	9.7460E+02	6.2036E+13	3.8775E+13	2.1511E+11	2.6793E+11	2.2189E+11	1.4506E+00	1.4506E+00
123	3.128	9.8273E+02	5.9836E+13	3.7581E+13	2.0793E+11	2.5933E+11	2.1433E+11	1.4488E+00	1.4488E+00
124	3.128	9.9086E+02	5.7638E+13	3.6398E+13	2.0075E+11	2.5073E+11	2.0633E+11	1.4469E+00	1.4469E+00
125	3.128	9.9899E+02	5.5444E+13	3.5222E+13	1.9355E+11	2.4213E+11	1.9879E+11	1.4451E+00	1.4451E+00
126	3.128	1.0071E+03	5.3252E+13	3.4033E+13	1.8635E+11	2.3353E+11	1.9082E+11	1.4435E+00	1.4435E+00
127	3.128	1.0143E+03	5.1051E+13	3.2843E+13	1.7915E+11	2.2493E+11	1.8271E+11	1.4419E+00	1.4419E+00
128	3.128	1.0215E+03	4.8845E+13	3.1653E+13	1.7195E+11	2.1633E+11	1.7448E+11	1.4403E+00	1.4403E+00
129	3.128	1.0287E+03	4.6639E+13	3.0463E+13	1.6475E+11	2.0773E+11	1.6615E+11	1.4389E+00	1.4389E+00
130	3.128	1.0359E+03	4.4433E+13	2.9273E+13	1.5755E+11	1.9913E+11	1.5767E+11	1.4373E+00	1.4373E+00
131	3.128	1.0431E+03	4.2227E+13	2.8083E+13	1.5035E+11	1.9053E+11	1.5105E+11	1.4358E+00	1.4358E+00
132	3.128	1.0503E+03	4.0025E+13	2.6893E+13	1.4315E+11	1.8193E+11	1.4910E+11	1.4343E+00	1.4343E+00
133	3.128	1.0575E+03	3.7819E+13	2.5703E+13	1.3595E+11	1.7333E+11	1.3465E+11	1.4328E+00	1.4328E+00
134	3.128	1.0647E+03	3.5625E+13	2.4513E+13	1.2875E+11	1.6473E+11	1.2241E+11	1.4313E+00	1.4313E+00
135	3.128	1.0719E+03	3.3431E+13	2.3323E+13	1.2155E+11	1.5613E+11	1.1329E+11	1.4298E+00	1.4298E+00
136	3.128	1.0791E+03	3.1237E+13	2.2133E+13	1.1435E+11	1.4753E+11	1.0415E+11	1.4283E+00	1.4283E+00
137	3.128	1.0863E+03	2.9043E+13	2.0943E+13	1.0715E+11	1.3893E+11	9.531E+10	1.4268E+00	1.4268E+00
138	3.128	1.0935E+03	2.6849E+13	1.9753E+13	1.0005E+11	1.3033E+11	8.6036E+10	1.4253E+00	1.4253E+00
139	3.128	1.1007E+03	2.4655E+13	1.8563E+13	9.285E+10	1.2173E+11	7.7344E+10	1.4238E+00	1.4238E+00
140	3.128	1.1079E+03	2.2461E+13	1.7373E+13	8.565E+10	1.1313E+11	6.9296E+10	1.4223E+00	1.4223E+00
141	3.128	1.1151E+03	2.0267E+13	1.6183E+13	7.845E+10	1.0453E+11	6.2355E+10	1.4208E+00	1.4208E+00
142	3.128	1.1223E+03	1.8073E+13	1.5003E+13	7.125E+10	9.592E+10	5.5415E+10	1.4193E+00	1.4193E+00
143	3.128	1.1295E+03	1.5879E+13	1.3813E+13	6.405E+10	8.732E+10	4.8455E+10	1.4178E+00	1.4178E+00
144	3.128	1.1367E+03	1.3685E+13	1.2623E+13	5.685E+10	7.873E+10	4.1515E+10	1.4163E+00	1.4163E+00
145	3.128	1.1439E+03	1.1491E+13	1.1431E+13	4.965E+10	7.013E+10	3.4575E+10	1.4148E+00	1.4148E+00
146	3.128	1.1511E+03	1.1052E+13	1.1052E+13	4.245E+10	6.153E+10	2.7635E+10	1.4133E+00	1.4133E+00
147	3.128	1.1583E+03	1.0613E+13	1.0613E+13	3.525E+10	5.293E+10	2.0695E+10	1.4118E+00	1.4118E+00
148	3.128	1.1655E+03	1.0175E+13	1.0175E+13	2.805E+10	4.433E+10	1.3755E+10	1.4103E+00	1.4103E+00
149	3.128	1.1727E+03	9.7375E+12	9.7375E+12	2.085E+10	3.573E+10	6.9296E+09	1.4088E+00	1.4088E+00
150	3.128	1.1799E+03	9.3005E+12	9.3005E+12	1.365E+10	2.713E+10	6.2355E+09	1.4073E+00	1.4073E+00
151	3.128	1.1871E+03	8.8635E+12	8.8635E+12	6.445E+09	1.843E+10	5.5415E+09	1.4058E+00	1.4058E+00
152	3.128	1.1943E+03	8.4265E+12	8.4265E+12	3.725E+09	1.403E+10	4.8455E+09	1.4043E+00	1.4043E+00
153	3.128	1.2015E+03	7.9895E+12	7.9895E+12	1.005E+09	1.005E+10	4.1515E+09	1.4028E+00	1.4028E+00
154	3.128	1.2087E+03	7.5525E+12	7.5525E+12	2.285E+08	7.985E+09	3.4575E+09	1.4013E+00	1.4013E+00
155	3.128	1.2159E+03	7.1155E+12	7.1155E+12	1.565E+08	6.865E+09	2.7635E+09	1.4003E+00	1.4003E+00
156	3.128	1.2231E+03	6.6785E+12	6.6785E+12	8.445E+07	5.745E+09	2.0695E+09	1.3988E+00	1.3988E+00
157	3.128	1.2303E+03	6.2415E+12	6.2415E+12	5.725E+07	4.625E+09	1.3755E+09	1.3973E+00	1.3973E+00
158	3.128	1.2375E+03	5.8045E+12	5.8045E+12	3.005E+07	3.505E+09	1.0815E+09	1.3958E+00	1.3958E+00
159	3.128	1.2447E+03	5.3675E+12	5.3675E+12	1.285E+07	2.385E+09	8.115E+08	1.3943E+00	1.3943E+00
160	3.128	1.2519E+03	4.9305E+12	4.9305E+12	5.665E+06	1.265E+09	6.9296E+08	1.3928E+00	1.3928E+00
161	3.128	1.2591E+03	4.4935E+12	4.4935E+12	2.945E+06	1.005E+09	6.2355E+08	1.3913E+00	1.3913E+00
162	3.128	1.2663E+03	4.0565E+12	4.0565E+12	1.225E+06	7.915E+08	5.5415E+08	1.3898E+00	1.3898E+00
163	3.128	1.2735E+03	3.6195E+12	3.6195E+12	5.545E+05	6.795E+08	4.8455E+08	1.3883E+00	1.3883E+00
164	3.128	1.2807E+03	3.1825E+12	3.1825E+12	2.825E+05	5.675E+08	4.1515E+08	1.3868E+00	1.3868E+00
165	3.128	1.2879E+03	2.7455E+12	2.7455E+12	1.105E+05	4.555E+08	3.4575E+08	1.3853E+00	1.3853E+00
166	3.128	1.2951E+03	2.3085E+12	2.3085E+12	4.385E+04	3.435E+08	2.7635E+08	1.3838E+00	1.3838E+00
167	3.128	1.3023E+03	1.8715E+12	1.8715E+12	1.665E+04	2.315E+08	2.0695E+08	1.3823E+00	1.3823E+00
168	3.128	1.3095E+03	1.4345E+12	1.4345E+12	6.945E+03	1.195E+08	1.3755E+08	1.3808E+00	1.3808E+00
169	3.128	1.3167E+03	1.0075E+12	1.0075E+12	2.825E+03	8.835E+07	1.0815E+08	1.3793E+00	1.3793E+00
170	3.128	1.3239E+03	9.6385E+11	9.6385E+11	1.105E+03	7.715E+07	9.531E+07	1.3778E+00	1.3778E+00
171	3.128	1.3311E+03	9.1915E+11	9.1915E+11	4.385E+02	6.595E+07	8.6036E+07	1.3763E+00	1.3763E+00
172	3.128	1.3383E+03	8.7445E+11	8.7445E+11	1.665E+02	5.475E+07	7.7344E+07	1.3748E+00	1.3748E+00
173	3.128	1.3455E+03	8.2975E+11	8.2975E+11	6.445E+01	4.355E+07	6.9296E+07	1.3733E+00	1.3733E+00
174	3.128	1.3527E+03	7.8605E+11	7.8605E+11	2.825E+01	3.235E+07	6.2355E+07	1.3718E+00	1.3718E+00
175	3.128	1.3599E+03	7.4235E+11	7.4235E+11	1.105E+01	2.115E+07	5.5415E+07	1.3703E+00	1.3703E+00
176	3.128	1.3671E+03	6.9865E+11	6.9865E+11	4.385E+00	1.005E+07	4.8455E+07	1.3688E+00	1.3688E+00
177	3.128	1.3743E+03	6.5495E+11	6.5495E+11	1.665E+00	8.935E+06	4.1515E+07	1.3673E+00	1.3673E+00
178	3.128	1.3815E+03	6.1125E+11	6.1125E+11	6.945E+00	7.815E+06	3.4575E+07	1.3658E+00	1.3658E+00
179	3.128	1.3887E+03	5.6755E+11	5.6755E+11	2.825E+00	6.695E+06	2.7635E+07	1.3643E+00	1.3643E+00
180	3.128	1.3959E+03	5.2385E+11	5.2385E+11	1.105E+00	5.575E+06	2.0695E+07	1.3628E+00	1.3628E+00
181	3.128	1.4031E+03	4.8015E+11	4.8015E+11	4.385E+00	4.455E+06	1.3755E+07	1.3613E+00	1.3613E+00
182	3.128	1.4103E+03	4.3645E+11	4.3645E+11	1.665E+00	3.335E+06	1.0815E+07	1.3598E+00	1.3598E+00
183	3.128	1.4175E+03	3.9275E+11	3.9275E+11	6.945E+00	2.215E+06	9.531E+06	1.3583E+00	1.3583E+00
184	3.128	1.4247E+03	3.4905E+11	3.4905E+11	2.825E+00	1.095E+06	8.6036E+06	1.3568E+00	1.3568E+00
185	3.128	1.4319E+03	3.0535E+11	3.0535E+11	1.105E+00	9.835E+05	7.7344E+06	1.3553E+00	1.3553E+00
186	3.128	1.4391							

GROUP 1	FLUX	GROUP 2	FLUX
0.	1.503925E+11	3.728849E+11	5.657003E+11
1.	1.491020E+11	1.827935E+11	2.125647E+11
1.1	1.486805E+11	1.827935E+11	2.125647E+11
4.	1.471446E+11	1.827935E+11	2.125647E+11
6.	1.461562E+11	1.827935E+11	2.125647E+11
6.2	1.451141E+11	1.827935E+11	2.125647E+11
6.4	1.440806E+11	1.827935E+11	2.125647E+11
6.6	1.430471E+11	1.827935E+11	2.125647E+11
6.8	1.420136E+11	1.827935E+11	2.125647E+11
7.	1.409801E+11	1.827935E+11	2.125647E+11
7.1	1.399466E+11	1.827935E+11	2.125647E+11
7.2	1.389131E+11	1.827935E+11	2.125647E+11
7.3	1.378796E+11	1.827935E+11	2.125647E+11
7.4	1.368461E+11	1.827935E+11	2.125647E+11
7.5	1.358126E+11	1.827935E+11	2.125647E+11
7.6	1.347791E+11	1.827935E+11	2.125647E+11
7.7	1.337456E+11	1.827935E+11	2.125647E+11
7.8	1.327121E+11	1.827935E+11	2.125647E+11
7.9	1.316786E+11	1.827935E+11	2.125647E+11
8.	1.306451E+11	1.827935E+11	2.125647E+11
8.1	1.296116E+11	1.827935E+11	2.125647E+11
8.2	1.285781E+11	1.827935E+11	2.125647E+11
8.3	1.275446E+11	1.827935E+11	2.125647E+11
8.4	1.265111E+11	1.827935E+11	2.125647E+11
8.5	1.254776E+11	1.827935E+11	2.125647E+11
8.6	1.244441E+11	1.827935E+11	2.125647E+11
8.7	1.234106E+11	1.827935E+11	2.125647E+11
8.8	1.223771E+11	1.827935E+11	2.125647E+11
8.9	1.213436E+11	1.827935E+11	2.125647E+11
9.	1.203101E+11	1.827935E+11	2.125647E+11
9.1	1.192766E+11	1.827935E+11	2.125647E+11
9.2	1.182431E+11	1.827935E+11	2.125647E+11
9.3	1.172096E+11	1.827935E+11	2.125647E+11
9.4	1.161761E+11	1.827935E+11	2.125647E+11
9.5	1.151426E+11	1.827935E+11	2.125647E+11
9.6	1.141091E+11	1.827935E+11	2.125647E+11
9.7	1.130756E+11	1.827935E+11	2.125647E+11
9.8	1.120421E+11	1.827935E+11	2.125647E+11
9.9	1.110086E+11	1.827935E+11	2.125647E+11
10.	1.100751E+11	1.827935E+11	2.125647E+11
10.1	1.090416E+11	1.827935E+11	2.125647E+11
10.2	1.080081E+11	1.827935E+11	2.125647E+11
10.3	1.069746E+11	1.827935E+11	2.125647E+11
10.4	1.059411E+11	1.827935E+11	2.125647E+11
10.5	1.049076E+11	1.827935E+11	2.125647E+11
10.6	1.038741E+11	1.827935E+11	2.125647E+11
10.7	1.028406E+11	1.827935E+11	2.125647E+11
10.8	1.018071E+11	1.827935E+11	2.125647E+11
10.9	1.007736E+11	1.827935E+11	2.125647E+11
11.	9.973991E+10	1.827935E+11	2.125647E+11
11.1	9.870246E+10	1.827935E+11	2.125647E+11
11.2	9.766501E+10	1.827935E+11	2.125647E+11
11.3	9.662756E+10	1.827935E+11	2.125647E+11
11.4	9.559011E+10	1.827935E+11	2.125647E+11
11.5	9.455266E+10	1.827935E+11	2.125647E+11
11.6	9.351521E+10	1.827935E+11	2.125647E+11
11.7	9.247776E+10	1.827935E+11	2.125647E+11
11.8	9.144031E+10	1.827935E+11	2.125647E+11
11.9	9.040286E+10	1.827935E+11	2.125647E+11
12.	8.936541E+10	1.827935E+11	2.125647E+11
12.1	8.832796E+10	1.827935E+11	2.125647E+11
12.2	8.729051E+10	1.827935E+11	2.125647E+11
12.3	8.625306E+10	1.827935E+11	2.125647E+11

ELAPSED TIME FROM START OF CASE 12.869 SEC

STIT FRONT TO REAS SCRAM TRANSPARENT WITH SLOPES TOO BANK

DEFAULT = .1900E+00

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TIME STEP NO. 21 TIME: .201E+01
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REACTIVITY (TIME STEP) = .1069E-02

ROD WITHDRAWAL DISTANCE = C.

RELATIVE POWER (TIME STEP 20) = .14975+01

PEAK TO AVERAGE POWER (TIME STEP 20)

PLAK 10: 4V1K45: 40u28 (1T4E 31-P 20)	.3376E+00	.1147E+01	.1317E+01	.1422E+01	.1457E+01	.1422E+01	.1317E+01
0.							

[illegible]

IODINE CONCENTRATION

$\frac{1}{2}$

VIEW CONCENTRATION

0
0
0
0
0
0
0
0

39500+03	39715+03	40325+03	41265+03	42475+03	43490+03	45447+03	47031+03	48585+03	50015+03
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[illegible]

CONSTITUTION

	TEMPERATURE				
.3950E+03	.4547E+03	.5123E+03	.5658E+03	.6150E+03	.6554E+03
					.6865E+03
					.7067E+03
					.7152E+03
					.7115E+03

• 6955+33 • 000000 • 000000 • 000000 • 000000

POINT(S) (I TO J)	REGIONS T-W/NUCL	DIFFUSION COEFFICIENTS	ABSORPTION		NU * SIGMA(FISS)	REMOVAL	CROSS SECTIONS		
			GROUP 1	GROUP 2			GROUP 1	GROUP 2	
0 10	1	1.48E+01	3.6313E+03	1.230E-03	2.2090E-02	0.	0.	5181E-02	2.2090E-02
10 20	2	1.89E+01	1.3281E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
20 30	3	1.93E+01	1.3381E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
30 40	4	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
40 50	5	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
50 60	6	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
60 70	7	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
70 80	8	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
80 90	9	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
90 100	10	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
100 110	11	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
110 120	12	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
120 130	13	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
130 140	14	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
140 150	15	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
150 160	16	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
160 170	17	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
170 180	18	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
180 190	19	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
190 200	20	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
200 210	21	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
210 220	22	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
220 230	23	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
230 240	24	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
240 250	25	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
250 260	26	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03	5.5148E-02	3.336E-02	4.990E-02
260 270	27	1.88E+01	1.3081E+01	1.65E-02	5.3850E-02	9.833E-03			

PT	DEL X	DIST	FLUX GR1	FLUX GR2	ADJ GR1	ADJ GR2	POMC	POM3	POM1
1	7.000	0.	0.	0.	3.8734E+11	1.2011E+01	0.	0.	0.
2	7.036	7.036E+00	1.5135E+11	7.4154E+11	2.0501E+09	1.0952E+09	0.	0.	0.
3	7.036	1.4072E+01	3.2492E+11	1.5331E+12	4.2917E+09	3.292E+09	0.	0.	0.
4	7.036	2.1108E+01	5.6490E+11	2.4235E+12	6.8731E+09	3.8533E+09	0.	0.	0.
5	7.036	2.8144E+01	8.9575E+11	3.4575E+12	9.9929E+09	5.762E+09	0.	0.	0.
6	7.036	3.5140E+01	1.3432E+12	4.6697E+12	1.3450E+10	8.6395E+09	0.	0.	0.
7	7.036	4.2216E+01	2.1162E+12	6.0723E+12	1.8647E+10	1.2496E+10	0.	0.	0.
8	7.036	4.9282E+01	3.2935E+12	7.6320E+12	2.4563E+10	1.7936E+10	0.	0.	0.
9	7.036	5.6288E+01	4.9517E+12	9.2293E+12	3.1695E+10	2.5849E+10	0.	0.	0.
10	7.036	6.3324E+01	7.3407E+12	1.0589E+13	3.9886E+10	3.6611E+10	0.	0.	0.
11	7.036	6.3324E+01	7.3407E+12	1.0589E+13	3.9886E+10	3.6611E+10	0.	0.	0.
12	8.331	7.036E+01	1.1102E+13	1.1162E+13	4.9010E+10	5.2312E+10	5.8282E+10	1.4347E+00	1.4347E+00
13	8.331	7.036E+01	1.4385E+13	1.1512E+13	5.7672E+10	4.5973E+10	6.2533E+10	1.4349E+00	1.4349E+00
14	8.331	7.036E+01	1.8311E+13	1.2511E+13	6.6733E+10	4.4646E+10	6.9296E+10	1.4352E+00	1.4352E+00
15	8.331	7.036E+01	2.1359E+13	1.3820E+13	7.5991E+10	9.0718E+10	7.7344E+10	1.4356E+00	1.4356E+00
16	8.331	7.036E+01	2.4232E+13	1.5337E+13	8.5311E+10	1.244E+11	8.6036E+10	1.4361E+00	1.4361E+00
17	8.331	7.036E+01	2.7328E+13	1.6878E+13	9.4634E+10	1.394E+11	9.5032E+10	1.4367E+00	1.4367E+00
18	8.331	7.036E+01	3.0459E+13	1.8472E+13	1.0393E+11	1.2528E+11	1.0415E+11	1.4374E+00	1.4374E+00
19	8.331	7.036E+01	3.3512E+13	2.0111E+13	1.1315E+11	1.3649E+11	1.1329E+11	1.4381E+00	1.4381E+00
20	8.331	7.036E+01	3.6512E+13	2.1736E+13	1.2231E+11	1.4758E+11	1.2241E+11	1.4390E+00	1.4390E+00
21	8.331	7.036E+01	3.9454E+13	2.3356E+13	1.3133E+11	1.5855E+11	1.3144E+11	1.4399E+00	1.4399E+00
22	8.331	7.036E+01	4.2354E+13	2.5000E+13	1.4037E+11	1.6900E+11	1.4044E+11	1.4399E+00	1.4399E+00
23	8.331	7.036E+01	4.5205E+13	2.6655E+13	1.4937E+11	1.7870E+11	1.4910E+11	1.4409E+00	1.4409E+00
24	8.331	7.036E+01	4.8005E+13	2.8310E+13	1.5837E+11	1.8870E+11	1.5876E+11	1.4419E+00	1.4419E+00
25	8.331	7.036E+01	5.0755E+13	2.9965E+13	1.6737E+11	1.9821E+11	1.6761E+11	1.4428E+00	1.4428E+00
26	8.331	7.036E+01	5.3505E+13	3.1620E+13	1.7637E+11	2.0772E+11	1.7661E+11	1.4438E+00	1.4438E+00
27	8.331	7.036E+01	5.6255E+13	3.3275E+13	1.8537E+11	2.1723E+11	1.8571E+11	1.4448E+00	1.4448E+00
28	8.331	7.036E+01	5.9005E+13	3.4930E+13	1.9437E+11	2.2674E+11	1.9471E+11	1.4458E+00	1.4458E+00
29	8.331	7.036E+01	6.1755E+13	3.6585E+13	2.0337E+11	2.3625E+11	2.0371E+11	1.4468E+00	1.4468E+00
30	8.331	7.036E+01	6.4505E+13	3.8240E+13	2.1237E+11	2.4576E+11	2.1321E+11	1.4478E+00	1.4478E+00
31	8.331	7.036E+01	6.7255E+13	3.9895E+13	2.2137E+11	2.5527E+11	2.2215E+11	1.4488E+00	1.4488E+00
32	8.331	7.036E+01	7.0005E+13	4.1550E+13	2.3037E+11	2.6478E+11	2.3113E+11	1.4498E+00	1.4498E+00
33	8.331	7.036E+01	7.2755E+13	4.3205E+13	2.3937E+11	2.7429E+11	2.4013E+11	1.4508E+00	1.4508E+00
34	8.331	7.036E+01	7.5505E+13	4.4860E+13	2.4837E+11	2.8380E+11	2.4903E+11	1.4518E+00	1.4518E+00
35	8.331	7.036E+01	7.8255E+13	4.6515E+13	2.5737E+11	2.9331E+11	2.5803E+11	1.4528E+00	1.4528E+00
36	8.331	7.036E+01	8.1005E+13	4.8170E+13	2.6637E+11	3.0282E+11	2.6703E+11	1.4538E+00	1.4538E+00
37	8.331	7.036E+01	8.3755E+13	4.9825E+13	2.7537E+11	3.1233E+11	2.7603E+11	1.4548E+00	1.4548E+00
38	8.331	7.036E+01	8.6505E+13	5.1480E+13	2.8437E+11	3.2184E+11	2.8553E+11	1.4558E+00	1.4558E+00
39	8.331	7.036E+01	8.9255E+13	5.3135E+13	2.9337E+11	3.3135E+11	2.9453E+11	1.4568E+00	1.4568E+00
40	8.331	7.036E+01	9.2005E+13	5.4790E+13	3.0237E+11	3.4086E+11	3.0373E+11	1.4578E+00	1.4578E+00
41	8.331	7.036E+01	9.4755E+13	5.6445E+13	3.1137E+11	3.5037E+11	3.1273E+11	1.4588E+00	1.4588E+00
42	8.331	7.036E+01	9.7505E+13	5.8100E+13	3.2037E+11	3.5988E+11	3.2173E+11	1.4598E+00	1.4598E+00
43	8.331	7.036E+01	1.0025E+14	5.9755E+13	3.2937E+11	3.6939E+11	3.3073E+11	1.4608E+00	1.4608E+00
44	8.331	7.036E+01	1.0295E+14	6.1410E+13	3.3837E+11	3.7890E+11	3.4013E+11	1.4618E+00	1.4618E+00
45	8.331	7.036E+01	1.0565E+14	6.3065E+13	3.4737E+11	3.8841E+11	3.4953E+11	1.4628E+00	1.4628E+00
46	8.331	7.036E+01	1.0835E+14	6.4720E+13	3.5637E+11	3.9792E+11	3.5893E+11	1.4638E+00	1.4638E+00
47	8.331	7.036E+01	1.1105E+14	6.6375E+13	3.6537E+11	4.0743E+11	3.6833E+11	1.4648E+00	1.4648E+00
48	8.331	7.036E+01	1.1375E+14	6.8030E+13	3.7437E+11	4.1694E+11	3.7783E+11	1.4658E+00	1.4658E+00
49	8.331	7.036E+01	1.1645E+14	6.9685E+13	3.8337E+11	4.2645E+11	3.8733E+11	1.4668E+00	1.4668E+00
50	8.331	7.036E+01	1.1915E+14	7.1340E+13	3.9237E+11	4.3596E+11	3.9683E+11	1.4678E+00	1.4678E+00
51	8.331	7.036E+01	1.2185E+14	7.2995E+13	4.0137E+11	4.4547E+11	4.0633E+11	1.4688E+00	1.4688E+00
52	8.331	7.036E+01	1.2455E+14	7.4650E+13	4.1037E+11	4.5498E+11	4.1573E+11	1.4698E+00	1.4698E+00
53	8.331	7.036E+01	1.2725E+14	7.6305E+13	4.1937E+11	4.6449E+11	4.2513E+11	1.4708E+00	1.4708E+00
54	8.331	7.036E+01	1.2995E+14	7.7960E+13	4.2837E+11	4.7400E+11	4.3453E+11	1.4718E+00	1.4718E+00
55	8.331	7.036E+01	1.3265E+14	7.9615E+13	4.3737E+11	4.8351E+11	4.4393E+11	1.4728E+00	1.4728E+00
56	8.331	7.036E+01	1.3535E+14	8.1270E+13	4.4637E+11	4.9302E+11	4.5333E+11	1.4738E+00	1.4738E+00
57	8.331	7.036E+01	1.3805E+14	8.2925E+13	4.5537E+11	5.0253E+11	4.6273E+11	1.4748E+00	1.4748E+00
58	8.331	7.036E+01	1.4075E+14	8.4580E+13	4.6437E+11	5.1204E+11	4.7213E+11	1.4758E+00	1.4758E+00
59	8.331	7.036E+01	1.4345E+14	8.6235E+13	4.7337E+11	5.2155E+11	4.8153E+11	1.4768E+00	1.4768E+00
60	8.331	7.036E+01	1.4615E+14	8.7890E+13	4.8237E+11	5.3106E+11	4.9093E+11	1.4778E+00	1.4778E+00
61	8.331	7.036E+01	1.4885E+14	8.9545E+13	4.9137E+11	5.4057E+11	5.0033E+11	1.4788E+00	1.4788E+00
62	8.331	7.036E+01	1.5155E+14	9.1200E+13	5.0037E+11	5.5008E+11	5.0973E+11	1.4798E+00	1.4798E+00
63	8.331	7.036E+01	1.5425E+14	9.2855E+13	5.0937E+11	5.5959E+11	5.1913E+11	1.4808E+00	1.4808E+00
64	8.331	7.036E+01	1.5695E+14	9.4510E+13	5.1837E+11	5.6910E+11	5.2853E+11	1.4818E+00	1.4818E+00
65	8.331	7.036E+01	1.5965E+14	9.6165E+13	5.2737E+11	5.7861E+11	5.3793E+11	1.4828E+00	1.4828E+00
66	8.331	7.036E+01	1.6235E+14	9.7820E+13	5.3637E+11	5.8812E+11	5.4733E+11	1.4838E+00	1.4838E+00
67	8.331	7.036E+01	1.6505E+14	9.9475E+13	5.4537E+11	5.9763E+11	5.5673E+11	1.4848E+00	1.4848E+00
68	8.331	7.036E+01	1.6775E+14	1.0113E+14	5.5437E+11	6.0714E+11	5.6613E+11	1.4858E+00	1.4858E+00
69	8.331	7.036E+01	1.7045E+14	1.0278E+14	5.6337E+11	6.1665E+11	5.7553E+11	1.4868E+00	1.4868E+00
70	8.331	7.036E+01	1.7315E+14	1.0443E+14	5.7237E+11	6.2616E+11	5.8493E+11	1.4878E+00	1.4878E+00
71	8.331	7.036E+01	1.7585E+14	1.0608E+14	5.8137E+11	6.3567E+11	5.9433E+11	1.4888E+00	1.4888E+00
72	8.331	7.036E+01	1.7855E+14	1.0773E+14	5.9037E+11	6.4518E+11	6.0373E+11	1.4898E+00	1.4898E+00
73	8.331	7.036E+01	1.8125E+14	1.0938E+14	5.9937E+11	6.5469E+11	6.1313E+11	1.4908E+00	1.4908E+00
74	8.331	7.036E+01	1.8395E+14	1.1103E+14	6.0837E+11	6.6420E+11	6.2253E+11	1.4918E+00	1.4918E+00
75	8.331	7.036E+01	1.8665E+14	1.1268E+14	6.1737E+11	6.7371E+11	6.3193E+11	1.4928E+00	1.4928E+00
76	8.331	7.036E+01	1.8935E+14	1.1433E+14	6.2637E+11	6.8322E+11	6.4133E+11	1.4938E+00	1.4938E+00
77	8.331	7.036E+01	1.9205E+14	1.1598E+14	6.3537E+11	6.9273E+11	6.5073E+11	1.4948E+00	1.4948E+00
78	8.331	7.036E+01	1.9475E+14	1.1763E+14	6.4437E+11	7.0224E+11	6.6013E+11	1.4958E+00	1.4958E+00
79	8.331	7.036E+01	1.9745E+14	1.1928E+14	6.5337E+11	7.1175E+11	6.6953E+11	1.4968E+00	1.4968E+00
80	8.331	7.036E+01	2.0015E+14	1.2093E+14	6.6237E+11	7.2126E+11	6.7893E+11	1.4978E+00	1.4978E+00
81	8.331	7.036E+01	2.0285E+14	1.2258E+14	6.7137E+11	7.3077E+11	6.8833E+11	1.4988E+00	1.4988E+00
82	8.331	7.036E+01	2.0555E+14	1.2423E+14	6.8037E+11	7.4028E+11	6.9773E+11	1.4998E+00	1.4998E+00
83	8.331	7.036E+01	2.0825E+14	1.2588E+14	6.8937E+11	7.4979E+11	7.0713E+11	1.5008E+00	1.5008E+00
84	8.331	7.036E+01	2.1095E+14	1.2753E+14	6.9837E+11	7.5930E+11	7.1653E+11	1.5018E+00	1.5018E+00
85	8.331	7.036E+01	2.1365E+14	1.2918E+14	7.0737E+11	7.6881E+11	7.2593E+11	1.5028E+00	1.5028E+00
86	8.331	7.036E+01	2.1635E+14	1.3083E+14	7.1637E+11	7.7832E+11	7.3533E+11	1.5038E+00	1.5038E+00
87	8.331	7.036E+01	2.1905E+14	1.3248E+14	7.2537E+11	7.8783E+11	7.4473E+11	1.5048E+00	1.5048E+00
88	8.331	7.036E+01	2.2175E+14	1.3413E+14	7.3437E+11	7.9734E+11	7.5413E+11	1.5058E+00	1.5058E+00
89	8.331	7.036E+01	2.2445E+14	1.3578E+14	7				

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50 8.128 3.4938E+02 1.0004E+14 6.1845E+13 3.3442E+11 4.0292E+11 3.3003E+11 1.5036E+00 1.5557E+13
51 8.128 3.9751E+02 1.0146E+14 6.2716E+13 3.7879E+11 4.0826E+11 3.3388E+11 1.5023E+00
52 8.128 4.0564E+02 1.0282E+14 6.3560E+13 3.7301E+11 4.1335E+11 3.4259E+11 1.5038E+00
53 8.128 4.1377E+02 1.0414E+14 6.4370E+11 3.4707E+11 4.1821E+11 3.4463E+11 1.5052E+00
54 8.128 4.2190E+02 1.0540E+14 6.5182E+13 3.5597E+11 4.2290E+11 3.5092E+11 1.5066E+00
55 8.128 4.3002E+02 1.0661E+14 6.5900E+13 3.5470E+11 4.2741E+11 3.5425E+11 1.5079E+00
56 8.128 4.3815E+02 1.0776E+14 6.6616E+13 3.5828E+11 4.3178E+11 3.5781E+11 1.5090E+00
57 8.128 4.4628E+02 1.0879E+14 6.7298E+13 3.6165E+11 4.3583E+11 3.6121E+11 1.5102E+00
58 8.128 4.5441E+02 1.0992E+14 6.7947E+13 3.6494E+11 4.3975E+11 3.6444E+11 1.5112E+00
59 8.128 4.6253E+02 1.1095E+14 6.8562E+13 3.6802E+11 4.4347E+11 3.6751E+11 1.5121E+00
60 8.128 4.7066E+02 1.1185E+14 6.9144E+13 3.7098E+11 4.4698E+11 3.7041E+11 1.5130E+00
***** END OF THE 3MAL-HVD REG. NO. 6 *****
60 8.128 4.7366E+02 1.1186E+14 6.9144E+13 3.7098E+11 4.4698E+11 3.7041E+11 1.5130E+00 1.7459E+13
61 8.128 4.7876E+02 1.1274E+14 6.9631E+13 3.7367E+11 4.5025E+11 3.7314E+11 1.5139E+00
62 8.128 4.8692E+02 1.1357E+14 7.0234E+13 3.7623E+11 4.5335E+11 3.7570E+11 1.5146E+00
63 8.128 4.9505E+02 1.1434E+14 7.0682E+13 3.7835E+11 4.5625E+11 3.7809E+11 1.5153E+00
64 8.128 5.0317E+02 1.1504E+14 7.1126E+13 3.8084E+11 4.5892E+11 3.8030E+11 1.5159E+00
65 8.128 5.1130E+02 1.1573E+14 7.1576E+13 3.8230E+11 4.6139E+11 3.8234E+11 1.5165E+00
66 8.128 5.1943E+02 1.1633E+14 7.1910E+13 3.8474E+11 4.6364E+11 3.8421E+11 1.5171E+00
67 8.128 5.2756E+02 1.1689E+14 7.2249E+13 3.8648E+11 4.6569E+11 3.8590E+11 1.5179E+00
68 8.128 5.3569E+02 1.1737E+14 7.2593E+13 3.8800E+11 4.6753E+11 3.8742E+11 1.5179E+00
69 8.128 5.4381E+02 1.1780E+14 7.2821E+13 3.8934E+11 4.6915E+11 3.8875E+11 1.5183E+00
70 8.128 5.5194E+02 1.1818E+14 7.3054E+13 3.9051E+11 4.7055E+11 3.8992E+11 1.5186E+00
***** END OF THE 3MAL-HVD REG. NO. 7 *****
70 8.128 5.5194E+02 1.1818E+14 7.3054E+13 3.9051E+11 4.7055E+11 3.8992E+11 1.5186E+00 1.9281E+13
71 8.128 5.6007E+02 1.1859E+14 7.3250E+13 3.9150E+11 4.7173E+11 3.9090E+11 1.5189E+00
72 8.128 5.6820E+02 1.1895E+14 7.3425E+13 3.9231E+11 4.7275E+11 3.9170E+11 1.5191E+00
73 8.128 5.7633E+02 1.1926E+14 7.3587E+13 3.9294E+11 4.7347E+11 3.9233E+11 1.5193E+00
74 8.128 5.8445E+02 1.1951E+14 7.3626E+13 3.9334E+11 4.7401E+11 3.9278E+11 1.5194E+00
75 8.128 5.9258E+02 1.1971E+14 7.3663E+13 3.9363E+11 4.7435E+11 3.9305E+11 1.5194E+00
76 8.128 6.0071E+02 1.1987E+14 7.3688E+13 3.9377E+11 4.7445E+11 3.9314E+11 1.5195E+00
77 8.128 6.0884E+02 1.1999E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.9305E+11 1.5194E+00
78 8.128 6.1697E+02 1.2011E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.9278E+11 1.5194E+00
79 8.128 6.2509E+02 1.2021E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.9233E+11 1.5192E+00
80 8.128 6.3322E+02 1.2028E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.9170E+11 1.5191E+00
***** END OF THE 3MAL-HVD REG. NO. 8 *****
80 8.128 6.3322E+02 1.2028E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.9170E+11 1.5191E+00 1.9751E+13
81 8.128 6.4135E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.9170E+11 1.5191E+00
82 8.128 6.4948E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.9090E+11 1.5186E+00
83 8.128 6.5761E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.8992E+11 1.5183E+00
84 8.128 6.6573E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.8875E+11 1.5183E+00
85 8.128 6.7386E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.8742E+11 1.5179E+00
86 8.128 6.8199E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.8590E+11 1.5175E+00
87 8.128 6.9012E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.8421E+11 1.5170E+00
88 8.128 6.9825E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.8234E+11 1.5164E+00
89 8.128 7.0637E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.8030E+11 1.5156E+00
90 8.128 7.1450E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.7809E+11 1.5152E+00
***** END OF THE 3MAL-HVD REG. NO. 9 *****
90 8.128 7.1450E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.7809E+11 1.5152E+00 1.9240E+13
91 8.128 7.2263E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.7702E+11 1.5145E+00
92 8.128 7.3076E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.7570E+11 1.5137E+00
93 8.128 7.3889E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.7401E+11 1.5129E+00
94 8.128 7.4701E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.7215E+11 1.5120E+00
95 8.128 7.5514E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.6994E+11 1.5110E+00
96 8.128 7.6327E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.6751E+11 1.5102E+00
97 8.128 7.7140E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.6444E+11 1.5090E+00
98 8.128 7.7953E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.6121E+11 1.5079E+00
99 8.128 7.8765E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.5781E+11 1.5066E+00
100 8.128 7.9578E+02 1.2031E+14 7.3698E+13 3.9383E+11 4.7445E+11 3.5425E+11 1.5052E+00
***** END OF THE 3MAL-HVD REG. NO. 10 *****

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100	8.12	7.9578E+02	1.0281E+14	6.3531E+13	3.4301E+11	4.1332E+11	3.4259E+11	1.5036E+00	1.7859E+13
101	8.12	8.0391E+02	1.0144E+14	6.2707E+13	3.3378E+11	4.0825E+11	3.3838E+11	1.5021E+00	
102	8.12	8.1204E+02	1.0003E+14	6.1932E+13	3.3442E+11	4.0297E+11	3.3402E+11	1.5004E+00	
103	8.12	8.2017E+02	9.8557E+13	6.0928E+13	3.2398E+11	3.9188E+11	3.2951E+11	1.4987E+00	
104	8.12	8.2829E+02	9.7132E+13	5.9948E+13	3.2522E+11	3.9188E+11	3.2845E+11	1.4968E+00	
105	8.12	8.3642E+02	9.5478E+13	5.9021E+13	3.2391E+11	3.8607E+11	3.2804E+11	1.4944E+00	
106	8.12	8.4455E+02	9.3846E+13	5.8023E+13	3.1542E+11	3.8008E+11	3.1508E+11	1.4927E+00	
107	8.12	8.5268E+02	9.2204E+13	5.6997E+13	3.1033E+11	3.7392E+11	3.0997E+11	1.4904E+00	
108	8.12	8.6081E+02	9.0462E+13	5.5944E+13	3.0503E+11	3.6759E+11	3.0473E+11	1.4880E+00	
109	8.12	8.6893E+02	8.8733E+13	5.4878E+13	2.9982E+11	3.6111E+11	2.9435E+11	1.4854E+00	
110	8.12	8.7706E+02	8.6942E+13	5.3746E+13	2.9406E+11	3.5447E+11	2.9385E+11	1.4828E+00	
***** END OF NUCLEAR REGION NO. 5 AND THERMAL HYD REGION NO.11 *****									
110	8.12	8.7706E+02	8.6942E+13	5.3746E+13	2.9406E+11	3.5447E+11	2.9385E+11	1.4828E+00	
111	8.12	8.8519E+02	8.5122E+13	5.2607E+13	2.8835E+11	3.4771E+11	2.8823E+11	1.4794E+00	
112	8.12	8.9332E+02	8.3245E+13	5.1441E+13	2.8248E+11	3.4075E+11	2.8244E+11	1.4762E+00	
113	8.12	9.0145E+02	8.1287E+13	5.0249E+13	2.7643E+11	3.3353E+11	2.7644E+11	1.4733E+00	
114	8.12	9.0957E+02	7.9330E+13	4.9330E+13	2.7021E+11	3.2605E+11	2.7025E+11	1.4706E+00	
115	8.12	9.1770E+02	7.7303E+13	4.7746E+13	2.6385E+11	3.1834E+11	2.6386E+11	1.4680E+00	
116	8.12	9.2583E+02	7.5253E+13	4.6517E+13	2.5722E+11	3.1041E+11	2.5729E+11	1.4655E+00	
117	8.12	9.3396E+02	7.3189E+13	4.5225E+13	2.5047E+11	3.0223E+11	2.5054E+11	1.4631E+00	
118	8.12	9.4209E+02	7.1084E+13	4.3908E+13	2.4355E+11	2.9392E+11	2.4362E+11	1.4609E+00	
119	8.12	9.5022E+02	6.8962E+13	4.2564E+13	2.3646E+11	2.8537E+11	2.3653E+11	1.4597E+00	
120	8.12	9.5834E+02	6.6842E+13	4.1297E+13	2.2927E+11	2.7663E+11	2.2929E+11	1.4567E+00	
***** END OF NUCLEAR REGION NO. 6 AND THERMAL HYD REGION NO.12 *****									
120	8.12	9.5834E+02	6.6842E+13	4.1297E+13	2.2927E+11	2.7663E+11	2.2929E+11	1.4567E+00	
121	8.12	9.6647E+02	6.4422E+13	3.9824E+13	2.2181E+11	2.6769E+11	2.2189E+11	1.4542E+00	
122	8.12	9.7460E+02	6.2153E+13	3.8420E+13	2.1425E+11	2.5858E+11	2.1433E+11	1.4529E+00	
123	8.12	9.8273E+02	5.9456E+13	3.6995E+13	2.0656E+11	2.4923E+11	2.0663E+11	1.4512E+00	
124	8.12	9.9085E+02	5.7309E+13	3.5651E+13	1.9872E+11	2.3981E+11	1.9879E+11	1.4495E+00	
125	8.12	9.9898E+02	5.5122E+13	3.4288E+13	1.9075E+11	2.3021E+11	1.9082E+11	1.4480E+00	
126	8.12	1.0071E+03	5.2745E+13	3.2806E+13	1.8255E+11	2.2043E+11	1.8271E+11	1.4465E+00	
127	8.12	1.0152E+03	5.0320E+13	3.1107E+13	1.7442E+11	2.1043E+11	1.7446E+11	1.4451E+00	
128	8.12	1.0234E+03	4.7746E+13	2.9592E+13	1.6637E+11	2.0042E+11	1.6613E+11	1.4438E+00	
129	8.12	1.0315E+03	4.5300E+13	2.8061E+13	1.5761E+11	1.9021E+11	1.5767E+11	1.4425E+00	
130	8.12	1.0396E+03	4.2847E+13	2.6516E+13	1.4934E+11	1.7947E+11	1.4910E+11	1.4414E+00	
***** END OF NUCLEAR REGION NO. 7 AND THERMAL HYD REGION NO.13 *****									
130	8.12	1.0396E+03	4.2847E+13	2.6516E+13	1.4934E+11	1.7947E+11	1.4910E+11	1.4414E+00	
131	8.12	1.0477E+03	4.0361E+13	2.4952E+13	1.4037E+11	1.6942E+11	1.4045E+11	1.4403E+00	
132	8.331	1.0561E+03	3.7747E+13	2.3342E+13	1.3133E+11	1.5855E+11	1.3146E+11	1.4394E+00	
133	8.331	1.0644E+03	3.5169E+13	2.1724E+13	1.2231E+11	1.4753E+11	1.2245E+11	1.4384E+00	
134	8.331	1.0727E+03	3.2444E+13	2.0103E+13	1.1315E+11	1.3649E+11	1.1329E+11	1.4376E+00	
135	8.331	1.0811E+03	2.9759E+13	1.8486E+13	1.0492E+11	1.2528E+11	1.0415E+11	1.4368E+00	
136	8.331	1.0894E+03	2.7013E+13	1.6871E+13	9.6434E+10	1.1394E+11	9.5031E+10	1.4362E+00	
137	8.331	1.0977E+03	2.4239E+13	1.5301E+13	8.7311E+10	1.0244E+11	8.6036E+10	1.4356E+00	
138	8.331	1.1061E+03	2.1351E+13	1.3815E+13	7.5931E+10	9.0718E+10	7.7344E+10	1.4351E+00	
139	8.331	1.1144E+03	1.8311E+13	1.2495E+13	6.6733E+10	7.9645E+10	6.9296E+10	1.4346E+00	
140	8.331	1.1227E+03	1.4972E+13	1.1075E+13	5.7672E+10	6.9372E+10	6.2535E+10	1.4343E+00	
***** END OF NUCLEAR REGION NO. 8 AND THERMAL HYD REGION NO.14 *****									
140	8.331	1.1227E+03	1.4972E+13	1.1075E+13	5.7672E+10	6.9372E+10	6.2535E+10	1.4343E+00	
141	8.331	1.1311E+03	1.1984E+13	1.1155E+13	4.9313E+10	5.2212E+10	0.	0.	
142	7.036	1.1331E+03	7.3379E+12	1.0584E+13	3.9985E+10	3.3611E+10	0.	0.	
143	7.036	1.1451E+03	4.8498E+12	9.2234E+12	3.1996E+10	2.5649E+10	0.	0.	
144	7.036	1.1522E+03	3.2222E+12	7.8251E+12	2.4560E+10	1.7936E+10	0.	0.	
145	7.036	1.1592E+03	2.1397E+12	6.0793E+12	1.8547E+10	1.2496E+10	0.	0.	
146	7.036	1.1662E+03	1.3387E+12	4.6640E+12	1.3850E+10	8.5386E+09	0.	0.	
147	7.036	1.1733E+03	8.9541E+11	3.0568E+12	9.9329E+09	5.8762E+09	0.	0.	
148	7.036	1.1803E+03	5.6324E+11	2.4226E+12	6.8731E+09	3.5885E+09	0.	0.	
149	7.036	1.1873E+03	3.2843E+11	1.5326E+12	4.2917E+09	2.1295E+09	0.	0.	
150	7.036	1.1944E+03	1.5129E+11	7.4126E+11	2.0601E+09	1.0952E+09	0.	0.	
***** END OF NUCLEAR REGION NO. 9 AND THERMAL HYD REGION NO.15 *****									
150	7.036	1.1944E+03	1.5129E+11	7.4126E+11	2.0601E+09	1.0952E+09	0.	0.	
151	7.036	1.2014E+03	0.	0.	3.8733E+01	1.2011E+01	0.	0.	

GROUP 1 FLUX

0. 1.513452E+11 3.289207E+11 5.635326E+11 8.957472E+11 1.333272E+12 2.110481E+12 3.233452E+12 4.851655E+12 7.340712E+12
 1.110261E+13 1.498453E+13 2.135997E+13 2.423934E+13 2.702842E+13 2.976448E+13 3.245025E+13 3.512131E+13 3.776049E+13
 4.037492E+13 4.290205E+13 4.530311E+13 4.763379E+13 4.981855E+13 5.195903E+13 5.405266E+13 5.609835E+13 5.819647E+13
 6.444024E+13 6.667797E+13 6.888084E+13 7.104774E+13 7.317700E+13 7.526932E+13 7.732487E+13 7.933421E+13 8.130534E+13
 8.512017E+13 8.662338E+13 8.976440E+13 9.351343E+13 9.782058E+13 9.338108E+13 9.549412E+13 9.705592E+13 9.857473E+13
 1.014566E+14 1.024216E+14 1.041355E+14 1.053978E+14 1.066073E+14 1.077650E+14 1.088688E+14 1.099186E+14 1.109143E+14
 1.127405E+14 1.135705E+14 1.143648E+14 1.150633E+14 1.157282E+14 1.163701E+14 1.168791E+14 1.173704E+14 1.178044E+14
 1.182405E+14 1.187607E+14 1.190772E+14 1.193722E+14 1.196552E+14 1.199199E+14 1.191655E+14 1.189610E+14 1.187576E+14
 1.184928E+14 1.182405E+14 1.179828E+14 1.176552E+14 1.173552E+14 1.169772E+14 1.165286E+14 1.160605E+14 1.155614E+14
 1.150334E+14 1.144455E+14 1.138028E+14 1.131112E+14 1.123652E+14 1.115762E+14 1.107532E+14 1.105349E+14 1.104221E+14
 1.102316E+14 1.100269E+14 1.098261E+14 1.095936E+13 1.093366E+13 1.090481E+13 1.087311E+13 1.083857E+13 1.079857E+13
 1.075321E+13 1.070254E+13 1.064654E+13 1.058543E+13 1.051942E+13 1.044852E+13 1.037318E+13 1.029777E+13 1.021885E+13
 8.510197E+13 8.321587E+13 8.124672E+13 7.933544E+13 7.733300E+13 7.525040E+13 7.315857E+13 7.102885E+13 6.886202E+13
 6.442168E+13 6.215015E+13 5.945646E+13 5.743149E+13 5.514132E+13 5.274485E+13 5.031983E+13 4.786779E+13 4.539887E+13
 4.036074E+13 3.774637E+13 3.519462E+13 3.244437E+13 2.975047E+13 2.701833E+13 2.423021E+13 2.135083E+13 1.831135E+13
 1.193777E+13 7.337904E+12 4.349462E+12 3.202233E+12 2.110655E+12 1.382709E+12 9.354051E+11 5.632674E+11 3.287951E+11 1.512874E+11
 0.

GROUP 2 FLUX

0. 7.415385E+11 1.533125E+12 2.423537E+12 3.447557E+12 4.669748E+12 6.072331E+12 7.632020E+12 9.229337E+12 1.058850E+13
 1.115961E+13 1.171175E+13 1.250097E+13 1.381981E+13 1.570731E+13 1.677645E+13 1.848694E+13 2.011106E+13 2.173615E+13
 2.496603E+13 2.622439E+13 2.807665E+13 2.960187E+13 3.111753E+13 3.261667E+13 3.409838E+13 3.556198E+13 3.700655E+13
 3.945345E+13 4.121441E+13 4.354006E+13 4.594065E+13 4.823516E+13 4.652023E+13 4.779809E+13 4.934208E+13 5.026056E+13
 5.261843E+13 5.376697E+13 5.486436E+13 5.595194E+13 5.703731E+13 5.803380E+13 5.303096E+13 5.999828E+13 6.093528E+13
 6.271633E+13 6.375332E+13 6.477202E+13 6.513226E+13 6.530024E+13 6.614586E+13 6.729734E+13 6.734697E+13 6.856237E+13
 6.963093E+13 7.023372E+13 7.063245E+13 7.112649E+13 7.163562E+13 7.130935E+13 7.224839E+13 7.255703E+13 7.282393E+13
 7.329040E+13 7.341150E+13 7.356735E+13 7.362638E+13 7.368052E+13 7.389725E+13 7.357964E+13 7.362565E+13 7.353576E+13
 7.354850E+13 7.351368E+13 7.341833E+13 7.254974E+13 7.234564E+13 7.190682E+13 7.153382E+13 7.112202E+13 7.067764E+13
 6.998544E+13 6.913743E+13 6.855609E+13 6.794631E+13 6.729086E+13 6.660826E+13 5.892581E+13 6.514228E+13 6.436371E+13
 6.270743E+13 6.187218E+13 6.092572E+13 5.994447E+13 5.902087E+13 5.802347E+13 5.699675E+13 5.594121E+13 5.485738E+13
 5.263716E+13 5.144141E+13 5.124436E+13 4.903039E+13 4.774264E+13 4.651745E+13 4.222436E+13 4.399078E+13 4.256834E+13
 3.942377E+13 3.841979E+13 3.695233E+13 3.448757E+13 3.260607E+13 3.116722E+13 2.959189E+13 2.806102E+13 2.651568E+13
 2.495717E+13 2.334750E+13 2.173420E+13 2.013323E+13 1.847932E+13 1.674375E+13 1.570119E+13 1.414545E+13 1.249617E+13
 1.115532E+13 1.054447E+13 9.225505E+12 7.629103E+12 6.070613E+12 4.667966E+12 3.456213E+12 2.422013E+12 1.532540E+12 7.412560E+11
 0.

STIT FRONT TO EAR SCRAM TRANSIENT WITH SECOND ROD BANK ELAPSED TIME FROM START OF CASE 17.665 SEC

TIME STEP NO. 31 TIME .3001E+01 DELTA T = .1000E+00

REACTIVITY (TIME STEP 30) = .4924E-03

ROD WITHDRAWAL DISTANCE = 0.

RELATIVE POWER (TIME STEP 30) = .1471E+01

PEAK TO AVERAGE POWER (TIME STEP 30)

0. .3844E+00 .6453E+00 .9214E+00 .1148E+01 .1317E+01 .1421E+01 .1456E+01 .1420E+01 .1316E+01
 .1146E+01 .9197E+00 .6447E+00 .3378E+00 0.

IODINE CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

XENON CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

INLET TEMPERATURE = .3950E+03

COOLANT TEMPERATURE

.3950E+03 .3973E+03 .4037E+03 .4137E+03 .4267E+03 .4420E+03 .4587E+03 .4759E+03 .4928E+03 .5083E+03
 .5218E+03 .5325E+03 .5385E+03 .5435E+03 .5477E+03

OUTLET TEMPERATURE = .5413E+03

FUEL TEMPERATURE

.3950E+03 .4591E+03 .5131E+03 .5771E+03 .6295E+03 .6717E+03 .7046E+03 .7260E+03 .7346E+03 .7302E+03
 .7127E+03 .6828E+03 .6411E+03 .5839E+03 .5295E+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS GROUP 1	ABSORPTION		NU * SIGMA(FISS)	REMOVAL	TOTAL CROSS SECTIONS																																																																																																																																																	
			GROUP 1	GROUP 2			GROUP 1	GROUP 2																																																																																																																																																
0, 10	1/ 1	.1480E+31	.86310E+09	.1230E-03	.22090E-02	0.	.5098E-02	.5181E-02 .22090E-02																																																																																																																																																
10, 20	2/ 2	.189E+31	.13041E+01	.1555E-02	.53850E-02	.9833E-03	.65148E-02	.4990E-02 .53850E-02																																																																																																																																																
20, 30	3/ 3	.189E+31	.13041E+01	.1555E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
30, 40	4/ 4	.134E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
40, 50	5/ 5	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
50, 60	6/ 6	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
60, 70	7/ 7	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
70, 80	8/ 8	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
80, 90	9/ 9	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
90, 100	10/ 10	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
100, 110	11/ 11	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
110, 120	12/ 12	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
120, 130	13/ 13	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
130, 140	14/ 14	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
140, 150	15/ 15	.189E+31	.13041E+01	.1626E-02	.53850E-02	.9833E-03	.65148E-02	.4991E-02 .53850E-02																																																																																																																																																
RHO=(-(C1*(A1*(F1 -C02*2*(F2 -(SIG T1-NU SIG F1) *A1*F1 +C(NU SIG F2)*A1*F2 -(SIG T2)*A2*F2 +((SIG R1)*A2*F1) /Q																																																																																																																																																								
Q=(^((NU SIG F1)*A1*F1 +^((NU SIG F2)*A1*F2)																																																																																																																																																								
<table border="1"> <thead> <tr> <th>PO-H</th> <th>A1*F1</th> <th>A2*F1</th> <th>A2*F2</th> <th>A1*F1</th> <th>A1*F2</th> <th>A2*F2</th> <th>A1*F1</th> <th>A1*F2</th> </tr> </thead> <tbody> <tr> <td>0, 10</td> <td>5.11374176E+24</td> <td>9.92554478E+24</td> <td>5.5279611E+24</td> <td>8.4405837E+24</td> <td>1.4137554E+22</td> <td>8.30712179E+21</td> <td></td> <td></td> </tr> <tr> <td>10, 20</td> <td>2.8145224E+26</td> <td>1.4454559E+26</td> <td>2.7386484E+26</td> <td>1.7331710E+26</td> <td>3.1940476E+22</td> <td>1.99621081E+22</td> <td></td> <td></td> </tr> <tr> <td>20, 30</td> <td>7.53102377E+26</td> <td>4.48640034E+26</td> <td>9.45222330E+26</td> <td>5.6942170E+26</td> <td>2.40336176E+22</td> <td>1.79203461E+22</td> <td></td> <td></td> </tr> <tr> <td>30, 40</td> <td>1.56877059E+27</td> <td>9.45947759E+26</td> <td>1.59234436E+27</td> <td>1.1700511E+27</td> <td>1.6981502E+22</td> <td>1.29503165E+22</td> <td></td> <td></td> </tr> <tr> <td>40, 50</td> <td>2.8324329E+27</td> <td>1.47780351E+27</td> <td>2.38426429E+27</td> <td>1.78090637E+27</td> <td>1.01156078E+22</td> <td>7.49910461E+21</td> <td></td> <td></td> </tr> <tr> <td>50, 60</td> <td>3.1173453E+27</td> <td>1.92270415E+27</td> <td>3.7478333E+27</td> <td>2.31679868E+27</td> <td>4.87177566E+21</td> <td>3.6274941E+21</td> <td></td> <td></td> </tr> <tr> <td>60, 70</td> <td>3.60151940E+27</td> <td>2.22526594E+27</td> <td>4.14615053E+27</td> <td>2.54257201E+27</td> <td>1.34347972E+21</td> <td>1.00026858E+21</td> <td></td> <td></td> </tr> <tr> <td>70, 80</td> <td>4.7753153E+27</td> <td>2.83342726E+27</td> <td>4.56491063E+27</td> <td>2.8115897E+27</td> <td>1.4688577E+20</td> <td>7.79315437E+19</td> <td></td> <td></td> </tr> <tr> <td>80, 90</td> <td>1.5937222E+27</td> <td>2.22490651E+27</td> <td>4.3375333E+27</td> <td>2.6805256E+27</td> <td>1.35774206E+21</td> <td>1.0103181E+21</td> <td></td> <td></td> </tr> <tr> <td>90, 100</td> <td>3.10761463E+27</td> <td>1.32039131E+27</td> <td>3.7435593E+27</td> <td>2.51401176E+27</td> <td>4.8915910E+21</td> <td>3.6423343E+21</td> <td></td> <td></td> </tr> <tr> <td>100, 110</td> <td>2.33574566E+27</td> <td>1.47322043E+27</td> <td>2.47627503E+27</td> <td>1.77730418E+27</td> <td>1.01267926E+22</td> <td>7.50648020E+21</td> <td></td> <td></td> </tr> <tr> <td>110, 120</td> <td>1.56333715E+27</td> <td>9.67542137E+26</td> <td>1.48879740E+27</td> <td>1.16747441E+27</td> <td>1.68677459E+22</td> <td>1.25410235E+22</td> <td></td> <td></td> </tr> <tr> <td>120, 130</td> <td>7.83997131E+26</td> <td>4.49715283E+26</td> <td>3.51108064E+26</td> <td>5.47916394E+26</td> <td>2.39871958E+22</td> <td>1.78852271E+22</td> <td></td> <td></td> </tr> <tr> <td>130, 140</td> <td>2.27514780E+26</td> <td>1.44145595E+26</td> <td>2.7311185E+26</td> <td>1.72837045E+26</td> <td>3.18564734E+22</td> <td>1.89123955E+22</td> <td></td> <td></td> </tr> <tr> <td>140, 150</td> <td>5.6955346E+24</td> <td>9.49455365E+24</td> <td>5.50424988E+24</td> <td>8.44167697E+24</td> <td>1.1316266E+22</td> <td>8.2835554E+21</td> <td></td> <td></td> </tr> </tbody> </table>									PO-H	A1*F1	A2*F1	A2*F2	A1*F1	A1*F2	A2*F2	A1*F1	A1*F2	0, 10	5.11374176E+24	9.92554478E+24	5.5279611E+24	8.4405837E+24	1.4137554E+22	8.30712179E+21			10, 20	2.8145224E+26	1.4454559E+26	2.7386484E+26	1.7331710E+26	3.1940476E+22	1.99621081E+22			20, 30	7.53102377E+26	4.48640034E+26	9.45222330E+26	5.6942170E+26	2.40336176E+22	1.79203461E+22			30, 40	1.56877059E+27	9.45947759E+26	1.59234436E+27	1.1700511E+27	1.6981502E+22	1.29503165E+22			40, 50	2.8324329E+27	1.47780351E+27	2.38426429E+27	1.78090637E+27	1.01156078E+22	7.49910461E+21			50, 60	3.1173453E+27	1.92270415E+27	3.7478333E+27	2.31679868E+27	4.87177566E+21	3.6274941E+21			60, 70	3.60151940E+27	2.22526594E+27	4.14615053E+27	2.54257201E+27	1.34347972E+21	1.00026858E+21			70, 80	4.7753153E+27	2.83342726E+27	4.56491063E+27	2.8115897E+27	1.4688577E+20	7.79315437E+19			80, 90	1.5937222E+27	2.22490651E+27	4.3375333E+27	2.6805256E+27	1.35774206E+21	1.0103181E+21			90, 100	3.10761463E+27	1.32039131E+27	3.7435593E+27	2.51401176E+27	4.8915910E+21	3.6423343E+21			100, 110	2.33574566E+27	1.47322043E+27	2.47627503E+27	1.77730418E+27	1.01267926E+22	7.50648020E+21			110, 120	1.56333715E+27	9.67542137E+26	1.48879740E+27	1.16747441E+27	1.68677459E+22	1.25410235E+22			120, 130	7.83997131E+26	4.49715283E+26	3.51108064E+26	5.47916394E+26	2.39871958E+22	1.78852271E+22			130, 140	2.27514780E+26	1.44145595E+26	2.7311185E+26	1.72837045E+26	3.18564734E+22	1.89123955E+22			140, 150	5.6955346E+24	9.49455365E+24	5.50424988E+24	8.44167697E+24	1.1316266E+22	8.2835554E+21		
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TOTAL OF ALL REGIONS 2.71825147E+28 1.58302084E+28 1.27203392E+28 2.02425835E+28 2.01173254E+23 1.39726049E+23																																																																																																																																																								

PT	DEL X	DIST	FLUX GRI	FLUX G2	ADJ G3	POMD	POM3	POM1
1	0.000	C.	0.	0.	ADJ G2	0.	0.	0.
2	0.036	7.0350E+00	1.5083E+11	7.3929E+11	2.0501E+09	1.0959E+09	0.	0.
3	0.036	1.4072E+01	3.2791E+11	1.5295E+12	4.2317E+09	2.4293E+09	0.	0.
4	0.036	2.1104E+01	5.6180E+11	2.4162E+12	6.8731E+10	3.5838E+09	0.	0.
5	0.036	2.8144E+01	8.3035E+11	3.4470E+12	9.9929E+09	5.3765E+09	0.	0.
6	0.036	3.5184E+01	1.3791E+12	4.6556E+12	1.2950E+10	6.6385E+09	0.	0.
7	0.036	4.2216E+01	2.1041E+12	6.0539E+12	1.6667E+10	1.2493E+10	0.	0.
8	0.036	4.9262E+01	3.1938E+12	7.6088E+12	2.2650E+10	1.7032E+10	0.	0.
9	0.036	5.6284E+01	4.5370E+12	9.2012E+12	3.1895E+10	2.5645E+10	0.	0.
10	0.036	6.3324E+01	7.3185E+12	1.0950E+13	3.9986E+10	3.8611E+10	0.	0.
..... END OF NUCLEAR REGION NO. 1 AND THERMAL								
11	0.036	6.3324E+01	7.3185E+12	1.0950E+13	3.9986E+10	3.8611E+10	C.	0.
12	0.036	7.0350E+00	1.5083E+11	1.1255E+13	4.9013E+10	5.2210E+10	5.8228E+10	1.4333E+00
13	0.036	7.7380E+00	1.8333E+11	1.4765E+13	5.6752E+10	5.9974E+10	5.2955E+10	1.4305E+00
14	0.036	8.4410E+00	2.1666E+11	1.8666E+13	6.5555E+10	6.9999E+10	6.2222E+10	1.4307E+00
15	0.036	9.1440E+00	2.4999E+11	2.2555E+13	7.4444E+10	7.8888E+10	7.1111E+10	1.4311E+00
16	0.036	9.8470E+00	2.8333E+11	2.6444E+13	8.3333E+10	8.7777E+10	8.0000E+10	1.4315E+00
17	0.036	1.0550E+01	3.1666E+11	3.0333E+13	9.2222E+10	9.6666E+10	8.8888E+10	1.4319E+00
18	0.036	1.1253E+01	3.5000E+11	3.4222E+13	1.0111E+11	1.0555E+11	1.1333E+11	1.4323E+00
19	0.036	1.1956E+01	3.8333E+11	3.8111E+13	1.1000E+11	1.1444E+11	1.2222E+11	1.4327E+00
20	0.036	1.2659E+01	4.1666E+11	4.2000E+13	1.1888E+11	1.2333E+11	1.3111E+11	1.4331E+00
21	0.036	1.3362E+01	4.5000E+11	4.5888E+13	1.2777E+11	1.3222E+11	1.4000E+11	1.4335E+00
22	0.036	1.4065E+01	4.8333E+11	4.9777E+13	1.3666E+11	1.4111E+11	1.4888E+11	1.4339E+00
23	0.036	1.4768E+01	5.1666E+11	5.3666E+13	1.4555E+11	1.5000E+11	1.5777E+11	1.4343E+00
24	0.036	1.5471E+01	5.5000E+11	5.7555E+13	1.5444E+11	1.5888E+11	1.6666E+11	1.4347E+00
25	0.036	1.6174E+01	5.8333E+11	6.1444E+13	1.6333E+11	1.6833E+11	1.7666E+11	1.4351E+00
26	0.036	1.6877E+01	6.1666E+11	6.5333E+13	1.7222E+11	1.7722E+11	1.8555E+11	1.4355E+00
27	0.036	1.7580E+01	6.5000E+11	6.9222E+13	1.8111E+11	1.8611E+11	1.9444E+11	1.4359E+00
28	0.036	1.8283E+01	6.8333E+11	7.3111E+13	1.9000E+11	1.9500E+11	2.0333E+11	1.4363E+00
29	0.036	1.8986E+01	7.1666E+11	7.7000E+13	1.9888E+11	2.0444E+11	2.1222E+11	1.4367E+00
30	0.036	1.9689E+01	7.5000E+11	8.0888E+13	2.0777E+11	2.1333E+11	2.2111E+11	1.4371E+00
31	0.036	2.0392E+01	7.8333E+11	8.4777E+13	2.1666E+11	2.2222E+11	2.3000E+11	1.4375E+00
32	0.036	2.1095E+01	8.1666E+11	8.8666E+13	2.2555E+11	2.3111E+11	2.3888E+11	1.4379E+00
33	0.036	2.1798E+01	8.5000E+11	9.2555E+13	2.3444E+11	2.4000E+11	2.4777E+11	1.4383E+00
34	0.036	2.2501E+01	8.8333E+11	9.6444E+13	2.4333E+11	2.4999E+11	2.5777E+11	1.4387E+00
35	0.036	2.3204E+01	9.1666E+11	1.0033E+14	2.5222E+11	2.5888E+11	2.6555E+11	1.4391E+00
36	0.036	2.3907E+01	9.5000E+11	1.0422E+14	2.6111E+11	2.6833E+11	2.7555E+11	1.4395E+00
37	0.036	2.4610E+01	9.8333E+11	1.0811E+14	2.7000E+11	2.7722E+11	2.8444E+11	1.4399E+00
38	0.036	2.5313E+01	1.0166E+12	1.1200E+14	2.7888E+11	2.8611E+11	2.9333E+11	1.4403E+00
39	0.036	2.6016E+01	1.0500E+12	1.1588E+14	2.8777E+11	2.9500E+11	3.0222E+11	1.4407E+00
40	0.036	2.6719E+01	1.0833E+12	1.1977E+14	2.9666E+11	3.0377E+11	3.1111E+11	1.4411E+00
41	0.036	2.7422E+01	1.1166E+12	1.2366E+14	3.0555E+11	3.1255E+11	3.2000E+11	1.4415E+00
42	0.036	2.8125E+01	1.1500E+12	1.2755E+14	3.1444E+11	3.2133E+11	3.2888E+11	1.4419E+00
43	0.036	2.8828E+01	1.1833E+12	1.3144E+14	3.2333E+11	3.3011E+11	3.3777E+11	1.4423E+00
44	0.036	2.9531E+01	1.2166E+12	1.3533E+14	3.3222E+11	3.3888E+11	3.4666E+11	1.4427E+00
45	0.036	3.0234E+01	1.2500E+12	1.3922E+14	3.4111E+11	3.4777E+11	3.5555E+11	1.4431E+00
46	0.036	3.0937E+01	1.2833E+12	1.4311E+14	3.5000E+11	3.5655E+11	3.6444E+11	1.4435E+00
47	0.036	3.1640E+01	1.3166E+12	1.4700E+14	3.5888E+11	3.6533E+11	3.7333E+11	1.4439E+00
48	0.036	3.2343E+01	1.3500E+12	1.5088E+14	3.6777E+11	3.7411E+11	3.8222E+11	1.4443E+00
49	0.036	3.3046E+01	1.3833E+12	1.5477E+14	3.7666E+11	3.8288E+11	3.9111E+11	1.4447E+00
50	0.036	3.3749E+01	1.4166E+12	1.5866E+14	3.8555E+11	3.9166E+11	4.0000E+11	1.4451E+00
..... END OF THERMAL-MYD REG. NO. 5								

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50 8.128 7.8938E+02 9.9463E+13 6.1477E+13 3.3442E+11 4.0297E+11 3.3403E+11 1.4318E+00 1.5474E+13
51 3.128 3.9751E+02 1.0385E+14 6.2842E+13 3.7879E+11 4.0829E+11 3.3838E+11 1.4333E+00
52 6.128 4.5647E+02 1.0221E+14 6.3175E+13 3.4731E+11 4.1332E+11 3.4259E+11 1.4347E+00
53 8.128 4.2149E+02 1.0475E+14 6.3977E+13 3.4767E+11 4.1821E+11 3.4688E+11 1.4360E+00
54 9.128 4.3025E+02 1.0395E+14 6.5435E+13 3.5470E+11 4.3230E+11 3.5625E+11 1.4394E+00
55 8.128 4.3815E+02 1.0709E+14 6.6191E+13 3.5828E+11 4.3712E+11 3.5781E+11 1.4395E+00
56 8.128 4.4228E+02 1.0414E+14 6.6964E+13 3.6163E+11 4.3583E+11 3.6121E+11 1.4395E+00
57 8.128 4.5441E+02 1.0323E+14 6.7564E+13 3.6494E+11 4.3974E+11 3.6444E+11 1.4395E+00
58 8.128 4.6253E+02 1.0202E+14 6.8115E+13 3.6762E+11 4.3732E+11 3.6751E+11 1.4395E+00
59 8.128 4.6665E+02 1.1112E+14 6.8831E+13 3.7393E+11 4.4693E+11 3.7041E+11 1.4395E+00
60 8.128 4.7066E+02 1.1112E+14 6.8831E+13 3.7393E+11 4.4693E+11 3.7041E+11 1.4395E+00
61 8.128 4.7879E+02 1.1207E+14 6.9222E+13 3.7879E+11 4.5025E+11 3.7314E+11 1.4395E+00
62 8.128 4.8692E+02 1.1221E+14 6.9222E+13 3.7879E+11 4.5025E+11 3.7314E+11 1.4395E+00
63 8.128 4.9505E+02 1.1357E+14 7.0127E+13 3.7879E+11 4.5025E+11 3.7314E+11 1.4395E+00
64 8.128 5.0317E+02 1.1424E+14 7.0634E+13 3.8386E+11 4.5692E+11 3.8030E+11 1.5055E+00
65 8.128 5.1130E+02 1.1493E+14 7.1076E+13 3.8995E+11 4.6139E+11 3.8234E+11 1.5055E+00
66 8.128 5.1943E+02 1.1558E+14 7.1765E+13 3.8648E+11 4.5692E+11 3.8234E+11 1.5055E+00
67 8.128 5.2756E+02 1.1622E+14 7.2034E+13 3.8807E+11 4.5914E+11 3.8475E+11 1.5071E+00
68 8.128 5.3569E+02 1.1697E+14 7.2297E+13 3.8934E+11 4.5914E+11 3.8475E+11 1.5071E+00
69 8.128 5.4381E+02 1.1734E+14 7.2524E+13 3.9351E+11 4.7055E+11 3.8992E+11 1.5071E+00
70 8.128 5.5194E+02 1.1734E+14 7.2524E+13 3.9351E+11 4.7055E+11 3.8992E+11 1.5071E+00
71 8.128 5.6007E+02 1.1734E+14 7.2524E+13 3.9351E+11 4.7055E+11 3.8992E+11 1.5071E+00
72 8.128 5.6820E+02 1.1793E+14 7.2473E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.5071E+00
73 8.128 5.7633E+02 1.1815E+14 7.2895E+13 3.9294E+11 4.7271E+11 3.9231E+11 1.5071E+00
74 8.128 5.8445E+02 1.1822E+14 7.3058E+13 3.9384E+11 4.7403E+11 3.9278E+11 1.5071E+00
75 8.128 5.9258E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
76 8.128 6.0071E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
77 8.128 6.0884E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
78 8.128 6.1697E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
79 8.128 6.2509E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
80 8.128 6.3322E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
81 8.128 6.4135E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
82 8.128 6.4948E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
83 8.128 6.5761E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
84 8.128 6.6573E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
85 8.128 6.7386E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
86 8.128 6.8199E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
87 8.128 6.9012E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
88 8.128 6.9825E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
89 8.128 7.0637E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
90 8.128 7.1450E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
91 8.128 7.2263E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
92 8.128 7.3076E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
93 8.128 7.3889E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
94 8.128 7.4701E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
95 8.128 7.5514E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
96 8.128 7.6327E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
97 8.128 7.7140E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
98 8.128 7.7953E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
99 8.128 7.8765E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00
100 8.128 7.9578E+02 1.1832E+14 7.3115E+13 3.9384E+11 4.7403E+11 3.9305E+11 1.5071E+00

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100	8.128	7.9578E+02	1.0205E+14	6.3072E+13	3.4301E+11	4.1332E+11	3.4259E+11	1.4923E+03	1.7728E+13
101	8.128	8.0391E+02	1.0569E+14	6.2335E+13	3.3879E+11	4.0822E+11	3.3838E+11	1.4308E+00	
102	8.128	8.1204E+02	9.9290E+13	6.1370E+13	3.3482E+11	4.0292E+11	3.3402E+11	1.4392E+00	
103	8.128	8.2017E+02	9.3937E+13	6.0472E+13	3.2993E+11	3.9752E+11	3.2951E+11	1.4373E+00	
104	8.128	8.2829E+02	9.6335E+13	5.9544E+13	3.2522E+11	3.9188E+11	3.2485E+11	1.4857E+00	
105	8.128	8.3642E+02	9.4778E+13	5.8685E+13	3.2039E+11	3.8607E+11	3.2004E+11	1.4838E+00	
106	8.128	8.4455E+02	9.3184E+13	5.7867E+13	3.1542E+11	3.8038E+11	3.1508E+11	1.4817E+00	
107	8.128	8.5268E+02	9.1544E+13	5.6930E+13	3.1033E+11	3.7392E+11	3.0997E+11	1.4795E+00	
108	8.128	8.6081E+02	8.9849E+13	5.5934E+13	3.0503E+11	3.6759E+11	3.0473E+11	1.4772E+00	
109	8.128	8.6893E+02	8.8126E+13	5.4941E+13	3.0001E+11	3.6118E+11	2.9935E+11	1.4746E+00	
110	8.128	8.7706E+02	8.6335E+13	5.3953E+13	2.9465E+11	3.5542E+11	2.9355E+11	1.4719E+00	
111	8.128	8.8519E+02	8.4505E+13	5.2938E+13	2.8946E+11	3.5047E+11	2.9385E+11	1.4719E+00	1.5447E+13
112	8.128	8.9332E+02	8.2635E+13	5.1875E+13	2.8438E+11	3.4571E+11	2.8823E+11	1.4688E+00	
113	8.128	9.0145E+02	8.0723E+13	5.0765E+13	2.7948E+11	3.4075E+11	2.8244E+11	1.4658E+00	
114	8.128	9.0957E+02	7.8769E+13	4.9634E+13	2.7463E+11	3.3553E+11	2.7644E+11	1.4630E+00	
115	8.128	9.1770E+02	7.6776E+13	4.8484E+13	2.6987E+11	3.3055E+11	2.7035E+11	1.4603E+00	
116	8.128	9.2583E+02	7.4734E+13	4.7342E+13	2.6512E+11	3.2538E+11	2.6386E+11	1.4578E+00	
117	8.128	9.3396E+02	7.2666E+13	4.6195E+13	2.6042E+11	3.2042E+11	2.5739E+11	1.4550E+00	
118	8.128	9.4209E+02	7.0562E+13	4.5048E+13	2.5572E+11	3.1542E+11	2.5054E+11	1.4531E+00	
119	8.128	9.5021E+02	6.8435E+13	4.3895E+13	2.5102E+11	3.1042E+11	2.4362E+11	1.4509E+00	
120	8.128	9.5834E+02	6.6210E+13	4.2742E+13	2.4632E+11	3.0542E+11	2.3653E+11	1.4489E+00	
121	8.128	9.6647E+02	6.3993E+13	4.1589E+13	2.4162E+11	3.0042E+11	2.2929E+11	1.4469E+00	1.2388E+13
122	8.128	9.7460E+02	6.1775E+13	4.0436E+13	2.3692E+11	2.9542E+11	2.2199E+11	1.4451E+00	
123	8.128	9.8273E+02	5.9557E+13	3.9283E+13	2.3222E+11	2.9042E+11	2.1433E+11	1.4433E+00	
124	8.128	9.9086E+02	5.7349E+13	3.8130E+13	2.2752E+11	2.8542E+11	2.0663E+11	1.4417E+00	
125	8.128	9.9899E+02	5.5141E+13	3.6977E+13	2.2282E+11	2.8042E+11	1.9893E+11	1.4401E+00	
126	8.128	1.0071E+03	5.2938E+13	3.5824E+13	2.1812E+11	2.7542E+11	1.9123E+11	1.4386E+00	
127	8.128	1.0152E+03	5.0735E+13	3.4671E+13	2.1342E+11	2.7042E+11	1.8353E+11	1.4371E+00	
128	8.128	1.0233E+03	4.8532E+13	3.3518E+13	2.0872E+11	2.6542E+11	1.7583E+11	1.4356E+00	
129	8.128	1.0314E+03	4.6329E+13	3.2365E+13	2.0402E+11	2.6042E+11	1.6813E+11	1.4347E+00	
130	8.128	1.0395E+03	4.4126E+13	3.1212E+13	1.9932E+11	2.5542E+11	1.6043E+11	1.4335E+00	
131	8.128	1.0476E+03	4.1923E+13	3.0059E+13	1.9462E+11	2.5042E+11	1.5273E+11	1.4324E+00	
132	8.128	1.0557E+03	3.9730E+13	2.8906E+13	1.8992E+11	2.4542E+11	1.4503E+11	1.4313E+00	8.6885E+12
133	8.128	1.0638E+03	3.7537E+13	2.7753E+13	1.8522E+11	2.4042E+11	1.3733E+11	1.4302E+00	
134	8.128	1.0719E+03	3.5344E+13	2.6600E+13	1.8052E+11	2.3542E+11	1.2963E+11	1.4291E+00	
135	8.128	1.0800E+03	3.3151E+13	2.5447E+13	1.7582E+11	2.3042E+11	1.2193E+11	1.4280E+00	
136	8.128	1.0881E+03	3.0958E+13	2.4294E+13	1.7112E+11	2.2542E+11	1.1423E+11	1.4269E+00	
137	8.128	1.0962E+03	2.8765E+13	2.3141E+13	1.6642E+11	2.2042E+11	1.0653E+11	1.4258E+00	
138	8.128	1.1043E+03	2.6572E+13	2.1990E+13	1.6172E+11	2.1542E+11	9.883E+10	1.4247E+00	
139	8.128	1.1124E+03	2.4379E+13	2.0839E+13	1.5702E+11	2.1042E+11	9.113E+10	1.4236E+00	
140	8.128	1.1205E+03	2.2186E+13	1.9688E+13	1.5232E+11	2.0542E+11	8.343E+10	1.4225E+00	
141	8.128	1.1286E+03	1.9993E+13	1.8537E+13	1.4762E+11	2.0042E+11	7.573E+10	1.4214E+00	
142	8.128	1.1367E+03	1.7800E+13	1.7386E+13	1.4292E+11	1.9542E+11	6.803E+10	1.4203E+00	
143	8.128	1.1448E+03	1.5607E+13	1.6235E+13	1.3822E+11	1.9042E+11	6.033E+10	1.4192E+00	
144	8.128	1.1529E+03	1.3414E+13	1.5084E+13	1.3352E+11	1.8542E+11	5.263E+10	1.4181E+00	
145	8.128	1.1610E+03	1.1221E+13	1.3931E+13	1.2882E+11	1.8042E+11	4.493E+10	1.4170E+00	
146	8.128	1.1691E+03	9.028E+12	1.2778E+13	1.2412E+11	1.7542E+11	3.723E+10	1.4159E+00	
147	8.128	1.1772E+03	6.835E+12	1.1625E+13	1.1942E+11	1.7042E+11	2.953E+10	1.4148E+00	
148	8.128	1.1853E+03	4.642E+12	1.0472E+13	1.1472E+11	1.6542E+11	2.183E+10	1.4137E+00	
149	8.128	1.1934E+03	2.449E+12	9.319E+12	1.1002E+11	1.6042E+11	1.413E+10	1.4126E+00	
150	8.128	1.2015E+03	2.230E+12	8.166E+12	1.0532E+11	1.5542E+11	6.253E+10	1.4115E+00	
151	8.128	1.2096E+03	1.015E+12	7.013E+12	1.0062E+11	1.5042E+11	1.4259E+10	1.4104E+00	

STIT FRONT TO PEAK SCRAM TRANSIENT WITH SECOND ROD BANK ELAPSED TIME FROM START OF CASE 22.497 SEC

TIME STEP 10. 41 TIME .4001E+01 DELTA T = .1000E+00

REACTIVITY (TIME STEP 40) = .7513E-03

*00 WITHDRAWAL DISTANCE = 3.

RELATIVE POWER (TIME STEP 40) = .1451E+01

PEAK TO AVERAGE POWER (TIME STEP 40)

0. .3392E+00 .6480E+00 .9232E+00 .1150E+01 .1318E+01 .1421E+01 .1455E+01 .1419E+01 .1314E+01

IODINE CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

XENON CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

INLET TEMPERATURE = .3960E+03

COOLANT TEMPERATURE

.3950E+03 .3977E+03 .4040E+03 .4145E+03 .4231E+03 .4442E+03 .4617E+03 .4799E+03 .4978E+03 .5144E+03

OUTLET TEMPERATURE = .5507E+03

FUEL TEMPERATURE

.3950E+03 .4605E+03 .5234E+03 .5842E+03 .6340E+03 .6831E+03 .7177E+03 .7406E+03 .7492E+03 .7446E+03

POINT(S) (I TO J)	REGIONS T-4/NUCL	DIFFUSION COEFFICIENTS	ABSORPTION		NU * SIGMA(FISS)	REMOVAL	CROSS SECTIONS		TOTAL	
			GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2		
0, 10	1/ 1	1.440E+21	9.531E+00	1.235E-03	2.2040E+22	C.	0.	5.054E-02	5.181E-02	2.2090E+02
10, 20	2/ 2	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.990E-02	5.3850E-02
20, 30	3/ 3	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
30, 40	4/ 4	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
40, 50	5/ 5	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
50, 60	6/ 6	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
60, 70	7/ 7	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
70, 80	8/ 8	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
80, 90	9/ 9	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
90, 100	10/ 10	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
100, 110	11/ 11	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
110, 120	12/ 12	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
120, 130	13/ 13	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
130, 140	14/ 14	1.880E+01	1.3091E+01	1.57E-02	5.8850E-02	9.833E-03	6.5144E-02	3.336E-02	4.991E-02	5.3850E-02
140, 150	15/ 15	1.440E+21	9.531E+00	1.235E-03	2.2040E+22	C.	0.	5.054E-02	5.181E-02	2.2090E+02

RHO= (- C01*CA1*CF) - (C2+A2*CF2) - ((SIG T1-NU SIG F1) *A1*F1 + ((NU SIG F2)*A1*F2) - ((SIG T2)*A2*F2) - ((SIG R1)*A1*F1))

Q= ((NU SIG F1)*A1*F1 + ((NU SIG F2)*A1*F2))

00-H 21*F1 21*F2 21*F3 21*F4 21*F5 21*F6 21*F7 21*F8 21*F9 21*F10 21*F11 21*F12 21*F13 21*F14 21*F15 21*F16 21*F17 21*F18 21*F19 21*F20 21*F21 21*F22 21*F23 21*F24 21*F25 21*F26 21*F27 21*F28 21*F29 21*F30 21*F31 21*F32 21*F33 21*F34 21*F35 21*F36 21*F37 21*F38 21*F39 21*F40 21*F41 21*F42 21*F43 21*F44 21*F45 21*F46 21*F47 21*F48 21*F49 21*F50 21*F51 21*F52 21*F53 21*F54 21*F55 21*F56 21*F57 21*F58 21*F59 21*F60 21*F61 21*F62 21*F63 21*F64 21*F65 21*F66 21*F67 21*F68 21*F69 21*F70 21*F71 21*F72 21*F73 21*F74 21*F75 21*F76 21*F77 21*F78 21*F79 21*F80 21*F81 21*F82 21*F83 21*F84 21*F85 21*F86 21*F87 21*F88 21*F89 21*F90 21*F91 21*F92 21*F93 21*F94 21*F95 21*F96 21*F97 21*F98 21*F99 21*F100 21*F101 21*F102 21*F103 21*F104 21*F105 21*F106 21*F107 21*F108 21*F109 21*F110 21*F111 21*F112 21*F113 21*F114 21*F115 21*F116 21*F117 21*F118 21*F119 21*F120 21*F121 21*F122 21*F123 21*F124 21*F125 21*F126 21*F127 21*F128 21*F129 21*F130 21*F131 21*F132 21*F133 21*F134 21*F135 21*F136 21*F137 21*F138 21*F139 21*F140 21*F141 21*F142 21*F143 21*F144 21*F145 21*F146 21*F147 21*F148 21*F149 21*F150 21*F151 21*F152 21*F153 21*F154 21*F155 21*F156 21*F157 21*F158 21*F159 21*F160 21*F161 21*F162 21*F163 21*F164 21*F165 21*F166 21*F167 21*F168 21*F169 21*F170 2

TOTAL OF ALL REGIONS 2.6970546E+23 1.5587949E+23 3.2501915E+28 2.0105144E+28 1.9983351E+23 1.39766561E+23

PT	C/L	X	CTST	FLUX G31	FLUX G32	1CJ G31	1CJ G32	APJ G31	APJ G32	POW3	POW4	POW1
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	7.036	7.036E+03	1.5300E+11	7.369E+11	2.160E+11	1.873E+11	1.201E+11	0.0	0.0	0.0	0.0	0.0
3	7.036	1.407E+11	3.2684E+11	1.523E+12	4.291E+12	2.160E+11	1.595E+11	0.0	0.0	0.0	0.0	0.0
4	7.036	2.110E+11	5.6000E+11	2.4094E+12	6.871E+12	2.4094E+12	3.299E+12	0.0	0.0	0.0	0.0	0.0
5	7.036	3.5144E+11	9.319E+11	3.4359E+12	3.992E+12	3.992E+12	5.676E+12	0.0	0.0	0.0	0.0	0.0
6	7.036	3.5140E+11	1.1746E+12	4.6405E+12	1.395E+12	1.395E+12	8.6386E+12	0.0	0.0	0.0	0.0	0.0
7	7.036	4.9252E+11	2.0216E+12	6.034E+12	1.864E+12	1.864E+12	1.2436E+12	0.0	0.0	0.0	0.0	0.0
8	7.036	4.9252E+11	3.1835E+12	7.884E+12	2.4436E+12	2.4436E+12	1.7936E+12	0.0	0.0	0.0	0.0	0.0
9	7.036	5.6294E+11	4.6215E+12	9.171E+12	3.1695E+12	3.1695E+12	2.5649E+12	0.0	0.0	0.0	0.0	0.0
10	7.036	6.3324E+11	7.2951E+12	1.052E+13	3.9985E+12	3.9985E+12	3.661E+12	0.0	0.0	0.0	0.0	0.0
11	7.036	6.3324E+11	7.2951E+12	1.052E+13	3.9985E+12	3.9985E+12	3.661E+12	0.0	0.0	0.0	0.0	0.0
12	8.331	7.8691E+11	1.4335E+13	1.089E+13	5.767E+12	5.767E+12	5.821E+12	0.0	0.0	0.0	0.0	0.0
13	8.331	7.8691E+11	1.4335E+13	1.089E+13	5.767E+12	5.767E+12	5.821E+12	0.0	0.0	0.0	0.0	0.0
14	8.331	9.5353E+11	2.1122E+13	1.3731E+13	7.591E+12	7.591E+12	9.071E+12	0.0	0.0	0.0	0.0	0.0
15	4.331	1.0768E+12	2.4085E+13	1.5207E+13	8.531E+12	8.531E+12	1.024E+13	0.0	0.0	0.0	0.0	0.0
16	4.331	1.0768E+12	2.4085E+13	1.5207E+13	8.531E+12	8.531E+12	1.024E+13	0.0	0.0	0.0	0.0	0.0
17	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
18	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
19	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
20	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
21	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
22	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
23	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
24	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
25	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
26	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
27	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
28	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
29	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
30	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
31	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
32	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
33	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
34	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
35	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
36	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
37	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
38	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
39	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
40	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
41	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
42	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
43	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
44	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
45	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
46	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
47	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
48	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
49	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0
50	4.331	1.2035E+12	2.9567E+13	1.676E+13	9.463E+12	9.463E+12	1.139E+13	0.0	0.0	0.0	0.0	0.0

END OF THERMAL-HVD REG. NO. 1

END OF THERMAL-HVD REG. NO. 2

END OF THERMAL-HVD REG. NO. 3

END OF THERMAL-HVD REG. NO. 4

END OF THERMAL-HVD REG. NO. 5

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50 9.128 3.8938E+02 9.8924E+13 5.1139E+13 3.3442E+11 4.5297E+11 3.3430E+11 1.4437E+00 1.5391E+13
51 8.128 3.9751E+02 1.0031E+14 6.1994E+13 3.3879E+11 4.3824E+11 3.3838E+11 1.4450E+00 1.4850E+00
52 8.128 4.0564E+02 1.0165E+14 6.2818E+13 3.4301E+11 4.3132E+11 3.4259E+11 1.4863E+00 1.4863E+00
53 8.128 4.1377E+02 1.0295E+14 6.3641E+13 3.4721E+11 4.2421E+11 3.4663E+11 1.4875E+00 1.4875E+00
54 8.128 4.2190E+02 1.0426E+14 6.4472E+13 3.5097E+11 4.1729E+11 3.5522E+11 1.4887E+00 1.4887E+00
55 8.128 4.3002E+02 1.0553E+14 6.5104E+13 3.5471E+11 4.1027E+11 3.5425E+11 1.4898E+00 1.4898E+00
56 8.128 4.3815E+02 1.0679E+14 6.5739E+13 3.5848E+11 4.0326E+11 3.5781E+11 1.4908E+00 1.4908E+00
57 8.128 4.4628E+02 1.0794E+14 6.6383E+13 3.6185E+11 3.9624E+11 3.6121E+11 1.4915E+00 1.4915E+00
58 8.128 4.5441E+02 1.0905E+14 6.7055E+13 3.6493E+11 3.8974E+11 3.6444E+11 1.4923E+00 1.4923E+00
59 8.128 4.6253E+02 1.0953E+14 6.7638E+13 3.6302E+11 4.3457E+11 3.6751E+11 1.4930E+00 1.4930E+00
60 8.128 4.7066E+02 1.1042E+14 6.8254E+13 3.7193E+11 4.4695E+11 3.7041E+11 1.4937E+00 1.4937E+00
..... END OF THERMAL-HYD REG. NO. 6 .....
60 8.128 4.7866E+02 1.1145E+14 6.8258E+13 3.7093E+11 4.4695E+11 3.7041E+11 1.4937E+00 1.7642E+13
61 8.128 4.7866E+02 1.1145E+14 6.8258E+13 3.7093E+11 4.4695E+11 3.7041E+11 1.4937E+00 1.7642E+13
62 8.128 4.8679E+02 1.1211E+14 6.8789E+13 3.7357E+11 4.5025E+11 3.7314E+11 1.4943E+00 1.4943E+00
63 8.128 4.8679E+02 1.1211E+14 6.8789E+13 3.7357E+11 4.5025E+11 3.7314E+11 1.4943E+00 1.4943E+00
64 8.128 4.9095E+02 1.1284E+14 6.9749E+13 3.7483E+11 4.5335E+11 3.7570E+11 1.4949E+00 1.4949E+00
65 8.128 4.9095E+02 1.1284E+14 6.9749E+13 3.7483E+11 4.5335E+11 3.7570E+11 1.4949E+00 1.4949E+00
66 8.128 4.9511E+02 1.1355E+14 7.0178E+13 3.8030E+11 4.5692E+11 3.8030E+11 1.4958E+00 1.4958E+00
67 8.128 4.9511E+02 1.1355E+14 7.0178E+13 3.8030E+11 4.5692E+11 3.8030E+11 1.4958E+00 1.4958E+00
68 8.128 4.9927E+02 1.1426E+14 7.0574E+13 3.8239E+11 4.6139E+11 3.8239E+11 1.4962E+00 1.4962E+00
69 8.128 4.9927E+02 1.1426E+14 7.0574E+13 3.8239E+11 4.6139E+11 3.8239E+11 1.4962E+00 1.4962E+00
70 8.128 5.0343E+02 1.1497E+14 7.0935E+13 3.8478E+11 4.6364E+11 3.8478E+11 1.4965E+00 1.4965E+00
71 8.128 5.0343E+02 1.1497E+14 7.0935E+13 3.8478E+11 4.6364E+11 3.8478E+11 1.4965E+00 1.4965E+00
72 8.128 5.0759E+02 1.1568E+14 7.1251E+13 3.8649E+11 4.6563E+11 3.8590E+11 1.4968E+00 1.4968E+00
73 8.128 5.0759E+02 1.1568E+14 7.1251E+13 3.8649E+11 4.6563E+11 3.8590E+11 1.4968E+00 1.4968E+00
74 8.128 5.1175E+02 1.1639E+14 7.1573E+13 3.8800E+11 4.6752E+11 3.8742E+11 1.4971E+00 1.4971E+00
75 8.128 5.1175E+02 1.1639E+14 7.1573E+13 3.8800E+11 4.6752E+11 3.8742E+11 1.4971E+00 1.4971E+00
76 8.128 5.1591E+02 1.1709E+14 7.1810E+13 3.8934E+11 4.6915E+11 3.8875E+11 1.4973E+00 1.4973E+00
77 8.128 5.1591E+02 1.1709E+14 7.1810E+13 3.8934E+11 4.6915E+11 3.8875E+11 1.4973E+00 1.4973E+00
78 8.128 5.1591E+02 1.1709E+14 7.1810E+13 3.8934E+11 4.6915E+11 3.8875E+11 1.4973E+00 1.4973E+00
79 8.128 5.1591E+02 1.1709E+14 7.1810E+13 3.8934E+11 4.6915E+11 3.8875E+11 1.4973E+00 1.4973E+00
80 8.128 5.1591E+02 1.1709E+14 7.1810E+13 3.8934E+11 4.6915E+11 3.8875E+11 1.4973E+00 1.4973E+00
..... END OF THERMAL-HYD REG. NO. 7 .....
80 8.128 5.1944E+02 1.1655E+14 7.2032E+13 3.9051E+11 4.7055E+11 3.8992E+11 1.4974E+00 1.9021E+13
81 8.128 5.1944E+02 1.1655E+14 7.2032E+13 3.9051E+11 4.7055E+11 3.8992E+11 1.4974E+00 1.9021E+13
82 8.128 5.2360E+02 1.1726E+14 7.2370E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.4976E+00 1.4976E+00
83 8.128 5.2360E+02 1.1726E+14 7.2370E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.4976E+00 1.4976E+00
84 8.128 5.2776E+02 1.1797E+14 7.2695E+13 3.9413E+11 4.7471E+11 3.9233E+11 1.4978E+00 1.4978E+00
85 8.128 5.2776E+02 1.1797E+14 7.2695E+13 3.9413E+11 4.7471E+11 3.9233E+11 1.4978E+00 1.4978E+00
86 8.128 5.3192E+02 1.1868E+14 7.3019E+13 3.9595E+11 4.7671E+11 3.9278E+11 1.4979E+00 1.4979E+00
87 8.128 5.3192E+02 1.1868E+14 7.3019E+13 3.9595E+11 4.7671E+11 3.9278E+11 1.4979E+00 1.4979E+00
88 8.128 5.3608E+02 1.1939E+14 7.3343E+13 3.9777E+11 4.7871E+11 3.9305E+11 1.4979E+00 1.4979E+00
89 8.128 5.3608E+02 1.1939E+14 7.3343E+13 3.9777E+11 4.7871E+11 3.9305E+11 1.4979E+00 1.4979E+00
90 8.128 5.3608E+02 1.1939E+14 7.3343E+13 3.9777E+11 4.7871E+11 3.9305E+11 1.4979E+00 1.4979E+00
..... END OF THERMAL-HYD REG. NO. 8 .....
90 8.128 5.4024E+02 1.1709E+14 7.2370E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.4976E+00 1.9476E+13
91 8.128 5.4024E+02 1.1709E+14 7.2370E+13 3.9231E+11 4.7271E+11 3.9170E+11 1.4976E+00 1.9476E+13
92 8.128 5.4440E+02 1.1780E+14 7.2695E+13 3.9413E+11 4.7471E+11 3.9233E+11 1.4978E+00 1.4978E+00
93 8.128 5.4440E+02 1.1780E+14 7.2695E+13 3.9413E+11 4.7471E+11 3.9233E+11 1.4978E+00 1.4978E+00
94 8.128 5.4856E+02 1.1851E+14 7.3019E+13 3.9595E+11 4.7671E+11 3.9278E+11 1.4979E+00 1.4979E+00
95 8.128 5.4856E+02 1.1851E+14 7.3019E+13 3.9595E+11 4.7671E+11 3.9278E+11 1.4979E+00 1.4979E+00
96 8.128 5.5272E+02 1.1922E+14 7.3343E+13 3.9777E+11 4.7871E+11 3.9305E+11 1.4979E+00 1.4979E+00
97 8.128 5.5272E+02 1.1922E+14 7.3343E+13 3.9777E+11 4.7871E+11 3.9305E+11 1.4979E+00 1.4979E+00
98 8.128 5.5688E+02 1.1993E+14 7.3667E+13 3.9959E+11 4.8071E+11 3.9305E+11 1.4979E+00 1.4979E+00
99 8.128 5.5688E+02 1.1993E+14 7.3667E+13 3.9959E+11 4.8071E+11 3.9305E+11 1.4979E+00 1.4979E+00
100 8.128 5.5688E+02 1.1993E+14 7.3667E+13 3.9959E+11 4.8071E+11 3.9305E+11 1.4979E+00 1.4979E+00
..... END OF THERMAL-HYD REG. NO. 9 .....
90 8.128 5.6100E+02 1.1868E+14 7.3019E+13 3.9595E+11 4.7671E+11 3.9278E+11 1.4979E+00 1.8993E+13
91 8.128 5.6100E+02 1.1868E+14 7.3019E+13 3.9595E+11 4.7671E+11 3.9278E+11 1.4979E+00 1.8993E+13
92 8.128 5.6516E+02 1.1939E+14 7.3343E+13 3.9777E+11 4.7871E+11 3.9305E+11 1.4979E+00 1.4979E+00
93 8.128 5.6516E+02 1.1939E+14 7.3343E+13 3.9777E+11 4.7871E+11 3.9305E+11 1.4979E+00 1.4979E+00
94 8.128 5.6932E+02 1.2010E+14 7.3667E+13 3.9959E+11 4.8071E+11 3.9305E+11 1.4979E+00 1.4979E+00
95 8.128 5.6932E+02 1.2010E+14 7.3667E+13 3.9959E+11 4.8071E+11 3.9305E+11 1.4979E+00 1.4979E+00
96 8.128 5.7348E+02 1.2081E+14 7.3991E+13 4.0141E+11 4.8271E+11 3.9305E+11 1.4979E+00 1.4979E+00
97 8.128 5.7348E+02 1.2081E+14 7.3991E+13 4.0141E+11 4.8271E+11 3.9305E+11 1.4979E+00 1.4979E+00
98 8.128 5.7764E+02 1.2152E+14 7.4315E+13 4.0326E+11 4.8421E+11 3.9305E+11 1.4979E+00 1.4979E+00
99 8.128 5.7764E+02 1.2152E+14 7.4315E+13 4.0326E+11 4.8421E+11 3.9305E+11 1.4979E+00 1.4979E+00
100 8.128 5.7764E+02 1.2152E+14 7.4315E+13 4.0326E+11 4.8421E+11 3.9305E+11 1.4979E+00 1.4979E+00
..... END OF THERMAL-HYD REG. NO. 10 .....

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100	3.128	7.95781E+02	1.0172E+14	6.2588E+13	3.4701E+11	4.1332E+11	3.4259E+11	1.4999E+10	1.7591E+13
101	3.128	8.0391E+02	9.9929E+13	6.1756E+13	3.373E+11	4.0824E+11	3.3838E+11	1.4794E+10	
102	3.128	8.1204E+02	9.8337E+13	6.0498E+13	3.3442E+11	4.0237E+11	3.3402E+11	1.4778E+10	
103	3.128	8.2017E+02	9.7395E+13	6.0077E+13	3.293E+11	3.9752E+11	3.2951E+11	1.4761E+10	
104	3.128	8.2828E+02	9.5564E+13	5.9085E+13	3.232E+11	3.9183E+11	3.2465E+11	1.4743E+10	
105	3.128	8.3642E+02	9.4055E+13	5.8155E+13	3.233E+11	3.8637E+11	3.2004E+11	1.4724E+10	
106	3.128	8.4451E+02	9.2479E+13	5.715E+13	3.1542E+11	3.8008E+11	3.1508E+11	1.4704E+10	
107	3.128	8.5266E+02	9.0346E+13	5.6145E+13	3.1035E+11	3.7332E+11	3.0997E+11	1.4682E+10	
108	3.128	8.6081E+02	8.8163E+13	5.5108E+13	3.0537E+11	3.6759E+11	3.0473E+11	1.4659E+10	
109	3.128	8.6893E+02	8.7444E+13	5.4047E+13	2.9962E+11	3.6111E+11	2.9935E+11	1.4634E+10	
110	3.128	8.7703E+02	8.5576E+13	5.2950E+13	2.9406E+11	3.5447E+11	2.9185E+11	1.4606E+10	
111	3.128	8.8513E+02	8.5675E+13	5.2950E+13	2.9406E+11	3.5447E+11	2.9185E+11	1.4606E+10	
112	3.128	8.9328E+02	8.2011E+13	5.0646E+13	2.8355E+11	3.4771E+11	2.823E+11	1.4577E+10	
113	3.128	9.0143E+02	8.0114E+13	4.9514E+13	2.7843E+11	3.3533E+11	2.7844E+11	1.4516E+10	
114	3.128	9.0957E+02	7.8176E+13	4.8316E+13	2.7021E+11	3.2605E+11	2.7025E+11	1.4432E+10	
115	3.128	9.1770E+02	7.6197E+13	4.7033E+13	2.633E+11	3.1834E+11	2.6385E+11	1.4407E+10	
116	3.128	9.2584E+02	7.4178E+13	4.5345E+13	2.5722E+11	3.1015E+11	2.5729E+11	1.4431E+10	
117	3.128	9.3398E+02	7.2120E+13	4.4073E+13	2.547E+11	3.0237E+11	2.5054E+11	1.4421E+10	
118	3.128	9.4209E+02	7.0125E+13	4.3278E+13	2.4355E+11	2.9332E+11	2.4362E+11	1.4400E+10	
119	3.128	9.5021E+02	6.7493E+13	4.1964E+13	2.3545E+11	2.8537E+11	2.3653E+11	1.4390E+10	
120	3.128	9.5834E+02	6.5726E+13	4.0621E+13	2.2922E+11	2.7632E+11	2.2929E+11	1.4360E+10	
121	3.128	9.6647E+02	6.5726E+13	4.0621E+13	2.2922E+11	2.7632E+11	2.2929E+11	1.4360E+10	
122	3.128	9.7460E+02	6.3524E+13	3.9251E+13	2.2181E+11	2.6769E+11	2.2189E+11	1.4343E+10	
123	3.128	9.8273E+02	5.9920E+13	3.7837E+13	2.1425E+11	2.5884E+11	2.1433E+11	1.4326E+10	
124	3.128	9.9085E+02	5.6713E+13	3.6476E+13	2.0650E+11	2.4923E+11	2.0663E+11	1.4309E+10	
125	3.128	9.9898E+02	5.4383E+13	3.5056E+13	1.9872E+11	2.3983E+11	1.9879E+11	1.4294E+10	
126	3.128	1.0071E+03	5.2027E+13	3.3615E+13	1.9755E+11	2.3021E+11	1.9082E+11	1.4280E+10	
127	3.128	1.0152E+03	4.9632E+13	3.2156E+13	1.8635E+11	2.2063E+11	1.8271E+11	1.4266E+10	
128	3.128	1.0233E+03	4.7233E+13	3.0680E+13	1.7421E+11	2.1009E+11	1.7448E+11	1.4253E+10	
129	3.128	1.0314E+03	4.4781E+13	2.9188E+13	1.6607E+11	2.0002E+11	1.6513E+11	1.4230E+10	
130	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
131	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
132	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
133	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
134	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
135	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
136	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
137	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
138	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
139	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
140	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
141	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
142	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
143	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
144	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
145	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
146	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
147	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
148	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
149	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
150	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	
151	3.128	1.0395E+03	4.2315E+13	2.6157E+13	1.5681E+11	1.9021E+11	1.5767E+11	1.4230E+10	

GROUP 1 FLUX

0. 1.504044E+11 3.268760E+11 3.593997E+11 9.901730E+11 1.374630E+12 2.097342E+12 3.183543E+12 4.821495E+12 7.295079E+12
 1.103300E+13 1.489111E+13 2.122330E+13 2.434755E+13 2.695417E+13 2.956725E+13 3.224159E+13 3.490563E+13 3.750307E+13
 4.009514E+13 4.269979E+13 4.504008E+13 4.753504E+13 5.036442E+13 5.364424E+13 5.707815E+13 6.088852E+13 6.516662E+13
 6.991615E+13 7.511931E+13 8.082366E+13 8.704118E+13 9.381185E+13 1.012313E+14 1.097372E+14 1.190160E+14 1.292551E+14
 8.423899E+13 8.609043E+13 9.786591E+13 9.988701E+13 9.988701E+13 9.988701E+13 9.988701E+13 9.988701E+13 9.988701E+13
 1.103303E+14 1.016421E+14 1.028253E+14 1.028253E+14 1.028253E+14 1.028253E+14 1.028253E+14 1.028253E+14 1.028253E+14
 1.113350E+14 1.121637E+14 1.124598E+14 1.124598E+14 1.124598E+14 1.124598E+14 1.124598E+14 1.124598E+14 1.124598E+14
 1.135565E+14 1.171024E+14 1.172917E+14 1.172917E+14 1.172917E+14 1.172917E+14 1.172917E+14 1.172917E+14 1.172917E+14
 1.157639E+14 1.164430E+14 1.164656E+14 1.164656E+14 1.164656E+14 1.164656E+14 1.164656E+14 1.164656E+14 1.164656E+14
 1.110445E+14 1.101704E+14 1.092423E+14 1.092423E+14 1.092423E+14 1.092423E+14 1.092423E+14 1.092423E+14 1.092423E+14
 9.992922E+13 9.953673E+13 9.709478E+13 9.560464E+13 9.406521E+13 9.247901E+13 9.084622E+13 8.916763E+13 8.744403E+13
 8.585905E+13 8.301049E+13 8.011414E+13 7.817572E+13 7.619653E+13 7.417725E+13 7.212014E+13 6.993303E+13 6.762564E+13
 5.522378E+13 6.128415E+13 5.901852E+13 5.611305E+13 5.347892E+13 5.022732E+13 4.663358E+13 4.272275E+13 3.821489E+13
 3.982443E+13 3.224429E+13 3.464498E+13 3.201965E+13 2.932505E+13 2.666440E+13 2.405558E+13 2.157528E+13 1.925758E+13
 1.095536E+13 7.243743E+12 4.787566E+12 3.161141E+12 2.325323E+12 1.364865E+12 8.395147E+11 5.150505E+11 3.245758E+11 1.493460E+11
 0.

GROUP 2 FLUX

0. 7.360373E+11 1.523548E+12 2.409395E+12 3.435927E+12 4.640546E+12 6.034331E+12 7.544212E+12 9.171439E+12 1.052193E+13
 1.102916E+13 1.143471E+13 1.242109E+13 1.378029E+13 1.520735E+13 1.676663E+13 1.836376E+13 1.997498E+13 2.158735E+13
 2.749495E+13 2.633421E+13 2.788554E+13 2.939184E+13 3.082415E+13 3.236003E+13 3.383198E+13 3.527925E+13 3.670716E+13
 3.501231E+13 4.086635E+13 4.290980E+13 4.351105E+13 4.482932E+13 4.610359E+13 4.735351E+13 4.857833E+13 4.977733E+13
 5.099537E+13 5.430498E+13 5.536460E+13 5.640372E+13 5.741055E+13 5.830783E+13 5.913953E+13 5.993530E+13 6.052246E+13
 6.193388E+13 6.281775E+13 6.361055E+13 6.437184E+13 6.510140E+13 6.580461E+13 6.646316E+13 6.709472E+13 6.769309E+13
 6.874858E+13 6.924556E+13 6.974891E+13 7.017936E+13 7.057367E+13 7.093463E+13 7.126107E+13 7.155282E+13 7.180972E+13
 7.211844E+13 7.237021E+13 7.248716E+13 7.253300E+13 7.251586E+13 7.262765E+13 7.266046E+13 7.264509E+13 7.245259E+13
 7.216045E+13 7.196251E+13 7.172944E+13 7.146162E+13 7.115914E+13 7.082218E+13 7.045953E+13 6.999599E+13 6.913312E+13
 6.852662E+13 6.800664E+13 6.751317E+13 6.693655E+13 6.626696E+13 6.559481E+13 6.489953E+13 6.415432E+13 6.339659E+13
 6.173424E+13 6.099603E+13 6.007015E+13 5.904575E+13 5.813474E+13 5.715442E+13 5.614513E+13 5.507925E+13 5.404276E+13
 5.183143E+13 5.068249E+13 4.951380E+13 4.815852E+13 4.709268E+13 4.584494E+13 4.457327E+13 4.327435E+13 4.196085E+13
 3.826659E+13 3.787651E+13 3.647765E+13 3.505597E+13 3.361529E+13 3.215454E+13 3.068030E+13 2.918769E+13 2.767958E+13
 2.462135E+13 2.303708E+13 2.143876E+13 1.983568E+13 1.823572E+13 1.664535E+13 1.510058E+13 1.363404E+13 1.233365E+13
 1.101982E+13 1.044767E+13 9.106751E+12 7.540755E+12 5.931808E+12 4.607853E+12 3.411725E+12 2.339143E+12 1.512819E+12 7.317462E+11
 0.

STUT FRONT TO REAR SCRAM TRANSIENT WITH SECOND ROD BANK ELAPSED TIME FROM START OF CASE 27.354 SEC

TIME STEP NO. 51 TIME .5001E+01 DELTA T = .1000E+00

REACTIVITY (TIME STEP 50) = .6647E-31

ROD WITHDRAWAL DISTANCE = 0.

RELATIVE POWER (TIME STEP 50) = .1434E+01

PEAK TO AVERAGE POWER (TIME STEP 50)

0. .3608E+00 .6436E+00 .9250E+00 .1151E+01 .1319E+01 .1421E+01 .1455E+01 .1418E+01 .1313E+01
 .1144E+01 .9171E+00 .6432E+00 .3372E+00 0.

IODINE CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

XENON CONCENTRATION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

INLET TEMPERATURE = .3950E+03

COOLANT TEMPERATURE

.3950E+03 .3974E+03 .4043E+03 .4150E+03 .4231E+03 .4456E+03 .4639E+03 .4828E+03 .5014E+03 .5187E+03
 .5339E+03 .5462E+03 .5548E+03 .5592E+03 .5592E+03

OUTLET TEMPERATURE = .5581E+03

FULL TEMPERATURE

.3950E+03 .4620E+03 .5270E+03 .5830E+03 .6445E+03 .6912E+03 .7260E+03 .7502E+03 .7555E+03
 .7370E+03 .7051E+03 .6605E+03 .6061E+03 .5417E+03

POINT(S) (I TO J)	REGIONS T-H/NUCL	DIFFUSION COEFFICIENTS		ABSORPTION CROSS SECTIONS		NU * SIGMA(FISS)		REMOVAL		TOTAL CROSS SECTIONS	
		GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2	GROUP 1	GROUP 2
3, 10	1/ 1	1480E+01	48310E+00	1230E-03	22090E-02	0.	0.	505E-02	5181E-02	22090E-02	5181E-02
10, 20	2/ 2	1940E+01	13041E+01	1635E-02	53850E-02	9833E-03	65148E-02	333E-02	4990E-02	53850E-02	4990E-02
20, 30	3/ 3	1876E+01	12986E+01	1777E-02	55398E-02	9833E-03	65278E-02	331E-02	5086E-02	55398E-02	5086E-02
30, 40	4/ 4	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65378E-02	329E-02	5169E-02	56706E-02	5169E-02
40, 50	5/ 5	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5180E-02	56866E-02	5180E-02
50, 60	6/ 6	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
60, 70	7/ 7	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
70, 80	8/ 8	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
80, 90	9/ 9	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
90, 100	10/ 10	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
100, 110	11/ 11	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
110, 120	12/ 12	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
120, 130	13/ 13	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
130, 140	14/ 14	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
140, 150	15/ 15	1872E+01	12907E+01	1897E-02	56706E-02	9933E-03	65398E-02	328E-02	5181E-02	56866E-02	5181E-02
TOTAL OF ALL REGIONS											

RHO=(-(C1*(A1*(F1) - (C2*(A2*(F2) - (SIG T1-NU SIG F1) *A1*F1 +((NU SIG F2)*A1*F2 -((SIG T2)*A2*F2 +((SIG R1)*A2*F1) /Q

Q=((NU SIG F1)*A1*F1 +((NU SIG F2)*A1*F2)

PO-H	AI*F1	AI*F2	A2*F1	A2*F2	AI*F1	AI*F2	A2*F1	A2*F2
0, 10	1/ 1	7.587201E+24	3.4700643E+24	5.4983505E+24	8.3959214E+24	1.1353967E+22	8.2623299E+21	1.1353967E+22
10, 20	2/ 2	2.2848231E+26	1.43731E+26	2.7234091E+26	1.7234020E+26	3.1749124E+22	1.8441540E+22	3.1749124E+22
20, 30	3/ 3	7.587201E+26	4.8323844E+26	9.4745616E+26	5.8580574E+26	2.3829862E+22	1.7765144E+22	2.3829862E+22
30, 40	4/ 4	1.5570152E+27	9.6224631E+26	1.8787572E+27	1.1611363E+27	1.6679179E+22	1.2398611E+22	1.6679179E+22
40, 50	5/ 5	3.3554273E+27	1.4445260E+27	3.8559386E+27	2.2930914E+27	3.9512880E+21	7.3745228E+21	3.9512880E+21
50, 60	6/ 6	3.3743314E+27	1.4445260E+27	3.8559386E+27	2.2930914E+27	3.9512880E+21	7.3745228E+21	3.9512880E+21
60, 70	7/ 7	3.5513156E+27	2.2038046E+27	4.2912553E+27	2.6514839E+27	1.2997654E+21	9.6742325E+20	1.2997654E+21
70, 80	8/ 8	3.7249664E+27	2.3343644E+27	4.4922886E+27	2.7766758E+27	1.0283934E+20	7.6531938E+19	1.0283934E+20
80, 90	9/ 9	3.9327995E+27	2.1955017E+27	4.7409804E+27	2.6454983E+27	1.3551778E+21	1.0088635E+21	1.3551778E+21
90, 100	10/ 10	3.9500175E+27	1.4940470E+27	4.9323171E+27	2.8231311E+27	4.8407409E+21	3.6037618E+21	4.8407409E+21
100, 110	11/ 11	2.8338237E+27	1.4547054E+27	3.8367561E+27	1.7530706E+27	9.9926504E+21	7.4059025E+21	9.9926504E+21
110, 120	12/ 12	1.5418398E+27	3.5809774E+26	1.8623828E+27	1.1512518E+27	1.6629446E+22	1.2361379E+22	1.6629446E+22
120, 130	13/ 13	7.7741868E+26	4.547153E+26	3.8211405E+26	5.7985288E+26	2.3650107E+22	1.7631357E+22	5.7985288E+26
130, 140	14/ 14	2.2448837E+26	1.4220419E+26	2.6447136E+26	1.7050919E+26	3.1468459E+22	1.8551867E+22	1.7050919E+26
140, 150	15/ 15	5.0150315E+24	9.7612565E+24	5.4355466E+24	9.3050539E+24	1.1231412E+22	8.1727037E+21	5.4355466E+24

TOTAL OF ALL REGIONS 2.5839127E+28 1.6604774E+28 3.2342059E+28 2.0049457E+28 1.9885569E+28 1.3806826E+28

PT	DEL X	OIST	FLUX GR1	FLUX GR2	ADJ GR1	ADJ GR2	POMD	POW3	FCW1
1	0.000	0.	0.	0.	3.8739E+01	1.2011E+01	0.	0.	
2	7.036	2.0350E+00	2.0195E+10	1.0528E+11	2.0501E+09	1.0522E+09	0.	0.	
3	7.036	1.4072E+01	4.3889E+10	2.0719E+11	4.2917E+09	2.3292E+09	0.	0.	
4	7.036	2.1108E+01	7.5141E+10	3.6218E+11	6.8731E+09	3.8583E+09	0.	0.	
5	7.036	2.8144E+01	1.1943E+11	4.6596E+11	9.9295E+09	5.5762E+09	0.	0.	
6	7.036	3.5180E+01	1.6443E+11	6.5243E+11	1.3450E+10	6.5386E+09	0.	0.	
7	7.036	4.2216E+01	2.0182E+11	8.4341E+11	1.6647E+10	1.2496E+10	0.	0.	
8	7.036	4.9252E+01	2.4270E+11	1.0336E+12	2.4460E+10	1.7936E+10	0.	0.	
9	7.036	5.6288E+01	2.8667E+11	1.2652E+12	3.1696E+10	2.5643E+10	0.	0.	
10	7.036	6.3324E+01	3.2923E+11	1.4434E+12	3.9985E+10	3.6611E+10	0.	0.	
11	7.036	7.0360E+01	3.7168E+11	1.6180E+12	4.8276E+10	4.3661E+10	0.	0.	
12	7.036	7.7396E+01	4.1413E+11	1.7925E+12	5.6565E+10	5.2212E+10	0.	0.	
13	7.036	8.4432E+01	4.5658E+11	1.9682E+12	6.4859E+10	6.0762E+10	0.	0.	
14	7.036	9.1468E+01	4.9903E+11	2.1441E+12	7.3153E+10	6.8865E+10	0.	0.	
15	7.036	9.8504E+01	5.4148E+11	2.3199E+12	8.1447E+10	7.6968E+10	0.	0.	
16	7.036	1.0554E+02	5.8393E+11	2.4958E+12	8.9741E+10	8.5072E+10	0.	0.	
17	7.036	1.1258E+02	6.2638E+11	2.6717E+12	9.8034E+10	9.3176E+10	0.	0.	
18	7.036	1.1962E+02	6.6883E+11	2.8476E+12	1.0632E+11	1.0129E+11	0.	0.	
19	7.036	1.2666E+02	7.1128E+11	3.0235E+12	1.1459E+11	1.0948E+11	0.	0.	
20	7.036	1.3370E+02	7.5373E+11	3.2000E+12	1.2286E+11	1.1767E+11	0.	0.	
21	7.036	1.4074E+02	7.9620E+11	3.3761E+12	1.3113E+11	1.2586E+11	0.	0.	
22	7.036	1.4778E+02	8.3867E+11	3.5458E+12	1.3940E+11	1.3405E+11	0.	0.	
23	7.036	1.5482E+02	8.8114E+11	3.7155E+12	1.4767E+11	1.4224E+11	0.	0.	
24	7.036	1.6186E+02	9.2361E+11	3.8852E+12	1.5594E+11	1.5043E+11	0.	0.	
25	7.036	1.6890E+02	9.6608E+11	4.0549E+12	1.6421E+11	1.5862E+11	0.	0.	
26	7.036	1.7594E+02	1.0085E+12	4.2246E+12	1.7248E+11	1.6681E+11	0.	0.	
27	7.036	1.8298E+02	1.0512E+12	4.3943E+12	1.8075E+11	1.7500E+11	0.	0.	
28	7.036	1.8992E+02	1.0939E+12	4.5640E+12	1.8902E+11	1.8319E+11	0.	0.	
29	7.036	1.9696E+02	1.1366E+12	4.7337E+12	1.9729E+11	1.9138E+11	0.	0.	
30	7.036	2.0399E+02	1.1793E+12	4.9034E+12	2.0556E+11	1.9957E+11	0.	0.	
31	7.036	2.1103E+02	1.2220E+12	5.0731E+12	2.1383E+11	2.0776E+11	0.	0.	
32	7.036	2.1807E+02	1.2647E+12	5.2428E+12	2.2210E+11	2.1595E+11	0.	0.	
33	7.036	2.2511E+02	1.3073E+12	5.4125E+12	2.3037E+11	2.2414E+11	0.	0.	
34	7.036	2.3215E+02	1.3500E+12	5.5822E+12	2.3864E+11	2.3233E+11	0.	0.	
35	7.036	2.3919E+02	1.3926E+12	5.7519E+12	2.4691E+11	2.4052E+11	0.	0.	
36	7.036	2.4623E+02	1.4352E+12	5.9216E+12	2.5518E+11	2.4871E+11	0.	0.	
37	7.036	2.5327E+02	1.4778E+12	6.0913E+12	2.6345E+11	2.5690E+11	0.	0.	
38	7.036	2.6031E+02	1.5204E+12	6.2610E+12	2.7172E+11	2.6509E+11	0.	0.	
39	7.036	2.6735E+02	1.5630E+12	6.4307E+12	2.7999E+11	2.7328E+11	0.	0.	
40	7.036	2.7439E+02	1.6056E+12	6.6004E+12	2.8826E+11	2.8147E+11	0.	0.	
41	7.036	2.8143E+02	1.6482E+12	6.7701E+12	2.9653E+11	2.8966E+11	0.	0.	
42	7.036	2.8847E+02	1.6908E+12	6.9398E+12	3.0480E+11	2.9785E+11	0.	0.	
43	7.036	2.9551E+02	1.7334E+12	7.1095E+12	3.1307E+11	3.0604E+11	0.	0.	
44	7.036	3.0255E+02	1.7760E+12	7.2792E+12	3.2134E+11	3.1423E+11	0.	0.	
45	7.036	3.0959E+02	1.8186E+12	7.4489E+12	3.2961E+11	3.2242E+11	0.	0.	
46	7.036	3.1663E+02	1.8612E+12	7.6186E+12	3.3788E+11	3.3061E+11	0.	0.	
47	7.036	3.2367E+02	1.9038E+12	7.7883E+12	3.4615E+11	3.3880E+11	0.	0.	
48	7.036	3.3071E+02	1.9464E+12	7.9580E+12	3.5442E+11	3.4699E+11	0.	0.	
49	7.036	3.3775E+02	1.9890E+12	8.1277E+12	3.6269E+11	3.5518E+11	0.	0.	
50	7.036	3.4479E+02	2.0316E+12	8.2974E+12	3.7096E+11	3.6337E+11	0.	0.	

50	9.128	3.8938E+02	6.8322E+12	4.0911E+12	3.3442E+11	4.0297E+11	3.3403E+11	1.0041E-01	1.5336E+13
51	4.128	3.9751E+02	6.9105E+12	4.1337E+12	3.3879E+11	4.0884E+11	3.3838E+11	1.0015E-01	
52	9.128	4.0564E+02	6.9903E+12	4.1759E+12	3.4301E+11	4.1382E+11	3.4259E+11	9.9925E-02	
53	4.128	4.1377E+02	7.0487E+12	4.2164E+12	3.4730E+11	4.1821E+11	3.4663E+11	9.9726E-02	
54	3.128	4.2199E+02	7.1153E+12	4.2562E+12	3.5075E+11	4.2290E+11	3.5052E+11	9.9552E-02	
55	8.128	4.3002E+02	7.1810E+12	4.2949E+12	3.5473E+11	4.2741E+11	3.5425E+11	9.9401E-02	
56	8.128	4.3815E+02	7.2426E+12	4.3324E+12	3.5824E+11	4.3172E+11	3.5781E+11	9.9268E-02	
57	8.128	4.4628E+02	7.3029E+12	4.3684E+12	3.6169E+11	4.3581E+11	3.6121E+11	9.9153E-02	
58	9.128	4.5441E+02	7.3607E+12	4.4030E+12	3.6444E+11	4.3974E+11	3.6444E+11	9.9052E-02	
59	3.128	4.6253E+02	7.4150E+12	4.4361E+12	3.6702E+11	4.4345E+11	3.6751E+11	9.8931E-02	
60	4.128	4.7066E+02	7.4685E+12	4.4676E+12	3.7033E+11	4.4635E+11	3.7041E+11	9.8844E-02	
61	8.128	4.7880E+02	7.5219E+12	4.5000E+12	3.7303E+11	4.4958E+11	3.7304E+11	9.8744E-02	
62	9.128	4.8693E+02	7.5752E+12	4.5315E+12	3.7573E+11	4.5273E+11	3.7570E+11	9.8644E-02	
63	8.128	4.9506E+02	7.6285E+12	4.5621E+12	3.7843E+11	4.5584E+11	3.7809E+11	9.8544E-02	
64	8.128	5.0319E+02	7.6818E+12	4.5928E+12	3.8113E+11	4.5892E+11	3.8035E+11	9.8444E-02	
65	8.128	5.1132E+02	7.7351E+12	4.6234E+12	3.8383E+11	4.6199E+11	3.8334E+11	9.8344E-02	
66	8.128	5.1945E+02	7.7884E+12	4.6540E+12	3.8653E+11	4.6506E+11	3.8621E+11	9.8244E-02	
67	9.128	5.2758E+02	7.8417E+12	4.6846E+12	3.8923E+11	4.6813E+11	3.8920E+11	9.8144E-02	
68	8.128	5.3571E+02	7.8950E+12	4.7152E+12	3.9193E+11	4.7120E+11	3.9190E+11	9.8044E-02	
69	8.128	5.4384E+02	7.9483E+12	4.7458E+12	3.9463E+11	4.7427E+11	3.9460E+11	9.7944E-02	
70	8.128	5.5197E+02	8.0016E+12	4.7764E+12	3.9733E+11	4.7732E+11	3.9730E+11	9.7844E-02	
71	8.128	5.6010E+02	8.0549E+12	4.8069E+12	3.9993E+11	4.8042E+11	3.9990E+11	9.7744E-02	
72	9.128	5.6823E+02	8.1082E+12	4.8375E+12	4.0263E+11	4.8320E+11	4.0260E+11	9.7644E-02	
73	8.128	5.7636E+02	8.1615E+12	4.8680E+12	4.0533E+11	4.8627E+11	4.0530E+11	9.7544E-02	
74	8.128	5.8449E+02	8.2148E+12	4.8986E+12	4.0803E+11	4.8930E+11	4.0800E+11	9.7444E-02	
75	8.128	5.9262E+02	8.2681E+12	4.9291E+12	4.1073E+11	4.9217E+11	4.1070E+11	9.7344E-02	
76	8.128	6.0075E+02	8.3214E+12	4.9597E+12	4.1343E+11	4.9487E+11	4.1340E+11	9.7244E-02	
77	9.128	6.0888E+02	8.3747E+12	4.9902E+12	4.1613E+11	4.9846E+11	4.1610E+11	9.7144E-02	
78	8.128	6.1701E+02	8.4280E+12	5.0208E+12	4.1883E+11	5.0126E+11	4.1880E+11	9.7044E-02	
79	8.128	6.2514E+02	8.4813E+12	5.0513E+12	4.2153E+11	5.0431E+11	4.2150E+11	9.6944E-02	
80	8.128	6.3327E+02	8.5346E+12	5.0818E+12	4.2423E+11	5.0736E+11	4.2420E+11	9.6844E-02	
81	8.128	6.4140E+02	8.5879E+12	5.1123E+12	4.2693E+11	5.1041E+11	4.2690E+11	9.6744E-02	
82	9.128	6.4953E+02	8.6412E+12	5.1428E+12	4.2963E+11	5.1346E+11	4.2960E+11	9.6644E-02	
83	8.128	6.5766E+02	8.6945E+12	5.1733E+12	4.3233E+11	5.1651E+11	4.3230E+11	9.6544E-02	
84	8.128	6.6579E+02	8.7478E+12	5.2038E+12	4.3503E+11	5.1956E+11	4.3500E+11	9.6444E-02	
85	8.128	6.7392E+02	8.8011E+12	5.2343E+12	4.3773E+11	5.2261E+11	4.3770E+11	9.6344E-02	
86	8.128	6.8205E+02	8.8544E+12	5.2648E+12	4.4043E+11	5.2566E+11	4.4040E+11	9.6244E-02	
87	9.128	6.9018E+02	8.9077E+12	5.2953E+12	4.4313E+11	5.2871E+11	4.4310E+11	9.6144E-02	
88	8.128	6.9831E+02	8.9610E+12	5.3258E+12	4.4583E+11	5.3176E+11	4.4580E+11	9.6044E-02	
89	8.128	7.0644E+02	9.0143E+12	5.3563E+12	4.4853E+11	5.3481E+11	4.4850E+11	9.5944E-02	
90	8.128	7.1457E+02	9.0676E+12	5.3868E+12	4.5123E+11	5.3786E+11	4.5120E+11	9.5844E-02	
91	8.128	7.2270E+02	9.1209E+12	5.4173E+12	4.5393E+11	5.4091E+11	4.5390E+11	9.5744E-02	
92	9.128	7.3083E+02	9.1742E+12	5.4478E+12	4.5663E+11	5.4396E+11	4.5660E+11	9.5644E-02	
93	8.128	7.3896E+02	9.2275E+12	5.4783E+12	4.5933E+11	5.4701E+11	4.5930E+11	9.5544E-02	
94	8.128	7.4709E+02	9.2808E+12	5.5088E+12	4.6203E+11	5.5006E+11	4.6200E+11	9.5444E-02	
95	8.128	7.5522E+02	9.3341E+12	5.5393E+12	4.6473E+11	5.5311E+11	4.6470E+11	9.5344E-02	
96	8.128	7.6335E+02	9.3874E+12	5.5698E+12	4.6743E+11	5.5616E+11	4.6740E+11	9.5244E-02	
97	9.128	7.7148E+02	9.4407E+12	5.6003E+12	4.7013E+11	5.5921E+11	4.7010E+11	9.5144E-02	
98	8.128	7.7961E+02	9.4940E+12	5.6308E+12	4.7283E+11	5.6226E+11	4.7280E+11	9.5044E-02	
99	8.128	7.8774E+02	9.5473E+12	5.6613E+12	4.7553E+11	5.6531E+11	4.7550E+11	9.4944E-02	
100	8.128	7.9587E+02	9.6006E+12	5.6918E+12	4.7823E+11	5.6836E+11	4.7820E+11	9.4844E-02	

100	8.128	7.9578E+02	6.9547E+12	4.1596E+12	3.4301E+11	4.1332E+11	3.4259E+11	9.9504E-02	1.7486E+13
101	8.128	8.0391E+02	6.8840E+12	4.1174E+12	3.373E+11	4.0885E+11	3.388E+11	9.9761E-02	
102	8.128	8.1204E+02	6.8121E+12	4.0743E+12	3.3442E+11	4.0297E+11	3.3402E+11	1.0001E-01	
103	8.128	8.2017E+02	6.7390E+12	4.0306E+12	3.2990E+11	3.9782E+11	3.2951E+11	1.0029E-01	
104	8.128	8.2829E+02	6.6652E+12	3.9884E+12	3.2522E+11	3.9188E+11	3.2485E+11	1.0061E-01	
105	8.128	8.3642E+02	6.5934E+12	3.9443E+12	3.233E+11	3.8607E+11	3.2004E+11	1.0099E-01	
106	8.128	8.4455E+02	6.5162E+12	3.8974E+12	3.1924E+11	3.8009E+11	3.1508E+11	1.0142E-01	
107	8.128	8.5268E+02	6.4419E+12	3.8510E+12	3.1505E+11	3.7332E+11	3.0997E+11	1.0191E-01	
108	8.128	8.6081E+02	6.3681E+12	3.8090E+12	3.1033E+11	3.6759E+11	3.0473E+11	1.0244E-01	
109	8.128	8.6894E+02	6.2922E+12	3.7669E+12	3.0621E+11	3.6111E+11	2.935E+11	1.0314E-01	
110	8.128	8.7707E+02	6.2216E+12	3.7243E+12	2.9856E+11	3.5447E+11	2.9385E+11	1.0390E-01	
***** END OF NUCLEAR REGION NO. 5 AND THERMAL HYD REGION NO.11 *****									
110	8.128	8.7707E+02	6.2236E+12	3.7240E+12	2.9456E+11	3.5447E+11	2.9385E+11	1.0390E-01	1.5232E+13
111	8.128	8.8519E+02	6.1537E+12	3.6839E+12	2.835E+11	3.4715E+11	2.8823E+11	1.0472E-01	
112	8.128	8.9332E+02	6.0846E+12	3.6432E+12	2.824E+11	3.4075E+11	2.8244E+11	1.0571E-01	
113	8.128	9.0145E+02	6.0156E+12	3.6039E+12	2.7643E+11	3.3393E+11	2.7644E+11	1.0690E-01	
114	8.128	9.0957E+02	5.9471E+12	3.5634E+12	2.7214E+11	3.2695E+11	2.7025E+11	1.0802E-01	
115	8.128	9.1770E+02	5.8793E+12	3.5235E+12	2.6383E+11	3.1834E+11	2.6386E+11	1.0939E-01	
116	8.128	9.2583E+02	5.8142E+12	3.4838E+12	2.5722E+11	3.1031E+11	2.5729E+11	1.1095E-01	
117	8.128	9.3396E+02	5.7512E+12	3.4439E+12	2.5067E+11	3.0227E+11	2.5354E+11	1.1273E-01	
118	8.128	9.4209E+02	5.6844E+12	3.4136E+12	2.4455E+11	2.9392E+11	2.4362E+11	1.1477E-01	
119	8.128	9.5021E+02	5.6153E+12	3.3830E+12	2.3846E+11	2.8537E+11	2.3653E+11	1.1712E-01	
120	8.128	9.5834E+02	5.5434E+12	3.3525E+12	2.3222E+11	2.7663E+11	2.2929E+11	1.1987E-01	
***** END OF NUCLEAR REGION NO. 6 AND THERMAL HYD REGION NO.12 *****									
120	8.128	9.5834E+02	5.5434E+12	3.3525E+12	2.3222E+11	2.7663E+11	2.2929E+11	1.1987E-01	1.2216E+13
121	8.128	9.6647E+02	5.4753E+12	3.3139E+12	2.2611E+11	2.6769E+11	2.2189E+11	1.2293E-01	
122	8.128	9.7460E+02	5.4072E+12	3.2748E+12	2.1926E+11	2.5858E+11	2.1633E+11	1.2638E-01	
123	8.128	9.8273E+02	5.3474E+12	3.2350E+12	2.1265E+11	2.4939E+11	2.0863E+11	1.2971E-01	
124	8.128	9.9086E+02	5.2891E+12	3.1945E+12	2.0622E+11	2.3981E+11	1.9879E+11	1.3298E-01	
125	8.128	9.9899E+02	5.2304E+12	3.1544E+12	1.9975E+11	2.3021E+11	1.9882E+11	1.3625E-01	
126	8.128	1.0071E+03	5.1742E+12	3.1146E+12	1.9359E+11	2.2043E+11	1.8715E+11	1.3957E-01	
127	8.128	1.0152E+03	5.1151E+12	3.0752E+12	1.8742E+11	2.1069E+11	1.7448E+11	1.4299E-01	
128	8.128	1.0233E+03	5.0533E+12	3.0359E+12	1.8127E+11	2.0082E+11	1.6513E+11	1.4659E-01	
129	8.128	1.0314E+03	4.9913E+12	2.9964E+12	1.7501E+11	1.9021E+11	1.5767E+11	1.5044E-01	
130	8.128	1.0395E+03	4.9284E+12	2.9565E+12	1.6874E+11	1.7987E+11	1.4910E+11	1.5466E-01	
***** END OF NUCLEAR REGION NO. 7 AND THERMAL HYD REGION NO.13 *****									
130	8.128	1.0395E+03	4.9284E+12	2.9565E+12	1.6874E+11	1.7987E+11	1.4910E+11	1.5466E-01	8.5677E+12
131	8.128	1.0477E+03	4.8645E+12	2.9167E+12	1.6250E+11	1.6973E+11	1.4310E+11	1.5866E-01	
132	8.128	1.0558E+03	4.7992E+12	2.8749E+12	1.5637E+11	1.5950E+11	1.4044E+11	1.5896E-01	
133	8.128	1.0640E+03	4.7349E+12	2.8331E+12	1.5024E+11	1.4925E+11	1.3148E+11	1.5938E-01	
134	8.128	1.0721E+03	4.6706E+12	2.7912E+12	1.4411E+11	1.3893E+11	1.2241E+11	1.6043E-01	
135	8.128	1.0803E+03	4.6063E+12	2.7494E+12	1.3800E+11	1.2864E+11	1.1329E+11	1.7252E-01	
136	8.128	1.0884E+03	4.5420E+12	2.7076E+12	1.3185E+11	1.1834E+11	1.0415E+11	1.7625E-01	
137	8.128	1.0965E+03	4.4777E+12	2.6658E+12	1.2572E+11	1.0799E+11	9.5031E+10	1.7964E-01	
138	8.128	1.1046E+03	4.4134E+12	2.6240E+12	1.1959E+11	9.7115E+10	8.6335E+10	1.8270E-01	
139	8.128	1.1127E+03	4.3491E+12	2.5822E+12	1.1344E+11	8.7185E+10	7.7344E+10	1.8547E-01	
140	8.128	1.1208E+03	4.2848E+12	2.5404E+12	1.0729E+11	7.8655E+10	6.9265E+10	1.8732E-01	
***** END OF NUCLEAR REGION NO. 8 AND THERMAL HYD REGION NO.14 *****									
140	8.128	1.1208E+03	4.2848E+12	2.5404E+12	1.0729E+11	7.8655E+10	6.9265E+10	1.8732E-01	4.6030E+12
141	8.128	1.1289E+03	4.2205E+12	2.4986E+12	1.0114E+11	6.9721E+10	6.2335E+10	1.9004E-01	
142	8.128	1.1370E+03	4.1562E+12	2.4568E+12	9.5073E+10	6.0722E+10	5.2225E+10	0.	
143	8.128	1.1451E+03	4.0919E+12	2.4149E+12	8.9017E+10	5.1611E+10	0.	0.	
144	8.128	1.1532E+03	4.0276E+12	2.3731E+12	8.2960E+10	4.2509E+10	0.	0.	
145	8.128	1.1613E+03	3.9633E+12	2.3313E+12	7.6904E+10	3.3405E+10	0.	0.	
146	8.128	1.1694E+03	3.8990E+12	2.2894E+12	7.0847E+10	2.4300E+10	0.	0.	
147	8.128	1.1775E+03	3.8347E+12	2.2476E+12	6.4790E+10	1.5191E+10	0.	0.	
148	8.128	1.1856E+03	3.7704E+12	2.2057E+12	5.8733E+10	6.2822E+09	0.	0.	
149	8.128	1.1937E+03	3.7061E+12	2.1638E+12	5.2676E+10	3.6583E+09	0.	0.	
150	8.128	1.2018E+03	3.6418E+12	2.1219E+12	4.6619E+10	2.3242E+09	0.	0.	
***** END OF NUCLEAR REGION NO. 9 AND THERMAL HYD REGION NO.15 *****									
150	8.128	1.2018E+03	3.6418E+12	2.1219E+12	4.6619E+10	2.3242E+09	0.	0.	
151	8.128	1.2099E+03	3.5775E+12	2.0800E+12	4.0561E+10	1.4922E+09	0.	0.	
152	8.128	1.2180E+03	3.5132E+12	2.0381E+12	3.4503E+10	1.2011E+09	0.	0.

2000

0.	1.057752E+11	3.421584E+11	4.855556E+11	6.528307E+11	8.436143E+11	1.053608E+12	1.265151E+12	1.440387E+12
1.	1.508490E+12	1.659894E+12	1.800017E+12	1.952788E+12	2.126506E+12	2.430033E+12	2.561869E+12	2.676250E+12
2.	2.855661E+12	2.930871E+12	3.038428E+12	3.181360E+12	3.349819E+12	3.293897E+12	3.341139E+12	3.411239E+12
3.	3.361778E+12	3.379523E+12	3.435160E+12	3.465393E+12	3.505499E+12	3.584477E+12	3.624367E+12	3.664482E+12
4.	3.703771E+12	3.743455E+12	3.827595E+12	3.871608E+12	3.915566E+12	4.003545E+12	4.091058E+12	4.091058E+12
5.	4.133651E+12	4.178457E+12	4.265316E+12	4.298420E+12	4.333357E+12	4.368428E+12	4.436119E+12	4.467579E+12
6.	4.133651E+12	4.178457E+12	4.265316E+12	4.298420E+12	4.333357E+12	4.368428E+12	4.436119E+12	4.467579E+12
7.	4.694186E+12	4.707872E+12	4.741431E+12	4.771733E+12	4.717987E+12	4.711657E+12	4.707577E+12	4.699396E+12
8.	4.694186E+12	4.707872E+12	4.741431E+12	4.771733E+12	4.717987E+12	4.711657E+12	4.707577E+12	4.699396E+12
9.	4.488512E+12	4.476709E+12	4.420418E+12	4.390351E+12	4.319543E+12	4.261369E+12	4.201013E+12	4.159933E+12
10.	4.111736E+12	4.107630E+12	4.030536E+12	3.941512E+12	3.897357E+12	3.809635E+12	3.765876E+12	3.732395E+12
11.	3.681865E+12	3.644281E+12	3.603930E+12	3.563346E+12	3.498102E+12	3.447893E+12	3.383000E+12	3.357540E+12
12.	3.339344E+12	3.318774E+12	3.284973E+12	3.240619E+12	3.212553E+12	3.195924E+12	3.209339E+12	3.282955E+12
13.	2.473412E+12	2.465510E+12	2.502447E+12	2.411310E+12	2.366289E+12	2.176061E+12	1.638016E+12	1.526340E+12
14.	1.493144E+12	1.425127E+12	1.255247E+12	1.045346E+12	8.371132E+11	6.476889E+11	5.154708E+11	1.044416E+11

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