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Westinghouse Astronuclear Laboratory

NUCLEAR HEATING MEASUREMENT IN THE PLUM BROOK REACTOR (RE-4)

MASTER

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ABSTRACT

An aluminum pedestal type calorimeter was used to measure nuclear heat generation rates in HT-1 (Horizontal Through Hole No. 1) of the Plum Brook Reactor Facility. The nuclear heating rate on the HT-1 axis at the core North-South vertical midplane averaged 3.73 watts/gm over the eight days that it was measured with a maximum of 3.78 watts/gm, when the reactor control rod bank position was near 23 inches. The nuclear heating measurement at this location is shown to be accurate to ±7.5% at the 95% confidence level.

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1.0 INTRODUCTION

Materials and instrument transducers are to be irradiated at cryogenic temperatures in a test capsule (Figure 1) in the Plum Brook Reactor Facility in support of the NERVA (Nuclear Engine for Rocket Vehicle Application) program. It is important to duplicate, with a high level of confidence, both the fast neutron flux and the nuclear radiation heating that these transducers experience in NERVA environments. The current prediction of radiation heating in this test region is accurate to ±22% at the 95% confidence limit (Reference 10). A knowledge of the radiation heating should be more accurate than this to provide the optimum relationship between test program and definition of limits for application. These measurements make use of aluminum cylindrical calorimeters; the basic design was previously used successfully (References 1-3).

The calorimeter shown in Figure 2 consisting of three aluminum cylinders was used to measure nuclear heating rates on nine different days in the 65-P cycle along the HT-1 axis and along the line perpendicular to the core vertical surface intersecting the HT-1 axis as shown in Figure 1.

2.0 SUMMARY

Average values of nuclear heating rate at the core North-South vertical midplane are 4.94, 3.73, and 3.12 watts/gm for the near, middle, and far calorimeter cylinders, respectively at 60 MW reactor power. The middle cylinder is on the HT-1 axis, while the near and far cylinders are 2.5 inches toward and away from the core, respectively. Maximum values of the above heating rates at 60 MW are 5.00, 3.78, and 3.15 watts/gm for the near, middle, and far calorimeter cylinders, respectively. This maximum point occurs at approximately the 23 inch rod bank position. The accuracy of these measurements of heating rate in pure aluminum are ±6.2, ±7.5, and ±8.1% at the full-in position for the near, middle, and far cylinders, respectively, at the 95% confidence level. The full-in position is defined as the calorimeter position when the center of the aluminum cylinders are in the core North-South vertical midplane. Plots of nuclear heating rate as a function of distance along the HT-1 axis, distance along the axis perpendicular to the core vertical surface, and rod bank position are given in Figures 7-12. A plot of calorimeter accuracy as a function of heating rate is given in Figure 6. The accuracy of all measurements between 0 and 14.5 inches from full-in is ±10% or better at the 95% confidence level.

3.0 DESCRIPTION OF CALORIMETER AND EXPERIMENT

3.1 Calorimeter Description

The calorimeter used for these nuclear heating measurements consists of 3 aluminum cylinders (99.995% pure) as shown in Figure 2. One end of each cylinder is connected to a cover plate, the right side of which is maintained near cooling water temperature. The remaining surfaces of each cylinder are exposed to air at 1 mm of Hg pressure maintained inside the calorimeter container. The outer surface of the cover plate and calorimeter container are cooled with nominal 65 gpm, 130°F Plum Brook Reactor cooling water, which is directed past the assembly by a shroud. As a steady state gamma heating takes place in the cylinders, they develop a steady state temperature distribution with the hottest point at the end of the cylinder inside the container and the coldest point toward the wetted surface of the cover plate.

The nuclear heating rate is a function of cylinder ΔT measured by 4 chromel-alumel thermocouples attached to each cylinder as shown in Figure 2 with the thermocouple identification number. The midpoint between the two sets of thermocouples is located at the core North-South vertical midplane, when the W2-3 capsule is inserted to the full-in position. The calorimeter assembly, which includes the cylinders, thermocouples, cover plate, and container, was designed and fabricated by the Idaho Nuclear Corporation (References 1-3).

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3.1 (Cont'd)

More detail on the calorimeter assembly is found in Idaho Nuclear Corporation Drawings, Reference 4. More detail on the shroud and W2-3 capsule designed and fabricated by Westinghouse Astronuclear Laboratory is found in Reference 5.

3.2 Description of Test

The objective is to define the nuclear heating spatial distribution in HT-1 where experimental assemblies will be irradiated. This is shown in Figure 1. Specimens will usually be near the core North-South vertical midplane. The W2-3 capsule can be moved to any position between full-in and completely withdrawn. The spatial heating distribution was obtained along the HT-1 axis by taking measurements at the following distances from the full-in position: 0, 1, 3, 5, 8.5, 12, 13, 13.5, 14, 14.5, 15, 15.5, 16, 18, 20, 25, 30, 40, and 45 inches from the full-in position, the density of points increasing near 13.5 inches, the core boundary. The spatial heating distribution was obtained along a horizontal line perpendicular to the core vertical surface and intersecting the HT-1 axis by the use of three aluminum cylinders each separated by 2.5 inches in the horizontal plane containing the HT-1 axis. The above measurements were made on nine different days in the 65-P cycle, recording data described in Section 4.0 in each case.

3.2 (Cont'd)

The contribution of background radiation to total nuclear heating was determined by inserting the calorimeter assembly to the full-in position after shutdown.

4.0 DATA ACQUISITION

The data obtained in this experiment at each calorimeter position along the HT-1 axis are: date, time, reactor power (MW), time integrated power (MWD), core inlet and outlet temperatures, shim rod bank positions, regulator rod positions, temperatures of the 12 calorimeter thermocouples, the average temperature of each of the 12 calorimeter thermocouples during the period the calorimeter remained in a given position, the standard deviation of each calorimeter thermocouple temperature, the temperature of the calorimeter container, HT-1 water flow, the calorimeter container air pressure, and the calorimeter distance from full-in position. The PBRF Experiment Data Logger Acquisition System (EDLAS) recorded all the above data except the calorimeter container air pressure, one of the four calorimeter container thermocouples, and the calorimeter distance from full-in position. These three parameters were recorded in the Experiment Control Room (XCR), however.

The data logger (EDLAS) prints out data once every minute or on demand. Typical data logger printout is shown in APPENDIX A for each calorimeter position on September 13, 1967. The first column on the left is the date; the fourth column from the left (neglecting the column containing BA and that containing T) is the time; the fifth and sixth columns from the left contain the time integrated power and the power, respectively. These columns are numbered 29 and 30 as

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4.0 (Cont'd)

indicated by the number directly above the column. The columns to the right of these are numbered 32 through 85 as shown. Directly above the column number is a description of the parameter in that column and in some cases an indication of where the decimal point is to be placed. For example, 10-2 means multiply the value in that column by 10^{-2} or put the decimal point two places to the left. If there is no such indication in the column heading, the decimal point is immediately to the right of the last digit on the right. There is one exception to this in column 61, HT-1 flow. Here the value should be multiplied by 10^{-1}. Table 1 gives an explanation of each column with units. It should be noted that column 59, HT-1 inlet temperature, is really HT-1 outlet temperature and column 60, HT-1 outlet temperature is really HT-1 inlet temperature. A row is skipped between the data associated with each calorimeter position.

The following data were taken by Plum Brook WANL Test Operations personnel at each calorimeter position: reactor power, control rod bank position, calorimeter container air pressure, date, time, calorimeter distance from full-in position, HT-1 flow and temperatures, and one thermocouple on the calorimeter container. The calorimeter position (distance from full-in) was recorded beside the applicable data logger printout.

5.0 ANALYTICAL TECHNIQUES

The TOSS heat transfer code is used to describe the equilibrium temperature distribution in the cover plate and calorimeter cylinders, so that an accurate proportionality can be obtained between cylinder ΔT and heating rate using a calculation that includes heat loss from cylinders by radiation and convection. A computer program was written to reduce the raw data and calculate nuclear heating from it. A set of criteria are discussed and used accepting only the reliable temperature data. The accuracy of this calorimeter is calculated and given as a function of nuclear heating rate. The nuclear heating rates normalized to 60 MW are fitted to equations describing the spatial distribution using a linear regression computer program.

5.1 TOSS Model

For the TOSS computer model (Reference 6) the calorimeter cylinder, cover plate, and fins are divided into 42 internal nodes (small volume elements), surface nodes associated with some of these internal nodes, and two boundary nodes 2001 and 2002 as shown in Figure 3. The computer calculates the steady state internal and surface temperatures of each node. The thermocouples are in nodes 4 and 10. Heat transfer is considered by conduction between nodes, from each of nodes 1-12 to the wall of the calorimeter container by convection and radiation, and from nodes 42, 50-62, 71, 73, 75, and 77 to the cooling water by forced convection.

5.1 (Cont'd)

Node 2001 is a boundary node that has the temperature of the inside wall of the calorimeter container (Figures 2 and 3). Node 2002 is a boundary node that has the bulk temperature of Plum Brook Reactor cooling water passing through HT-1 and incident on the fins and cover plate. All nodes are given cylindrical symmetry with the axis of the center calorimeter. Thus, nodes 1-13, 21, and 50 are cylinders, while nodes 32-42, 51-62, 71, 73, 75, and 77 are cylindrical shells. Nodes 74, 73, 75, and 77 represent the fins, which are not in reality cylindrical shells but flat plates. Node 21 is a 2 mil thick air space to represent an interface between the end of the calorimeter cylinder and the bottom of the hole in the cover plate where the cylinder is inserted. The dimensions of each node are given in Table II. Cases are run for 7, 6, 5, 3, 1, and 0.2 watts/gram to obtain a relationship between heat generation rate and ΔT across the calorimeter, which is the difference between node 4 and node 10 temperatures.

The input to TOC for each case consists of specifying a heat generation rate for each internal node, fixed boundary temperatures for boundary nodes 2001 and 2002, heat capacity and thermal conductivity of the aluminum and air (node 21), node dimensions with realistic lengths and areas for heat transfer, heat transfer coefficients for radiation or forced or free convection, and an estimate of the initial internal and surface node temperatures. The heat generation rate, which is

5.1 (Cont'd)

the same for all internal nodes except node 21 (which has essentially no heat generation rate), takes on values of 7, 6, 5, 3, 1, or 0.2 watts/gram depending on which case is being run. Node 21 is given zero heat generation rate; because the input to TOSS is in BTU/hr-in^3, and the air density is so much smaller than the aluminum density that the volumetric heat generation rate in air is negligible. In reality, the heat generation rate is not uniform throughout the material in this TOSS model, and each node should have an individual heating rate. This uncertainty is accounted for in the accuracy analysis (Reference 13) for the cylinder itself. The above six cases are run for each of four different node 2002 temperatures: 120, 125, 130, and 135°F in order to provide a relationship between heat generation rate and ΔT for all MT-1 inlet temperatures experienced during calorimeter heating rate measurements. Node 2001 temperature, which is also fixed throughout any given case, is the temperature of bulk cooling water (2002) plus the film rise plus the ΔT across the 0.2815 inch thick calorimeter container wall. $T_{2001} = T_{2002} + 4.31H$.

Where H is the heat generation rate (watts/gram),

4.31 is the proportionality between ΔT (film) + ΔT (wall) and heat generation rate,

5.1 (Cont'd)

ΔT (film) = q/h,

$q = (6.13 \times 10^3)H$ = BTU/hr-ft^2 of heat flux coming out of the calorimeter container,

$h = 1750$ BTU/hr-ft^2-°F,

ΔT (wall) = QA/2k,

$Q = (2.61 \times 10^5)H$ = BTU/hr-ft^3,

$A = 5.50 \times 10^{-4}$ ft^2,

and k = thermal conductivity = 89.5 BTU/hr-ft-°F.

The thermal conductivity of pure aluminum is given in Table III and is taken from Reference 7. The thermal conductivity of air is assumed to be constant at 0.0157 BTU/hr-ft-°F. Heat transfer by radiation from nodes 1-12 to the calorimeter container wall is accomplished with the Stefan-Boltzman radiation law using an emissivity of 0.3 (Reference 8, Table A-23, p. 472). This yields a radiation heat transfer coefficient that can be put into TOSS. The free convection heat transfer coefficient, h, to describe heat loss from nodes 1-12 by free convection is taken from McAdams (Reference 8), equation (7-6a):

$$h = \frac{0.53k_f}{D_o}\left[\frac{D_o^3\,\rho_f^2 g\,\beta_f\,\Delta t}{\mu_f^2}\right]^{0.25}\left(\frac{c_p\mu}{k}\right)_f^{0.25}$$

Where k is the thermal conductivity of the air (BTU/hr-ft-°F),

D_o is the outside diameter of the calorimeter cylinder (ft),

5.1 (Cont'd)

ρ is the air density (lbs/ft^3),

g is the acceleration of gravity (4.17×10^8 ft/hr^2),

β is the coefficient of volumetric expansion (°F^{-1}),

Δt is the temperature difference (°F) between the cylinder surface and the bulk air,

μ is the viscosity of the air (lbs/hr-ft),

c_p is the specific heat of the air (BTU/lbs-°F),

and the subscript, f, implies film property.

The air pressure in the calorimeter container was maintained at 1 mm of Hg ±50%. A forced convection heat transfer coefficient, h_m, of 1750 BTU/hr-ft^2-°F was used for the cylindrical surfaces associated with nodes 42 and 62 (annular region). This coefficient was obtained from an equation used by McBride (Reference 9):

$$\left(\frac{h_m D_e}{k}\right)_b = 0.023 \left(N_{Re}\right)_b^{.8} \left(N_{Pr}\right)_b^{.4} \left(\frac{d_2}{d_1}\right)^{.45}$$

where $D_e = d_2 - d_1 = (7.000-6.625)\ 1/12 = .03125$ ft.,

$k = 0.374$ BTU/hr-ft-°F,

$N_{Re} = vD_e\ \rho/\mu = 30{,}530. = (5.14\ \text{ft/sec})(.03125\ \text{ft})(61.6\ \text{lbs/ft}^3)/(3.24 \times 10^{-4}\ \text{lbs/ft-sec})$

based on a flow of 63.7 gpm,

and $N_{Pr} = 3.27$.

5.1 (Cont'd)

A film heat transfer coefficient in the vicinity of the fins was taken to be 500 BTU/hr-ft^2-°F based on this same equation, using a I_e of 0.0104 ft^2 and a velocity of approximately 1 ft/sec. Then the film heat transfer coefficients for the surfaces associated with nodes 58-61 are simply chosen to be 600, 700, 800, 900, and 1000 BTU/hr-ft^2-°F, respectively, as the velocity is increasing with the radius of the cover plate.

The output of TOTI gives the steady state temperature distribution for the internal and surface nodes. There are a total of 24 output cases: 7, 6, 5, 3, 1, and 0.2 watts/gram at each of four TI-1 cooling water bulk temperatures of 120, 125, 130, and 135°F. These temperature distributions yield a relationship between nuclear heating rate (watts/gram) and calorimeter ΔT (°F) as a function of nuclear heating rate for a family of four different bulk cooling water temperatures. This is given in Table IV.

5.2 Computer Program to Reduce Data

The problem of calculating nuclear heating rate (watts/gram) from the raw data for each calorimeter position on each day that measurements were taken involves numerous calculations by hand. A computer program to reduce this data is given in APPENDIX B; the reduced data is given in APPENDIX C.

5.2 (Cont'd)

Each thermocouple was individually calibrated by the Idaho Nuclear Corporation. These calibration curves (in degrees C) are given in the Design Data Package, Reference 9. But the Plum Brook data logger prints out these temperatures (in degrees F) using the standard calibration from EMF to temperature for chromel-alumel thermocouples. So each temperature was corrected by converting the data logger temperature back to EMF (millivolts) using the standard calibration and then converting this EMF to temperature using the individual calibration by Idaho Nuclear. By hand, this in itself would involve reading two plots (the standard calibration curve and the applicable individual calibration curve) approximately 1400 times. One subroutine, FUNCTION EMF(T), converts data logger temperatures to EMF; another subroutine, CORECT, converts this EMF back to temperature (°F) using the individual calibration for the applicable thermocouples. This is accomplished in statements 12 through 80 in APPENDIX B.

Now the ΔT associated with each calorimeter cylinder is obtained using accepted temperatures for each cylinder as discussed in Section 5.3. This is accomplished in statements 205, 215, and 225 in APPENDIX B for the near, middle, and far cylinders, respectively. Subroutine HDELT then converts the ΔT to heating rate (watts/gram) using the appropriate

5.2 (Cont'd)

proportionality in Table IV. The heating rate of each cylinder is then normalized to 60 MW in statements 240, 250, and 260. APPENDIX C, the output of this program, is the reduced data for all calorimeter measurements made at power.

5.3 Temperature and Heating Data Acceptance

Examination of the reduced temperatures in APPENDIX C shows anomalous temperature data with some of the 12 calorimeter thermocouples. A pair of thermocouples is defined as two thermocouples at the same end of the same calorimeter cylinder (See Figure 2). APPENDIX C shows large temperature differences (such as 42, 24, and 46°F at full-in on September 13) between pairs 1 & 3, 6 & 8, and 10 & 12 respectively, for calorimeter positions near full-in. Only part of this temperature data can be accepted; therefore, a list of criteria are discussed for temperature acceptance.

5.3.1 Criteria For Temperature Acceptance

Criterion 1

When the calorimeter is sufficiently near the core (i.e. between 0 and 15 inches from full-in), $H_n > H_m > H_f$. Where H is heating rate (watts/gram), and the subscripts n, m, and f refer to near, middle, and far calorimeter cylinders, respectively. This may not be true at distances greater than 15 inches, because of such things as increasing complexity in attenuation geometries and an increasing ratio of secondary to prompt core gammas.

5.3.1 (Cont'd)

Criterion 2

$(T_n)_h > (T_m)_h > (T_f)_h$ and $(T_n)_c > (T_m)_c > (T_f)_c$.

Where T is temperature, the subscripts n, m, and f are the same as in Criterion 1, and the subscripts h and c refer to hot and cold end of a cylinder.

Criterion 3

When the calorimeter is between 0 and 15 inches from full-in, $|S_{nm}| > |S_{mf}|$. Where S_{nm} is the slope of lnH between the near and middle cylinders and S_{mf} is the same slope between the middle and far cylinders. This criterion is supported by Plum Brook MUR (Mock-Up Reactor) measurements, Reference 10, Figures 4-6. It also has theoretical support, because functions used to describe fields from a plane source such as 1/r or $E_1(b)$ or $E_2(b)$ in Rockwell's shielding manual (Reference 11) all satisfy this criterion.

Criterion 4

Electrical Integrity - Each thermocouple should be intact electrically, i.e., there should be no abnormal resistance or lack of continuity.

Criterion 5

TOSS Model - Measured temperatures should agree generally with those calculated using the TOSS model. Precise agreement may not

5.3.1 (Cont'd)

be possible for several reasons. First, the film heat transfer coefficients chosen for the surfaces of nodes 50, 52, 54, 56, 58-61, 71, 73, 75, and 77 are somewhat uncertain. Secondly, an accurate knowledge of calorimeter heat generation rate is dependent upon acceptance of only the reliable thermocouples. Finally, the TOSS model represents the middle calorimeter cylinder more closely than the near and far cylinders, which will experience some end effects or assymetries for the temperature distribution in the region of the cover plate into which they are inserted.

5.3.2 Accepted Temperature Data

In the first attempt to accept only the reliable temperature data it was thought that in any pair of temperatures with large difference, the thermocouple with the high reading was in error, because its junction was not in good thermal contact with the aluminum cylinder. It would therefore be hotter for two reasons: (1) there is a longer path for conduction to the heat sink than exists for the aluminum cylinder and (2) the thermal conductivity of the stainless steel is lower than that for aluminum. Under this hypothesis, the accepted thermocouples are:

Cylinder	Thermocouple Hot End	Thermocouple Cold End
Near	9	10
Middle	5 & 7	6
Far	1	2 & 4

5.3.2 (Cont'd)

And the corresponding temperatures on September 11 at the full-in position are (from APPENDIX C):

Cylinder	Corrected Temperature (°F) Hot End	Cold End
Near	465	277
Middle	401	260
Far	280	204

Using Table IV, this yields heating rates of 4.9, 3.65, and 1.95 watts/gm for the near, middle, and far cylinder respectively. Plotting this on semi-log paper shows that this set of temperature data does not satisfy Criterion 3.

Examination of the 12 temperatures plotted as a function of calorimeter distance from full-in position on a given day proves to be valuable in temperature data acceptance. Figures 4 and 5 are plots of the above temperatures on September 13; the thermocouple number itself is plotted. Temperatures have the same behavior on other days. It is seen from these figures that temperatures from thermocouples 2 and 4 are nearly equal at all calorimeter positions; the same is true with pair 5 & 7 as would be expected for all pairs. Pairs 6 & 8, and 9 & 11 show considerable spread. Pairs 1 & 3, and 10 & 12 also show considerable spread (approximately 50°F in each pair when calorimeter is near full-in position); but, in this case temperatures from thermocouples 1 and 10

5.3.2 (Cont'd)

are nearly equal at all calorimeter positions and so are temperatures from thermocouples 3 and 12. It is concluded from this that thermocouples 1 and 10 constitute a pair, and thermocouples 3 and 12 constitute a pair. Here, recall that a pair is defined as two thermocouples at the same end of the same cylinder. At this point there is still doubt as to which pair is to be associated with the hot end of the far cylinder and which pair to the cold end of the near cylinder. But after satisfying Criterion 4 as discussed in the next paragraph, it is seen that only if pair 1 and 10 is at the cold end of the near cylinder and pair 3 and 12 is at the hot end of the far cylinder can Criterion 3 be satisfied.

Electrical measurements, made by the PBRF WANL Test Operations group, of all 12 thermocouples are reported in Reference 12. Abnormalities are found in Table 3 of this reference, where a comparison is made between (1) the resistance across the entire thermocouple, i.e., resistance from chromel lead to alumel lead measured at the console in the containment vessel and (2) the sum of chromel to ground resistance and alumel to ground resistance measured at the same place. The latter value is always greater than the former value, but for thermocouples 3 and 11 this difference is 15.8 and 31.2 ohms, respectively. Table V of this document is taken from Table 3, Reference 11. It is seen that

5.3.2 (Cont'd)

thermocouples 3 and 11 have much greater differences than the others. Under a hypothesis that these differences for thermocouples 3 and 11 do not belong to the population of differences for the other 10 thermocouples, it is seen that at the 2 sigma level of significance $-1.59 \leq$ difference ≤ 8.25 ohms for the 10 thermocouples, and the hypothesis should be accepted with better than 95% confidence.

After accepting thermocouples 1 and 10 as the pair at the cold end of the near cylinder, accepting thermocouples 3 and 12 as the pair at the hot end of the far cylinder, and not accepting the data from thermocouples 3 and 11 to satisfy Criterion 4, it is seen that all remaining thermocouples except number 8 can be accepted. The temperature from thermocouple 8 is higher than those from thermocouples 1 and 10, hence data from thermocouple 8 is not accepted so that Criterion 2 will be satisfied. The resulting temperature data used to calculate heat generation rate is as follows:

Calorimeter Cylinder	Accepted Thermocouples Hot End	Cold End
Near	9	1 & 10
Middle	5 & 7	6
Far	12	2 & 4

Temperature data from the above thermocouples are used to calculate nuclear heating rates as shown in APPENDIX B and APPENDIX C.

5.3.3 Accepted Heating Rate Data

Examination of APPENDIX C shows that the near and far cylinders give negative heating rates, when the calorimeter is 40 inches from the full-in position. It is concluded that heating rates at 40 inches from full-in are below the sensitivity of this calorimeter, and this position is not used in the regression analysis to determine the nuclear heating rate distribution along the HT-1 axis.

5.4 Accuracy Analysis

An accuracy analysis for this calorimeter is given in Reference 13, which considers all uncertainties affecting the calorimeter accuracy. But two such uncertainties were found to be larger than assumed in Reference 13. Both uncertainties pertain to the temperature data. First, the individual calibrations for each thermocouple are accurate to ±1.8°F from Reference 9, whereas, they were assumed to be accurate to ±1.5°F in the original accuracy analysis. Second, the temperature accuracy of a thermocouple system as measured by the data logger was taken to be ±1°F in the accuracy analysis, but repeated readings at a given calorimeter position (APPENDIX A) shows these temperatures to be accurate to ±6°F at the 2 sigma confidence level. This is from an examination of all data logger printout at calorimeter positions between zero and 12 inches from full-in, which shows that the standard deviation, sigma, for temperatures from accepted thermocouples is equal

5.4 (Cont'd)

to or less than 3°F approximately 95% of the time. Table VI gives all the heat generation rate uncertainties using the ±1.8 and ±6°F uncertainties in thermocouple calibration and data logger reading respectively; the table also gives combined calorimeter accuracy. This is the same as Table II, Reference 13, except for use of the above uncertainties in temperature. These accuracies range from ±6.16% at 7 watts/gm to ±117% at 0.2 watts/gram. The accuracy at the 95% confidence limit is plotted in Figure 6.

5.5 Regression Analysis

The normalized nuclear heating rates are fitted to equations using a stepwise linear regression computer program. The equations have the form:

$$H(z) = a_0 + a_1 z + a_2 z^2 + a_3 z^3 \qquad \text{for } 0 < z < 18 \text{ inches}$$

$$\ln H(z) = b_0 + b_1 z + b_2 z^2 + b_3 z^3 \qquad \text{for } 18 < z < 30 \text{ inches}$$

$$\ln H(y) = c_0 + c_1 y + c_2 y^2 + c_3 y^3 \qquad \text{for } -2.5 < y < 2.5 \text{ inches}$$

$$H(x) = d_0 + d_1 x + d_2 x^2 + d_3 x^3$$

where H is the nuclear heating rate (watts/gram),

z is the distance from the full-in position (inches), z is the MT-1 axis in the case of the middle calorimeter cylinder,

y is the horizontal line perpendicular to the core vertical surface intersecting the MT-1 axis at zero inches from full-in. y = -2.5 in for the near cylinder, 0 inches for the middle cylinder, and 2.5 inches for the far cylinder.

5.5 (Cont'd)

x is the control rod bank position (inches),

and 18 inches is where $W(s)$ changes from approximately a parabola to approximately an exponential.

If some of the above powers of the independent variable are insignificant the computer code will give no dependency on them.

6.0 RESULTS

Results are given for the spatial heating distribution, the heating distribution as a function of reactor control rod bank position, and the heating after reactor shutdown. The accuracy of these measurements are given as a function of nuclear heating rate.

6.1 Heating Distribution Along MT-1 Axis, H(s)

The regression analysis gives, for H(s) between 0 and 18 inches from full-in, the following equations for the near, middle, and far cylinders, respectively.

$$H_n(s) = 4.937 + (6.775 \times 10^{-2})s - (1.749 \times 10^{-2})s^2 + (1.605 \times 10^{-4})s^3,$$

$$H_m(s) = 3.725 + (6.606 \times 10^{-2})s - (1.440 \times 10^{-2})s^2 + (1.929 \times 10^{-4})s^3,$$

$$H_f(s) = 3.118 + (5.124 \times 10^{-2})s - (1.141 \times 10^{-2})s^2 + (1.528 \times 10^{-4})s^3.$$

For $18 \leq s \leq 30$ inches the regression analysis gives:

$$\ln H_n(s) = 4.405 - 0.2216s,$$

$$\ln H_m(s) = 3.205 - 0.1795s + (1.118 \times 10^{-3})s^2,$$

$$\ln H_f(s) = 0.00297 + (7.403 \times 10^{-3})s^2 - (3.716 \times 10^{-4})s^3,$$

or

$$H_n(s) = 81.86\exp(-.2216s),$$

$$H_m(s) = 24.65\exp\left[-.1795s + (1.118 \times 10^{-3})s^2\right],$$

$$H_f(s) = 1.00297\exp\left[(7.403 \times 10^{-3})s^2 - (3.716 \times 10^{-4})s^3\right].$$

These functions are plotted in Figures 7-10, where the dashed lines indicate the limits of accuracy of the measurement at the 95% confidence level. These equations represent all data taken during the cycle.

6.1 (Cont'd)

It is seen from Figure 10 that, when z = 20 inches, the middle calorimeter cylinder gives a higher heating rate than the near cylinder. This may be due to such things as the increasing complexity of attenuation geometries and an increasing ratio of secondary gammas to prompt core gammas, but since the uncertainty beyond z = 20 inches is +25% or greater, there is not much statistical significance in this fact. The sensitivity of this calorimeter at low heating rates had to be compromised in the design in order to provide capability of measuring a maximum of " watts/gm, the upper limit in the envelope of predicted nuclear heating for the near cylinder as shown in Figure 5, Reference 14.

6.2 Heating Distribution Along Horizontal Line Perpendicular to Core Vertical Surface, H(y)

The regression analysis gives the following expression for H(y):

$\ln H(y) = 1.351 - 0.09229y$,

or $H(y) = 3.87\exp(-.09229y)$.

This is plotted in Figure 11, and it has a value of 3.87 watts/gm at y = 0 (on the H-1 axis) and a value of 4.88 watts/gm at y = -2.5 inches. These values represent the average of all measurements at the full-in position, hence they can be considered an average for the cycle.

6.3 Heating Vs. Rod Bank Position

The regression analysis gives the following expressions for nuclear heating as a function of rod bank position for the near, middle, and far cylinders, respectively, at z = 0:

$H_n(x) = 3.554 + 0.09410x - (5.876 \times 10^{-5})x^3$,

$H_m(x) = 2.783 + 0.06414x - (3.958 \times 10^{-5})x^3$,

$H_f(x) = 2.273 + 0.05670x - (3.494 \times 10^{-5})x^3$,

These are plotted in Figure 12, and it is seen that the maximum heating rate occurs at approximately the 23 inch rod bank position. Here heating rates are 5.00, 3.78, and 3.15 watts/gm for the near, middle, and far cylinders, respectively at the full-in position.

6.4 Heating After Shutdown

The heating rate on September 13 between 11:31 p.m. and 11:49 p.m., 2 hours after reactor shutdown, was .066 watts/gm for the near cylinder, 0.26 watts/gm for the middle cylinder, and negative for the far cylinder. This is in the region where the calorimeter cylinders are accurate to the order of ±100%. Hence, it is concluded that any heating after shutdown from fission product decay or active isotopes in the surrounding media is below the sensitivity of the calorimeters.

7.0 CONCLUSIONS & RECOMMENDATIONS

The following conclusions and recommendations are made.

1. This calorimeter is usable between 7 and 1.7 watts/gm at an accuracy of ±15% or better at the 95% confidence level. For accuracies of ±10% or better it is usable between 7 and 2.7 watts/gm.

2. The objectives of this experiment were accomplished successfully, as nuclear heating in pure aluminum was measured to within ±10% or better (95% confidence level) at positions between 0 and 14.5 inches from full-in.

3. It is recommended that the values of nuclear heating in pure aluminum given in this document be used for HT-1 with the accuracy indicated in Figure 6, until further measurements are made.

4. Further measurements could improve the accuracy at 3 watts/gm to ±5% (95% confidence level) at best by designing a new calorimeter that would reduce the temperature uncertainties to ±1 to 1.5°F.

5. If a new calorimeter is designed copper-constantan thermocouples are recommended for use instead of chromel-alumel, because there should be less uncertainty by virtue of greater EMF.

6. Also, if a new calorimeter is used, it is recommended that the one used in this experiment be disassembled and examined for causes

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7.0 (Cont'd)

of the anomalous temperature data. Otherwise, it is recommended that this calorimeter remain intact for future use.

7. The sensitivity of a new calorimeter can be extended to lower heating rates, because the upper limit in the envelope of predicted nuclear heating is now only 5 watts/gm plus 6.5% or 5.33 watts/gm at the 95% confidence level.

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APPENDIX A

Typical Data Logger Printout

Attached is the data logger printout of September 13, which is typical of data logger printout on the other days. Also included is the printout for the three sets of data on September 13 and 14 after reactor shutdown. APPENDIX C lists all data from data logger printout for each day at power except the standard deviation, sigma, associated with each set of temperature data.

	LOG HEADING	ACC MWD 10-1	PWRT MW 10-1	CORE INLT F	CORE OUTL F	SR 1 HTIN 10-2	SR 2 HTIN 10-2	SR 3 HTIN 10-2	SR 4 HTIN 10-2	SR 5 HTIN 10-2	SR 6 HTIN 10-2	SR 7 HTIN 10-2	SR 8 HTIN 10-2	RR 1 PER CENT	RR 2 PER CENT	TC01 FAR HOT	TC02 FAR COLD	TC03 FAR HOT	TC04 FAR COLD	TC05 MID HOT	TC06 MID COLD	TC07 MID HOT	TC
	SE13 BA H 0900	0029	0030	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	0050	00
	SE13 BA T 0910	7202	0602	0130	0157	2969	2969	2970	2967	2969	2970	2969	2970	0081	0088	0139	0142	0140	0141	0140	0138	0137	01
	SE13 BA T 0911	7202	0601	0130	0157	2969	2968	2970	2967	2969	2970	2970	2970	0081	0088	0140	0141	0137	0137	0135	0135	0139	01
	SE13 BA T 0912	7202	0602	0130	0157	2969	2968	2970	2967	2969	2969	2970	2969	0081	0088	0143	0145	0139	0135	0136	0135	0140	01
	SE13 BA T 0913	7202	0602	0130	0157	2969	2968	2970	2967	2969	2969	2970	2970	0081	0088	0140	0141	0137	0137	0141	0141	0140	01
	SE13 BA T 0914	7202	0601	0130	0157	2969	2968	2970	2967	2969	2970	2971	2970	0081	0088	0141	0142	0135	0135	0135	0135	0137	01
	SE13 BA T 0915	7202	0601	0130	0157	2969	2968	2969	2967	2969	2970	2970	2969	0081	0088	0137	0142	0139	0140	0141	0140	0138	01
	SE13 BA T 0916	7202	0599	0130	0157	2969	2968	2970	2967	2959	2970	2970	2970	0081	0088	0138	0142	0140	0140	0140	0137	0136	01
	SE13 BA T 0917	7202	0600	0130	0157	2969	2968	2969	2967	2969	2970	2970	2969	0081	0088	0142	0142	0136	0136	0140	0141	0140	01
45"	SE13 BA T 0918	7202	0598	0130	0157	2969	2968	2969	2967	2969	2970	2970	2970	0081	0088	0137	0142	0139	0140	0141	0139	0138	01
	SE13 BA T 0919	7202	0597	0130	0157	2975	2969	2970	2967	2969	2969	2970	2970	0081	0088	0138	0143	0141	0141	0140	0137	0136	01
	SE13 BA T 0927	7206	0599	0130	0157	2978	2978	2980	2978	2979	2979	2981	2980	0079	0088	0139	0144	0143	0141	0141	0137	0137	01
	SE13 BA T 0928	7206	0600	0130	0157	2978	2978	2980	2978	2979	2979	2981	2980	0079	0088	0139	0143	0143	0140	0141	0137	0143	01
	SE13 BA T 0929	7206	0599	0130	0157	2978	2978	2980	2978	2979	2979	2981	2980	0079	0088	0144	0147	0141	0137	0138	0136	0141	01
	SE13 BA T 0930	7210	0599	0130	0157	2980	2979	2980	2978	2979	2979	2980	2980	0079	0088	0142	0145	0142	0141	0141	0135	0139	01
	SE13 BA T 0931	7210	0602	0130	0157	2978	2978	2980	2978	2979	2979	2981	2980	0079	0088	0142	0143	0138	0136	0141	0141	0142	01
	SE13 BA T 0932	7210	0601	0130	0157	2978	2978	2979	2978	2979	2979	2981	2980	0079	0088	0143	0144	0138	0136	0139	0140	0143	01
	SE13 BA T 0933	7210	0600	0130	0157	2977	2978	2980	2978	2979	2979	2980	2980	0079	0088	0143	0147	0139	0140	0139	0140	0142	01
40"	SE13 BA T 0934	7210	0601	0130	0157	2978	2978	2979	2978	2979	2979	2981	2980	0079	0088	0138	0142	0140	0140	0142	0140	0139	01
	SE13 BA T 0935	7210	0600	0130	0158	2978	2978	2980	2978	2979	2979	2981	2980	0079	0088	0140	0141	0138	0139	0142	0140	0141	01
	SE13 BA T 0936	7210	0600	0130	0157	2978	2978	2980	2978	2979	2979	2981	2980	0079	0088	0139	0144	0143	0141	0141	0137	0138	01
	SE13 BA T 0943	7214	0603	0131	0158	2978	2978	2980	2978	2979	2979	2980	2980	0080	0088	0145	0150	0152	0142	0149	0141	0148	01
	SE13 BA T 0944	7214	0603	0131	0158	2978	2978	2979	2978	2979	2979	2981	2980	0080	0088	0148	0150	0150	0139	0149	0143	0153	01
	SE13 BA T 0945	7214	0601	0131	0158	2978	2978	2979	2978	2979	2979	2980	2980	0080	0088	0147	0149	0150	0144	0152	0146	0150	01
	SE13 BA T 0946	7214	0600	0131	0158	2978	2978	2980	2978	2979	2979	2981	2980	0080	0088	0148	0150	0150	0140	0149	0141	0152	01
	SE13 BA T 0947	7214	0601	0131	0158	2978	2978	2980	2978	2979	2979	2981	2980	0080	0088	0148	0150	0150	0140	0149	0141	0152	01
	SE13 BA T 0948	7214	0601	0131	0158	2978	2979	2980	2978	2979	2979	2981	2980	0080	0088	0143	0150	0153	0143	0150	0141	0149	01
	SE13 BA T 0949	7214	0603	0131	0158	2978	2979	2980	2978	2979	2979	2981	2980	0080	0088	0142	0149	0153	0143	0150	0142	0148	01
30"	SE13 BA T 0950	7219	0601	0131	0158	2978	2979	2979	2978	2979	2979	2981	2980	0080	0088	0143	0144	0148	0142	0154	0145	0152	01
	SE13 BA T 0951	7219	0600	0131	0158	2978	2978	2980	2978	2979	2979	2980	2980	0080	0088	0147	0150	0152	0141	0148	0142	0150	01
	SE13 BA T 0952	7219	0602	0131	0158	2978	2978	2980	2978	2979	2979	2980	2980	0080	0088	0145	0147	0149	0142	0154	0146	0150	01
	SE13 BA T 1029	7231	0602	0132	0159	2988	2987	2989	2987	2989	2990	2990	2989	0080	0088	0150	0157	0165	0149	0173	0156	0170	01
	SE13 BA T 1030	7235	0599	0132	0158	2989	2988	2989	2987	2989	2990	2990	2990	0080	0088	0156	0158	0168	0147	0167	0150	0168	01
	SE13 BA T 1031	7235	0602	0132	0158	2989	2987	2990	2987	2989	2990	2990	2989	0080	0088	0154	0154	0165	0146	0169	0155	0173	01
	SE13 BA T 1032	7235	0599	0132	0159	2989	2988	2989	2987	2989	2990	2990	2989	0080	0088	0150	0157	0170	0150	0169	0150	0168	01
	SE13 BA T 1033	7235	0598	0132	0159	2989	2987	2989	2987	2989	2990	2990	2989	0081	0088	0156	0157	0167	0147	0167	0150	0170	01
	SE13 BA T 1034	7235	0598	0132	0159	2989	2987	2989	2987	2989	2989	2990	2989	0081	0088	0157	0157	0167	0146	0168	0150	0173	01
	SE13 BA T 1035	7235	0599	0132	0159	2989	2988	2989	2987	2989	2990	2990	2989	0081	0088	0153	0158	0168	0149	0169	0149	0168	01
25"	SE13 BA T 1036	7235	0601	0132	0159	2989	2988	2989	2987	2989	2990	2990	2989	0081	0088	0156	0154	0165	0146	0169	0155	0173	01
	SE13 BA T 1037	7235	0600	0132	0159	2997	2999	2999	2997	2999	2990	2990	2989	0079	0088	0150	0156	0169	0150	0173	0152	0167	01
	SE13 BA T 1038	7235	0600	0132	0159	2997	2999	2999	2997	2999	2999	3000	2999	0079	0088	0150	0157	0169	0150	0170	0150	0168	01

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SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG
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0117	1775	0229	1780	0270	1775	0251	1785	0125	1782	0261	1768	0237	1780	0157	1782	0100	1787	0250					
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0000	1805	0050	1810	0000	1770	0000	1800	0100	1775	0150	1780	0100	1775	0250	1810	0100	1785	0250					
0128	1793	0170	1800	0181	1767	0083	1803	0254	1790	0244	1790	0163	1785	0248	1807	0101	1787	0240					
0132	1798	0163	1805	0129	1761	0092	1800	0223	1795	0216	1798	0182	1798	0216	1808	0092	1785	0204					
0188	1798	0204	1808	0123	1772	0206	1808	0217	1796	0207	1796	0176	1790	0244	1808	0167	1790	0159					
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0176	1795	0185	1808	0148	1784	0208	1808	0198	1792	0220	1791	0162	1790	0221	1797	0210	1793	0215					
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0150	1805	0150	1890	0000	1820	0100	1505	0250	1865	0150	1505	0150	1820	0100	1840	0100	1870	0100					
0106	1817	0211	1500	0181	1833	0211	1503	0208	1857	0170	1487	0287	1815	0130	1890	0081	1880	0163					
0086	1811	0182	1898	0129	1828	0204	1508	0192	1865	0178	1880	0248	1815	0111	1830	0070	1878	0187					
0094	1811	0178	1896	0123	1824	0199	1510	0178	1864	0166	1880	0226	1816	0102	1830	0063	1876	0181					
0126	1813	0181	1897	0113	1822	0188	1507	0182	1857	0221	1888	0205	1820	0123	1895	0125	1878	0198					
0180	1816	0177	1897	0106	1821	0175	1503	0191	1851	0241	1890	0192	1823	0108	1899	0150	1881	0187					
0163	1816	0165	1503	0171	1825	0187	1505	0187	1849	0236	1885	0223	1820	0150	1899	0136	1886	0186					
0159	1816	0158	1500	0176	1824	0177	1504	0179	1851	0233	1887	0216	1821	0146	1898	0133	1885	0198					
0161	1816	0149	1504	0206	1828	0200	1504	0169	1853	0229	1880	0211	1822	0141	1898	0126	1882	0188					
0000	1790	0000	1730	0000	1560	0000	1700	0000	1540	0000	1620	0000	1670	0000	1700	0000	1680	0000					
0150	1800	0100	1700	0300	1510	0300	1690	0100	1560	0200	1650	0300	1685	0150	1695	0050	1650	0300					
0181	1812	0190	1697	0249	1527	0267	1703	0211	1567	0194	1650	0244	1677	0176	1693	0050	1647	0252					
0212	1800	0158	1695	0217	1528	0277	1698	0204	1560	0200	1655	0229	1688	0248	1701	0163	1648	0216					
0189	1878	0150	1690	0219	1522	0273	1698	0185	1566	0215	1656	0206	1690	0219	1700	0154	1642	0225					
0172	1875	0150	1688	0206	1518	0262	1701	0208	1570	0216	1658	0198	1692	0206	1698	0148	1637	0235					
0164	1877	0149	1689	0189	1514	0263	1700	0207	1569	0206	1660	0185	1696	0216	1703	0175	1639	0226					
0169	1875	0150	1689	0176	1519	0271	1704	0217	1570	0193	1659	0176	1691	0231	1701	0169	1639	0208					
0175	1878	0165	1693	0211	1519	0256	1700	0230	1567	0207	1655	0171	1694	0236	1706	0201	1642	0221					
0174	1880	0167	1694	0201	1517	0250	1698	0227	1564	0212	1659	0167	1697	0237	1708	0205	1644	0215					

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	LOG HEADING	ACC MWD 10-1	PWRT MW 10-1	CORE INLT F	CORE OUTL F	SR 1 HTIN 10-2	SR 2 HTIN 10-2	SR 3 HTIN 10-2	SR 4 HTIN 10-2	SR 5 HTIN 10-2	SR 6 HTIN 10-2	SR 7 HTIN 10-2	SR 8 HTIN 10-2	RR 1 PER CENT	RR 2 PER CENT	TC01 FAR HOT	TC02 FAR COLD	TC03 FAR HOT	TC04 FAR COLD	TC05 MID HOT	TC06 MID COLD	TC[illegible] MID [illegible]
	SE13 BA H 1045	0029	0030	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	005[illegible]
	SE13 BA T 1045	7239	0598	0132	0159	2997	2999	2999	2997	2999	2999	3000	3000	0080	0088	0174	0170	0204	0166	0214	0173	021[illegible]
	SE13 BA T 1046	7239	0597	0132	0159	2997	2999	2998	2997	2999	2999	3000	2999	0080	0088	0168	0167	0206	0164	0218	0174	021[illegible]
	SE13 BA T 1047	7239	0597	0132	0159	2997	2999	2998	2997	2999	2999	3000	2999	0080	0088	0169	0164	0201	0162	0219	0177	021[illegible]
	SE13 BA T 1048	7239	0599	0132	0159	2997	2999	2998	2997	2999	2999	3000	3000	0080	0088	0175	0167	0202	0159	0216	0177	021[illegible]
	SE13 BA T 1049	7239	0599	0132	0159	2997	2998	2998	2997	2998	2999	3000	3000	0080	0088	0168	0166	0204	0164	0218	0176	021[illegible]
	SE13 BA T 1050	7244	0597	0132	0160	2997	2999	2998	2997	2998	2999	3000	3000	0080	0088	0168	0166	0205	0164	0215	0177	021[illegible]
	SE13 BA T 1051	7244	0598	0132	0160	2997	2999	2998	2997	2998	2999	3000	2999	0080	0088	0175	0173	0205	0161	0216	0173	021[illegible]
20"	SE13 BA T 1052	7244	0598	0132	0159	2997	2999	2998	2997	2999	2999	3000	2999	0080	0088	0173	0166	0201	0159	0219	0178	021[illegible]
	SE13 BA T 1053	7244	0599	0132	0160	2997	2998	2998	2997	2999	2999	2999	2999	0080	0088	0175	0173	0204	0161	0216	0173	021[illegible]
	SE13 BA T 1054	7244	0598	0132	0159	2997	2999	2998	2997	2998	2999	3000	2999	0080	0088	0175	0170	0205	0161	0216	0173	021[illegible]
	SE13 BA T 1101	7248	0598	0133	0159	3008	3007	3009	3008	3008	3010	3009	3009	0079	0088	0183	0173	0221	0166	0245	0191	028[illegible]
	SE13 BA T 1102	7248	0598	0132	0160	3008	3007	3009	3007	3008	3009	3009	3009	0079	0088	0185	0173	0221	0166	0245	0192	028[illegible]
	SE13 BA T 1103	7248	0598	0133	0159	3008	3007	3009	3007	3008	3010	3010	3009	0079	0088	0187	0175	0220	0166	0244	0191	028[illegible]
	SE13 BA T 1104	7248	0597	0132	0160	3008	3007	3009	3007	3008	3010	3009	3009	0079	0088	0187	0178	0226	0168	0244	0191	028[illegible]
	SE13 BA T 1105	7248	0597	0132	0159	3008	3007	3009	3007	3008	3010	3009	3009	0079	0088	0183	0173	0226	017[illegible]	0247	0188	028[illegible]
	SE13 BA T 1106	7248	0600	0133	0160	3008	3007	3009	3007	3008	3010	3010	3009	0079	0088	0185	0177	0227	017[illegible]	0244	0185	028[illegible]
	SE13 BA T 1107	7248	0598	0133	0160	3008	3007	3009	3007	3008	3010	3009	3009	0079	0088	0184	0172	022[illegible]	0165	0244	0187	028[illegible]
18"	SE13 BA T 1108	7248	0598	0133	0160	3008	3007	3009	3008	3009	3010	3010	3009	0079	0088	0184	0177	0227	0170	0246	0186	028[illegible]
	SE13 BA T 1109	7248	0597	0133	0160	3008	3007	3009	3007	3008	3010	3009	3009	0079	0088	0189	0176	022[illegible]	0165	0244	0189	028[illegible]
	SE13 BA T 1110	7252	0597	0133	0160	3008	3007	3009	3008	3008	3009	3009	3009	0079	0088	0184	0177	0227	0169	0244	0185	028[illegible]
	SE13 BA T 1117	7252	0599	0133	0160	3008	3007	3009	3007	3008	3010	3009	3009	0080	0088	0200	017[illegible]	0242	0174	0273	0204	028[illegible]
	SE13 BA T 1118	7252	0598	0133	0160	3008	3007	3009	3008	3009	3010	3010	3009	0080	0088	0202	0183	0241	0170	0270	0200	027[illegible]
	SE13 BA T 1119	7252	0598	0133	0160	3008	3007	3009	3008	3008	3009	3010	3009	0080	0088	0199	0183	0245	0178	0274	0203	027[illegible]
	SE13 BA T 1120	7256	0597	0133	0160	3008	3007	3009	3007	3008	3010	3010	3009	0080	0088	0200	0179	0242	0174	027[illegible]	0204	028[illegible]
	SE13 BA T 1121	7256	0598	0133	0160	3008	3007	3009	3007	3008	3010	3010	3009	0080	0088	0202	0184	0241	0174	0269	0199	028[illegible]
	SE13 BA T 1122	7256	0598	0133	0160	3008	3007	3009	3007	3008	3010	3009	3009	0081	0088	0201	0184	0244	0176	0269	0198	028[illegible]
	SE13 BA T 1123	7256	0597	0133	0160	3008	3007	3009	3007	3008	3009	3010	3009	0081	0088	0203	0184	0244	0174	0269	0199	027[illegible]
16"	SE13 BA T 1124	7256	0596	0133	0160	3008	3007	3009	3007	3008	3010	3009	3009	0081	0088	0202	0181	0241	0174	0271	0203	027[illegible]
	SE13 BA T 1125	7256	0597	0133	0160	3008	3007	3009	3007	3008	3010	3009	3009	0081	0088	0202	0181	0241	0174	0271	0203	027[illegible]
	SE13 BA T 1126	7256	0598	0133	0160	3018	3018	3019	3017	3019	3010	3010	3009	0079	0088	0202	0181	0239	0174	027[illegible]	0201	028[illegible]
	SE13 BA T 1133	7260	0599	0133	0160	3018	3019	3019	3017	3019	3020	3020	3019	0079	0088	0210	0187	0260	0183	0295	0210	028[illegible]
	SE13 BA T 1134	7260	0599	0133	0160	3018	3018	3019	3017	3017	3020	3020	3019	0079	0088	0214	0186	0254	0178	0294	0215	029[illegible]
	SE13 BA T 1135	7260	0599	0133	0160	3018	3018	3019	3017	3019	3019	3020	3018	0079	0088	0211	0184	0255	0179	0297	0215	029[illegible]
	SE13 BA T 1136	7260	0597	0133	0160	3018	3018	3019	3017	3019	3019	3020	3018	0079	0088	0210	0187	0261	0183	0295	0211	028[illegible]
	SE13 BA T 1137	7260	0597	0133	0160	3018	3018	3019	3017	3019	3019	3020	3018	0079	0088	0213	0185	0254	0178	0295	0215	029[illegible]
	SE13 BA T 1138	7260	0597	0133	0160	3018	3019	3019	3017	3019	3019	3020	3019	0079	0088	0210	0185	0260	018[illegible]	0295	0212	028[illegible]
	SE13 BA T 1139	7260	0596	0133	0160	3018	3019	3019	3017	3019	3019	3020	3019	0080	0088	0215	0191	0260	018[illegible]	0292	0210	028[illegible]
15"	SE13 BA T 1140	7264	0599	0133	0160	3019	3019	3019	3017	3019	3019	3020	3019	0080	0088	0210	0184	0257	0180	0298	0216	028[illegible]
	SE13 BA T 1141	7264	0596	0133	0160	3017	3019	3019	3018	3019	3019	3020	3018	0080	0088	0212	0189	0261	0183	0294	0209	028[illegible]
	SE13 BA T 1142	7264	0598	0133	0160	3018	3018	3019	3017	3019	3020	3020	3019	0080	0088	0209	0185	0259	0183	0295	0213	029[illegible]
	SE13 BA T 1149	7269	0597	0133	0160	3018	3018	3019	3017	3019	3020	3020	3019	0081	0088	0219	0189	0270	0187	0313	0221	030[illegible]
	SE13 BA T 1150	7269	0598	0133	0160	3018	3019	3019	3017	3019	3019	3020	3019	0081	0088	0227	0193	0267	0182	0311	0218	031[illegible]
	SE13 BA T 1151	7269	0598	0134	0160	3018	3019	3019	3017	3019	3019	3020	3019	0081	0088	0220	0193	0271	0186	0313	0219	030[illegible]
	SE13 BA T 1152	7269	0598	0133	0160	3018	3019	3019	3017	3019	3019	3020	3018	0081	0088	0226	0193	0267	0181	0312	0221	031[illegible]
	SE13 BA T 1153	7269	0600	0133	0161	3018	3018	3019	3017	3019	3019	3020	3018	0081	0088	0220	0189	0267	0186	0315	0223	030[illegible]
	SE13 BA T 1154	7269	0597	0133	0160	3018	3018	3019	3017	3019	3019	3020	3018	0081	0088	0227	0194	0269	0183	0310	0218	031[illegible]
14"	SE13 BA T 1155	7269	0600	0133	0161	3027	3024	3026	3023	3024	3020	3020	3019	0080	0088	0222	0193	0267	0183	0312	0222	030[illegible]
	SE13 BA T 1156	7269	0600	0134	0161	3027	3028	3028	3027	3028	3029	3030	3018	0079	0088	0221	0194	0271	0186	0312	0218	030[illegible]
	SE13 BA T 1157	7269	0601	0133	0160	3027	3028	3028	3027	3028	3029	3030	3028	0079	0088	0226	0193	0267	0182	0311	0220	031[illegible]
	SE13 BA T 1158	7269	0599	0133	0161	3027	3027	3028	3026	3028	3029	3030	3028	0079	0088	0227	0194	0268	0183	0312	0218	031[illegible]

TC08 MID COLD	TC09 NEAR HOT	TC10 NEAR COLD	TC11 NEAR HOT	TC12 NEAR COLD	TC13 EXT NEAR	TC14 EXT BOT	TC15 EXT FAR	HT-1 INLT TEMP	HT-1 OUTL TEMP	HT-1 FLOW	TC01 AVG 10-1	TC01 SIGM 10-2	TC02 AVG 10-1	TC02 SIGM 10-2	TC03 AVG 10-1	TC03 SIGM 10-2	TC04 AVG 10-1	TC04 SIGM 10-2	TC05 AVG 10-1	TC05 SIGM 10-2	TC06 AVG 10-1	TC06 SIGM 10-2	TC07 AVG 10-1	TC07 SIGM 10-2	TC08 AVG 10-1	TC08 SIGM 10-2	TC09 AVG 10-1	TC09 SIGM 10-2
0051	0052	0053	0054	0055	0056	0057	0058	0059	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079
0183	0215	0169	0222	0197	0135	0136	0137	0142	0133	0641	1740	0000	1700	0000	2040	0000	1600	0000	2140	0000	1730	0000	2130	0000	1830	0000	2150	0000
0178	0211	0170	0227	0202	0135	0135	0137	0140	0133	0641	1710	0100	1685	0150	2050	0100	1620	0200	2160	0200	1735	0050	2125	0050	1805	0250	2130	0200
0179	0210	0167	0225	0203	0135	0137	0137	0139	0131	0642	1703	0267	1670	0264	2037	0208	1620	0163	2170	0216	1747	0176	2133	0130	1800	0216	2120	0216
0183	0212	0167	0221	0199	0136	0139	0137	0141	0131	0643	1715	0304	1670	0212	2033	0132	1613	0192	2168	0192	1753	0178	2145	0229	1808	0227	2120	0187
0177	0211	0169	0227	0202	0135	0136	0136	0140	0133	0642	1708	0300	1668	0194	2038	0179	1618	0204	2170	0178	1754	0164	2144	0206	1800	0252	2118	0172
0178	0211	0167	0227	0204	0136	0137	0136	0140	0131	0641	1703	0300	1667	0179	2033	0163	1622	0203	2173	0179	1757	0160	2143	0180	1797	0243	2117	0160
0183	0216	0170	0225	0199	0134	0136	0137	0143	0133	0642	1710	0320	1676	0277	2036	0162	1620	0192	2171	0173	1753	0176	2141	0184	1801	0253	2123	0211
0182	0212	0165	0221	0202	0137	0137	0137	0140	0130	0641	1713	0307	1674	0264	2033	0171	1616	0205	2174	0172	1756	0186	2145	0193	1804	0244	2123	0198
0183	0216	0170	0225	0199	0134	0136	0137	0143	0133	0640	1717	0313	1680	0305	2033	0165	1616	0195	2172	0171	1753	0198	2143	0188	1807	0246	2127	0222
0183	0216	0170	0225	0199	0134	0136	0137	0143	0137	0641	1720	0313	1682	0296	2035	0162	1615	0185	2171	0165	1751	0199	2142	0185	1809	0244	2130	0232
0198	0246	0185	0260	0223	0136	0139	0138	0145	0132	0643	1830	0000	1740	0000	2210	0000	1660	0000	2050	0000	1910	0000	2140	0000	1980	0000	2160	0000
0196	0243	0179	0255	0220	0137	0138	0137	0140	0131	0642	1800	0100	1730	0000	2210	0000	1660	0000	2050	0000	1915	0050	2135	0050	1970	0100	2145	0150
0198	0244	0179	0258	0218	0136	0139	0138	0140	0131	0641	1850	0165	1737	0100	2207	0048	1660	0000	2047	0048	1913	0080	2140	0081	1973	0106	2143	0125
0199	0246	0182	0255	0218	0136	0139	0138	0142	0132	0642	1855	0165	1744	0204	2220	0214	1665	0066	2145	0050	1913	0083	2138	0082	1978	0108	2148	0129
0194	0244	0184	0262	0221	0136	0137	0136	0144	0133	0641	1850	0178	1744	0196	2228	0265	1678	0273	2150	0109	1906	0137	2134	0111	1970	0178	2146	0123
0196	0247	0185	0261	0219	0134	0137	0136	0142	0134	0641	1850	0196	1748	0206	2235	0287	1682	0261	2148	0109	1897	0245	2132	0106	1968	0169	2150	0141
0200	0246	0182	0255	0218	0135	0139	0139	0145	0132	0642	1854	0159	1744	0215	2234	0260	1677	0266	2147	0105	1893	0244	2134	0119	1973	0193	2151	0137
0195	0247	0185	0261	0220	0135	0136	0137	0141	0134	0641	1848	0147	1748	0216	2235	0275	1680	0259	2149	0105	1889	0252	2131	0136	1970	0193	2154	0140
0199	0246	0182	0255	0218	0135	0139	0138	0145	0132	0642	1852	0152	1749	0209	2236	0263	1677	0263	2148	0105	1889	0238	2133	0143	1972	0193	2154	0135
0195	0247	0185	0261	0219	0134	0137	0137	0142	0134	0641	1851	0188	1751	0209	2241	0268	1676	0253	2147	0102	1885	0253	2132	0140	1970	0194	2156	0136
0212	0277	0194	0233	0238	0138	0139	0138	0144	0131	0640	2000	0000	1740	0000	2420	0000	1740	0000	2730	0000	2040	0000	2690	0000	2120	0000	2770	0000
0214	0279	0195	0292	0235	0136	0140	0139	0142	0133	0643	2010	0100	1810	0200	2415	0050	1720	0200	2715	0150	2020	0200	2695	0050	2130	0100	2780	0100
0213	0278	0195	0293	0236	0137	0140	0139	0145	0131	0642	2003	0134	1807	0189	2427	0173	1740	0326	2723	0177	2023	0170	2700	0081	2130	0081	2780	0081
0212	0277	0194	0293	0238	0138	0139	0139	0140	0131	0640	2003	0108	1810	0200	2425	0150	1740	0202	2725	0150	2028	0163	2698	0082	2128	0082	2778	0082
0215	0279	0197	0294	0234	0135	0139	0140	0145	0134	0643	2006	0121	1816	0215	2426	0141	1740	0252	2718	0194	2020	0209	2696	0084	2132	0117	2780	0089
0213	0281	0199	0295	0235	0134	0138	0138	0143	0133	0640	2007	0113	1820	0216	2428	0134	1743	0244	2713	0205	2013	0244	2692	0125	2132	0107	2785	0138
0215	0279	0199	0295	0239	0136	0137	0137	0142	0132	0641	2010	0130	1823	0213	2430	0130	1743	0225	2710	0207	2010	0239	2693	0117	2134	0120	2786	0133
0212	0277	0194	0293	0241	0138	0139	0139	0140	0131	0641	2009	0126	1819	0226	2430	0122	1743	0210	2715	0234	2014	0244	2693	0108	2133	0119	2784	0131
0213	0278	0194	0294	0236	0137	0140	0139	0141	0131	0640	2010	0124	1818	0216	2428	0131	1742	0199	2714	0223	2016	0236	2694	0119	2132	0116	2783	0127
0215	0279	0200	0295	0237	0134	0138	0137	0142	0135	0639	2011	0124	1817	0206	2424	0170	1742	0190	2716	0217	2015	0224	2694	0112	2134	0124	2784	0123
0221	0307	0211	0325	0253	0136	0137	0139	0145	0135	0641	2100	0000	1870	0000	2600	0000	1830	0000	2950	0000	2100	0000	2870	0000	2210	0000	3070	0000
0227	0306	0205	0322	0251	0138	0141	0140	0141	0131	0642	2120	0200	1865	0050	2570	0300	1805	0250	2995	0050	2125	0250	2900	0300	2240	0300	3065	0050
0223	0304	0207	0325	0255	0137	0140	0140	0146	0134	0643	2117	0170	1857	0129	2563	0262	1800	0216	2953	0125	2133	0238	2907	0264	2237	0249	3057	0129
0221	0307	0211	0326	0254	0136	0137	0139	0140	0135	0641	2113	0163	1860	0122	2575	0304	1808	0227	2953	0108	2128	0227	2900	0254	2230	0244	3060	0122
0226	0305	0205	0322	0253	0138	0140	0140	0140	0131	0641	2116	0168	1858	0122	2568	0306	1802	0232	2952	0100	2132	0223	2904	0243	2236	0252	3058	0122
0222	0310	0212	0325	0253	0136	0137	0139	0140	0133	0641	2113	0160	1857	0113	2573	0305	1808	0254	2952	0092	2130	0208	2898	0255	2233	0235	3065	0189
0227	0312	0211	0324	0250	0135	0138	0139	0147	0134	0642	2119	0196	1864	0216	2577	0297	1807	0239	2947	0138	2126	0222	2897	0238	2239	0254	3073	0260
0226	0312	0211	0324	0251	0135	0138	0139	0142	0134	0642	2116	0193	1861	0214	2576	0278	1806	0223	2951	0169	2130	0234	2895	0229	2241	0247	3079	0289
0223	0311	0212	0325	0252	0135	0139	0138	0146	0135	0642	2117	0182	1864	0223	2580	0262	1809	0224	2950	0163	2126	0256	2894	0218	2240	0235	3082	0290
0220	0306	0210	0327	0254	0137	0139	0138	0141	0133	0639	2114	0192	1863	0216	2581	0270	1811	0222	2950	0154	2126	0243	2895	0206	2236	0254	3080	0282
0230	0331	0220	0350	0266	0137	0140	0138	0144	0134	0642	2190	0000	1890	0000	2700	0000	1870	0000	3130	0000	2210	0000	3050	0000	2300	0000	3310	0000
0236	0333	0218	0346	0261	0136	0141	0141	0141	0133	0641	2230	0400	1910	0200	2685	0150	1895	0250	3120	0100	2195	0150	3080	0300	2330	0300	3320	0100
0232	0332	0221	0349	0265	0136	0138	0139	0145	0135	0641	2220	0355	1917	0191	2693	0177	1890	0216	3123	0100	2193	0130	3070	0282	2327	0249	3320	0081
0236	0332	0217	0347	0262	0138	0142	0140	0140	0131	0641	2230	0353	1920	0173	2688	0178	1890	0254	3123	0082	2198	0129	3083	0326	2335	0259	3320	0070
0233	0329	0218	0349	0267	0137	0141	0140	0143	0133	0641	2224	0340	1914	0198	2684	0179	1894	0242	3128	0136	2204	0176	3084	0297	2338	0237	3314	0139
0236	0333	0220	0347	0261	0136	0140	0141	0141	0135	0642	2232	0354	1918	0203	2685	0160	1892	0228	3123	0161	2200	0182	3087	0275	2338	0234	3317	0137
0233	0331	0217	0346	0260	0136	0141	0141	0145	0134	0642	2230	0329	1920	0192	2683	0157	1890	0213	3123	0151	2203	0188	3083	0272	2337	0220	3316	0134
0233	0334	0223	0349	0261	0135	0140	0139	0142	0136	0640	2228	0315	1923	0192	2686	0172	1893	0210	3123	0139	2200	0187	3080	0264	2336	0205	3319	0145
0236	0334	0218	0345	0264	0137	0142	0140	0142	0133	0642	2231	0315	1923	0183	2688	0171	1890	0210	3121	0139	2200	0176	3083	0268	2339	0208	3321	0153
0236	[illegible]	0219	0346	0261	0136	0141	0141	0141	0134	0641	2235	0320	1925	0180	2688	0165	1839	0203	3121	0131	2198	0178	3086	0266	2341	0209	3322	0148

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TC02 AVG 10-1	TC02 SIGM 10-2	TC03 AVG 10-1	TC03 SIGM 10-2	TC04 AVG 10-1	TC04 SIGM 10-2	TC05 AVG 10-1	TC05 SIGM 10-2	TC06 AVG 10-1	TC06 SIGM 10-2	TC07 AVG 10-1	TC07 SIGM 10-2	TC08 AVG 10-1	TC08 SIGM 10-2	TC09 AVG 10-1	TC09 SIGM 10-2	TC10 AVG 10-1	TC10 SIGM 10-2	TC11 AVG 10-1	TC11 SIGM 10-2	TC12 AVG 10-1	TC12 SIGM 10-2
0064	0065	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	0080	0081	0082	0083	0084	0085
1700	0000	2040	0000	1600	0000	2140	0000	1730	0000	2130	0000	1830	0000	2150	0000	1690	0000	2220	0000	1970	0000
1685	0150	2050	0100	1620	0200	2160	0200	1735	0050	2125	0050	1805	0250	2130	0200	1695	0050	2245	0250	1995	0250
1670	0244	2037	0208	1620	0163	2170	0216	1747	0176	2133	0130	1800	0216	2120	0216	1687	0134	2247	0208	2007	0264
1670	0212	2033	0192	1613	0192	2168	0192	1753	0178	2145	0229	1808	0227	2120	0187	1683	0129	2238	0238	2003	0238
1668	0194	2034	0179	1618	0204	2170	0178	1754	0164	2144	0206	1800	0252	2118	0172	1684	0127	2244	0250	2006	0225
1667	0179	2033	0163	1622	0203	2173	0179	1757	0160	2143	0188	1797	0243	2117	0160	1682	0121	2248	0248	2012	0241
1676	0277	2036	0162	1620	0192	2171	0173	1753	0176	2141	0184	1801	0253	2123	0211	1684	0130	2249	0230	2009	0237
1674	0264	2033	0171	1616	0205	2174	0172	1756	0186	2145	0193	1804	0244	2123	0198	1680	0165	2244	0249	2010	0223
1680	0305	2033	0165	1616	0195	2172	0171	1753	0194	2143	0188	1807	0246	2127	0222	1682	0170	2244	0237	2008	0221
1682	0246	2035	0162	1615	0195	2171	0165	1751	0199	2142	0185	1809	0244	2130	0232	1684	0171	2245	0224	2006	0215
1730	0000	2210	0000	1660	0000	2450	0000	1910	0000	2440	0000	1980	0000	2460	0000	1850	0000	2600	0000	2230	0000
1730	0000	2210	0000	1660	0000	2450	0000	1915	0050	2435	0050	1970	0100	2445	0150	1820	0300	2575	0250	2215	0150
1737	0100	2207	0048	1660	0000	2447	0048	1913	0068	2440	0081	1973	0106	2443	0125	1810	0282	2577	0208	2203	0206
1748	0204	2220	0234	1665	0086	2445	0090	1913	0083	2438	0082	1978	0108	2448	0129	1813	0248	2570	0212	2198	0204
1744	1[illegible]	2228	0265	1678	0273	2450	0109	1906	0137	2434	0111	1970	0178	2446	0123	1818	0248	2580	0275	2200	0189
1748	0206	2235	0287	1682	0261	2448	0109	1897	0245	2432	0106	1968	0169	2450	0141	1823	0258	2585	0275	2198	0180
1744	0215	2234	0268	1677	0266	2447	0105	1893	0244	2434	0119	1973	0193	2451	0137	1823	0238	2583	0282	2196	0180
1748	0216	2237	0275	1680	0259	2449	0105	1889	0252	2431	0136	1970	0193	2454	0140	1826	0239	2584	0282	2196	0165
1749	0209	2238	0263	1677	0263	2448	0105	1889	0238	2433	0143	1972	0193	2454	0135	1826	0228	2580	0286	2194	0167
1751	0209	2241	0268	1678	0253	2447	0102	1885	0251	2432	0140	1970	0194	2456	0136	1828	0228	2583	0287	2194	0156
1740	0000	2420	0000	1740	0000	2730	0000	2040	0000	2690	0000	2120	0000	2770	0000	1940	0000	2930	0000	2380	0000
1810	0200	2415	0050	1720	0200	2715	0150	2020	0200	2695	0050	2130	0100	2780	0100	1945	0050	2925	0050	2365	0150
1817	0189	2427	0173	1740	0326	2723	0177	2023	0170	2700	0081	2130	0081	2780	0081	1947	0059	2927	0047	2363	0134
1810	0200	2425	0150	1740	0282	2725	0150	2028	0163	2698	0082	2128	0082	2778	0082	1945	0050	2928	0043	2368	0129
1816	0215	2426	0141	1740	0252	2718	0194	2020	0209	2696	0084	2132	0117	2780	0069	1950	0109	2930	0063	2362	0165
1820	0216	2428	0134	1743	0244	2713	0205	2013	0244	2692	0125	2132	0107	2785	0138	1957	0182	2933	0100	2360	0152
1823	0213	2430	0130	1743	0225	2710	0207	2010	0239	2693	0117	2134	0120	2786	0133	1961	0204	2936	0106	2364	0177
1813	0226	2430	0122	1743	0210	2715	0234	2014	0244	2693	0108	2133	0119	2784	0131	1959	0202	2935	0100	2370	0223
1818	0216	2428	0131	1742	0199	2714	0223	2016	0236	2694	0119	2132	0116	2783	0127	1957	0201	2936	0101	2369	0214
1817	0206	2424	0170	1742	0190	2716	0217	2015	0224	2694	0112	2134	0124	2784	0123	1961	0231	2937	0104	2369	0202
1870	0000	2600	0000	1830	0000	2950	0000	2100	0000	2870	0000	2210	0000	3070	0000	2110	0000	3250	0000	2530	0000
1865	0050	2570	0300	1805	0250	2945	0050	2125	0250	2900	0300	2240	0300	3065	0050	2080	0300	3235	0150	2520	0100
1857	0129	2563	0262	1800	0216	2953	0125	2133	0238	2907	0264	2237	0249	3057	0129	2077	0254	3240	0141	2530	0163
1860	0122	2575	0304	1808	0227	2953	0108	2128	0227	2900	0254	2230	0244	3060	0122	2085	0259	3245	0150	2533	0147
1858	0122	2568	0306	1802	0232	2952	0100	2132	0223	2904	0243	2236	0252	3058	0122	2078	0273	3240	0167	2532	0133
1857	0113	2573	0305	1808	0256	2952	0092	2130	0208	2898	0255	2233	0235	3065	0189	2085	0292	3242	0157	2532	0123
1864	0216	2577	0297	1807	0239	2947	0138	2126	0222	2897	0238	2239	0254	3073	0260	2089	0286	3241	0148	2527	0158
1861	0214	2576	0278	1806	0223	2951	0169	2130	0234	2895	0229	2241	0247	3079	0289	2091	0275	3241	0136	2525	0158
1864	0223	2580	0282	1809	0224	2950	0163	2126	0256	2894	0218	2240	0235	3082	0290	2094	0276	3242	0135	2524	0150
1863	0216	2581	0270	1811	0222	2950	0154	2126	0243	2895	0206	2236	0254	3080	0282	2095	0261	3245	0150	2526	0152
1890	0000	2700	0000	1870	0000	3130	0000	2210	0000	3050	0000	2300	0000	3310	0000	2200	0000	3500	0000	2660	0000
1910	0200	2685	0150	1845	0250	3120	0100	2195	0150	3080	0300	2330	0300	3320	0100	2190	0100	3480	0200	2675	0250
1917	0191	2693	0177	1850	0216	3123	0100	2193	0130	3070	0282	2327	0249	3320	0081	2197	0133	3483	0173	2680	0216
1920	0173	2688	0178	1840	0254	3123	0082	2198	0129	3083	0326	2335	0259	3320	0070	2190	0158	3480	0158	2675	0206
1914	0198	2684	0179	1844	0242	3128	0136	2204	0176	3084	0297	2334	0237	3314	0139	2188	0153	3482	0147	2682	0234
1918	0203	2685	0160	1842	0228	3123	0161	2200	0182	3087	0275	2338	0234	3317	0137	2190	0141	3480	0141	2637	0253
1920	0192	2683	0157	1840	0213	3123	0151	2203	0184	3083	0272	2337	0220	3316	0134	2187	0152	3477	0152	2631	0261
1923	0192	2686	0172	1843	0210	3123	0139	2200	0137	3080	0264	2336	0205	3319	0145	2193	0198	3479	0145	2631	0242
1923	0183	2684	0171	1840	0210	3121	0139	2200	0176	3083	0268	2339	0208	3321	0153	2191	0193	3476	0167	2669	0234
1925	0180	2684	0165	1839	0203	3121	0131	2198	0178	3086	0266	2341	0209	3322	0148	2191	0184	3474	0164	2627	0233

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	LOG HEADING	ACC MWD 10-1	PWRT MW 10-1	CORE INLT F	CORE OUTL F	SR 1 HTIN 10-2	SR 2 HTIN 10-2	SR 3 HTIN 10-2	SR 4 HTIN 10-2	SR 5 HTIN 10-2	SR 6 HTIN 10-2	SR 7 HTIN 10-2	SR 8 HTIN 10-2	NR 1 PER CENT	NR 2 PER CENT	TC01 FAR HOT	TC02 FAR COLD	TC03 FAR HOT	TC04 FAR COLD	TC05 MID HOT	TC06 MID COLD
	SE13 BA H 1206	0029	0030	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049
	SE13 BA T 1206	7277	0597	0134	0160	3027	3026	3028	3026	3028	3029	3030	3028	0079	0086	0227	0195	0270	0184	0320	0227
	SE13 BA T 1207	7277	0600	0133	0160	3027	3027	3029	3026	3028	3029	3030	3028	0079	0086	0225	0192	0270	0189	0321	0223
	SE13 BA T 1208	7277	0599	0133	0161	3027	3027	3027	3028	3027	3028	3029	3030	3028	0079	0088	0229	0194	0271	0185	0317	0226
	SE13 BA T 1209	7277	0600	0133	0161	3027	3027	3026	3026	3028	3029	3030	3029	0079	0086	0230	0195	0272	0185	0316	0221
	SE13 BA T 1210	7277	0600	0134	0160	3027	3027	3029	3026	3028	3029	3030	3029	0079	0088	0228	0192	[illegible]	0184	0321	0227
	SE13 BA T 1211	7277	0599	0133	0160	3027	3027	3026	3027	3028	3029	3030	3028	0079	0088	0226	0195	0277	0187	0320	0221
	SE13 BA T 1212	7277	0599	0134	0161	3027	3028	3029	3026	3028	3029	3029	3030	0079	0088	0225	0195	0277	0189	0321	0222
13.5"	SE13 BA T 1213	7277	0599	0134	0161	3027	3027	3029	3026	3028	3029	3030	3028	0079	0088	0225	0192	0270	0184	0322	0227
	SE13 BA T 1214	7277	0595	0133	0160	3027	3026	3026	3026	3028	3029	3030	3028	0079	0088	0229	0194	0270	0187	0318	0228
	SE13 BA T 1215	7277	0600	0134	0161	3027	3027	3028	3027	3028	3029	3030	3028	0079	0088	0225	0192	0271	0186	0323	0228
	SE13 BA T 1221	7281	0602	0134	0161	3027	3027	3029	3027	3028	3029	3030	3028	0080	0088	0230	0194	0270	0192	0333	0231
	SE13 BA T 1222	7281	0601	0134	0161	3028	3027	3028	3027	3028	3029	3030	3028	0080	0088	0235	0195	0270	0187	0329	0231
	SE13 BA T 1223	7281	0598	0134	0161	3027	3028	3028	3026	3028	3029	3030	3029	0080	0088	0230	0196	0275	0191	0331	0228
	SE13 BA T 1224	7281	0597	0134	0161	3027	3027	3028	3026	3028	3029	3030	3028	0080	0088	0232	0194	0273	0189	0332	0231
	SE13 BA T 1225	7281	0598	0134	0161	3027	3027	3029	3027	3028	3029	3030	3028	0080	0088	0230	0196	0281	0192	0331	0225
	SE13 BA T 1226	7281	0598	0133	0161	3027	3027	3028	3027	3028	3029	3030	3028	0080	0088	0236	0196	0275	0186	0327	0227
	SE13 BA T 1227	7281	0600	0134	0161	3027	3027	3028	3026	3028	3029	3030	3028	0080	0088	0234	0194	0277	0186	0332	0231
	SE13 BA T 1228	7281	0596	0134	0161	3027	3027	3029	3026	3028	3029	3030	3028	0080	0088	0235	0195	0276	0186	0327	0231
13"	SE13 BA T 1229	7281	0598	0134	0161	3027	3027	3028	3027	3028	3029	3030	3028	0080	0088	0231	0192	0278	0191	0333	0231
	SE13 BA T 1230	7285	0598	0134	0161	3027	3028	3028	3027	3028	3029	3030	3028	0080	0088	0232	0193	0278	0189	0332	0231
	SE13 BA T 1231	7285	0597	0134	0161	3027	3027	3028	3027	3028	3029	3030	3028	0080	0088	0230	0194	0278	0192	0332	0231
	SE13 BA T 1238	7285	0599	0134	0161	3028	3027	3026	3027	3028	3029	3030	3028	0081	0088	0239	0197	0290	0195	0347	0231
	SE13 BA T 1239	7285	0598	0134	0161	3039	3038	3039	3037	3038	3039	3039	3039	0079	0088	0245	0199	0287	0191	0343	0231
	SE13 BA T 1240	7289	0598	0134	0161	3039	3038	3039	3037	3038	3039	3039	3039	0079	0088	0245	0200	0287	0186	0343	0231
	SE13 BA T 1241	7289	0599	0134	0161	3039	3038	3039	3037	3038	3039	3039	3039	0079	0088	0245	0199	0287	0191	0343	0231
	SE13 BA T 1242	7289	0600	0134	0161	3039	3038	3039	3037	3038	3039	3040	3039	0079	0088	0241	0198	0286	0195	0347	0231
	SE13 BA T 1243	7289	0599	0134	0161	3039	3038	3039	3037	3038	3039	3040	3039	0079	0088	0246	0201	0286	0189	0343	0231
	SE13 BA T 1244	7289	0600	0134	0161	3039	3038	3039	3037	3038	3039	3039	3039	0079	0088	0245	0202	0290	0192	0343	0231
12	SE13 BA T 1245	7289	0597	0134	0161	3039	3038	3039	3037	3038	3039	3040	3039	0079	0088	0241	0198	0290	0195	0347	0231
	SE13 BA T 1246	7289	0600	0134	0161	3039	3038	3039	3037	3038	3039	3040	3039	0079	0088	0243	0201	0291	0194	0345	0231
	SE13 BA T 1247	7289	0599	0134	0161	3039	3038	3039	3037	3038	3039	3039	3039	0079	0088	0243	0201	0291	0194	0345	0231
	SE13 BA T 1301	7298	0598	0134	0161	3039	3038	3039	3037	3038	3038	3040	3039	0080	0088	0263	0204	0314	0201	0391	0234
	SE13 BA T 1302	7298	0598	0134	0161	3039	3038	3039	3037	3038	3039	3039	3039	0080	0088	0266	0206	0316	0204	0389	0234
	SE13 BA T 1303	7298	0598	0134	0161	3039	3038	3039	3037	3038	3039	3040	3039	0080	0088	0271	0211	0318	0202	0387	0234
	SE13 BA T 1304	7298	0601	0134	0162	3038	3038	3039	3037	3038	3038	3039	3039	0080	0088	0269	0210	0320	0200	0389	0234
	SE13 BA T 1305	7298	0597	0134	0161	3039	3037	3039	3037	3038	3038	3040	3039	0080	0088	0270	0206	0314	0199	0389	0234
	SE13 BA T 1306	7298	0599	0134	0161	3039	3038	3039	3037	3038	3039	3040	3039	0080	0088	0269	0206	0315	0200	0390	0234
	SE13 BA T 1307	7298	0598	0134	0161	3038	3038	3039	3037	3038	3038	3040	3039	0080	0088	0271	0207	0314	0199	0385	0234
8.5	SE13 BA T 1308	7298	0597	0134	0161	3039	3038	3039	3037	3038	3039	3039	3039	0081	0088	0267	0206	0316	[illegible]	0390	0234
	SE13 BA T 1309	7298	0601	0134	0161	3039	3038	3039	3037	3038	3039	3039	3039	0081	0088	0273	0209	0314	0206	0387	0234
	SE13 BA T 1310	7302	0600	0134	0162	3039	3038	3039	3037	3037	3038	3040	3039	0081	0088	0269	0211	0321	0200	0391	0234
	SE13 BA T 1318	7302	0600	0134	0161	3047	3047	3049	3046	3048	3049	3050	3048	0079	0088	0287	0212	0326	0203	0411	0237
	SE13 BA T 1319	7302	0600	0134	0161	3047	3047	3048	3046	3048	3049	3050	3047	0079	0088	0286	0217	0332	0207	0409	0236
	SE13 BA T 1320	7306	0601	0134	0161	3048	3048	3049	3046	3048	3049	3050	3048	0079	0088	0281	0212	0329	0209	0413	0237
	SE13 BA T 1321	7306	0601	0134	0161	3047	3047	3049	3046	3048	3049	3050	3048	0079	0087	0287	0217	0327	0203	0409	0236
	SE13 BA T 1322	7306	0603	0134	0162	3047	3047	3048	3046	3048	3049	3050	3047	0080	0086	0284	0211	0329	0206	0415	0237
	SE13 BA T 1323	7306	0601	0134	0161	3047	3047	3049	3046	3048	3049	3050	3048	0080	0086	0287	0217	0332	0206	0409	0236
	SE13 BA T 1324	7306	0597	0134	0162	3029	3036	3039	3041	3040	3049	3050	3048	0078	0100	0281	0211	0331	0210	0411	0236
5"	SE13 BA T 1325	7306	0597	0134	0162	3026	3027	3028	3027	3026	3030	3044	3047	0079	0100	0287	0214	0327	0202	0407	0236
	SE13 BA T 1326	7306	0597	0134	0161	3022	3025	3026	3025	3027	3030	3030	3026	0080	0100	0288	0215	0329	0208	0406	0236
	SE13 BA T 1327	7306	0602	0134	0162	3025	3024	3026	3024	3026	3026	3027	3026	0081	0100	0283	0213	0332	0210	0412	0236

TC05 MID COLD	TC07 MID HOT	TC08 MID COLD	TC09 NEAR HOT	TC10 NEAR COLD	TC11 NEAR HOT	TC12 NEAR COLD	TC13 FXT NEAR	TC14 FXT BOT	TC15 FXT FAR	HT-1 INLT TEMP	HT-1 OUTL TEMP	HT-1 FLOW	TC01 AVG	TC01 SIGM	TC02 AVG	TC02 SIGM	TC03 AVG	TC03 SIGM	TC04 AVG	TC04 SIGM	TC05 AVG	TC05 SIGM	TC06 AVG	TC06 SIGM	TC07 AVG	TC07 SIGM	TC08 AVG	TC08 SIGM
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	LOG HEADING	ACC MWD 10-1	PWRT MW 10-1	CORE INLT F	CORE OUTL F	SR 1 HTIN 10-2	SR 2 HTIN 10-2	SR 3 HTIN 10-2	SR 4 HTIN 10-2	SR 5 HTIN 10-2	SR 6 HTIN 10-2	SR 7 HTIN 10-2	SR 8 HTIN 10-2	RR 1 PER CENT	RR 2 PER CENT	TC01 FAR HOT	TC02 FAR COLD	TC03 FAR HOT	TC04 FAR COLD	TC05 MID HOT	TC06 MID COLD
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	SE13 BA T 1337	7310	0599	0134	0161	3025	3024	3026	3024	3025	3026	3027	3026	0081	0100	0290	0217	0332	0205	0413	0268
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TC07 MID HOT	TC08 MID COLD	TC09 NEAR HOT	TC10 NEAR COLD	TC11 NEAR HOT	TC12 NEAR COLD	TC13 EXT NEAR	TC14 EXT HOT	TC15 EXT FAR	HT-1 INLT TEMP	HT-1 OUTL TEMP	HT-1 FLOW	TC01 AVG 10-1	TC01 SIGM 10-2	TC02 AVG 10-1	TC02 SIGM 10-2	TC03 AVG 10-1	TC03 SIGM 10-2	TC04 AVG 10-1	TC04 SIGM 10-2	TC05 AVG 10-1	TC05 SIGM 10-2	TC06 AVG 10-1	TC06 SIGM 10-2	TC07 AVG 10-1	TC07 SIGM 10-2	TC08 AVG 10-1	TC08 SIGM 10-2	TC09 AVG 10-1
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[illegible]	[illegible]	[illegible]	0280	0487	0323	0141	0147	0142	0140	0135	0641	2860	0212	2118	0261	3285	0239	2046	0214	4129	0262	2696	0232	4079	0194	2868	0214	4703
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	TC03	TC04	TC04	TC05	TC05	TC06	TC06	TC07	TC07	TC08	TC08	TC09	TC09	TC10	TC10	TC11	TC11	TC12	TC12
	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM
	10-1	10-2	10-1	10-2	10-1	10-2	10-1	10-2	10-1	10-2	10-1	10-2	10-1	10-2	10-1	10-2	10-1	10-2	10-1	10-2
	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	0080	0081	0082	0083	0084	0085	
	0000	2050	0000	4130	0000	2680	0000	4080	0000	2890	0000	4740	0000	2860	0000	4880	0000	3250	0000
	0050	2050	0000	4125	0050	2680	0000	4080	0000	2890	0000	4740	0000	2860	0000	4885	0050	3250	0000
	0170	2050	0141	4123	0048	2690	0141	4097	0242	2890	0000	4730	0141	2843	0240	4880	0081	3250	0000
	0163	2043	0129	4123	0043	2688	0129	4093	0216	2890	0000	4733	0129	2848	0216	4883	0082	3250	0000
	0120	2042	0122	4130	0154	2696	0207	4096	0207	2890	0000	4728	0150	2838	0274	4882	0086	3256	0121
	0005	2047	0152	4128	0148	2692	0214	4092	0212	2885	0111	4727	0143	2843	0277	4883	0081	3257	0110
	0191	2050	0160	4127	0140	2687	0226	4089	0212	2884	0120	4726	0132	2846	0261	4883	0078	3256	0108
	0224	2053	0163	4130	0150	2688	0210	4086	0205	2880	0132	4725	0122	2849	0257	4885	0086	3260	0150
	0224	2054	0164	4130	0141	2686	0208	4086	0195	2879	0129	4726	0118	2851	0252	4887	0095	3260	0141
	0231	2056	0163	4132	0150	2685	0196	4084	0193	2877	0135	4725	0111	2853	0246	4888	0102	3263	0164
	0000	2030	0000	4160	0000	2750	0000	4110	0000	2870	0000	4690	0000	2810	0000	4880	0000	3280	0000
	0100	2030	0000	4125	0350	2715	0350	4100	0100	2865	0150	4710	0200	2835	0250	4880	0000	3255	0250
	0100	2025	0095	4127	0292	2700	0355	4093	0125	2883	0129	4727	0292	2843	0240	4883	0067	3250	0216
	0100	2025	0086	4123	0258	2695	0320	4090	0122	2885	0111	4730	0254	2848	0216	4880	0070	3245	0206
	0100	2026	0089	4116	0268	2690	0303	4086	0139	2886	0107	4732	0235	2850	0200	4878	0081	3242	0197
	0121	2033	0182	4125	0314	2693	0288	4087	0128	2882	0134	4725	0262	2843	0238	4882	0111	3250	0251
	0150	2033	0168	4129	0305	2699	0296	4090	0141	2881	0126	4720	0272	2837	0266	4880	0106	3253	0244
	0161	2031	0161	4129	0284	2700	0278	4094	0165	2881	0116	4716	0273	2833	0277	4879	0105	3251	0231
	0165	2034	0177	4128	0271	2696	0291	4090	0188	2880	0115	4718	0263	2836	0276	4880	0105	3250	0221
	0161	2032	0183	4127	0257	2697	0280	4093	0200	2880	0109	4717	0250	2833	0273	4878	0118	3249	0213
	0000	2060	0000	4150	0000	2700	0000	4070	0000	2840	0000	4670	0000	2800	0000	4880	0000	3280	0000
	0000	2060	0000	4155	0050	2705	0050	4075	0050	2840	0000	4675	0050	2805	0050	4885	0050	3285	0050
	0189	2070	0141	4153	0048	2703	0059	4077	0057	2847	0100	4677	0056	2807	0047	4880	0081	3270	0216
	0173	2058	0248	4143	0192	2705	0050	4085	0150	2855	0165	4685	0150	2805	0050	4878	0082	3260	0254
	0163	2050	0268	4144	0175	2710	0109	4086	0139	2858	0164	4684	0142	2804	0053	4874	0108	3262	0235
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	0181	2047	0233	4139	0253	2701	0198	4081	0148	2859	0174	4689	0210	2813	0200	4874	0096	3260	0239
	0183	2043	0248	4133	0286	2701	0183	4085	0165	2861	0176	4691	0208	2813	0185	4871	0116	3255	0259
	0216	2044	0242	4132	0270	2699	0185	4080	0210	2859	0182	4693	0205	2818	0231	4873	0124	3257	0249
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	0227	2049	0225	4134	0248	2695	0210	4079	0190	2860	0212	4697	0215	2821	0251	4873	0137	3256	0254
	0225	2050	0218	4136	0247	2695	0202	4078	0184	2863	0230	4698	0214	2820	0241	4871	0160	3254	0253
	0220	2049	0216	4133	0266	2694	0206	4077	0184	2864	0227	4701	0222	2823	0254	4871	0155	3252	0251
	0224	2047	0215	4130	0278	2693	0203	4077	0177	2866	0228	4703	0227	2825	0263	4871	0149	3250	0255
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	0242	2049	0206	4131	0273	2695	0240	4076	0173	2867	0222	4704	0225	2831	0288	4874	0172	3252	0250
	0238	2047	0211	4130	0268	2696	0236	4078	0185	2868	0218	4704	0220	2829	0284	4874	0168	3251	0249
	0239	2046	0214	4129	0262	2696	0232	4079	0194	2868	0214	4703	0216	2828	0284	4874	0164	3249	0246
	0233	2044	0215	4130	0256	2698	0238	4080	0189	2868	0208	4703	0211	2826	0283	4873	0162	3250	0244

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LOG HEADING	ACC MWO 10-1	PWRT MW 10-1	CORE INLT F	CORE OUTL F	SR 1 HTIN 10-2	SR 2 HTIN 10-2	SR 3 HTIN 10-2	SR 4 HTIN 10-2	SR 5 HTIN 10-2	SR 6 HTIN 10-2	SR 7 HTIN 10-2	SR 8 HTIN 10-2	RR 1 PER CENT	RR 2 PER CENT	TC01 FAR HOT	TC02 FAR COLD	TC03 FAR HOT	TC04 FAR COLD	TC05 MID HOT	TC06 MID COLD	TC07 MID HOT
			0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	0050
SE13 BA H 2330	0029	0030																			
SE13 A T 2330	7510	0015	0076	0077	0001	0004	-002	-004	-070	0007	0001	0004	0038	0036	0096	0093	0091	0085	0091	0088	009[illegible]
SE13 BA T 2331	7510	0016	0076	0077	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0089	0092	0094	0091	0094	0089	009[illegible]
SE13 BA T 2332	7510	0016	0076	0077	0000	0004	-002	-004	-070	0006	0001	0004	0038	0036	0094	0093	0090	0083	0092	0090	009[illegible]
SE13 BA T 2333	7510	0016	0076	0077	0000	0004	-002	-004	-070	0006	0001	0004	0038	0036	0092	0094	0093	0090	0092	0086	009[illegible]
SE13 BA T 2334	7510	0016	0076	0077	0000	0004	002	-004	-070	0006	0001	0004	0038	0036	0090	0088	0090	0089	0096	0091	009[illegible]
SE13 BA T 2335	7510	0016	0076	0077	0000	0003	-002	-005	-070	0006	0001	0003	0038	0036	0089	0090	0093	0091	0096	0089	009[illegible]
SE13 BA T 2336	7510	0016	0076	0077	0000	0004	-002	-004	-070	0006	0000	0004	0038	0036	0093	0091	0089	0085	0092	0091	009[illegible]
SE13 BA T 2337	7510	0016	0076	0077	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0094	0093	0090	0083	0092	0089	009[illegible]
SE13 BA T 2338	7510	0016	0076	0076	0001	0004	-002	-004	-070	0006	0001	0004	0038	0036	0091	0090	0090	0085	0094	0092	009[illegible]
SE13 BA T 2339	7510	0016	0076	0076	0000	0003	-00[illegible]	-004	-070	0007	0001	0004	0038	0036	0087	0090	0091	0090	0094	0091	009[illegible]
SE13 BA T 2340	7510	0016	0076	0076	0001	0003	-002	-004	-070	0006	0001	0004	0038	0036	0092	0094	0092	0089	0091	0085	009[illegible]
SE13 BA T 2341	7510	0016	0076	0076	0001	0003	-002	-004	-070	0006	0001	0004	0038	0036	0090	0094	0094	0089	0091	0086	009[illegible]
SE13 BA T 2342	7510	0016	0076	0076	0001	0003	-002	-004	-070	0006	0001	0004	0038	0036	0091	0090	0089	0085	0094	0092	009[illegible]
SE13 BA T 2343	7510	0016	0076	0076	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0088	0090	0093	0091	0096	0092	009[illegible]
SE13 BA T 2344	7510	0016	0076	0076	0000	0005	-002	-004	-070	0006	0001	0004	0038	0036	0093	0091	0089	0083	0091	0091	009[illegible]
SE13 BA T 2345	7510	0016	0076	0076	0000	0003	-002	-00[illegible]	-070	0006	0001	0004	0038	0036	0090	0089	0090	0085	0094	0092	009[illegible]
SE13 BA T 2346	7510	0016	0076	0076	0000	0003	-002	-004	070	0006	0001	0004	0038	0036	0089	0088	0087	0083	0091	0090	009[illegible]
SE13 BA T 2347	7510	0016	0076	0076	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0093	0096	0092	0087	0091	0085	009[illegible]
SE13 BA T 2348	7510	0016	0076	0076	0001	0003	-002	-004	-070	0007	0001	0004	0038	0036	0093	0094	0092	0086	0091	0086	009[illegible]
SE13 BA T 2349	7510	0016	0076	0076	0001	0003	-002	-004	-070	0006	0001	0004	0038	0036	0089	0091	009[illegible]	0090	0094	0091	009[illegible]
SE14 BA T 0230	7510	0015	0071	0072	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0086	0090	0086	0082	0083	0079	008[illegible]
SE14 BA T 0231	7510	0014	0071	0071	0001	0003	-002	-004	-070	0006	0001	0004	0038	0036	0082	0088	0088	008[illegible]	0087	0081	008[illegible]
SE14 BA T 0232	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0083	0082	0082	0082	0089	0085	008[illegible]
SE14 BA T 0233	7510	0014	0071	0071	0000	0003	-002	004	-070	0006	0001	0003	0038	0036	0085	0089	0086	008[illegible]	0085	0078	008[illegible]
SE14 BA T 0234	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0085	0083	0081	0080	0088	0086	008[illegible]
SE14 BA T 0235	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0003	0038	0036	0089	0088	0082	0079	0083	0080	008[illegible]
SE14 BA T 0236	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0003	0038	0036	0082	0082	0082	0082	0085	0086	008[illegible]
SE14 BA T 0237	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0088	0090	0085	0081	0082	0080	008[illegible]
SE14 BA T 0238	7510	0014	0071	0071	0001	0004	-002	-004	-070	0006	0001	0004	0038	0036	0083	0088	0087	0083	0083	0079	008[illegible]
SE14 BA T 0239	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0085	0082	0082	0081	0089	0083	008[illegible]
SE14 BA T 0240	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0086	0083	0080	0080	0086	0086	008[illegible]
SE14 BA T 0241	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0088	0090	0088	0083	0089	0083	008[illegible]
SE14 BA T 0242	7510	0014	0071	0071	0000	0003	-002	-004	-070	0007	0001	0004	0038	0036	0088	0085	0081	0079	0083	0085	008[illegible]
SE14 BA T 0243	7510	0014	0071	0071	0000	0004	002	-004	-070	0006	0001	0004	0038	0036	0082	0082	0082	0083	0088	0083	008[illegible]
SE14 BA T 0244	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0081	0083	0083	0083	0087	0083	008[illegible]
SE14 BA T 0245	7510	0014	0071	0071	0001	0003	-002	-004	-070	0006	0001	0004	0038	0036	0081	0082	0082	0083	0089	0083	008[illegible]
SE14 BA T 0246	7510	0014	0071	0071	0000	0003	002	-004	-070	0006	0001	0004	0038	0036	0090	0088	0082	0086	0086	0082	008[illegible]
SE14 BA T 0247	7510	0014	0071	0071	0001	0003	-002	-004	070	0007	0001	0004	0038	0036	0081	0082	0082	0083	0089	0083	008[illegible]
SE14 BA T 0248	7510	0014	0071	0071	0000	0003	002	-005	-070	0006	0001	0004	0038	0036	0089	0088	0082	0078	0082	0080	008[illegible]
SE14 BA T 0249	7510	0014	0071	0071	0000	0003	-002	-004	-070	0006	0001	0004	0038	0036	0083	0088	0086	0082	0083	0079	008[illegible]

#1

#2

008	TC09	TC10	TC11	TC12	TC13	TC14	TC15	HT-1	HT-1	HT-1	TC01	TC01	TC02	TC02	TC03	TC03	TC04	TC04	TC05	TC05	TC06	TC06	TC07	TC07	TC08	TC08	TC09	TC09	TC
ID	NEAR	NEAR	NEAR	NEAR	FXT	FXT	FXT	INLT	OUTL	FLOW	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	A
OLD	HOT	COLD	HOT	COLD	NEAR	BOT	FAR	TEMP	TEMP		10-1	10-2	10-1	10 2	10 1	10 2	10-1	10-2	10-1	10 2	10-1	10 2	10 1	10 2	10 1	10-2	10-1	10 2	10
51	0052	0053	0054	0055	0056	0057	0058	0059	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	00
96	0098	0091	00[illegible]	0088	0082	0084	0085	0080	0085	0659	0960	0000	0930	0000	0910	0000	0850	0000	0910	0000	0880	0000	0940	0000	0960	0000	0980	0000	09
89	0096	0092	01[illegible]	0092	0082	0081	0083	0079	0086	0659	0925	0350	0925	0050	0925	0150	0880	0300	0925	0150	0885	0050	0920	0200	0925	0350	0970	0100	09
93	0098	0089	0094	0089	0083	0085	0084	0080	0084	0659	0930	0294	0927	0060	0917	0170	0863	0343	0923	0134	0890	0081	0933	0252	0927	0289	0973	0095	09
90	0099	0093	01[illegible]0	0090	0080	0082	0082	0085	0087	0658	0928	0258	0930	0070	0920	0158	0873	0334	0923	0108	0883	0147	0928	0238	0920	0273	0978	0108	09
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89	0094	0092	0101	0092	0082	0081	0082	0078	0086	0659	0917	0262	0917	0205	0918	0159	0882	0308	0935	0197	0888	0159	0925	0206	0910	0264	0962	0248	09
92	0095	0088	0095	0089	0084	0086	0082	0079	0083	0660	0919	0248	0916	0194	0914	0177	0877	0306	0933	0190	0891	0164	0930	0226	0911	0248	0960	0232	09
93	0098	0089	0094	0089	0082	0085	0084	0080	0084	0659	0921	0242	0918	0185	0913	0171	0871	0325	0931	0183	0891	0153	0934	0234	0914	0239	0963	0227	09
91	0093	0088	0095	0092	0085	0083	0083	0078	0082	0659	0920	0230	0916	0183	0911	0166	0869	0315	0932	0176	0894	0173	0934	0224	091[illegible]	0226	0959	0239	09
86	0094	0090	0100	0093	0083	0082	0081	0078	0085	0659	0915	0265	0914	0181	0911	0159	0872	0313	0933	0169	0896	0169	0933	0216	0908	0268	0957	0232	09
91	0099	0092	0099	0089	0080	0082	0082	0081	0086	0660	0915	0255	0916	0189	0912	0152	0874	0303	0931	0175	0892	0208	0931	0217	0908	0255	0960	0241	09
89	0099	0093	0099	0090	0080	0082	0082	0080	0087	0657	0914	0247	0918	0191	0914	0167	0875	0292	0929	0177	0889	0218	0929	0215	0907	0250	0963	0245	09
91	0093	0086	0095	0092	0085	0083	0083	0082	0082	0659	0914	0238	0917	0190	0912	0172	0873	0289	0930	0170	0892	0225	0930	0207	0907	0240	0960	0251	09
92	0096	0088	0094	0089	0085	0084	0083	0078	0082	0659	0911	0245	0916	0189	0914	0173	0876	0295	0932	0183	0894	0228	0932	0215	0908	0234	0960	0242	09
92	0095	0089	0093	0089	0083	0085	0082	0079	0083	0660	0913	0241	0915	0183	0912	0177	0873	0307	0931	0184	0895	0225	0934	0218	0909	0227	0959	0235	09
90	0092	0088	0094	0092	0085	0083	0082	0077	0083	0659	0912	0235	0914	0186	0911	0172	0871	0301	0931	0179	0896	0226	0934	0211	0908	0221	0957	0246	09
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92	0099	0092	0098	0088	0080	0081	0083	0081	0085	0659	0912	0232	0914	0222	0909	0190	0869	0300	0929	0183	0894	0239	0933	0208	0910	0216	0959	0245	09
92	0099	0091	0094	0086	0083	0082	0081	0078	0085	0659	0913	0230	0916	0224	0910	0186	0868	0293	0928	0182	0892	0245	0932	0209	0911	0212	0961	0249	09
88	0092	0087	0099	0093	0083	0083	0082	0076	0083	0659	0911	0229	0915	0218	0911	0187	0870	0293	0928	0179	0893	0241	0931	0203	0909	0216	0958	0257	09
[illegible]	0090	0086	0089	0082	0076	0076	0078	0080	0080	0660	0860	0000	0900	0000	0860	0000	0820	0000	0830	0000	0790	0000	0830	0000	0850	0000	0900	0000	08
92	0090	0088	0090	0085	0077	0075	0077	0075	0082	0659	0840	0200	0890	0100	0870	0100	0825	0050	0850	0200	0800	0100	0825	0050	0835	0150	0900	0000	08
92	0083	0081	0088	0086	0079	0079	0077	0076	0079	0660	0837	0174	0867	0341	0853	0250	0823	0050	0863	0254	0817	0254	0837	0174	0830	0141	0877	0333	08
86-0091		0086	0089	0088	0077	0078	0076	0073	0078	0660	0840	0158	0873	0311	0855	0217	0825	0050	0860	0223	0808	0268	0835	0150	0838	0178	0885	0320	08
85	0085	0079	0087	0085	0080	0078	0078	0073	0077	0660	0842	0151	0864	0328	0846	0266	0820	0109	0864	0218	0818	0319	0844	0225	0840	0167	0878	0320	08
88	0089	0082	0086	0080	0076	0078	0079	0074	0079	0659	0850	0223	0867	0304	0842	0261	0815	0150	0858	0235	0815	0298	0847	0216	0847	0216	0880	0294	08
86	0086	0080	0088	0083	0079	0078	0077	0072	0077	0660	0846	0234	0860	0325	0839	0254	0816	0140	0857	0221	0821	0318	0851	0230	0849	0203	0877	[illegible]82	08
85	0090	0085	0087	0080	0077	0076	0078	0076	0080	0660	0850	0244	0865	0331	0840	0239	0815	0132	0853	0238	0819	0305	0849	0226	0850	0193	0880	0273	08
82	0090	0088	0090	0082	0075	0077	0076	0079	0081	0659	0848	0241	0867	0316	0843	0245	0817	0136	0850	0235	0816	0303	0847	0222	0847	0207	0882	0266	08
82	0066	0081	0087	0081	0077	0080	0077	0073	0077	0660	0848	0227	0862	0332	0841	0242	0816	0128	0854	0254	0817	0291	0849	0222	0844	0211	0880	0260	08
85	0086	0079	0086	0083	0079	0078	0078	0073	0076	0659	0849	0219	0859	0329	0837	0260	0815	0131	0855	0243	0821	0304	0852	0229	0845	0203	0878	0256	08
0	0085	0081	0091	0088	0078	0077	0076	0073	0078	0659	0852	0227	0863	0334	0841	0276	0816	0132	0858	0252	0822	0291	0850	0227	0841	0230	0876	0256	08
6	0086	0080	0086	0081	0078	0080	0077	0073	0077	0660	0854	0230	0862	0323	0838	0277	0814	0146	0855	0253	0824	0290	0852	0233	0842	0221	0875	0250	08
81	0083	0081	0090	0087	0078	0079	0079	0074	0079	0659	0851	0239	0859	0329	0837	0271	0815	0145	0857	0253	0824	0280	0852	0224	0839	0229	0871	0267	08
79	0085	0083	0090	0086	0078	0077	0076	0073	0073	0660	0849	0253	0857	0326	0837	0262	0816	0145	0858	0246	0825	0270	0851	0223	0836	0253	0870	0263	08
81	0083	0081	0090	0088	0077	0077	0076	0071	0078	0659	0846	0261	0854	0327	0836	0257	0817	0144	0860	0250	0825	0262	0851	0216	0834	0252	0868	0272	08
81	0085	0085	0091	0085	0076	0076	0077	0072	0080	0660	0849	0284	0856	0323	0835	0253	0819	0173	0860	0242	0825	0255	0849	0222	0833	0252	0866	0268	08
81	0083	0080	0090	0088	0077	0077	0076	0071	0077	0659	0847	0290	0854	0325	0834	0247	0820	0169	0862	0246	0825	0247	0848	0221	0832	0250	0864	0273	08
83	0088	0082	0085	0080	0076	0078	0079	0079	0079	0659	0849	0298	0855	0322	0833	0243	0818	0189	0859	0256	0824	0247	0849	0219	0834	0267	0865	0268	08
85	0090	0088	0091	0085	0079	0078	0077	0071	0078	0659	0848	0294	0856	0318	0834	0244	0818	0183	0858	0258	0822	0252	0848	0223	0835	0261	0867	0272	08

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02	TC03	TC03	TC04	TC04	TC05	TC05	TC06	TC06	TC07	TC07	TC08	TC08	TC09	TC09	TC10	TC10	TC11	TC11	TC12	TC12
IGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AV	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM	AVG	SIGM
-2	10 1	10 2	10-1	10-2	10-1	10 2	10 1	10 2	10 1	10 2	10 1	10-2	10-1	10 2	10 1	10-2	10-1	10-2	10-1	10 2
65	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	0080	0081	0082	0083	0084	0085
00	0910	0000	0850	0000	0910	0000	0880	0000	0940	0000	0960	0000	0980	0000	0910	0000	0960	0000	0880	0000
50	0925	0150	0880	0300	0925	0150	0885	0050	0920	0200	0925	0350	0970	0100	0915	0050	0985	0250	0900	0200
60	0917	0170	0863	0343	0923	0134	0890	0081	0933	0252	0927	0289	0973	0095	0907	0134	0970	0294	0897	0173
70	0920	0158	0873	0334	0923	0108	0883	0147	0928	0238	0920	0273	0978	0108	0913	0147	0978	0286	0898	0147
09	0916	0162	0876	0309	0930	0178	0888	0177	0928	0216	0914	0275	0966	0249	0908	0164	0980	0260	0904	0187
05	0918	0159	0882	0308	0935	0197	0888	0159	0925	0206	0910	0264	0962	0248	0910	0152	0985	0262	0907	0182
94	0914	0177	0877	0306	0933	0190	0891	0164	0930	0226	0911	0248	0960	0232	0906	0177	0980	0272	0904	0179
85	0913	0171	0871	0325	0931	0183	0891	0153	0934	0234	0914	0239	0963	0227	0904	0172	0975	0287	0903	0171
83	0911	0166	0869	0315	0932	0176	0894	0173	0934	0224	0913	0226	0959	0239	0901	0179	0972	0282	0904	0171
81	0911	0159	0872	0313	0933	0169	0896	0169	0933	0216	0908	0268	0957	0232	0901	0172	0975	0280	0907	0179
89	0912	0152	0874	0303	0931	0175	0892	0208	0931	0217	0908	0255	0960	0241	0903	0171	0976	0270	0905	0178
91	0914	0167	0875	0292	0929	0177	0889	0218	0929	0215	0907	0250	0963	0245	0905	0180	0978	0261	0905	0170
90	0912	0172	0873	0289	0930	0170	0892	0225	0930	0207	0907	0240	0960	0251	0902	0211	0975	0262	0906	0170
89	0914	0173	0876	0295	0932	0183	0894	0228	0932	0215	0908	0234	0960	0242	0900	0210	0973	0268	0905	0167
83	0912	0177	0873	0307	0931	0184	0895	0225	0934	0218	0909	0227	0959	0235	0899	0206	0970	0280	0904	0167
86	0911	0172	0871	0301	0931	0179	0896	0226	0934	0211	0908	0221	0957	0246	0898	0203	0968	0281	0905	0165
98	0909	0154	0869	0309	0930	0181	0896	0219	0934	0206	0909	0221	0957	0239	0899	0200	0967	0276	0904	0165
22	0909	0190	0869	0300	0929	0183	0894	0239	0933	0208	0910	0216	0959	0245	0900	0200	0968	0270	0903	0169
24	0910	0186	0868	0293	0928	0182	0892	0245	0932	0209	0911	0212	0961	0249	0901	0196	0966	0270	0901	0190
18	0911	0187	0870	0293	0928	0179	0893	0241	0931	0203	0909	0216	0958	0257	0899	0203	0968	0268	0902	0196
00	0860	0000	0820	0000	0830	0000	0790	0000	0830	0000	0850	0000	0900	0000	0860	0000	0890	0000	0820	0000
00	0870	0100	0825	0050	0850	0200	0800	0100	0825	0050	0835	0150	0900	0000	0870	0100	0895	0050	0835	0150
41	0853	0250	0823	0050	0863	0254	0817	0254	0837	0174	0830	0141	0877	0333	0850	0294	0890	0081	0843	0174
11	0855	0217	0825	0050	0860	0223	0808	0268	0835	0150	0838	0178	0885	0320	0853	0258	0890	0070	0853	0216
28	0846	0266	0820	0109	0864	0218	0818	0319	0844	0225	0840	0167	0878	0320	0840	0340	0886	0107	0852	0195
04	0842	0261	0815	0150	0858	0235	0815	0298	0847	0216	0847	0216	0880	0294	0837	0320	0882	0136	0843	0263
25	0839	0254	0816	0140	0857	0221	0821	0318	0851	0230	0849	0203	0877	0282	0831	0323	0881	0129	0841	0248
31	0840	0239	0815	0132	0853	0238	0819	0305	0849	0226	0850	0193	0880	0273	0834	0307	0880	0122	0836	0268
16	0843	0245	0817	0136	0850	0235	0816	0303	0847	0222	0847	0207	0882	0266	0839	0325	0882	0133	0834	0259
32	0841	0242	0816	0128	0854	0254	0817	0291	0849	0222	0844	0211	0880	0260	0836	0320	0881	0130	0832	0256
29	0837	0260	0815	0131	0855	0243	0821	0304	0852	0229	0845	0203	0878	0256	0832	0333	0879	0139	0832	0245
34	0841	0276	0816	0132	0858	0252	0822	0291	0850	0227	0841	0230	0876	0256	0830	0324	0882	0158	0836	0269
23	0838	0277	0814	0146	0855	0253	0824	0290	0852	0233	0842	0221	0875	0250	0828	0321	0880	0161	0834	0267
29	0837	0271	0815	0145	0857	0253	0824	0280	0852	0224	0839	0229	0871	0267	0826	0313	0881	0166	0836	0275
26	0837	0262	0816	0145	0858	0246	0825	0270	0851	0223	0836	0253	0870	0263	0827	0302	0883	0166	0838	0272
27	0836	0257	0817	0144	0860	0250	0825	0262	0851	0216	0834	0252	0868	0272	0826	0295	0884	0165	0841	0281
23	0835	0253	0819	0173	0860	0242	0825	0255	0849	0222	0833	0252	0866	0268	0827	0293	0885	0172	0841	0274
25	0834	0247	0820	0169	0862	0246	0825	0247	0843	0221	0832	0250	0864	0273	0826	0291	0886	0171	0843	0281
2	0833	0243	0818	0189	0859	0256	0824	0247	0849	0219	0834	0267	0865	0268	0825	0283	0884	0184	0841	0290
18	0834	0244	0818	0183	0858	0258	0822	0252	0848	0223	0835	0261	0867	0272	0828	0301	0885	0188	0841	0283

B.HR

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LOG HEADING	ACC PWR MWD	PWRT MW	CORE INLT F	CORE OUTL F	SR 1 HTIN 10-2	SR 2 HTIN 10-2	SR 3 HTIN 10-2	SR 4 HTIN 10-2	SR 5 HTIN 10-2	SR 6 HTIN 10-2	SR 7 HTIN 10-2	SR 8 HTIN 10-2	RR 1 PER CENT	RR 2 PER CENT	TC01 FAR HOT	TC02 FAR COLD	TC03 FAR HOT	TC04 FAR COLD	TC05 MID HOT	TC06 MID COLD	TC07 MID HOT
	10-1	10-1																			
SE14 BA H 0530	0029	0030	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	0050
SE14 BA T 0530	7510	0012	0068	0068	0001	0005	-002	-004	-070	0006	0001	0004	0002	-001	0077	0076	0078	0079	0082	0080	0082
SE14 BA T 0531	7510	0013	0068	0068	0001	0003	-002	-004	-070	0006	0001	0004	0002	-001	0075	0078	0081	0081	0082	0080	0079
SE14 BA T 0532	7510	0012	0068	0068	0000	0003	-002	-004	-070	0006	0001	0004	0002	-001	0078	0076	0078	0077	0083	0082	0082
SE14 BA T 0533	7510	0013	0068	0068	0000	0003	-002	-004	-070	0006	0001	0004	0002	-001	0075	0077	0080	0081	0082	0080	0079
SE14 BA T 0534	7510	0013	0068	0068	0001	0003	002	-004	-070	0006	0001	0004	0002	-001	0081	0083	0081	0077	0078	0075	0079
SE14 BA T 0535	7510	0013	0068	0068	0001	0003	-002	-004	-070	0006	0001	0004	0002	-001	0077	0076	0078	0077	0082	0081	0082
SE14 BA T 0536	7510	0013	0068	0068	0000	0003	-002	-004	-070	0006	0001	0004	0002	-001	0081	0083	0081	0077	0078	0075	0078
SE14 BA T 0537	7510	0013	0068	0068	0001	0003	-002	-004	-070	0006	0001	0004	0002	-001	0081	0079	0076	0075	0079	0080	0083
SE14 BA T 0538	7510	0012	0068	0068	0000	0003	-002	004	070	0006	0001	0004	0002	-001	0081	0079	0076	0075	0081	0081	0082
SE14 BA T 0539	7510	0013	0068	0068	0000	0003	-002	-004	-070	0006	0001	0003	0002	-001	0077	0076	0077	0077	0082	0081	0082
SE14 BA T 0540	7510	0012	0068	0068	0000	0003	-002	-004	-070	0006	0001	0004	0002	-001	0082	0082	0078	0074	0079	0077	0082
SE14 BA T 0541	7510	0013	0068	0068	0000	0003	-002	-004	-070	0006	0001	0004	0002	-001	0082	0076	0077	0079	0083	0080	0080
SE14 BA T 0542	7510	0013	0068	0068	0000	0003	002	-004	-070	0006	0001	0004	0002	-001	0077	0081	0081	0079	0081	0076	0077
SE14 BA T 0543	7510	0013	0068	0068	0000	0003	-002	-004	-070	0006	0001	0004	0002	-001	0079	0077	0077	0075	0081	0081	0081
SE14 BA T 0544	7510	0013	0068	0068	0000	0003	-002	-004	070	0006	0001	0004	0002	-001	0076	0079	0082	0079	0080	0076	0079
SE14 BA T 0545	7510	0012	0068	0068	0000	0003	-002	-004	-070	0006	0001	0004	0002	-001	0083	0081	0078	0074	0078	0076	0082
SE14 BA T 0546	7510	0013	0068	0068	0000	0003	002	-004	-070	0006	0001	0004	0002	001	0081	0081	0077	0074	0078	0079	0082
SE14 BA T 0547	7510	0013	0068	0068	0000	0004	002	-004	070	0006	0001	0003	0002	001	0076	0082	0081	0079	0082	0075	0077
SE14 BA T 0548	7510	0012	0068	0068	0001	0003	002	004	070	0006	0001	0004	0002	001	0076	0077	0081	0080	0081	0077	0078
SE14 BA T 0549	7510	0013	0068	0068	0000	0003	-002	-004	-070	0006	0001	0003	0002	-001	0077	0081	0081	0079	0081	0076	0077

#3

TC08 MID COLD	TC09 NEAR HOT	TC10 NEAR COLD	TC11 NEAR HOT	TC12 NEAR COLD	TC13 FXT NEAR	TC14 FXT BOT	TC15 FXT FAR	HT-1 INLT TEMP	HT-1 OUTL TEMP	HT-1 FLOW	TC01 AVG 10-1	TC01 SIGM 10-2	TC02 AVG 10-1	TC02 SIGM 10-2	TC03 AVG 10-1	TC03 SIGM 10-2	TC04 AVG 10-1	TC04 SIGM 10-2	TC05 AVG 10 1	TC05 SIGM 10-2	TC06 AVG 10-1	TC06 SIGM 10 2	TC07 AVG 10-1	TC07 SIGM 10-2	TC08 AVG 10-1	TC08 SIGM 10 2	TC09 AVG 10-1	TC09 SIGM 10-2
0051	0052	0053	0054	0055	0056	0057	0058	0059	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079
0077	0080	0077	0083	0082	0074	0074	0073	0068	0074	0652	0770	0000	0760	0000	0780	0000	0790	0000	0820	0000	0800	0000	0820	0000	0770	0000	0800	0000
0075	0081	0080	0086	0082	0074	0073	0072	0069	0076	0651	0760	0100	0770	0100	0795	0150	0800	0100	0820	0000	0800	0000	0805	0150	0760	0100	0805	0054
0078	0079	0076	0081	0081	0076	0075	0073	0067	0074	0652	0767	0125	0767	0095	0790	0141	0790	0163	0823	0050	0807	0101	0810	0141	0767	0125	0800	0081
0075	0080	0079	0086	0082	0074	0073	0072	0069	0075	0652	0763	0129	0768	0082	0793	0129	0795	0165	0823	0043	0805	0086	0805	0150	0763	0129	0800	0070
0081	0086	0081	0082	0077	0073	0072	0074	0072	0076	0653	0772	0225	0780	0260	0796	0138	0790	0178	0814	0177	0794	0234	0802	0149	0772	0225	0812	0251
0078	0079	0076	0083	0081	0074	0075	0073	0067	0074	0653	0772	0206	0777	0250	0793	0138	0787	0182	0815	0160	0797	0221	0805	0150	0773	0208	0808	0241
0081	0085	0081	0082	0077	0073	0072	0074	0073	0076	0653	0777	0231	0784	0298	0796	0140	0784	0178	0810	0192	0790	0261	0801	0167	0779	0230	0814	0269
0081	0081	0076	0082	0077	0074	0076	0073	0069	0073	0652	0781	0242	0785	0278	0791	0176	0780	0200	0808	0192	0791	0247	0805	0180	0783	0238	0814	0249
0081	0081	0075	0081	0079	0075	0076	0074	0069	0073	0652	0784	0246	0786	0263	0788	0194	0777	0211	0808	0181	0793	0240	0807	017[illegible]	0786	0241	0813	0236
0078	0079	0076	0082	0082	0074	0075	0073	0067	0074	0652	0783	0238	0783	0262	0786	0192	0776	0203	0809	0175	0795	0233	0808	0174	0785	0229	0811	0239
0082	0083	0077	0080	0076	0073	0075	0075	0071	0074	0653	0786	0249	0786	0270	0785	0185	0773	0219	0807	0173	0793	0234	0809	0169	0788	0242	0813	0231
0076	0080	0076	0085	0081	0074	0073	0072	0070	0075	0653	0789	0256	0784	0269	0784	0181	0774	0214	0809	0181	0793	0225	0808	0162	0786	0243	0812	0223
0077	0082	0082	0083	0081	0073	0071	0073	0070	0077	0653	0788	0252	0786	0268	0786	0187	0775	0209	0809	0173	0791	0234	0805	0188	0785	0237	0812	0215
0080	0080	0075	0081	0081	0076	0075	0073	0069	0073	0652	0788	0243	0785	0261	0785	0184	0774	0213	0809	0167	0792	0231	0806	0181	0786	0232	0811	0211
0077	0079	0081	0085	0081	0073	0073	0072	0069	0074	0652	0786	0245	0785	0252	0787	0199	0775	0210	0809	0164	0790	0236	0805	0179	0785	0227	0810	0209
0082	0083	0078	0081	0077	0073	0074	0075	0070	0075	0652	0789	0259	0787	0251	0787	0192	0773	0219	0807	0172	0788	0240	0806	0176	0787	0236	0811	0208
0081	0082	0077	0080	0076	0074	0075	0073	0100	0074	0652	0790	0256	0788	0251	0786	0191	0771	0226	0805	0178	0788	0234	0806	0175	0788	0236	0812	0204
0077	0083	0079	0085	0081	0073	0073	0072	0068	0076	0653	0788	0259	0790	0253	0787	0194	0772	0225	0806	0178	0786	0243	0804	0190	0787	0233	0813	0202
0076	0080	0081	0086	0081	0073	0072	0073	0068	0076	0652	0787	0260	0789	0251	0788	0196	0773	0227	0806	0173	0785	0239	0803	0193	0786	0235	0812	0199
0077	0082	0082	0083	0081	0073	0071	0073	0070	0077	0652	0785	0256	0790	0248	0789	0196	0774	0225	0806	0168	0784	0239	0801	0201	0785	0231	0813	0194

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TC02 SIGM	TC03 AVG	TC03 SIGM	TC04 AVG	TC04 SIGM	TC05 AVG	TC05 SIGM	TC06 AVG	TC06 SIGM	TC07 AVG	TC07 SIGM	TC08 AVG	TC08 SIGM	TC09 AVG	TC09 SIGM	TC10 AVG	TC10 SIGM	TC11 AVG	TC11 SIGM	TC12 AVG	TC12 SIGM
0-2	10-1	10 2	10-1	10-2	10 1	10 2	10 1	10 2	10-1	10-2	10 1	10 2	10 1	10 2	10 1	10 2	10 1	10 2	10-1	10 2
065	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	0080	0081	0082	0083	0084	0085
000	0780	0000	0790	0000	0820	0000	0800	0000	0820	0000	0770	0000	0800	0000	0770	0000	0830	0000	0820	0000
100	0795	0150	0800	0100	0820	0000	0800	0000	0805	0150	0760	0100	0805	0050	0765	0150	0845	0150	0820	0000
095	0790	0141	0790	0163	0823	0050	0807	0101	0810	0141	0767	0125	0800	0081	0777	0174	0833	0211	0817	0068
092	0793	0129	0795	0165	0823	0043	0805	0086	0805	0150	0763	0129	0800	0070	0780	0158	0840	0212	0818	0043
060	0796	0138	0790	0178	0814	0177	0794	0234	0802	0149	0772	0225	0812	0251	0786	0188	0836	0208	0808	0197
050	0793	0138	0787	0182	0815	0160	0797	0221	0805	0150	0773	0208	0808	0241	0782	0195	0835	0189	0808	0177
098	0796	0140	0784	0178	0810	0192	0790	0261	0801	0167	0779	0230	0814	0269	0786	0207	0833	0183	0803	0212
078	0791	0176	0780	0200	0808	0192	0791	0247	0805	0180	0783	0238	0814	0249	0783	0210	0831	0176	0799	0226
063	0788	0194	0777	0211	0808	0181	0793	0240	0807	0177	0786	0241	0813	0236	0779	0225	0829	0180	0798	0217
062	0786	0192	0776	0203	0809	0175	0795	0233	0808	0174	0785	0229	0811	0235	0777	0220	0828	0173	0800	0214
070	0785	0185	0773	0219	0807	0178	0793	0234	0809	0169	0788	0242	0813	0231	0776	0211	0825	0184	0796	0235
069	0784	0181	0774	0214	0809	0181	0793	0225	0808	0162	0786	0243	0812	0223	0775	0206	0828	0187	0798	0227
068	0786	0187	0775	0209	0809	0173	0791	0234	0805	0188	0785	0237	0812	0215	0778	0232	0828	0181	0798	0221
061	0785	0184	0774	0213	0809	0167	0792	0231	0806	0181	0786	0232	0811	0211	0776	0236	0826	0180	0799	0216
062	0787	0199	0775	0210	0809	0164	0790	0236	0805	0179	0785	0227	0810	0209	0779	0241	0828	0184	0800	0209
051	0787	0192	0773	0219	0807	0172	0788	0240	0806	0176	0787	0236	0811	0208	0779	0234	0827	0182	0798	0215
051	0786	0191	0771	0226	0805	0178	0788	0234	0806	0175	0788	0236	0812	0204	0778	0228	0825	0189	0796	0228
053	0787	0194	0772	0225	0806	0178	0786	0243	0804	0190	0787	0233	0813	0202	0779	0224	0827	0191	0797	0223
051	0788	0196	0773	0227	0806	0173	0785	0239	0803	0193	0786	0235	0812	0199	0781	0228	0828	0200	0797	0220
048	0789	0196	0774	0225	0806	0168	0784	0239	0801	0201	0785	0231	0813	0194	0783	0238	0828	0195	0798	0216

FBR

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APPENDIX B

Program To Reduce Data

Attached is the IBM compilation of the computer program written to reduce the temperature data to heating rates and to record all other data associated with the calorimeter measurements.

```
                PROGRAM SUBENCR (INPUT,OUTPUT,TAPE5= INPUT,TAPE6 = OUTPUT,  PUNCH,
               1TAPE7 = PUNCH)
000003            DIMENSION T(12)
000003         15 FORMAT ( 1A6,F6.2,F8.2,F5.1,F6.2,F6.0,F6.2,4F6.1)
000003        200 READ(5,15)DATE,TIM1,TIM2,POWR,DSTNCE,PRESS,RODBNK,FXTEMP,HTIN,
               1 HTOUT,FLOW
000035         10 FORMAT (12F6.1)
000035         12 READ (5,10)  (T(N), N = 1,12)
000047         50 DO 80 N = 1, 12
000051         60 X = T(N)
000053         70 E = EMF(X)
000056        800 CALL CORECT (N,E,TCR1,TCR2,TCR3,TCR4,TCR5,TCR6,TCR7,TCR8,TCR9,
               1 TCR10,TCR11,TCR12)
000075        900 FORMAT (1A6,11H/67, TIME =,F6.2,4H TO ,F6.2,F5.1,4H MW,,F6.2,21H
               1INCHES FROM FULL IN,,F6.0,23H MICRONS, ROD BNK POS =,F6.2, 4H IN,
               2 // 12H FIX TEMP = ,F6.1, 17H DEG F, HTINLT = ,F6.1, 14H F, HTOUTL
               3T = , F6.1, 15H F, HT1 FLOW = , F5.1,  4H GPM   /     )
000075        950 WRITE (6,90) DATE,TIM1,TIM2,POWR,DSTNCE,PRESS,RODBNK,FXTEMP,HTIN,
               1 HTOUT,FLOW
000127       1000 FORMAT ( 107H                    *   *   *   *   *   *   *   * TEMPER
               1ATURE (DEGREES F) *   *   *   *   *   *   *   *   *   *   /   10HH
               2THMCPL NO        1        2        3        4        5        6        7
               3        8        9       10       11       12    )
000127        104 WRITE (6,100)
000133       1100 FORMAT ( 14H DATA LGH TEMP , 12F8.2 // 14H CORECTED TEMP, 12F8.2/
               1 )
000133       1050 WRITE (6,110) (T(N), N = 1,12) , TCR1, TCR2, TCR3, TCR4, TCR5,
               1 TCR6, TCR7, TCR8, TCR9, TCR10, TCR11, TCR12
000175        205 DELT = TCR9 - (TCR1 + TCR10)/2.
000201        206 CALL HDELT (HTIN,DELT,H)
000204        210 HNEW = H
000206        215 DELT = (TCR5 + TCR7)/2. - TCR6
000212        216 CALL HDELT (HTIN,DELT,H)
000215        220 HMID = H
000217        225 DELT = TCR12 - (TCR2 + TCR4)/2.
000223        226 CALL HDELT (HTIN,DELT,H)
000226        230 HFAR = H
000230        240 HNEWNO = HNEW*(60./POWR)
000233        250 HMIDNO = HMID*(60./POWR)
000236        260 HFARNO = HFAR*(60./POWR)
000241        270 FORMAT  (110H ************************************ NUCLEAR HEATIN
               1G RATES (WATTS/GM) ****************************************/   110H
               2 ***************** AT INDICATED POWER *****************    *******
               3****** NORMALIZED TO 60 MW *****************/                 110H
               4         NEAR CYLINDER   MIDDLE CYLINDER    FAR CYLINDER    NEAR CY
               5LINDER   MIDDLE CYLINDER    FAR CYLINDER       )
```

```
000241      280  FORMAT (6F17.3////)
000241      290  WRITE (6,270)
000245      300  WRITE (6,280) HNER, FMID, HFAR, HNERNU, HMIDNO, HFARNO
000265      120  GO TO 20
000266           END
```

```
                FUNCTION EFF(T)
000004      10  IF(T - 12.5) 11, 15, 15
000006      11  EMF = 0.0220*T - 0.650
000011          RETURN
000012      15  IF(T - 87.5) 16, 20, 20
000015      16  EMF = 0.0220*T - 0.760
000020          RETURN
000021      20  IF(T - 97.5) 21, 25, 25
000024      21  EMF = 0.0220*T - 0.650
000027          RETURN
000030      25  IF(T - 102.5) 26, 30, 30
000033      26  EMF = 0.0230*T - 0.760
000036          RETURN
000037      30  IF(T - 107.5) 31, 35, 35
000042      31  EMF = 0.0230*T - 0.765
000045          RETURN
000046      35  IF(T - 172.5) 36, 40, 40
000051      36  EMF = 0.0230*T - 0.7523
000054          RETURN
000055      40  IF(T - 177.5) 41, 45, 45
000060      41  EMF = 0.0230*T - 0.765
000063          RETURN
000064      45  IF(T - 182.5) 46, 50, 50
000067      46  EMF = 0.0230*T - 0.760
000072          RETURN
000073      50  IF(T - 187.5) 51, 55, 55
000076      51  EMF = 0.0230*T - 0.775
000101          RETURN
000102      55  IF(T - 192.5) 56, 60, 60
000105      56  EMF = 0.0230*T - 0.760
000110          RETURN
000111      60  IF(T - 197.5) 61, 65, 65
000114      61  EMF = 0.0230*T - 0.765
000117          RETURN
000120      65  IF(T - 227.5) 66, 70, 70
000123      66  EMF = 0.0227*T - 0.7187
000126          RETURN
000127      70  IF(T - 297.5) 71, 75, 75
000132      71  EMF = 0.0227*T - 0.7123
000135          RETURN
000136      75  IF(T - 302.5) 76, 80, 80
000141      76  EMF = 0.0222*T - 0.570
000144          RETURN
000145      80  IF(T - 307.5) 81, 85, 85
000150      81  EMF = 0.0222*T - 0.571
000153          RETURN
```

```
000154        85  IF(T - 312.5) 86, 90, 90
000157        86  EMF = 0.0222*T - 0.572
000162            RETURN
000163        90  IF(T - 317.5) 91, 95, 95
000166        91  EMF = 0.0222*T - 0.573
000171            RETURN
000172        95  IF(T - 322.5) 96,100,100
000175        96  EMF = 0.0222*T - 0.574
000200            RETURN
000201       100  IF(T - 327.5)101,105,105
000204       101  EMF = 0.0222*T - 0.575
000207            RETURN
000210       105  IF(T - 332.5)106,110,110
000213       106  EMF = 0.0222*T - 0.576
000216            RETURN
000217       110  IF(T - 337.5)111,115,115
000222       111  EMF = 0.0222*T - 0.577
000225            RETURN
000226       115  IF(T - 342.5)116,120,120
000231       116  EMF = 0.0222*T - 0.578
000234            RETURN
000235       120  IF(T - 347.5)121,125,125
000240       121  EMF = 0.0222*T - 0.579
000243            RETURN
000244       125  IF(T - 352.5)126,130,130
000247       126  EMF = 0.0222*T - 0.570
000252            RETURN
000253       130  IF(T - 357.5)131,135,135
000256       131  EMF = 0.0222*T - 0.571
000261            RETURN
000262       135  IF(T - 362.5)136,140,140
000265       136  EMF = 0.0222*T - 0.572
000270            RETURN
000271       140  IF(T - 367.5)141,145,145
000274       141  EMF = 0.0222*T - 0.573
000277            RETURN
000300       145  IF(T - 372.5)146,150,150
000303       146  EMF = 0.0222*T - 0.574
000306            RETURN
000307       150  IF(T - 377.5)151,155,155
000312       151  EMF = 0.0222*T - 0.575
000315            RETURN
000316       155  IF(T - 382.5)156,160,160
000321       156  EMF = 0.0222*T - 0.576
000324            RETURN
000325       160  IF(T - 387.5)161,165,165
000330       161  EMF = 0.0222*T - 0.577
```

```
000333          RETURN
000334    165   IF(T - 392.5)166,170,170
000337    166   EMF = 0.0225*T - 0.568
000342          RETURN
000343    170   IF(T - 397.5)171,175,175
000346    171   EMF = 0.0225*T - 0.569
000351          RETURN
000352    175   IF(T - 437.5)176,180,180
000355    176   EMF = 0.0225*T - 0.6937
000360          RETURN
000361    180   IF(T - 442.5)181,185,185
000364    181   EMF = 0.0225*T - 0.700
000367          RETURN
000370    185   IF(T - 447.5)186,190,190
000373    186   EMF = 0.0225*T - 0.650
000376          RETURN
000377    190   IF(T - 452.5)191,195,195
000402    191   EMF = 0.0225*T - 0.7025
000405          RETURN
000406    195   IF(T - 457.5)196,200,200
000411    196   EMF = 0.0225*T - 0.655
000414          RETURN
000415    200   IF(T - 462.5)201,206,206
000420    201   EMF = 0.0225*T - 0.6575
000423          RETURN
000424    206   EMF = 0.0225*T - 0.6543
000427          RETURN
000430          END
```

```
                900 SUBROUTINE CURLCT (N,E,TCR1,TCR2,TCR3,TCR4,TCR5,TCR6,TCR7,TCR8,
                  1 TCR9,TCR10,TCR11,TCR12)
000017          100 IF (N - 1) 105, 105, 200
000021          105 IF (E - 2.02) 106, 110, 110
000024          106 TCR1  = 1.0*(23.164*E +  3.31) * 32.0
000031              RETURN
000031          110 IF (E - 5.52) 111, 115, 115
000034          111 TCR1  = 1.0*(23.488*E +  2.58) * 32.0
000041              RETURN
000041          115 IF (E - 6.91) 116, 120, 120
000044          116 TCR1  = 1.0*(25.180*E -  6.99) * 32.0
000051              RETURN
000051          120 IF (E - 8.14) 121, 125, 125
000054          121 TCR1  = 1.0*(25.203*E -  7.15) * 32.0
000061              RETURN
000061          125 IF (E -10.33) 126, 130, 130
000064          126 TCR1  = 1.0*(25.571*E - 10.15) * 32.0
000071              RETURN
000071          130 IF (E -12.38) 131, 135, 135
000074          131 TCR1  = 1.0*(23.415*E + 12.13) * 32.0
000101              RETURN
000101          135 IF (E -13.23) 136, 140, 140
000104          136 TCR1  = 1.0*(24.706*E -  3.86) * 32.0
000111              RETURN
000111          140 IF (E -14.58) 141, 145, 145
000114          141 TCR1  = 1.0*(23.529*E + 11.71) * 32.0
000121              RETURN
000121          145 TCR1  = 1.0*(23.788*E +  7.93) * 32.0
000126              RETURN
000126          200 IF (N - 2) 205, 205, 300
000130          205 IF (E - 2.02) 206, 210, 210
000133          206 TCR2  = 1.0*(23.232*E +  2.07) * 32.0
000140              RETURN
000140          210 IF (E - 2.93) 211, 215, 215
000143          211 TCR2  = 1.0*(23.077*E +  2.38) * 32.0
000150              RETURN
000150          215 IF (E - 7.18) 216, 220, 220
000153          216 TCR2  = 1.0*(24.471*E -  1.70) * 32.0
000160              RETURN
000160          220 IF (E - 8.24) 221, 225, 225
000163          221 TCR2  = 1.0*(25.472*E -  8.89) * 32.0
000170              RETURN
000170          225 IF (E - 9.53) 226, 230, 230
000173          226 TCR2  = 1.0*(24.341*E +  0.43) * 32.0
000200              RETURN
000200          230 IF (E -10.52) 231, 235, 235
```

```
000203      231   TCR2  = 1.R*(26.869*E - 23.66) + 32.0
000210            RETURN
000210      235   IF (E -12.08) 236, 240, 240
000213      236   TCR2  = 1.R*(23.077*E + 16.23) + 32.0
000220            RETURN
000220      240   IF (E -13.53) 241, 245, 245
000223      241   TCR2  = 1.R*(24.R2R*E -  4.42) + 32.0
000230            RETURN
000230      245   IF (E -14.67) 246, 250, 250
000233      246   TCR2  = 1.R*(21.930*E + 34.25) + 32.0
000240            RETURN
000240      250   TCR2  = 1.R*(23.947*E +  4.69) + 32.0
000245            RETURN
000245      300   IF (N - 3) 305, 305, 400
000247      305   IF (E - 2.27) 306, 310, 310
000252      306   TCR3  = 1.R*(23.485*E -  1.31) + 32.0
000257            RETURN
000257      310   IF (E - 3.13) 311, 315, 315
000262      311   TCR3  = 1.R*(26.744*E -  8.71) + 32.0
000267            RETURN
000267      315   IF (E - 4.09) 316, 320, 320
000272      316   TCR3  = 1.R*(21.875*E +  6.53) + 32.0
000277            RETURN
000277      320   IF (E - 6.37) 321, 325, 325
000302      321   TCR3  = 1.R*(25.439*E -  8.04) + 32.0
000307            RETURN
000307      325   IF (E - 6.85) 326, 330, 330
000312      326   TCR3  = 1.R*(22.917*E +  8.02) + 32.0
000317            RETURN
000317      330   IF (E - 9.50) 331, 335, 335
000322      331   TCR3  = 1.5*(24.906*E -  5.60) + 32.0
000327            RETURN
000327      335   IF (E -10.65) 336, 340, 340
000332      336   TCR3  = 1.R*(25.217*E -  8.57) + 32.0
000337            RETURN
000337      340   IF (E -12.38) 341, 345, 345
000342      341   TCR3  = 1.R*(24.278*E +  1.45) + 32.0
000347            RETURN
000347      345   TCR3  = 1.R*(24.026*E +  4.56) + 32.0
000354            RETURN
000354      400   IF (N - 4) 405, 405, 500
000356      405   IF (E - 4.52) 406, 410, 410
000361      406   TCR4  = 1.R*(23.416*E +  4.16) + 32.0
000366            RETURN
000366      410   IF (E - 9.13) 411, 415, 415
000371      411   TCR4  = 1.R*(24.946*E -  2.78) + 32.0
000376            RETURN
```

```
000376      415  IF (E -11.66) 416, 420, 420
000401      416  TCR4  = 1.8*(23.715*E +  8.48) + 32.0
000406           RETURN
000406      420  IF (E -13.45) 421, 425, 425
000411      421  TCR4  = 1.8*(22.905*E + 17.93) + 32.0
000416           RETURN
000416      425  IF (E -14.57) 426, 430, 430
000421      426  TCR4  = 1.8*(24.107*E +  1.76) + 32.0
000426           RETURN
000426      430  IF (E -16.66) 431, 435, 435
000431      431  TCR4  = 1.8*(22.967*E + 18.38) + 32.0
000436           RETURN
000436      435  IF (E -18.02) 436, 440, 440
000441      436  TCR4  = 1.8*(25.735*E - 27.75) + 32.0
000446           RETURN
000446      440  IF (E -19.15) 441, 445, 445
000451      441  TCR4  = 1.8*(23.894*E +  5.43) + 32.0
000456           RETURN
000456      445  IF (E -20.24) 446, 450, 450
000461      446  TCR4  = 1.8*(22.018*E + 41.35) + 32.0
000466           RETURN
000466      450  TCR4  = 1.8*(20.455*E + 73.00) + 32.0
000473           RETURN
000473      500  IF (N - 5) 505, 505, 600
000475      505  IF (E - 2.27) 506, 510, 510
000500      506  TCR5  = 1.8*(24.031*E -  2.55) + 32.0
000505           RETURN
000506      510  IF (E - 3.12) 511, 515, 515
000511      511  TCR5  = 1.8*(27.059*E -  9.42) + 32.0
000516           RETURN
000517      515  IF (E - 4.07) 516, 520, 520
000522      516  TCR5  = 1.8*(22.105*E +  6.03) + 32.0
000527           RETURN
000530      520  IF (E - 7.03) 521, 525, 525
000533      521  TCR5  = 1.8*(23.311*E +  1.13) + 32.0
000540           RETURN
000541      525  IF (E - 9.71) 526, 530, 530
000544      526  TCR5  = 1.8*(24.627*E -  8.13) + 32.0
000551           RETURN
000552      530  IF (E -10.95) 531, 535, 535
000555      531  TCR5  = 1.8*(23.387*E +  3.91) + 32.0
000562           RETURN
000563      535  IF (E -12.75) 536, 540, 540
000566      536  TCR5  = 1.8*(23.333*E +  4.50) + 32.0
000573           RETURN
000574      540  TCR5  = 1.8*(24.104*E -  5.33) + 32.0
000601           RETURN
```

```
000602      600  IF (N - 6) 605, 605, 700
000604      605  IF (E - 2.28) 606, 610, 610
000607      606  TCR6  = 1.8*(24.031*E -  2.79) + 32.0
000614           RETURN
000615      610  IF (E - 3.12) 611, 615, 615
000620      611  TCR6  = 1.8*(27.381*E - 10.43) + 32.0
000625           RETURN
000626      615  IF (E - 4.08) 616, 620, 620
000631      616  TCR6  = 1.8*(21.875*E +  6.75) + 32.0
000636           RETURN
000637      620  IF (E - 7.00) 621, 625, 625
000642      621  TCR8  = 1.8*(23.630*E -  0.41) + 32.0
000647           RETURN
000650      625  IF (E - 9.73) 626, 630, 630
000653      626  TCR6  = 1.8*(24.176*E -  4.23) + 32.0
000660           RETURN
000661      630  IF (E -10.92) 631, 635, 635
000664      631  TCR6  = 1.8*(24.370*E -  6.12) + 32.0
000671           RETURN
000672      635  IF (E -12.75) 636, 640, 640
000675      636  TCR6  = 1.8*(22.951*E +  9.38) + 32.0
000702           RETURN
000703      640  TCR6  = 1.8*(24.503*E - 10.47) + 32.0
000710           RETURN
000711      700  IF (N - 7) 705, 705, 800
000713      705  IF (E - 4.61) 706, 710, 710
000716      706  TCR7  = 1.8*(22.606*E +  5.78) + 32.0
000723           RETURN
000724      710  IF (E - 9.23) 711, 715, 715
000727      711  TCR7  = 1.8*(24.892*E -  4.75) + 32.0
000734           RETURN
000735      715  IF (E -10.13) 716, 720, 720
000740      716  TCR7  = 1.8*(24.444*E -  0.62) + 32.0
000745           RETURN
000746      720  IF (E -11.65) 721, 725, 725
000751      721  TCR7  = 1.8*(25.000*E -  6.25) + 32.0
000756           RETURN
000757      725  IF (E -13.38) 726, 730, 730
000762      726  TCR7  = 1.8*(23.699*E +  8.90) + 32.0
000767           RETURN
000770      730  IF (E -14.52) 731, 735, 735
000773      731  TCR7  = 1.8*(23.684*E +  9.11) + 32.0
001000           RETURN
001001      735  IF (E -16.61) 736, 740, 740
001004      736  TCR7  = 1.8*(22.967*E + 19.53) + 32.0
001011           RETURN
001012      740  IF (E -18.14) 741, 745, 745
```

```
001015      741   TCW7  = 1.8*(22.876*E + 21.03) + 32.0
001022            RETURN
001023      745   IF (E -19.22) 746, 750, 750
001026      746   TCW7  = 1.8*(25.000*E - 17.50) + 32.0
001033            RETURN
001034      750   IF (E -20.26) 751, 755, 755
001037      751   TCW7  = 1.8*(23.077*E + 19.46) + 32.0
001044            RETURN
001045      755   TCW7  = 1.8*(24.324*E -  5.81) + 32.0
001052            RETURN
001053      800   IF (N - 8) 805, 805, 900
001055      805   IF (E - 4.53) 806, 810, 810
001060      806   TCW8  = 1.8*(23.599*E +  3.10) + 32.0
001065            RETURN
001066      810   IF (E - 9.25) 811, 815, 815
001071      811   TCW8  = 1.8*(24.364*E -  0.37) + 32.0
001076            RETURN
001077      815   IF (E -10.11) 816, 820, 820
001102      816   TCW8  = 1.8*(25.581*E - 11.63) + 32.0
001107            RETURN
001110      820   IF (E -11.64) 821, 825, 825
001113      821   TCW8  = 1.8*(24.837*E -  4.10) + 32.0
001120            RETURN
001121      825   IF (E -13.38) 826, 830, 830
001124      826   TCW8  = 1.8*(23.563*E + 10.72) + 32.0
001131            RETURN
001132      830   IF (E -14.54) 831, 835, 835
001135      831   TCW8  = 1.8*(23.276*E + 14.57) + 32.0
001142            RETURN
001143      835   IF (E -16.58) 836, 840, 840
001146      836   TCW8  = 1.8*(23.529*E + 10.88) + 32.0
001153            RETURN
001154      840   IF (E -18.15) 841, 845, 845
001157      841   TCW8  = 1.8*(22.293*E + 31.38) + 32.0
001164            RETURN
001165      845   IF (E -19.16) 846, 850, 850
001170      846   TCW8  = 1.8*(20.733*E - 49.20) + 32.0
001175            RETURN
001176      850   TCW8  = 1.8*(24.419*E -  4.86) + 32.0
001203            RETURN
001204      900   IF (N - 9) 905, 905,1000
001206      905   IF (E - 1.97) 906, 910, 910
001211      906   TCW9  = 1.8*(24.000*E +  0.72) + 32.0
001216            RETURN
001217      910   IF (E - 2.65) 911, 915, 915
001222      911   TCW9  = 1.8*(24.615*E -  0.49) + 32.0
001227            RETURN
```

```
001230      915  IF (E - 3.99) 916, 920, 920
001233      916  TCW9  = 1.8*(23.134*E +  2.69) + 32.0
001240           RETURN
001241      920  IF (E - 5.48) 921, 925, 925
001244      921  TCW9  = 1.8*(24.832*E -  4.08) + 32.0
001251           RETURN
001252      925  IF (E - 5.78) 926, 930, 930
001255      926  TCW9  = 1.8*(25.667*E - 14.14) + 32.0
001262           RETURN
001263      930  IF (E - 8.17) 931, 935, 935
001266      931  TCW9  = 1.8*(24.268*E -  0.27) + 32.0
001273           RETURN
001274      935  IF (E -10.48) 936, 940, 940
001277      936  TCW9  = 1.8*(24.242*E -  0.06) + 32.0
001304           RETURN
001305      940  IF (E -12.40) 941, 945, 945
001310      941  TCW9  = 1.8*(25.000*E -  8.00) + 32.0
001315           RETURN
001316      945  IF (E -13.26) 946, 950, 950
001321      946  TCW9  = 1.8*(24.419*E -  0.80) + 32.0
001326           RETURN
001327      950  IF (E -14.62) 951, 955, 955
001332      951  TCW9  = 1.8*(23.529*E + 11.01) + 32.0
001337           RETURN
001340      955  IF (E -16.47) 956, 960, 960
001343      956  TCW9  = 1.8*(22.927*E + 19.81) + 32.0
001350           RETURN
001351      960  TCW9  = 1.8*(23.932*E +  3.05) + 32.0
001356           RETURN
001357     1000  IF (E -10)1005,1005,1100
001361     1005  IF (E - 1.91)1006,1010,1010
001364     1006  TCW10 = 1.8*(24.658*E +  0.90) + 32.0
001371           RETURN
001372     1010  IF (E - 3.[illegible])1011,1015,1015
001375     1011  TCW10 = 1.8*(23.500*E +  3.11) + 32.0
001402           RETURN
001403     1015  IF (E - 5.86)1016,1020,1020
001406     1016  TCW10 = 1.8*(23.077*E +  4.77) + 32.0
001413           RETURN
001414     1020  IF (E - 9.42)1021,1025,1025
001417     1021  TCW10 = 1.8*(24.495*E -  3.54) + 32.0
001424           RETURN
001425     1025  IF (E -12.83)1026,1030,1030
001430     1026  TCW10 = 1.8*(24.911*E -  7.63) + 32.0
001435           RETURN
001436     1030  IF (E -13.81)1031,1035,1035
001441     1031  TCW10 = 1.8*(23.684*E +  7.87) + 32.0
```

```
001446          RETURN
001447    1035  IF (E -14.63)1036,1040,1040
001452    1036  TCR10 = 1.8*(22.840*E + 18.85) + 32.0
001457          RETURN
001460    1040  IF (E -15.54)1041,1045,1045
001463    1041  TCR10 = 1.8*(24.176*E -  0.69) + 32.0
001470          RETURN
001471    1045  TCR10 = 1.8*(22.981*E + 19.43) + 32.0
001476          RETURN
001477    1100  IF (N -11)1105,1105,1205
001501    1105  IF (E - 1.92)1106,1110,1110
001504    1106  TCW11 = 1.8*(24.658*E  + 0.66) + 32.0
001511          RETURN
001512    1110  IF (E - 3.92)1111,1115,1115
001515    1111  TCW11 = 1.8*(23.500*E +  2.88) + 32.0
001522          RETURN
001523    1115  IF (E - 5.81)1116,1120,1120
001526    1116  TCR11 = 1.8*(23.810*E +  1.66) + 32.0
001533          RETURN
001534    1120  IF (E - 9.85)1121,1125,1125
001537    1121  TCR11 = 1.8*(24.010*E +  0.50) + 32.0
001544          RETURN
001545    1125  IF (E -12.63)1126,1130,1130
001550    1126  TCR11 = 1.8*(25.180*E - 11.02) + 32.0
001555          RETURN
001556    1130  IF (E -13.02)1131,1135,1135
001561    1131  TCW11 = 1.8*(23.077*E + 15.54) + 32.0
001566          RETURN
001567    1135  IF (E -14.63)1136,1140,1140
001572    1136  TCW11 = 1.8*(22.981*E + 16.79) + 32.0
001577          RETURN
001600    1140  IF (E -15.56)1141,1145,1145
001603    1141  TCW11 = 1.8*(23.656*E +  6.91) + 32.0
001610          RETURN
001611    1145  TCW11 = 1.8*(23.684*E +  6.48) + 32.0
001616          RETURN
001617    1205  IF (E - 2.06)1206,1210,1210
001622    1206  TCW12 = 1.8*(24.528*E -  1.53) + 32.0
001627          RETURN
001630    1210  IF (E - 4.20)1211,1215,1215
001633    1211  TCW12 = 1.8*(24.766*E -  2.02) + 32.0
001640          RETURN
001641    1215  IF (E - 5.45)1216,1220,1220
001644    1216  TCW12 = 1.8*(24.571*E -  1.20) + 32.0
001651          RETURN
001652    1220  IF (E - 7.35)1221,1225,1225
001655    1221  TCW12 = 1.8*(24.286*E +  0.50) + 32.0
```

```
001662          RETURN
001663    1225  IF (E -12.78)1226,1230,1230
001666    1226  TCK12 = 1.8*(24.862*E -  3.74) + 32.0
001673          RETURN
001674    1230  IF (E -14.00)1231,1235,1235
001677    1231  TCK12 = 1.8*(22.951*E + 20.69) + 32.0
001704          RETURN
001705    1235  IF (E -15.23)1236,1240,1240
001710    1236  TCK12 = 1.8*(25.203*E - 10.84) + 32.0
001715          RETURN
001716    1240  IF (E -17.21)1241,1245,1245
001721    1241  TCK12 = 1.8*(23.232*E + 19.14) + 32.0
001726          RETURN
001727    1245  TCK12 = 1.8*(24.528*E -  3.13) + 32.0
001734          RETURN
001735        END
```

```
                 90  SUBROUTINE  MDELT (MTIN,DELT,M)
000005          100  IF (MTIN - 122.5) 110, 200, 200
000010          110  IF (DELT -  38.52) 112, 120, 120
000013          112  M = DELT*.02626
000015               RETURN
000015          120  IF (DELT - 115.6)  122, 130, 130
000020          122  M = DELT*.02613
000022               RETURN
000022          130  IF (DELT - 192.6)  132, 140, 140
000025          132  M = DELT*.02627
000027               RETURN
000027          140  IF (DELT - 231.1)  142, 152, 152
000032          142  M = DELT*.02513
000034               RETURN
000034          152  M = DELT*.02550
000036               RETURN
000036          200  IF (MTIN - 127.5) 210, 300, 300
000041          210  IF (DELT -  38.52) 212, 220, 220
000044          212  M = DELT*.02624
000046               RETURN
000046          220  IF (DELT - 115.6)  222, 230, 230
000051          222  M = DELT*.02641
000053               RETURN
000053          230  IF (DELT - 192.6)  232, 240, 240
000056          232  M = DELT*.02565
000060               RETURN
000060          240  IF (DELT - 231.1)  242, 252, 252
000063          242  M = DELT*.02595
000065               RETURN
000065          252  M = DELT*.02527
000067               RETURN
000067          300  IF (MTIN - 132.5) 310, 410, 410
000072          310  IF (DELT -  38.52) 312, 320, 320
000075          312  M = DELT*.02597
000077               RETURN
000077          320  IF (DELT - 115.6)  322, 330, 330
000102          322  M = DELT*.02598
000104               RETURN
000104          330  IF (DELT - 192.6)  332, 340, 340
000107          332  M = DELT*.02598
000111               RETURN
000111          340  IF (DELT - 231.1)  342, 352, 352
000114          342  M = DELT*.02611
000116               RETURN
000116          352  M = DELT*.02548
000120               RETURN
```

```
000120      410  IF (DELT -  38.52) 412, 420, 420
000123      412  H = DELT*.02592
000125           RETURN
000125      420  IF (DELT - 115.6)  422, 430, 430
000130      422  H = DELT*.02615
000132           RETURN
000132      430  IF (DELT - 192.5)  432, 440, 440
000135      432  H = DELT*.02596
000137           RETURN
000137      440  IF (DELT - 231.1)  442, 452, 452
000142      442  H = DELT*.02581
000144           RETURN
000144      452  H = DELT*.02611
000146           RETURN
000146           END
```

APPENDIX C

Reduced Data

Attached is the output of the program given in APPENDIX B. This lists all data from data logger printout (except standard deviation) and all data taken by Plum Brook WANL Test Operations personnel for the entire test.

[illegible] TIME = 10.20 [illegible] 10.10 [illegible] 60.0 MO. 44.00 INCHES FROM FULL IN. 420 MICRONS, NOM MAX POS = 17.38 IN.

FIA TEMP = 128. [illegible] F. MTINLET = 140.1 F. MTOUTLET = 130.0 F. MT FLOW = 65.1 GPM

	TEMPERATURE (DEGREES F)											
THERMOCOUPLE NO.	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	132.00	135.00	129.50	129.[illegible]	129.30	128.00	130.30	129.00	130.60	128.70	129.10	128.50
CORRECTED TEMP	131.91	133.21	122.18	130.07	121.70	128.05	132.11	130.74	129.10	129.30	129.27	128.80

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 40 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.036	.171	-.105	-.036	.171	-.105

8/31/87. TIME = 10.30 TO 15.00 60.0 MO. 44.00 INCHES FROM FULL IN. 420 MICRONS, NOM MAX POS = 17.38 IN.

FIA TEMP = 128.0 [illegible] F. MTINLET = 141.1 F. MTOUTLET = 130.1 F. MT. FLOW = 65.1 GPM

	TEMPERATURE (DEGREES F)											
THERMOCOUPLE NO.	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	132.00	135.50	131.00	129.50	131.00	130.00	131.00	130.20	131.10	129.40	131.00	131.30
CORRECTED TEMP	131.91	132.03	123.92	131.03	129.26	122.04	133.01	131.13	129.61	129.98	131.70	127.67

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 40 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.030	.190	-.120	-.030	.158	-.120

8/31/07, TIME = 15.19 TO 15.29 60.1 MW, 36.00 INCHES FROM FULL IN, 420 MICRONS, ROD BNK POS = 17.41 IN,

FIX TEMP = 126.0 DEG F, HTINLT = 128.1 F, HTOUTLT = 136.5 F, HT1 FLOW = 65.0 GPM

TEMPERATURE (DEGREES F)												
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	137.00	136.90	140.60	131.50	141.50	135.50	143.10	138.50	140.70	132.40	140.50	139.40
CORRECTED TEMP	137.07	137.03	133.05	133.51	134.97	127.76	144.69	139.24	139.40	132.90	140.36	135.97

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 40 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.115	.305	.017	.114	.305	.017

8/31/07, TIME = 15.33 TO 15.43 80.2 MW, 25.00 INCHES FROM FULL IN, 420 MICRONS, ROD BNK POS = 17.43 IN,

FIX TEMP = 127.0 DEG F, HTINLT = 121.6 F, HTOUTLT = 136.5 F, HT1 FLOW = 65.0 GPM

TEMPERATURE (DEGREES F)												
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	142.90	145.60	156.50	137.00	159.70	143.80	159.50	146.00	156.00	139.80	159.20	154.80
CORRECTED TEMP	141.96	142.40	151.40	139.49	155.36	136.28	159.44	146.57	153.20	140.10	158.56	151.76

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 40 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.321	.555	.283	.320	.553	.282

9/ 1/07, TIME = 12.43 TO 12.54 49.9 MW, 25.00 INCHES FROM FULL IN, 420 MICRONS, ROD BNK POS = 18.53 IN,

FIX TEMP = 121.0 DEG F, HTINLT = 118.6 F, HTOUTLT = 127.3 F, HT1 FLOW = 44.3 GPM

• • • • • • • • TEMPERATURE (DEGREES F) • • • • • • • • • • •

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	135.20	130.40	144.60	129.20	148.40	135.00	147.60	137.70	143.90	138.50	147.10	144.00
CORRECTED TEMP	136.50	134.17	138.24	131.34	142.74	137.21	140.30	138.46	142.66	131.05	146.78	140.69

•••••••••••••••••••••••••••••••••••••• NUCLEAR HEATING RATES (WATTS/GM) ••••••••••••••••••••••••••••••••••••••
•••••••••••••••••• AT INDICATED POWER •••••••••••••••••• ••••••••••••• NORMALIZED TO 40 MW •••••••••••••••••

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.294	.480	.298	.311	.578	.251

9/ 1/67. TIME = 13.20 TO 13.42 49.8 MW. 14.00 INCHES FROM FULL IN. 550 MICRONS. ROD BNK POS = 18.58 IN.

FIX TEMP = 123.0 DEG F. HTINLT = 151.2 F. HTOUTLT = 127.2 F. HT1 FLOW = 64.2 GPM

• • • • • • • • TEMPERATURE (DEGREES F) • • • • • • • • • • •

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	178.90	158.70	238.50	153.10	232.10	173.90	243.80	180.40	234.60	168.90	248.50	203.90
CORRECTED TEMP	169.18	154.99	231.82	154.51	225.22	170.73	239.50	180.70	230.85	168.41	246.22	202.66

•••••••••••••••••••••••••••••••••••••• NUCLEAR HEATING RATES (WATTS/GM) ••••••••••••••••••••••••••••••••••••••
•••••••••••••••••• AT INDICATED POWER •••••••••••••••••• ••••••••••••• NORMALIZED TO 40 MW •••••••••••••••••

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.623	1.010	1.252	1.955	1.948	1.508

9/ 1/67. TIME = 13.53 TO 14.00 49.7 MW. 14.00 INCHES FROM FULL IN. 550 MICRONS. ROD BNK POS = 18.63 IN.

FIX TEMP = 123.0 DEG F. HTINLT = 148.9 F. HTOUTLT = 127.0 F. HT1 FLOW = 64.2 GPM

• • • • • • • • TEMPERATURE (DEGREES F) • • • • • • • • • • •

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	187.00	165.70	228.90	159.60	259.50	185.90	256.50	195.20	272.80	185.10	284.40	220.90
CORRECTED TEMP	185.84	161.91	220.47	160.81	251.32	181.99	252.42	194.94	269.60	184.90	281.15	219.83

•••••••••••••••••••••••••••••••••••••• NUCLEAR HEATING RATES (WATTS/GM) ••••••••••••••••••••••••••••••••••••••
•••••••••••••••••• AT INDICATED POWER •••••••••••••••••• ••••••••••••• NORMALIZED TO 40 MW •••••••••••••••••

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.241	1.020	1.528	2.657	2.204	1.844

9/ 1/87. TIME = 14.15 TO 14.26 49.8 MW. 12.00 INCHES FROM FULL IN. 1000 MICRONS. HOT BNK POS = 18.63 IN.

FIX TEMP = 127.0 DEG F. HTIMLT = 168.7 F. HTOUTLT = 127.0 F. HT1 FLOW = 64.2 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LAB TEMP	198.10	169.80	236.60	162.80	275.20	194.50	272.60	203.30	294.80	194.20	300.70	231.80
CORRECTED TEMP	194.11	166.57	230.44	163.92	266.27	189.38	268.79	203.08	292.72	193.33	302.48	231.06

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 40 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.541	2.042	1.726	3.085	2.460	2.080

9/ 1/87. TIME = 14.45 TO 15.01 49.8 MW. 8.50 INCHES FROM FULL IN. 1000 MICRONS. HOT BNK POS = 18.68 IN.

FIX TEMP = 126.0 DEG F. HTIMLT = 161.1 F. HTOUTLT = 125.0 F. HT1 FLOW = 64.2 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LAB TEMP	227.00	179.50	267.80	174.70	323.70	203.30	320.10	227.20	363.50	224.70	374.40	263.10
CORRECTED TEMP	224.04	176.03	263.27	175.76	311.44	197.56	316.13	226.13	358.99	222.61	367.26	262.48

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 40 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.554	3.053	2.257	4.284	3.678	2.720

9/ 1/87. TIME = 15.09 TO 15.25 49.9 MW. 3.00 INCHES FROM FULL IN. 1000 MICRONS. HOT BNK POS = 18.68 IN.

FIX TEMP = 127.0 DEG F. HTIMLT = 161.4 F. HTOUTLT = 126.3 F. HT1 FLOW = 64.2 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LAB TEMP	245.70	189.00	285.20	188.70	353.70	231.70	348.70	240.70	402.20	244.10	410.70	281.10

CORRECTED TEMP	241.40	182.83	241.38	181.79	340.13	224.68	344.76	239.72	396.50	241.17	402.29	280.55

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.078	3.094	2.567	4.894	3.720	3.087

9/ 1/47. TIME = 15.33 TO 15.54 50.0 MW. 0.00 INCHES FROM FULL IN. 1000 MICRONS, ROD BNK POS = 18.69 IN.

FIX TEMP = 124.0 DEG F. HTINLT = 122.8 F. HTOUTLT = 124.0 F. HT1 FLOW = 64.2 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	249.50	187.80	285.50	180.70	357.20	233.30	352.90	245.60	409.90	248.30	410.40	281.00
CORRECTED TEMP	245.02	184.84	282.71	181.79	343.57	226.22	348.89	244.59	404.06	245.13	409.77	280.45

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.070	3.078	2.585	4.884	3.694	3.078

9/ 5/47. TIME = 10.29 TO 10.40 54.5 MW. 44.25 INCHES FROM FULL IN. 510 MICRONS, ROD BNK POS = 21.43 IN.

FIX TEMP = 132.0 DEG F. HTINLT = 129.5 F. HTOUTLT = 140.0 F. HT1 FLOW = 63.8 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	139.40	143.50	137.60	136.00	136.10	135.60	136.60	136.90	137.30	136.40	136.80	135.80
CORRECTED TEMP	138.61	140.47	130.53	137.93	128.92	127.89	138.01	137.68	135.93	136.79	136.76	132.28

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.044	.145	-.140	-.050	.158	-.196

9/ 5/67. TIME = 10.43 TO 10.54 54.7 MW. 29.25 INCHES FROM FULL IN. 510 MICRONS, ROD BNK POS = 21.45 IN.

FIX TEMP = 133.0 DEG F. HTINLT = 129.8 F. HTOUTLT = 139.5 F. HT1 FLOW = 63.8 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOR TEMP	138.90	142.50	139.00	137.10	138.80	136.70	138.20	136.80	138.30	137.10	138.90	139.00
CORECTED TEMP	138.13	139.52	132.08	139.06	131.94	129.14	139.50	137.58	136.95	137.47	138.81	135.56

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.022	.171	-.096	-.024	.188	-.105

9/ 5/67. TIME = 10.58 TO 11.09 54.8 MW. 29.25 INCHES FROM FULL IN. 510 MICRONS, ROD BNK POS = 21.45 IN.

FIX TEMP = 133.0 DEG F. HTINLT = 129.4 F. HTOUTLT = 139.0 F. HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOR TEMP	142.90	145.90	149.00	141.10	150.50	141.90	148.90	142.60	146.50	140.50	150.90	148.20
CORECTED TEMP	141.96	142.76	143.15	142.88	145.05	135.03	149.52	143.24	145.31	140.78	150.48	145.00

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.182	.318	.056	.112	.348	.062

9/ 5/67. TIME = 11.21 TO 11.32 54.8 MW. 24.25 INCHES FROM FULL IN. 510 MICRONS, ROD BNK POS = 21.45 IN.

FIX TEMP = 133.0 DEG F. HTINLT = 130.3 F. HTOUTLT = 139.0 F. HT1 FLOW = 63.8 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOR TEMP	150.70	152.40	166.30	148.20	170.40	151.50	169.90	154.50	165.10	147.50	174.70	165.60
CORECTED TEMP	149.50	148.97	162.31	147.82	167.27	145.91	169.17	154.87	161.97	147.59	173.94	162.84

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.349	.579	.375	.382	.634	.411

9/ 5/87. TIME = 11.46 TO 11.57 54.6 MW. 19.25 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 21.48 IN.

FIX TEMP = 135.0 DEG F. HTINLT = 129.6 F. HTOUTLT = 139.5 F. HT1 FLOW = 63.7 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	170.20	164.70	202.50	158.80	217.20	174.20	215.30	179.20	213.50	166.60	228.30	199.70
CORECTED TEMP	168.43	160.90	196.45	160.04	210.76	171.00	212.03	179.53	209.16	166.17	226.57	198.41

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.088	1.049	.985	1.191	1.149	1.079

9/ 5/87. TIME = 12.10 TO 12.21 54.6 MW. 17.25 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 21.51 IN.

FIX TEMP = 135.0 DEG F. HTINLT = 131.2 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	183.00	171.50	222.90	166.10	244.80	185.50	239.50	192.80	245.30	181.20	263.70	219.20
CORECTED TEMP	181.58	167.79	216.31	167.11	237.31	181.63	235.13	192.60	241.71	180.89	261.01	218.12

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.571	1.418	1.316	1.720	1.553	1.441

9/ 5/87. TIME = 12.27 TO 12.43 54.7 MW. 15.25 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 21.54 IN.

FIX TEMP = 134.0 DEG F. HTINLT = 131.8 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	201.80 180.10 243.50 171.90 274.90 200.50 272.90 212.00 286.60 197.50 303.00 237.40
CORECTED TEMP	199.65 177.04 238.01 172.74 265.98 195.06 269.10 211.47 284.59 196.84 298.93 236.68

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.243	1.883	1.605	2.461	2.066	1.761

9/ 5/67. TIME = 12.50 TO 13.06 54.7 MW, 14.25 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 21.54 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 131.1 F, HTOUTLT = 140.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	211.30 183.10 252.90 175.70 290.10 209.00 288.50 219.70 305.90 205.50 324.10 248.80
CORECTED TEMP	208.75 180.30 247.79 176.73 280.46 202.66 284.96 218.90 303.22 204.50 319.00 248.12

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.519	2.080	1.808	2.753	2.281	1.984

9/ 5/67, TIME = 13.14 TO 13.30 54.6 MW, 13.25 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 21.58 IN.

FIX TEMP = 137.0 DEG F, HTINLT = 132.4 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	218.10 186.20 262.50 180.40 304.90 215.20 300.70 225.70 325.50 214.50 345.30 259.10
CORECTED TEMP	215.27 183.44 257.76 181.50 294.09 208.47 297.01 224.68 322.05 212.99 339.60 258.47

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.804	2.262	1.974	3.081	2.486	2.170

9/ 5/87. TIME = 13.37 TO 13.53 54.8 MW. 12.75 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 21.58 IN.

FIX TEMP = 137.0 DEG F. HTINLT = 131.6 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOR TEMP	221.08	186.50	267.30	182.40	313.50	218.70	308.10	229.10	337.10	219.80	357.40	264.60
CORRECTED TEMP	218.05	183.75	262.75	183.43	302.02	211.85	304.28	228.23	333.21	217.99	351.13	263.99

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.993	2.372	2.089	3.289	2.607	2.295

9/ 5/87. TIME = 14.15 TO 14.31 55.0 MW. 12.25 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 21.58 IN.

FIX TEMP = 136.0 DEG F. HTINLT = 131.4 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOR TEMP	230.20	189.70	272.60	182.60	323.20	224.30	320.50	236.30	351.70	225.90	369.70	268.40
CORRECTED TEMP	227.13	186.77	268.26	183.84	310.97	217.26	316.53	235.34	347.68	223.74	362.80	267.80

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.178	2.507	2.143	3.465	2.735	2.338

9/ 5/87. TIME = 14.37 TO 14.53 54.9 MW. 11.25 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 21.58 IN.

FIX TEMP = 137.0 DEG F. HTINLT = 131.2 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOR TEMP	239.70	194.10	281.00	184.10	335.10	229.50	333.90	244.20	371.10	234.00	389.30	276.50

CORRECTED TEMP 236.23 191.81 276.99 185.29 321.97 222.55 329.72 243.20 366.31 231.64 381.86 275.93

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.439	2.684	2.281	3.759	2.933	2.493

9/ 5/67, TIME = 15.04 TO 15.20 54.8 MW, 7.75 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 21.62 IN.

FIX TEMP = 138.0 DEG F, HTINLT = 131.9 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.7 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	263.70	201.40	306.10	195.00	376.10	248.30	371.00	263.30	425.40	260.90	445.90	302.40
CORRECTED TEMP	259.23	198.66	302.55	195.44	362.00	240.70	366.76	262.21	419.28	257.01	437.11	301.45

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.187	3.213	2.712	4.584	3.518	2.970

9/ 5/67, TIME = 15.31 TO 15.47 54.8 MW, 4.25 INCHES FROM FULL IN, 750 MICRONS, ROD BNK POS = 21.62 IN.

FIX TEMP 138.0 DEG F, HTINLT = 132.6 F, HTOUTLT = 136.0 F, HT1 FLOW = 63.6 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	274.10	203.70	317.30	198.60	397.70	260.40	391.30	271.30	450.20	272.30	472.20	314.00
CORRECTED TEMP	269.19	200.96	313.37	199.21	383.28	252.39	387.22	270.18	443.24	267.76	462.24	312.58

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.537	3.449	2.942	4.968	3.776	3.221

9/ 5/67, TIME = 15.55 TO 16.11 55.0 MW, 2.25 INCHES FROM FULL IN, 750 MICRONS, ROD BNK POS = 21.62 IN.

FIX TEMP = 138.0 DEG F, HTINLT = 133.4 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LOR TEMP	276.20 206.50 321.50 199.10 402.30 262.80 396.90 276.30 458.90 277.10 478.60 316.50
CORRECTED TEMP	273.36 203.76 317.18 199.69 387.87 254.70 392.75 275.16 452.44 272.28 468.77 315.00

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.663	3.520	2.962	5.087	3.840	3.232

9/ 5/67, TIME = 16.15 TO 16.31 54.8 MW, .25 INCHES FROM FULL IN, 750 MICRONS, ROD BNK POS = 21.62 IN.

FIX TEMP = 137.0 DEG F, HTINLT = 133.4 F, HTOUTLT = 135.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LOR TEMP	278.90 206.10 318.90 197.90 400.70 262.60 396.50 277.00 458.00 276.10 476.30 313.20
CORRECTED TEMP	274.08 203.36 314.80 198.54 386.27 254.51 392.35 275.85 451.56 271.34 466.42 311.80

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.643	3.429	2.899	5.083	3.831	3.174

9/ 5/67, TIME = 16.38 TO 16.59 55.0 MW, 0.00 INCHES FROM FULL IN, 750 MICRONS, ROD BNK POS = 21.62 IN.

FIX TEMP = 138.0 DEG F, HTINLT = 133.9 F, HTOUTLT = 135.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LOR TEMP	279.10 205.80 317.90 197.20 399.40 262.20 395.40 276.40 458.00 276.20 475.80 313.10
CORRECTED TEMP	274.29 203.06 313.88 197.57 384.97 254.12 391.25 275.26 451.56 271.43 465.91 311.71

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER NORMALIZED TO 60 MW

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.639	3.478	2.913	5.061	3.795	3.178

9/ 6/67, TIME = 6.33 TO 6.56 55.4 MW, 0.00 INCHES FROM FULL IN, 750 MICRONS, ROD BNK POS = 21.99 IN.

FIX TEMP = 138.0 DEG F, MTINLT = 132.4 F, MTOUTLT = 133.0 F, MT1 FLOW = 63.7 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	275.99	203.80	315.20	196.40	396.30	258.00	391.90	273.00	455.00	274.30	474.60	311.30
CORECTED TEMP	270.99	201.06	311.45	196.80	382.14	250.07	387.82	271.87	448.28	269.64	464.69	310.00

************************************ NUCLEAR HEATING RATES (WATTS/GM) **

***************** AT INDICATED POWER *****************   ************* NORMALIZED TO 60 MW ****************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.674	3.505	2.886	5.007	3.796	3.125

9/ 6/67, TIME = 8.04 TO 8.15 55.5 MW, 44.16 INCHES FROM FULL IN, 750 MICRONS, ROD BNK POS = 22.01 IN.

FIX TEMP = 131.0 DEG F, MTINLT = 128.3 F, MTOUTLT = 137.0 F, MT1 FLOW = 63.8 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	136.40	139.50	13[illegible].10	134.50	136.00	135.70	134.50	133.70	134.30	134.00	135.60	136.30
CORECTED TEMP	135.73	136.65	123.87	136.48	128.81	128.00	136.04	134.55	132.87	134.45	135.59	132.79

************************************ NUCLEAR HEATING RATES (WATTS/GM) **

***************** AT INDICATED POWER *****************   ************* NORMALIZED TO 60 MW ****************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.058	.115	-.098	-.062	.124	-.106

9/ 6/67, TIME = 8.20 TO 8.31 55.3 MW, 39.16 INCHES FROM FULL IN, 750 MICRONS, ROD BNK POS = 22.04 IN.

FIX TEMP = 131.0 DEG F, MTINLT = 127.2 F, MTOUTLT = 136.0 F, MT1 FLOW = 63.8 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	139.30	140.50	134.70	133.20	136.80	137.10	139.00	137.30	135.90	132.10	134.70	135.4?
CORECTED TEMP	138.51	137.60	127.32	135.22	129.70	129.59	140.25	138.07	134.50	132.60	134.72	131.87

************************************ NUCLEAR HEATING RATES (WATTS/GM) **
***************** AT INDICATED POWER *****************   ************* NORMALIZED TO 60 MW *****************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.028	.141	-.119	-.030	.153	-.129

9/ 6/67, TIME = 8.34 TO 8.45 55.3 MW, 29.16 INCHES FROM FULL IN. 750 MICRONS, ROD BNK POS = 22.04 IN.

FIX TEMP = 131.0 DEG F. HTINLT = 128.7 F. HTOUTLT = 137.0 F. HT1 FLOW = 63.7 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	141.30	145.00	148.40	139.10	148.10	140.20	147.10	141.10	145.30	139.00	148.10	146.80
CORECTED TEMP	140.43	141.99	142.49	140.94	142.36	133.10	147.83	141.78	144.08	139.32	147.76	143.56

************************************ NUCLEAR HEATING RATES (WATTS/GM) **
***************** AT INDICATED POWER *****************   ************* NORMALIZED TO 60 MW *****************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.109	.311	.056	.119	.338	.060

9/ 6/67, TIME = 8.49 TO 9.00 55.3 MW, 24.16 INCHES FROM FULL IN. 750 MICRONS, ROD BNK POS = 22.06 IN.

FIX TEMP = 132.0 DEG F. HTINLT = 130.0 F. HTOUTLT = 137.0 F. HT1 FLOW = 63.7 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	150.90	152.10	165.70	144.19	167.90	149.10	168.00	154.15	164.70	148.20	171.00	163.50
CORECTED TEMP	149.69	148.69	161.64	145.79	164.54	143.19	167.39	154.48	161.59	148.27	170.04	160.68

************************************ NUCLEAR HEATING RATES (WATTS/GM) **
***************** AT INDICATED POWER *****************   ************* NORMALIZED TO 60 MW *****************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.328	.591	.349	.355	.642	.379

9/ 6/67, TIME = 9.09 TO 9.19 55.2 MW, 19.16 INCHES FROM FULL IN, 750 MICRONS, ROD BNK POS = 22.07 IN.

FIX TEMP = 132.0 DEG F, HTINLT = 130.5 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	170.60	164.10	202.40	157.40	216.40	172.40	215.10	179.70	213.30	166.60	226.80	199.60
CORECTED TEMP	168.81	160.29	196.36	158.68	210.00	169.08	211.84	180.01	208.95	166.17	224.83	198.31

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.077	1.087	1.009	1.171	1.181	1.096

9/ 6/67, TIME = 9.24 TO 9.35 54.9 MW, 17.16 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.10 IN.

FIX TEMP = 135.0 DEG F, HTINLT = 130.8 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	187.00	172.70	224.70	165.60	246.50	187.50	245.10	197.00	249.80	182.70	267.90	220.40
CORECTED TEMP	185.46	169.32	218.18	166.63	238.93	183.24	240.82	196.70	246.27	182.56	265.09	219.33

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.618	1.471	1.334	1.768	1.608	1.458

9/ 6/67, TIME = 9.42 TO 9.57 54.8 MW, 15.16 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.13 IN.

FIX TEMP = 135.0 DEG F, HTINLT = 130.6 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	202.90	179.10	244.90	173.30	277.70	202.70	274.80	212.60	287.60	197.40	307.60	241.00
CORECTED TEMP	200.71	174.03	239.47	174.40	268.65	197.03	271.03	212.05	285.58	196.44	303.30	240.29

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.260	1.892	1.691	2.475	2.071	1.851

9/ 6/67, TIME = 10.06 TO 10.22 54.7 MW, 14.16 INCHES FROM FULL IN, 550 MICRONS, ROD BNK POS = 22.15 IN.

FIX TEMP = 135.0 DEG F, HTINLT = 131.1 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	212.10 183.90 255.70 177.40 292.00 209.00 289.20 222.00 310.70 208.30 327.90 249.70
CORECTED TEMP	209.52 181.11 250.70 178.38 282.27 202.66 285.68 221.12 307.83 207.14 322.61 249.03

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.585	2.113	1.800	2.835	2.317	1.974

9/ 6/67, TIME = 10.29 TO 10.45 54.1 MW, 13.16 INCHES FROM FULL IN, 550 MICRONS, ROD BNK POS = 22.19 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 131.9 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	219.30 186.40 263.30 180.30 305.40 215.40 302.30 228.90 328.30 216.30 347.00 258.30
CORECTED TEMP	216.42 183.64 258.60 181.40 294.56 208.67 298.60 228.04 324.72 214.69 341.23 257.66

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.836	2.284	1.952	3.146	2.533	2.165

9/ 6/67, TIME = 10.51 TO 11.07 54.1 MW, 12.68 INCHES FROM FULL IN, 550 MICRONS, ROD BNK POS = 22.22 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 131.5 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.6 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	225.00	188.30	267.70	181.30	314.00	219.50	310.90	233.40	339.60	219.90	357.70	263.30
CORECTED TEMP	221.88	185.35	263.17	182.37	302.48	212.62	307.07	232.45	336.03	218.08	351.37	262.68

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.015	2.394	2.048	3.344	2.655	2.271

9/ 6/87, TIME = 11.12 TO 11.28 54.2 MW, 12.16 INCHES FROM FULL IN, 550 MICRONS, ROD BNK POS = 22.22 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 131.8 F, HTOUTLT = 136.0 F, HT1 FLOW = 63.6 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	230.90	190.00	273.70	183.70	323.80	224.60	320.30	238.50	352.40	226.00	371.80	269.80
CORECTED TEMP	227.80	187.07	269.41	184.91	311.53	217.55	316.33	237.53	348.35	223.83	364.81	269.21

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.184	2.504	2.162	3.524	2.772	2.393

9/ 6/87, TIME = 11.34 TO 11.50 54.1 MW, 11.16 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.25 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 131.5 F, HTOUTLT = 136.0 F, HT1 FLOW = 63.6 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	238.70	193.70	280.90	186.20	335.00	229.30	331.50	245.00	370.50	234.00	388.30	276.50
CORECTED TEMP	235.28	190.60	276.89	187.33	321.88	222.36	327.38	244.00	365.73	231.64	380.90	275.93

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER

3.436	2.657	2.259	3.811	2.947	2.506

9/ 6/67. TIME = 11.58 TO 12.15 54.2 MW. 7.68 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 22.25 IN.

FIX TEMP = 137.0 DEG F. HTINLT = 131.9 F. HTOUTLT = 136.0 F. HT1 FLOW = 63.6 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	264.30	201.30	304.80	194.90	375.00	249.10	370.30	264.40	424.20	260.30	444.10	301.50
CORECTED TEMP	259.80	198.56	301.22	195.34	360.91	241.48	366.06	263.31	418.10	256.44	435.36	300.58

********************************** NUCLEAR HEATING RATES (WATTS/GM) **

**************** AT INDICATED POWER ****************			************* NORMALIZED TO 60 MW ****************		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.156	3.170	2.692	4.601	3.509	2.980

9/ 6/67. TIME = 12.20 TO 12.36 54.4 MW. 4.16 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 22.25 IN.

FIX TEMP = 137.0 DEG F. HTINLT = 133.5 F. HTOUTLT = 136.0 F. HT1 FLOW = 63.6 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	275.40	20[illegible].10	315.60	197.10	391.90	256.90	388.70	274.40	448.80	272.30	466.80	310.90
CORECTED TEMP	270.48	202.36	311.81	197.47	377.85	249.01	384.63	273.26	441.87	267.76	456.81	309.61

********************************** NUCLEAR HEATING RATES (WATTS/GM) **

**************** AT INDICATED POWER ****************			************* NORMALIZED TO 60 MW ****************		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.485	3.433	2.869	4.946	3.786	3.164

9/ 6/67. TIME = 12.44 TO 13.00 54.2 MW. 2.16 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 22.25 IN.

FIX TEMP = 138.0 DEG F. HTINLT = 132.8 F. HTOUTLT = 133.5 F. HT1 FLOW = 63.5 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	[illegible]	5	6	7	8	9	10	11	12

DATA LGR TEMP	276.30	203.40	314.90	196.10	395.10	260.30	391.70	276.10	451.50	272.00	468.90	311.80
CORECTED TEMP	271.41	200.66	311.17	196.50	380.96	252.29	387.62	274.96	444.52	267.47	458.88	310.49

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.545	3.427	2.926	5.031	3.793	3.239

9/ 6/87, TIME = 13.09 TO 13.25 54.2 MW, .16 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.27 IN.

FIX TEMP = 138.0 DEG F, HTINLT = 132.5 F, HTOUTLT = 136.0 F, HT1 FLOW = 63.1 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	275.50	202.10	313.50	195.50	393.70	259.70	389.90	274.50	450.10	271.70	467.70	309.40
CORECTED TEMP	270.58	199.36	309.89	195.92	379.58	251.71	385.83	273.36	443.15	267.19	457.69	308.16

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.524	3.401	2.890	5.008	3.764	3.199

9/ 6/87, TIME = 13.31 TO 13.52 54.3 MW, 0.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.27 IN.

FIX TEMP = 137.0 DEG F, HTINLT = 132.2 F, HTOUTLT = 136.0 F, HT1 FLOW = 63.5 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	275.50	202.30	313.20	195.60	394.30	259.30	390.90	274.70	450.90	272.20	468.10	309.00
CORECTED TEMP	270.58	199.56	309.62	196.02	380.17	251.32	386.82	273.56	443.93	267.66	458.08	307.77

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.542	3.434	2.857	5.018	3.794	3.157

9/ 7/87, TIME = 8.59 TO 9.10 55.1 MW, 44.12 INCHES FROM FULL IN, 520 MICRONS, ROD BNK POS = 22.79 IN.

FIX TEMP = 129.0 DEG F, HTINLT = 127.3 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.8 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	137.00	140.10	135.60	134.50	136.10	134.30	135.40	134.30	135.00	134.50	135.30	135.90
CORECTED TEMP	136.30	137.22	128.32	136.48	128.92	126.42	136.88	135.14	133.59	134.94	135.30	132.38

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.053	.170	-.117	-.058	.185	-.128

9/ 7/87, TIME = 9.14 TO 9.25 55.0 MW, 39.12 INCHES FROM FULL IN, 520 MICRONS, ROD BNK POS = 22.81 IN.

FIX TEMP = 131.0 DEG F, HTINLT = 127.2 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	138.70	141.80	137.70	135.10	137.10	135.20	137.40	136.50	137.00	135.40	137.30	136.70
CORECTED TEMP	137.93	138.85	130.64	137.06	130.04	127.44	138.76	137.28	135.62	135.81	137.25	133.20

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.033	.183	-.125	-.036	.199	-.136

9/ 7/87, TIME = 9.39 TO 9.50 54.9 MW, 29.12 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.83 IN.

FIX TEMP = 131.0 DEG F, HTINLT = 127.2 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	141.60	143.30	147.20	139.70	150.80	142.10	149.80	142.10	14[illegible].60	137.30	148.00	148.10
CORECTED TEMP	140.72	140.28	141.16	141.52	145.39	135.26	150.36	142.76	143.37	137.66	147.66	144.89

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.110	.331	.105	.120	.362	.114

9/ 7/67, TIME = 10.02 TO 10.13 54.8 MW, 24.12 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.86 IN.

FIX TEMP = 132.0 DEG F, HTINLT = 148.3 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.6 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	148.40	150.60	165.60	145.40	170.50	151.00	168.10	152.90	163.30	146.20	170.80	165.20
CORECTED TEMP	147.26	147.25	161.53	147.05	167.36	145.35	167.49	153.31	160.25	146.32	169.84	162.43

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.349	.573	.397	.383	.628	.434

9/ 7/67, TIME = 10.24 TO 10.35 54.8 MW, 19.12 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.87 IN.

FIX TEMP = 132.0 DEG F, HTINLT = 149.9 F, HTOUTLT = 140.0 F, HT1 FLOW = 63.6 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	171.10	165.60	206.00	160.40	219.90	174.10	217.30	180.30	217.50	169.60	231.90	201.40
CORECTED TEMP	169.30	161.81	199.58	161.59	213.33	170.91	213.88	180.60	213.22	169.09	230.07	200.13

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.144	1.109	.998	1.252	1.214	1.093

9/ 7/67, TIME = 10.43 TO 10.54 54.7 MW, 17.12 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.92 IN.

FIX TEMP = 134.0 DEG F, HTINLT = 148.9 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.6 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	185.30	171.30	223.40	165.90	246.30	186.30	244.00	195.80	248.20	181.80	265.10	219.00
CORECTED TEMP	183.81	167.58	216.83	166.92	238.74	182.35	239.70	195.53	244.65	181.48	262.37	217.92

************************************** NUCLEAR HEATING RATES (WATTS/GM) **************************************

***************** AT INDICATED POWER ***************** ************** NORMALIZED TO 60 MW *****************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.611	1.478	1.316	1.767	1.621	1.444

9/ 7/67. TIME = 11.02 TO 11.18 54.5 MW. 15.12 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 22.92 IN.

FIX TEMP = 135.0 DEG F. HTINLT = 129.8 F. HTOUTLT = 139.0 F. HT1 FLOW = 63.6 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	203.70	180.10	244.50	172.50	276.80	201.70	275.40	214.60	290.10	198.70	305.60	238.70
CORECTED TEMP	201.47	177.04	239.05	173.63	267.79	196.13	271.64	213.98	288.06	197.99	301.43	237.98

************************************** NUCLEAR HEATING RATES (WATTS/GM) **************************************

***************** AT INDICATED POWER ***************** ************** NORMALIZED TO 60 MW *****************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.295	1.912	1.628	2.526	2.105	1.792

9/ 7/67. TIME = 11.26 TO 11.42 54.4 MW. 14.12 INCHES FROM FULL IN. 520 MICRONS. ROD BNK POS = 22.99 IN.

FIX TEMP = 134.0 DEG F. HTINLT = 130.8 F. HTOUTLT = 137.0 F. HT1 FLOW = 63.5 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	212.30	183.40	256.70	176.30	295.40	210.10	290.50	221.70	312.70	209.10	330.70	251.40
CORECTED TEMP	209.71	180.61	251.74	179.46	285.51	203.64	287.00	220.83	309.72	207.90	325.29	250.73

************************************** NUCLEAR HEATING RATES (WATTS/GM) **************************************

***************** AT INDICATED POWER ***************** ************** NORMALIZED TO 60 MW *****************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.622	2.146	1.837	2.892	2.367	2.026

9/ 7/87, TIME = 11.51 TO 12.07 54.5 MW, 13.12 INCHES FROM FULL IN, 520 MICRONS, ROD BNK POS = 22.99 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 130.4 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	223.10	188.10	266.60	181.50	311.60	217.70	307.80	232.20	336.10	218.70	352.70	261.50
CORECTED TEMP	220.06	185.15	262.03	182.56	300.29	210.89	303.99	231.25	332.24	216.95	346.62	260.87

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.955	2.371	2.001	3.253	2.610	2.203

9/ 7/87, TIME = 12.21 TO 12.37 54.4 MW, 12.62 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 22.99 IN.

FIX TEMP = 137.0 DEG F, HTINLT = 130.5 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.5 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	227.50	190.50	270.20	181.90	317.50	220.80	314.10	236.00	346.00	223.00	361.10	264.90
CORECTED TEMP	224.54	187.58	265.77	182.95	305.70	213.88	310.21	235.04	342.19	221.00	354.63	264.29

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.102	2.444	2.053	3.422	2.696	2.264

9/ 7/87, TIME = 12.51 TO 13.07 54.5 MW, 12.12 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.01 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 131.5 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.5 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	231.70	191.50	275.60	183.90	325.50	224.70	322.30	240.20	356.40	228.10	372.00	269.90

CORECTED TEMP	228.57	188.59	271.38	185.10	313.11	217.65	318.32	239.22	352.19	226.08	365.00	269.31

********** NUCLEAR HEATING RATES (WATTS/GM) **********
********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.244	2.548	2.142	3.571	2.805	2.359

9/ 7/67, TIME = 13.19 TO 13.35 54.5 MW, 11.12 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.01 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 130.5 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.5 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	241.50	195.20	283.50	185.80	339.10	231.40	336.20	247.90	375.10	235.50	390.30	278.70
CORECTED TEMP	237.96	192.12	279.55	186.94	326.08	224.39	332.01	246.88	370.15	233.06	382.82	278.14

********** NUCLEAR HEATING RATES (WATTS/GM) **********
********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.498	2.719	2.302	3.851	2.993	2.534

9/ 7/67, TIME = 13.45 TO 14.01 54.5 MW, 7.62 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.02 IN.

FIX TEMP = 139.0 DEG F, HTINLT = 132.3 F, HTOUTLT = 135.0 F, HT1 FLOW = 63.5 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	266.00	203.00	307.80	195.70	378.70	250.20	373.90	267.30	428.60	263.10	446.90	302.40
CORECTED TEMP	261.43	200.28	304.23	196.12	364.95	242.54	369.60	266.20	422.42	259.08	438.08	301.45

********** NUCLEAR HEATING RATES (WATTS/GM) **********
********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.213	3.241	2.683	4.638	3.568	2.954

9/ 7/67, TIME = 14.13 TO 14.29 54.6 MW, 4.12 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.03 IN.

FIX TEMP = 139.0 DEG F, HTINLT = 132.8 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	275.80	205.10	317.90	199.60	396.70	260.50	391.60	276.20	450.80	273.80	470.70	314.40
CORECTED TEMP	270.89	202.36	313.88	200.17	382.53	252.48	387.52	275.06	443.83	269.17	460.71	312.97

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.512	3.441	2.921	4.958	3.781	3.210

9/ 7/67, TIME = 14.48 TO 14.56 54.4 MW, 2.12 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.06 IN.

FIX TEMP = 139.0 DEG F, HTINLT = 130.0 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.5 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	278.20	206.00	318.70	199.00	399.10	262.40	393.40	277.70	454.20	274.70	473.30	314.10
CORECTED TEMP	273.36	203.26	314.61	199.59	384.67	254.32	389.26	276.55	447.50	270.02	463.36	312.68

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.588	3.446	2.890	5.038	3.801	3.188

9/ 7/67, TIME = 15.11 TO 15.32 54.3 MW, 0.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.07 IN.

FIX TEMP = 140.0 DEG F, HTINLT = 133.4 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	277.80	203.90	314.50	196.60	396.30	261.60	392.70	276.80	453.10	273.80	470.80	311.70
CORECTED TEMP	272.95	201.16	310.81	196.99	382.14	253.55	388.57	275.65	446.42	269.17	460.81	310.39

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.552	3.422	2.911	5.030	3.781	3.216

9/ 8/67, TIME = 9.22 TO 9.31 54.4 MW, 44.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.58 IN.

FIX TEMP = 131.0 DEG F, HTINLT = 128.5 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.8 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	137.70 140.80 137.10 136.30 137.30 136.40 136.40 135.30 135.80 136.10 137.10 137.50
CORECTED TEMP	136.98 137.89 129.98 138.23 130.26 128.80 137.82 136.11 134.40 136.50 137.05 134.02

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWE. ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.061	.136	-.105	-.066	.149	-.114

9/ 8/67, TIME = 9.41 TO 9.50 54.7 MW, 39.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.60 IN.

FIX TEMP = 133.0 DEG F, HTINLT = 128.1 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.8 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	140.70 142.50 137.20 134.60 137.10 136.70 139.60 138.40 137.60 135.00 136.30 136.70
CORECTED TEMP	139.85 139.52 130.09 136.58 130.06 129.14 140.81 139.14 136.24 135.43 136.28 133.20

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.036	.163	-.126	-.040	.179	-.138

9/ 8/67, TIME = 10.02 TO 10.11 54.7 MW, 29.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.63 IN.

FIX TEMP = 133.0 DEG F, HTINLT = 129.1 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.8 GPM

	* TEMPERATURE (DEGREES F) *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	142.20	145.40	147.60	139.80	148.30	141.20	147.40	142.30	145.90	140.10	147.30	146.50
CORECTED TEMP	141.39	142.29	141.60	141.62	142.59	134.24	148.11	142.95	144.69	140.39	146.98	143.25

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.099	.289	.034	.108	.317	.037

9/ 8/67, TIME = 10.19 TO 10.28 54.6 MW, 24.90 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.64 IN.

FIX TEMP = 133.0 DEG F, HTINLT = 128.8 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.8 GPM

	* TEMPERATURE (DEGREES F) *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	148.40	150.30	162.30	145.20	166.80	150.60	165.40	152.30	160.90	145.10	165.90	162.00
CORECTED TEMP	147.26	146.97	157.88	146.85	163.31	144.89	164.96	152.72	157.95	145.25	165.07	159.14

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.304	.800	.318	.334	.549	.349

9/ 8/67, TIME = 10.39 TO 10.48 54.4 MW, 19.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.67 IN.

FIX TEMP = 133.0 DEG F, HTINLT = 130.4 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.8 GPM

	* TEMPERATURE (DEGREES F) *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	167.30	163.50	198.80	158.20	210.00	169.60	208.00	175.90	204.70	164.10	217.70	195.80
CORECTED TEMP	165.61	159.68	193.15	159.46	203.93	166.43	205.29	176.09	200.41	163.74	215.98	194.13

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.928	.991	.897	1.024	1.094	.990

9/ 8/67, TIME = 10.56 TO 11.05 54.4 MW, 17.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.70 IN.

FIX TEMP = 134.0 DEG F, HTINLT = 131.0 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.8 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	180.90	171.90	217.10	164.10	234.40	180.30	232.20	190.70	235.90	178.20	250.20	211.10
CORECTED TEMP	179.33	168.19	210.28	165.18	227.41	176.72	227.90	190.76	232.17	177.97	247.87	209.95

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.390	1.323	1.124	1.534	1.459	1.240

9/ 8/67, TIME = 11.12 TO 11.21 54.4 MW, 15.90 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.71 IN.

FIX TEMP = 135.0 DEG F, HTINLT = 131.1 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.8 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	196.90	178.40	236.70	171.30	265.00	195.80	262.20	206.80	271.90	193.00	289.60	231.60
CORECTED TEMP	194.65	175.32	230.95	172.16	256.56	190.56	258.22	206.46	268.70	192.16	286.23	230.86

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.956	1.736	1.484	2.157	1.915	1.637

9/ 8/67, TIME = 11.28 TO 11.37 54.3 MW, 14.90 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.73 IN.

FIX TEMP = 135.0 DEG F, HTINLT = 131.9 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	203.80	180.90	248.00	176.00	281.10	203.40	276.80	214.30	293.80	202.30	312.60	243.60

CORECTED TEMP	201.57	177.85	242.69	177.02	271.89	197.65	273.06	213.69	291.73	201.45	308.06	242.90

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.344	1.944	1.701	2.590	2.148	1.879

9/ 8/67, TIME = 11.45 TO 11.54 54.4 MW, 13.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.73 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 130.9 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	215.40	184.50	259.80	180.00	300.40	213.30	295.20	226.10	318.00	212.10	336.40	254.60
CORECTED TEMP	212.68	181.72	254.96	181.11	289.94	206.64	291.78	225.07	314.82	210.73	330.72	253.95

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.679	2.188	1.884	2.955	2.413	2.078

9/ 8/67, TIME = 12.02 TO 12.11 54.3 MW, 13.40 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.76 IN.

FIX TEMP = 137.0 DEG F, HTINLT = 131.9 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	220.00	185.60	263.40	181.10	309.60	218.40	304.50	230.20	328.80	216.20	346.30	260.30
CORECTED TEMP	217.09	182.83	258.70	182.17	298.43	211.56	300.75	229.29	325.21	214.59	340.56	259.67

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.841	2.287	2.005	3.140	2.527	2.215

9/ 8/67, TIME = 12.17 TO 12.26 54.3 MW, 12.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.76 IN.

FIX TEMP = 137.0 DEG F, HTINLT = 131.2 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	226.50	189.20	268.80	182.00	315.90	222.00	312.60	235.70	340.90	220.30	357.00	263.80
CORECTED TEMP	223.32	186.26	264.31	183.05	304.25	215.04	308.71	234.74	337.29	218.46	350.74	263.18

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.024	2.376	2.040	3.342	2.625	2.254

9/ 8/67, TIME = 12.31 TO 12.40 54.3 MW, 11.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.78 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 131.2 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	234.80	192.90	277.60	185.20	330.20	228.70	326.60	243.80	360.90	229.90	377.70	272.60
CORECTED TEMP	231.54	189.79	273.46	186.36	317.45	221.78	322.55	242.80	356.51	227.78	370.82	272.02

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.296	2.552	2.181	3.642	2.820	2.410

9/ 8/67, TIME = 13.08 TO 13.17 54.5 MW, 8.40 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 23.79 IN.

FIX TEMP = 137.0 DEG F, HTINLT = 132.2 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	261.30	200.30	301.90	194.20	371.20	248.30	366.40	263.50	416.60	256.00	434.70	297.80
CORECTED TEMP	256.93	197.56	298.36	194.66	357.22	240.70	362.23	262.41	410.64	252.39	425.62	296.99

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.052	3.092	2.621	4.461	3.404	2.885

9/ 8/87. TIME = 13.29 TO 13.38 54.5 MW. 4.90 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 23.79 IN.

FIX TEMP = 140.0 DEG F. HTINLT = 132.4 F. HTOUTLT = 137.0 F. HT1 FLOW = 63.8 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	275.50	205.40	314.60	197.60	392.40	259.10	388.80	275.30	444.70	269.90	464.40	311.80
CORECTED TEMP	270.58	202.66	310.96	198.25	378.35	251.13	384.73	274.16	438.83	265.49	454.48	310.49

************************************** NUCLEAR HEATING RATES (WATTS/GM) **************************************

****************** AT INDICATED POWER ****************** ************* NORMALIZED TO 60 MW ******************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.437	3.388	2.859	4.885	3.730	3.147

9/ 8/87. TIME = 13.44 TO 13.53 54.5 MW. 2.80 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 23.78 IN.

FIX TEMP = 139.0 DEG F. HTINLT = 133.2 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	277.50	206.60	317.20	198.80	397.30	260.70	392.70	277.80	452.40	273.60	471.30	314.20
CORECTED TEMP	272.64	203.86	313.28	199.40	383.12	252.68	388.57	276.65	445.40	268.98	461.32	312.77

************************************** NUCLEAR HEATING RATES (WATTS/GM) **************************************

****************** AT INDICATED POWER ****************** ************* NORMALIZED TO 60 MW ******************

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.532	3.457	2.906	4.998	3.806	3.200

9/ 8/87. TIME = 13.59 TO 14.08 54.6 MW. .80 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 23.83 IN.

FIX TEMP = 140.0 DEG F. HTINLT = 133.9 F. HTOUTLT = 136.0 F. HT1 FLOW = 63.7 GPM

* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * * *

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	278.00	204.50	315.00	197.40	390.30	261.20	392.30	277.30	452.00	272.30	469.50	312.10
CORRECTED TEMP	272.02	202.00	311.26	197.77	382.14	253.14	388.22	276.15	445.01	267.76	459.49	310.78

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.546	3.427	2.899	5.033	3.794	3.209

9/ 8/87. TIME = 14.15 TO 14.34 54.3 MW. 0.00 INCHES FROM FULL IN. 510 MICRONS, ROD BNK POS = 23.83 IN.

FIX TEMP = 138.0 DEG F. HTINLT = 134.7 F. HTOUTLT = 137.0 F. HT1 FLOW = 63.7 GPM

TEMPERATURE (DEGREES)

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	277.30	205.80	315.70	197.61	393.90	259.50	398.60	276.40	452.30	275.30	469.70	310.00
CORRECTED TEMP	272.44	203.08	311.91	198.25	379.78	251.52	386.52	275.26	445.31	270.59	459.69	308.74

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.512	3.417	2.826	4.985	3.776	3.123

9/11/87. TIME = 9.18 TO 9.27 61.3 MW. 45.10 INCHES FROM FULL IN. 510 MICRONS, ROD BNK POS = 26.35 IN.

FIX TEMP = 132.0 DEG F. HTINLT = 149.2 F. HTOUTLT = 139.0 F. HT1 FLOW = 63.8 GPM

TEMPERATURE (DEGREES F)

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	139.50	142.80	137.84	136.20	136.50	135.30	137.10	137.10	137.20	136.90	137.50	136.80
CORRECTED TEMP	138.70	139.80	138.75	138.13	129.37	127.55	138.47	137.87	135.83	137.27	137.44	133.31

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.058	.165	-.147	-.058	.165	-.146

9/11/87, TIME = 9.35 TO 9.44 60.1 MW, 40.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 26.38 IN.

FIX TEMP = 132.0 DEG F, HTINLT = 140.0 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.8 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	138.90 141.50 138.10 136.10 138.40 136.40 138.80 137.10 137.60 136.00 138.30 138.30
CORRECTED TEMP	138.13 138.56 131.04 130.83 131.59 129.36 140.07 137.87 136.24 136.40 138.22 134.84

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.027	.167	-.090	-.027	.166	-.089

9/11/87, TIME = 9.53 TO 10.02 60.0 MW, 29.90 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 26.40 IN.

FIX TEMP = 132.0 DEG F, HTINLT = 128.8 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.8 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	142.90 145.20 147.90 139.10 149.40 142.70 150.40 143.50 146.50 139.00 148.10 147.50
CORRECTED TEMP	141.96 142.10 141.94 140.94 143.82 135.94 150.92 144.12 145.31 139.32 147.76 144.28

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.121	.297	.072	.121	.297	.072

9/11/87, TIME = 10.18 TO 10.19 60.2 MW, 24.90 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 26.43 IN.

FIX TEMP = 133.0 DEG F, HTINLT = 129.2 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.8 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	150.30 152.30 165.80 145.90 168.90 151.30 168.20 153.60 163.60 147.20 170.30 164.30
CORRECTED TEMP	149.11 148.88 161.76 147.53 165.66 145.69 167.58 153.99 160.54 147.29 169.35 161.50

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.320	.544	.345	.319	.542	.344

9/11/67, TIME = 10.38 TO 10.39 60.0 MW, 20.10 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 26.45 IN.

FIX TEMP = 133.0 DEG F, HTINLT = 130.8 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	168.30	164.90	200.90	158.20	213.10	171.20	211.40	178.00	208.10	165.20	220.10	197.10
CORECTED TEMP	166.58	161.10	195.82	159.46	206.85	168.00	208.43	178.35	203.68	164.81	218.32	195.46

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.986	1.030	.914	.986	1.030	.914

9/11/67, TIME = 10.46 TO 10.55 59.9 MW, 18.10 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 26.49 IN.

FIX TEMP = 134.0 DEG F, HTINLT = 129.6 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	181.70	171.40	219.10	164.70	240.10	184.10	236.70	192.30	238.70	178.10	253.00	216.00
CORECTED TEMP	180.11	167.69	212.30	165.76	232.86	180.36	232.28	192.32	235.01	177.88	250.60	214.90

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.455	1.356	1.252	1.458	1.358	1.254

9/11/67, TIME = 11.03 TO 11.12 59.5 MW, 16.10 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 26.52 IN.

FIX TEMP = 135.0 DEG F. HTINLT = 131.0 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LOP TEMP	199.10	180.80	243.50	173.20	272.90	199.70	268.90	210.30	279.90	196.40	297.70	238.40
CORECTED TEMP	197.07	176.94	238.01	174.31	264.08	194.35	265.03	209.83	277.34	195.47	293.89	237.68

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.106	1.824	1.612	2.110	1.827	1.615

9/11/87. TIME = 11.19 TO 11.28 59.9 MW. 15.20 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 26.52 IN.

FIX TEMP = 135.0 DEG F. HTINLT = 130.8 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LOP TEMP	208.00	183.50	252.90	177.00	287.80	207.30	283.90	218.90	301.10	203.80	316.20	247.50
CORECTED TEMP	205.59	180.71	247.79	177.99	278.27	201.14	280.29	218.13	298.61	202.89	311.51	246.82

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.452	2.030	1.753	2.456	2.033	1.756

9/11/87. TIME = 11.35 TO 11.44 59.9 MW. 14.20 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 26.57 IN.

FIX TEMP = 136.0 DEG F. HTINLT = 130.8 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LOP TEMP	218.70	187.80	264.30	180.50	300.40	216.30	303.70	230.80	325.30	213.90	341.40	260.00
CORECTED TEMP	215.84	184.84	259.63	181.59	295.49	209.54	299.95	229.87	321.86	212.42	335.90	259.37

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER

2.799 2.291 1.978 2.803 2.295 1.982

9/11/87. TIME = 11.51 TO 12.00 60.0 MW. 13.00 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 26.56 IN.

FIX TEMP = 136.0 DEG F. MTINLT = 132.5 F. MTOUTLT = 138.2 F. MT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * *											
DATA LOG TEMP	225.20	191.70	272.30	184.20	318.20	220.20	313.60	236.10	341.40	220.50	357.00	266.20
CORRECTED TEMP	222.07	188.79	267.95	185.39	306.35	213.30	309.71	235.14	337.77	218.65	350.74	265.59

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.048	2.477	2.053	3.048	2.477	2.053

9/11/87. TIME = 12.07 TO 12.16 59.6 MW. 13.20 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 26.57 IN.

FIX TEMP = 136.0 DEG F. MTINLT = 131.8 F. MTOUTLT = 137.0 F. MT1 FLOW = 63.6 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * *											
DATA LOG TEMP	228.80	191.30	275.90	185.30	326.00	227.10	321.80	239.30	348.30	223.90	366.40	272.20
CORRECTED TEMP	225.82	188.39	271.89	186.46	313.58	219.96	317.82	238.32	344.28	221.85	359.67	271.62

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.142	2.487	2.187	3.147	2.491	2.191

9/11/87. TIME = 12.22 TO 12.31 59.7 MW. 12.20 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 26.59 IN.

FIX TEMP = 137.0 DEG F. MTINLT = 131.9 F. MTOUTLT = 138.0 F. MT1 FLOW = 63.6 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * *											

DATA LGR TEMP	234.20	195.50	285.40	189.20	339.90	232.10	335.70	247.40	370.80	234.50	387.60	281.20
CORECTED TEMP	234.40	192.42	281.47	190.03	326.82	225.06	331.51	246.39	366.02	232.11	380.23	280.65

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.444	2.705	2.323	3.461	2.718	2.335

9/11/87, TIME = 12.37 TO 12.44 59.6 MW, 8.60 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 26.63 IN.

FIX TEMP = 137.0 DEG F, HTINLT = 132.5 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.6 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	208.20	205.90	313.00	197.80	383.70	252.50	380.10	271.10	433.80	264.40	451.80	307.20
CORECTED TEMP	203.54	203.10	309.43	198.45	369.33	244.76	376.17	269.98	427.53	260.31	441.87	306.07

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.299	3.329	2.753	4.328	3.351	2.771

9/11/87, TIME = 12.53 TO 13.02 59.8 MW, 5.20 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 26.64 IN.

FIX TEMP = 138.0 DEG F, HTINLT = 133.7 F, HTOUTLT = 137.0 F, HT1 FLOW = 63.6 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	284.10	211.60	327.70	202.00	408.10	265.30	404.90	284.40	466.30	279.30	485.60	322.80
CORECTED TEMP	279.43	208.86	322.77	202.46	393.65	257.12	400.56	283.22	459.41	274.36	475.91	321.03

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.738	3.634	3.017	4.754	3.646	3.027

9/11/87. TIME = 13.09 TO 13.18 59.9 MW. 3.20 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 26.65 IN.

FIX TEMP = 139.0 DEG F. HTINLT = 133.8 F. HTOUTLT = 137.0 F. HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	286.10 211.10 330.50 203.70 414.60 268.30 410.00 286.00 472.90 282.90 492.70 327.30
CORECTED TEMP	281.49 208.36 325.34 204.09 400.13 260.01 405.70 284.81 465.89 277.75 483.15 325.40

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.836	3.710	3.094	4.844	3.716	3.099

9/11/87. TIME = 13.25 TO 13.34 59.8 MW. 1.20 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 26.68 IN.

FIX TEMP = 139.0 DEG F. HTINLT = 134.1 F. HTOUTLT = 137.0 F. HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	284.80 209.70 328.40 202.30 414.70 269.00 409.60 284.70 472.80 282.80 492.10 325.60
CORECTED TEMP	280.15 206.98 323.87 202.75 400.23 260.69 405.30 283.52 465.79 277.66 482.53 323.75

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.842	3.688	3.088	4.868	3.701	3.097

9/11/87. TIME = 13.41 TO 14.00 59.7 MW. 0.00 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 26.70 IN.

FIX TEMP = 139.0 DEG F. HTINLT = 134.3 F. HTOUTLT = 136.0 F. HT1 FLOW = 63.6 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	284.40 209.00 327.20 201.30 412.40 268.30 408.10 284.20 471.60 281.80 489.00 323.40
CORECTED TEMP	279.74 206.26 322.35 201.00 397.94 260.01 403.78 283.02 464.61 276.71 479.37 321.61

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.839	3.656	3.053	4.863	3.675	3.068

9/12/67, TIME = 8.45 TO 8.54 60.0 MW, 45.20 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 27.79 IN.

FIX TEMP = 132.0 DEG F, HTINLT = 149.0 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.8 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	138.50 141.40 137.20 136.40 136.90 135.60 136.20 135.80 136.60 135.70 136.80 136.90
CORECTED TEMP	137.74 138.46 130.09 138.32 129.82 127.89 137.63 136.60 135.22 136.11 136.76 133.41

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.044	.152	-.129	-.044	.152	-.129

9/12/67, TIME = 9.01 TO 9.10 59.9 MW, 40.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 27.84 IN.

FIX TEMP = 133.0 DEG F, HTINLT = 129.4 F, HTOUTLT = 138.5 F, HT1 FLOW = 63.7 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	139.30 142.70 139.30 136.70 138.20 136.10 139.30 137.40 137.90 136.60 138.10 137.70
CORECTED TEMP	138.51 139.71 132.41 138.61 131.27 128.46 140.53 138.16 136.54 136.98 138.03 134.23

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** ORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.031	.193	-.128	-.031	.194	-.128

9/12/67, TIME = 9.17 TO 9.26 59.8 MW, 30.10 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 27.84 IN.

FIX TEMP = 133.0 DEG F, HTINLT = 129.0 F, HTOUTLT = 139.0 F, HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	143.40	145.80	147.70	138.80	148.60	141.80	149.60	144.00	146.50	138.70	147.10	146.50
CORECTED TEMP	142.44	142.67	141.71	140.65	142.92	[illegible].92	[illegible]50.17	144.61	145.31	139.02	146.78	143.25

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.119	.302	.041	.119	.303	.042

9/12/67. TIME = 9.33 TO 9.42 59.7 MW. 25.10 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 27.89 IN.

FIX TEMP = 133.0 DEG F. HTINLT = 130.3 F. HTOUTLT = 139.0 F. HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	150.00	153.00	165.40	146.40	168.30	149.60	166.30	152.60	163.20	147.40	168.90	163.20
CORECTED TEMP	148.82	149.55	161.31	148.02	164.99	143.76	165.80	153.01	160.15	147.49	167.99	160.38

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.312	.562	.301	.313	.565	.303

9/12/67. TIME = 9.51 TO 10.00 59.6 MW. 20.20 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 27.94 IN.

FIX TEMP = 135.0 DEG F. HTINLT = 130.3 F. HTOUTLT = 138.0 F. HT1 FLOW = 63.7 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
DATA LGR TEMP	169.60	164.60	200.70	158.20	214.70	174.20	213.60	179.00	209.20	164.60	218.40	198.00
CORECTED TEMP	167.84	160.80	194.84	159.46	208.38	171.00	210.46	179.33	204.79	164.22	216.66	196.69

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.007	.998	.950	1.014	1.004	.956

9/12/67, TIME = 10.07 TO 10.16 59.6 MW, 18.10 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 27.99 IN.

FIX TEMP = 135.0 DEG F, HTINLT = 131.3 F, HTOUTLT = 138.0 F, HT1 FLOW = 63.5 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	182.50	172.40	221.80	166.30	243.50	186.30	240.20	194.90	242.90	180.40	255.80	217.50
CORECTED TEMP	181.10	168.70	215.17	167.31	236.08	182.35	235.84	194.65	239.27	180.12	253.32	216.42

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.524	1.393	1.258	1.534	1.402	1.266

9/13/67, TIME = 9.10 TO 9.19 60.0 MW, 44.90 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 29.69 IN.

FIX TEMP = 135.0 DEG F, HTINLT = 129.9 F, HTOUTLT = 141.0 F, HT1 FLOW = 64.0 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	139.50	142.20	138.30	138.20	138.90	137.80	138.10	137.50	137.90	137.90	139.30	139.00
CORECTED TEMP	138.70	139.23	131.31	140.07	132.06	130.38	139.41	138.26	136.54	138.25	139.19	135.56

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.050	.139	-.106	-.050	.139	-.106

9/13/67, TIME = 9.27 TO 9.36 60.0 MW, 39.80 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 29.79 IN.

FIX TEMP = 134.0 DEG F, HTINLT = 130.2 F, HTOUTLT = 140.0 F, HT1 FLOW = 64.1 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	140.90	144.00	140.50	139.10	140.50	138.30	140.50	139.00	139.20	137.40	139.80	139.50

CORECTED TEMP	140.04	140.95	133.74	140.94	133.85	130.95	141.66	139.73	137.87	137.76	139.68	136.08

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
-.027	.177	-.126	-.027	.177	-.126

9/13/67, TIME = 9.43 TO 9.52 60.2 MW, 30.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 29.79 IN.

FIX TEMP = 134.0 DEG F, HTINLT = 131.1 F, HTOUTLT = 140.0 F, HT1 FLOW = 64.1 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	145.60	148.90	150.70	141.60	150.40	142.80	150.40	145.30	148.80	142.20	149.60	148.20
CORECTED TEMP	144.55	145.63	145.04	143.36	144.94	136.05	150.92	145.88	147.65	142.43	149.41	145.00

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.108	.309	.013	.108	.307	.013

9/13/67, TIME = 10.29 TO 10.38 60.0 MW, 25.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 29.92 IN.

FIX TEMP = 135.0 DEG F, HTINLT = 132.1 F, HTOUTLT = 142.0 F, HT1 FLOW = 64.1 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	153.20	156.50	167.30	148.00	169.40	151.70	169.80	156.40	165.90	149.70	170.80	164.40
CORECTED TEMP	151.92	152.89	163.42	149.57	166.22	146.14	169.08	156.73	162.74	149.73	169.84	161.61

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER **********			********** NORMALIZED TO 60 MW **********		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
.309	.559	.269	.309	.559	.269

9/13/67, TIME = 10.45 TO 10.54 59.8 MW, 20.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 29.98 IN.

FIX TEMP = 136.0 DEG F, HTINLT = 132.5 F, HTOUTLT = 142.0 F, HT1 FLOW = 64.1 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	172.00 168.20 203.50 161.50 217.10 175.10 214.20 180.90 213.00 168.40 224.50 200.60
CORECTED TEMP	170.17 164.44 197.35 162.66 210.66 171.82 211.01 181.19 208.65 167.92 222.60 199.32

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.036	1.020	.927	1.039	1.024	.930

9/13/67, TIME = 11.01 TO 11.10 59.7 MW, 18.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 30.08 IN.

FIX TEMP = 13 0 DEG F, HTINLT = 132.5 F, HTOUTLT = 142.0 F, HT1 FLOW = 64.2 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	185.10 175.10 224.10 167.80 244.70 188.50 243.20 197.00 245.60 182.80 258.30 219.40
CORECTED TEMP	183.62 171.76 217.56 168.76 237.22 184.15 238.89 196.70 242.01 182.66 255.75 218.32

********** NUCLEAR HEATING RATES (WATTS/GM) **********

********** AT INDICATED POWER ********** ********** NORMALIZED TO 60 MW **********

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
1.540	1.410	1.257	1.547	1.417	1.263

9/13/67, TIME = 11.17 TO 11.26 59.8 MW, 16.20 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 30.09 IN.

FIX TEMP = 138.0 DEG F, HTINLT = 132.2 F, HTOUTLT = 142.0 F, HT1 FLOW = 64.1 GPM

	* * * * * * * * TEMPERATURE (DEGREES F) * * * * * * * * * *
THMCPL NO	1 2 3 4 5 6 7 8 9 10 11 12
DATA LGR TEMP	201.10 181.70 242.40 174.20 271.60 201.50 269.40 213.40 278.40 196.10 293.70 236.90
CORECTED TEMP	198.98 178.66 236.87 175.27 262.84 195.95 265.54 212.82 275.71 195.18 290.25 236.18

********** NUCLEAR HEATING RATES (WATTS/GM) **********

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.043	1.773	1.538	2.050	1.779	1.543

9/13/67, TIME = 11.33 TO 11.42 59.8 MW, 15.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 30.18 IN.

FIX TEMP = 130.0 DEG F, HTINLT = 133.5 F, HTOUTLT = 142.0 F, HT1 FLOW = 64.2 GPM

TEMPERATURE (DEGREES F)												
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	211.40	186.30	258.10	181.10	295.00	212.60	289.50	223.60	308.00	209.50	324.50	252.60
CORECTED TEMP	208.85	183.54	253.19	182.17	285.13	205.96	285.98	222.66	305.21	208.28	319.39	251.94

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.527	2.081	1.806	2.536	2.088	1.813

9/13/67, TIME = 11.49 TO 11.58 59.9 MW, 14.00 INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 30.23 IN.

FIX TEMP = 130.0 DEG F, HTINLT = 133.8 F, HTOUTLT = 142.0 F, HT1 FLOW = 64.1 GPM

TEMPERATURE (DEGREES F)												
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LGR TEMP	223.50	192.50	268.40	183.90	312.10	219.80	308.60	234.10	332.20	219.10	347.40	262.70
CORECTED TEMP	220.44	189.38	263.00	185.10	300.78	212.91	304.78	233.15	328.50	217.33	341.62	262.08

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
2.867	2.350	1.957	2.871	2.354	1.960

9/13/67, TIME = 12.08 TO 12.15 59.9 MW, 13.5[illegible] INCHES FROM FULL IN, 510 MICRONS, ROD BNK POS = 30.27 IN.

FIX TEMP = 130.[illegible] DEG F, HTINLT = 134.5 F, HTOUTLT = 141.[illegible] F, HT1 FLOW = 64.1 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	227.20	193.30	272.60	185.70	319.90	224.60	315.70	238.30	341.20	222.30	357.30	267.70
CORECTED TEMP	223.99	190.19	268.24	186.84	367.94	217.55	311.80	237.33	337.58	220.34	351.03	267.10

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.818	2.414	2.055	3.823	2.418	2.058

9/13/67. TIME = 12.21 TO 12.31 59.8 MW. 13.00 INCHES FROM FULL IN. 518 MICRONS. ROD BNK POS = 30.27 IN.

FIX TEMP = 130.0 DEG F. MTINLT = 133.5 F. MTOUTLT = 141.0 F. MT1 FLOW = 64.1 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	230.00	194.00	270.00	192.00	332.00	230.00	325.00	242.00	355.00	227.00	373.00	278.00
CORECTED TEMP	226.94	190.90	273.80	192.74	319.13	223.04	320.96	241.01	350.83	224.78	365.92	277.44

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.244	2.537	2.239	3.255	2.545	2.246

9/13/67. TIME = 12.30 TO 12.47 59.9 MW. 12.00 INCHES FROM FULL IN. 518 MICRONS. ROD BNK POS = 30.38 IN.

FIX TEMP = 140.0 DEG F. MTINLT = 135.7 F. MTOUTLT = 141.0 F. MT1 FLOW = 64.0 GPM

	TEMPERATURE (DEGREES F)											
THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	243.30	199.00	289.30	192.50	344.40	235.30	348.80	251.50	377.80	239.40	392.70	283.80
CORECTED TEMP	239.68	196.86	285.62	193.02	331.07	228.15	336.99	258.47	373.16	236.73	385.08	283.26

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
3.503	2.769	2.318	3.509	2.773	2.314

9/13/87. TIME = 13.31 TO 13.18 59.9 MW. 8.40 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 30.38 IN.

FIX TEMP = 141.0 DEG F. MTINLT = 135.6 F. MTOUTLT = 143.8 F. MT1 FLOW = 64.0 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	• • • • • • • • TEMPERATURE (DEGREES F) • • • • • • • • • •											
DATA LGR TEMP	209.40	207.60	316.10	201.40	370.80	257.10	383.40	272.50	436.30	266.30	455.00	312.90
CORRECTED TEMP	204.69	204.86	312.27	201.89	374.80	249.28	379.41	271.37	429.98	262.10	445.31	311.51

•••••••••••••••••••••••••••••••••••• NUCLEAR HEATING RATES (WATTS/GM) ••

•••••••••••••••••• AT INDICATED POWER •••

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.329	3.328	2.828	4.332	3.326	2.832

9/13/87. TIME = 13.18 TO 13.27 60.6 MW. 5.80 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 30.43 IN.

FIX TEMP = 140.0 DEG F. MTINLT = 137.1 F. MTOUTLT = 146.8 F. MT1 FLOW = 64.0 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	• • • • • • • • TEMPERATURE (DEGREES F) • • • • • • • • • •											
DATA LGR TEMP	205.10	213.50	329.40	206.80	418.20	260.20	406.80	285.70	465.70	280.70	485.50	325.90
CORRECTED TEMP	200.44	218.70	324.33	206.29	395.75	250.92	431.67	284.51	458.82	275.68	475.80	324.04

•••••••••••••••••••••••••••••••••••• NUCLEAR HEATING RATES (WATTS/GM) ••

•••••••••••••••••• AT INDICATED POWER •••

NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.692	3.683	3.021	4.692	3.683	3.021

9/13/87. TIME = 13.37 TO 13.46 59.9 MW. 3.80 INCHES FROM FULL IN. 510 MICRONS. ROD BNK POS = 30.29 IN.

FIX TEMP = 140.0 DEG F. MTINLT = 137.1 F. MTOUTLT = 141.8 F. MT1 FLOW = 64.0 GPM

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
	• • • • • • • • TEMPERATURE (DEGREES F) • • • • • • • • • •											
DATA LGR TEMP	208.80	215.50	332.50	205.60	413.20	260.50	408.40	287.70	472.50	285.30	488.80	326.30

CORECTED TEMP 203.44 212.76 327.13 205.91 398.74 208.21 484.89 206.51 465.58 288.81 479.17 324.43

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.771	3.666	3.816	4.779	3.672	3.815

9/13/87, TIME = 13.55 TO 14.04 59.8 MW. .98 INCHES FROM FULL IN. 518 MICRONS, ROD BANK POS = 38.38 IN.

FIX TEMP = 142.0 DEG F. MTINLT = 136.9 F. MTOUTLT = 148.8 F. MT1 FLOW = 64.8 GPM

TEMPERATURE (DEGREES F)

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	207.70	213.10	329.26	203.28	412.78	209.78	489.30	208.88	471.78	283.38	487.88	324.90
CORECTED TEMP	203.14	218.30	324.14	203.61	398.24	201.37	484.99	206.88	464.71	278.13	478.15	323.87

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.779	3.641	3.814	4.795	3.653	3.824

9/13/87, TIME = 14.11 TO 14.30 59.8 MW. 0.00 INCHES FROM FULL IN. 518 MICRONS, ROD BANK POS = 38.49 IN.

FIX TEMP = 141.0 DEG F. MTINLT = 136.9 F. MTOUTLT = 148.8 F. MT1 FLOW = 64.8 GPM

TEMPERATURE (DEGREES F)

THMCPL NO	1	2	3	4	5	6	7	8	9	10	11	12
DATA LOG TEMP	206.00	211.70	328.40	204.40	413.00	209.80	488.00	206.80	478.38	282.60	487.30	325.00
CORECTED TEMP	201.39	208.90	323.41	204.70	398.54	201.46	483.68	205.61	463.34	277.47	477.64	323.17

NUCLEAR HEATING RATES (WATTS/GM)

AT INDICATED POWER			NORMALIZED TO 60 MW		
NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER	NEAR CYLINDER	MIDDLE CYLINDER	FAR CYLINDER
4.774	3.625	3.819	4.798	3.637	3.829

TABLE I

Explanation of Data Logger Printout

Column(s)	Parameter Description	Units
32	Core Inlet Temperature	°F
33	Core Outlet Temperature	°F
34 - 38	Shim Rod Bank Position, Rods 1 - 5	Inches
39 - 41	Shim Rod Bank Position, Rods 6 - 8	Inches
42 & 43	Regulator Rod Positions, Rods 1 & 2	%
44 - 55	Calorimeter Temperatures	°F
44 & 46	Far* Calorimeter, Hot End Thermocouples	°F
45 & 47	Far* Calorimeter, Cold End Thermocouples	°F
48 & 50	Middle* Calorimeter, Hot End Thermocouples	°F
49 & 51	Middle* Calorimeter, Cold End Thermocouples	°F
52 & 54	Near* Calorimeter, Hot End Thermocouples	°F
53 & 55	Near* Calorimeter, Cold End Thermocouples	°F
56 - 59	Calorimeter Container Temperature	°F
59	HT-1 Outlet Temperature	°F
60	HT-1 Inlet Temperature	°F
61	HT-1 Flow	GPM
62, 64, ..., 84	Average Temperature From Each Calorimeter Thermocouple	°F
63, 65, ..., 85	Standard Deviation From Mean of Each Temperature	°F

* With Respect to Reactor Core.

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TABLE II

TOSS Model Node Dimensions

Node(s)	Outside Radius (Inches)	Inside Radius (Inches)	Length (Inches)
1	0.197	0	0.03
2-5, 9, 10, 11	0.197	0	0.02
6-8	0.197	0	0.77
12	0.197	0	0.21
13	0.197	0	0.50
21	0.197	0	0.002
50	0.062	0	0.50
51 & 71	0.187	0.062	0.50
32 & 52	0.312	0.187	0.50
33 & 53 & 73	0.437	0.312	0.50
34 & 54	0.562	0.437	0.50
35 & 55 & 75	0.687	0.562	0.50
36 & 56	0.812	0.687	0.50
37 & 57 & 77	0.937	0.812	0.50
38 & 58	1.30	0.937	0.50
39 & 59	1.80	1.30	0.50
40 & 60	2.30	1.80	0.50
41 & 61	2.80	2.30	0.50
42 & 62	3.3125	2.80	0.50

TABLE III

Aluminum Thermal Conductivity As

A Function of Temperature

Temperature (°K)	Thermal Conductivity (calories/sec-cm-°K)
200	0.566
250	0.561
273	0.563
300	0.566
350	0.573
400	0.573
500	0.[illegible]
600	0.5[illegible]
700	0.539
800	0.525
900	0.508

TABLE IV

Relationship Between Nuclear Heating

and Calorimeter ΔT From

TOSS Temperature Distribution

Range Of Heating Rates (watts/gram)	Relationship Between Nuclear Heating Rate and Calorimeter ΔT (watts/gm per °R of ΔT) At Indicated Bulk Cooling Water Temp. (°F) 120	125	130	135
$0.2 < H < 1$	.02626	.02624	.02595	.02592
$1 < H < 3$	.02613	.02641	.02598	.02615
$3 < H \leq 5$	.02627	.02565	.02598	.02596
$5 < H < 6$	.02513	.02595	.02611	.02581
$6 < H < 7$	.02550	.02527	.02548	.02611

TABLE V

Thermocouple Resistance Measurements

Thermocouple	Resistance From Chromel to Alumel (ohms)	Resistance: Alumel to Ground Plus Chromel to Ground (ohms)	Difference (ohms)
1	441.5	442.9	1.4
2	446.2	448.4	2.2
3	437.2	453.	15.8
4	431.3	432.7	1.4
5	433.	437.9	4.9
6	431.9	433.	1.1
7	430.	438.1	8.1
8	425.3	426.7	1.4
9	442.1	446.1	4.0
10	432.8	434.4	1.6
11	428.1	459.3	31.2
12	437.	444.2	7.2

TABLE VI

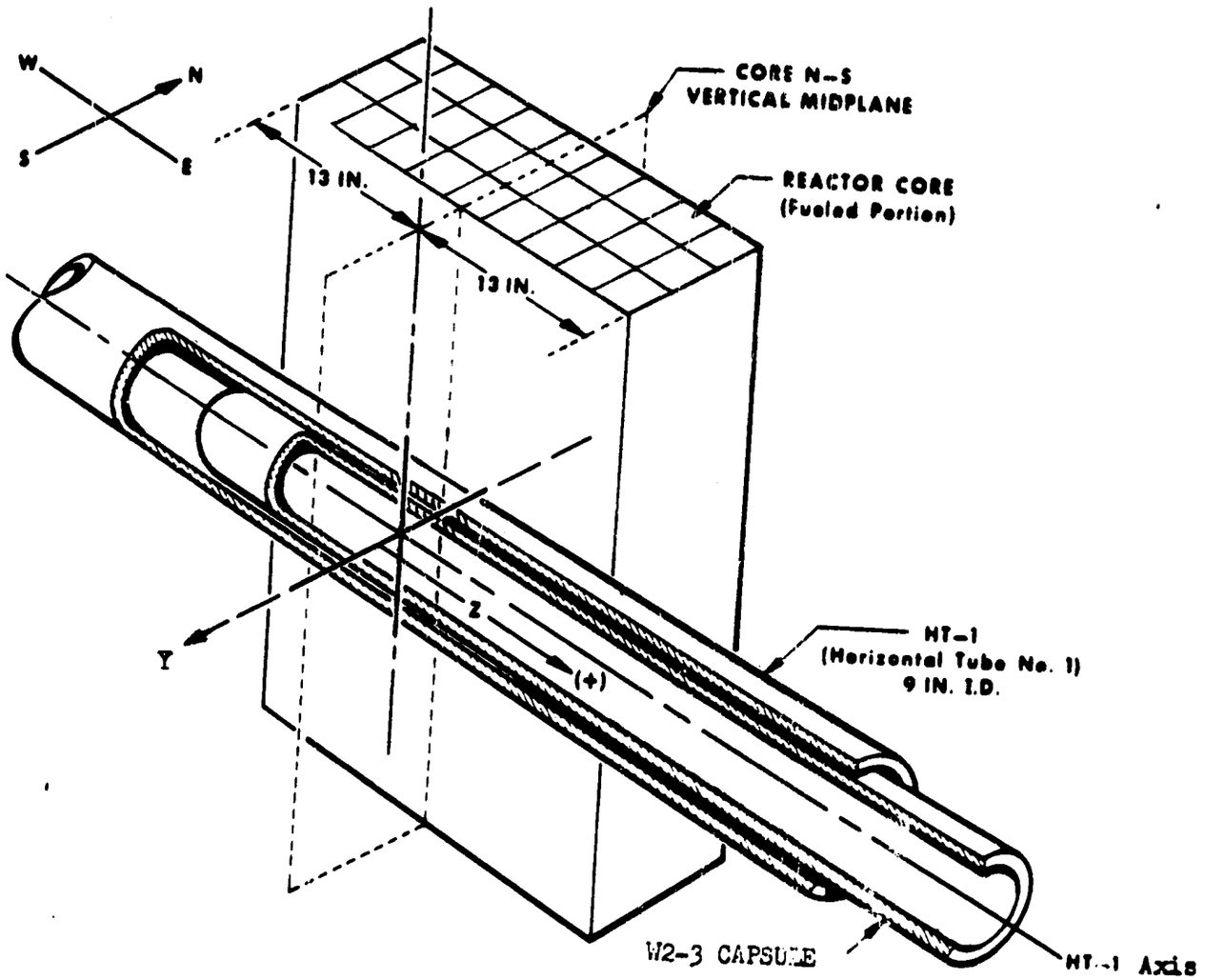
Calorimeter Accuracy

At The 95% Confidence Limit

Nuclear Heat Generation Rate Measurement Uncertainties (±%),

As A Result of Uncertainties in Each of the Indicated Parameters

Heat Generation Rate (watts/gm)	7	6	5	3	1	.2
Spatial Heating Distribution	0.681	0.702	0.948	0.903	0.526	6.18
Air Pressure in Calorimeter Container	negligible					
Emissivity of Aluminum	3.72	3.13	2.65	2.06	1.92	1.18
Thermal Conductivity of Aluminum	2.50	2.39	2.52	3.08	1.87	6.85
Distance Between T/C's	0.410	0.410	0.411	0.415	0.421	0.461
Thermocouple Calibration	0.975	1.11	1.34	2.23	6.70	33.5
Data Logger	3.18	3.72	4.46	7.44	22.3	111.2
Reactor Power	1.0	1.0	1.0	1.0	1.0	1.0
Calorimeter Cylinder Position	2.3	2.3	2.3	2.3	2.3	2.3
Combined Calorimeter Accuracy	6.16	6.12	6.53	9.00	23.6	117.



IRRADIATION TEST SYSTEM

PLUM BROOK REACTOR - SANDUSKY, OHIO

FIGURE 1

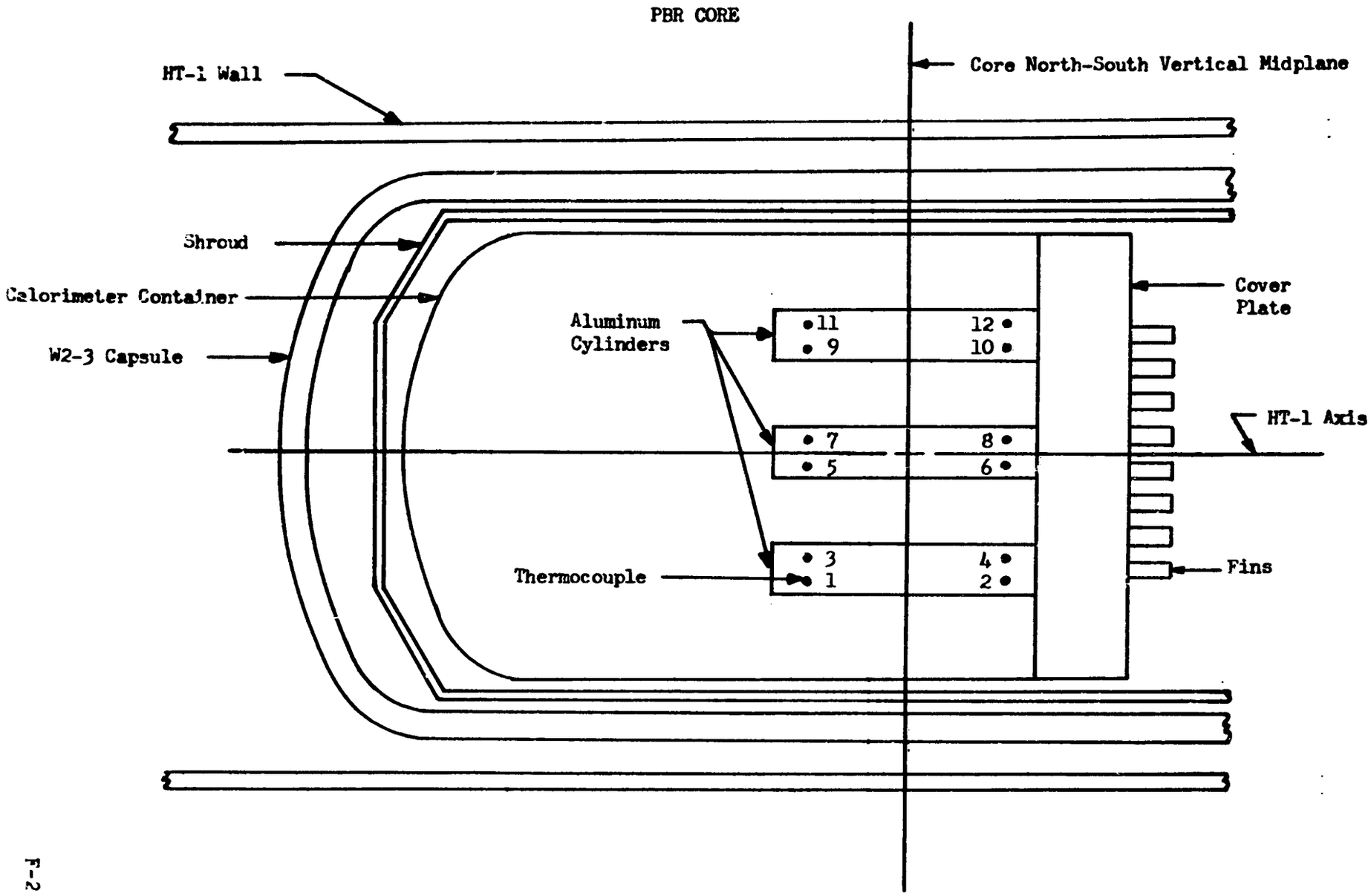


FIGURE 2 Calorimeter Assembly

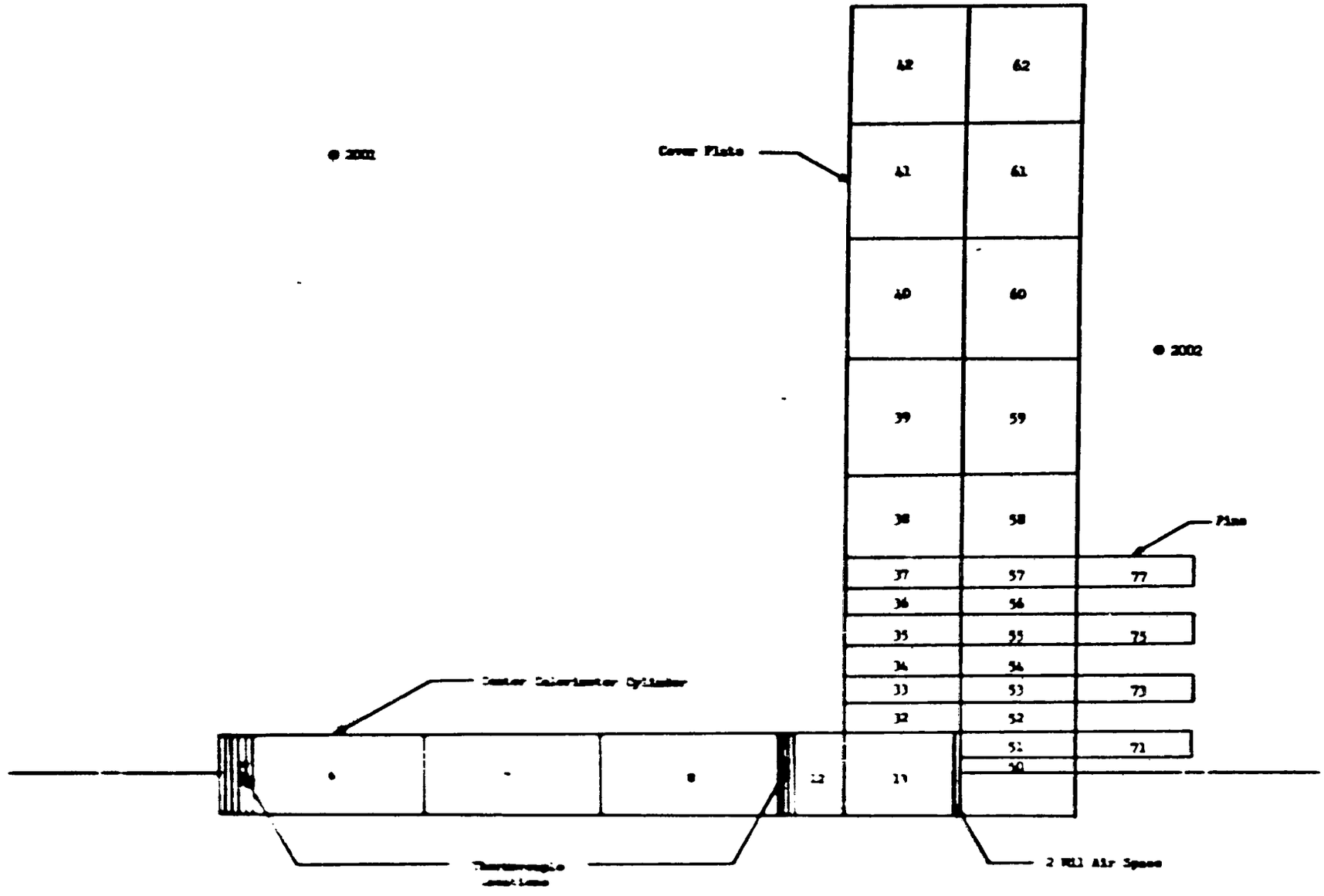


FIGURE 1 TOSS Model of Calorimeter

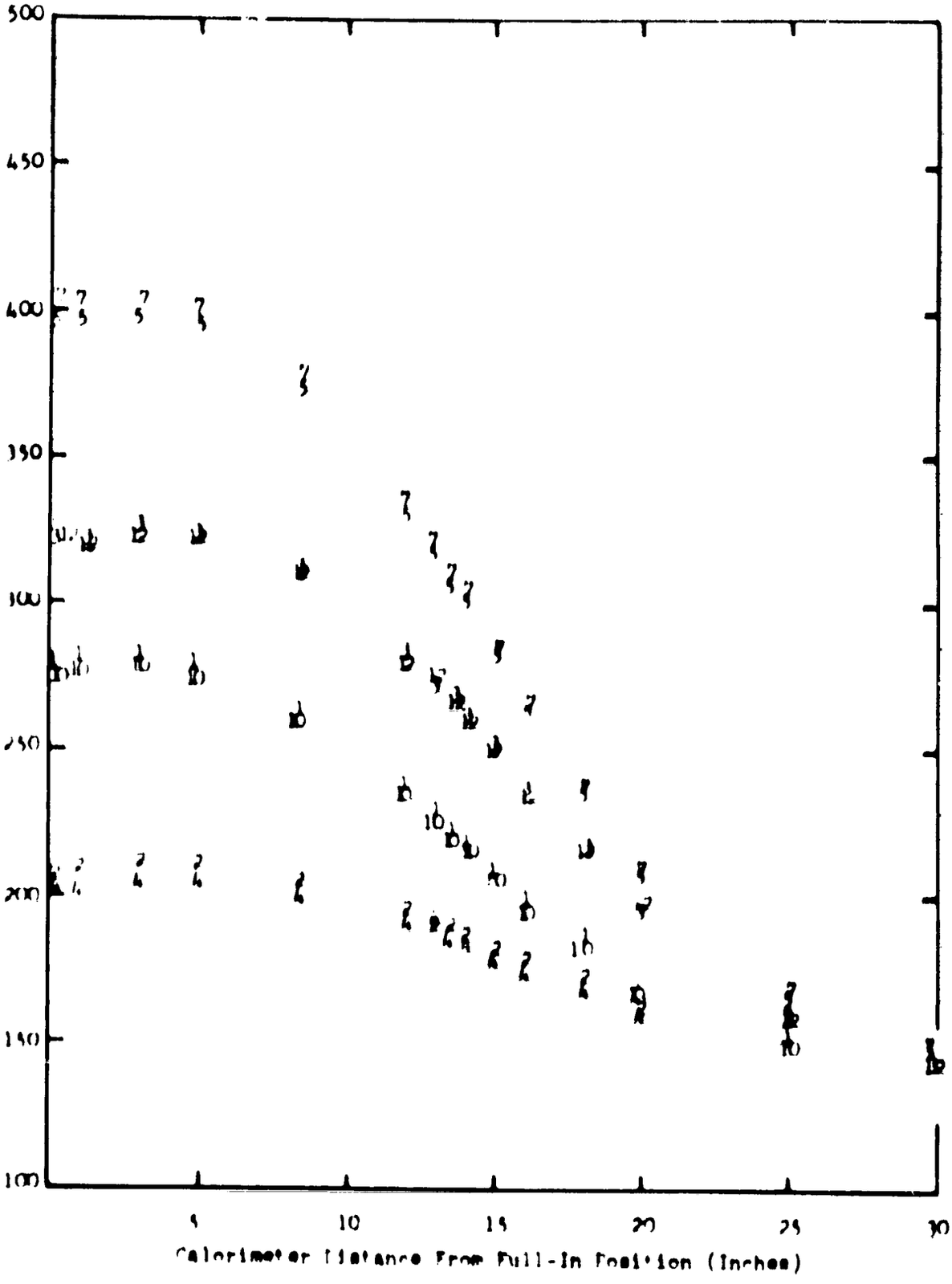


Figure 4. Corrected Thermocouple Readings As A Function of Calorimeter Position On September 11 (Thermocouples 1, 2, 3, 4, 5, 7, 10, 12)

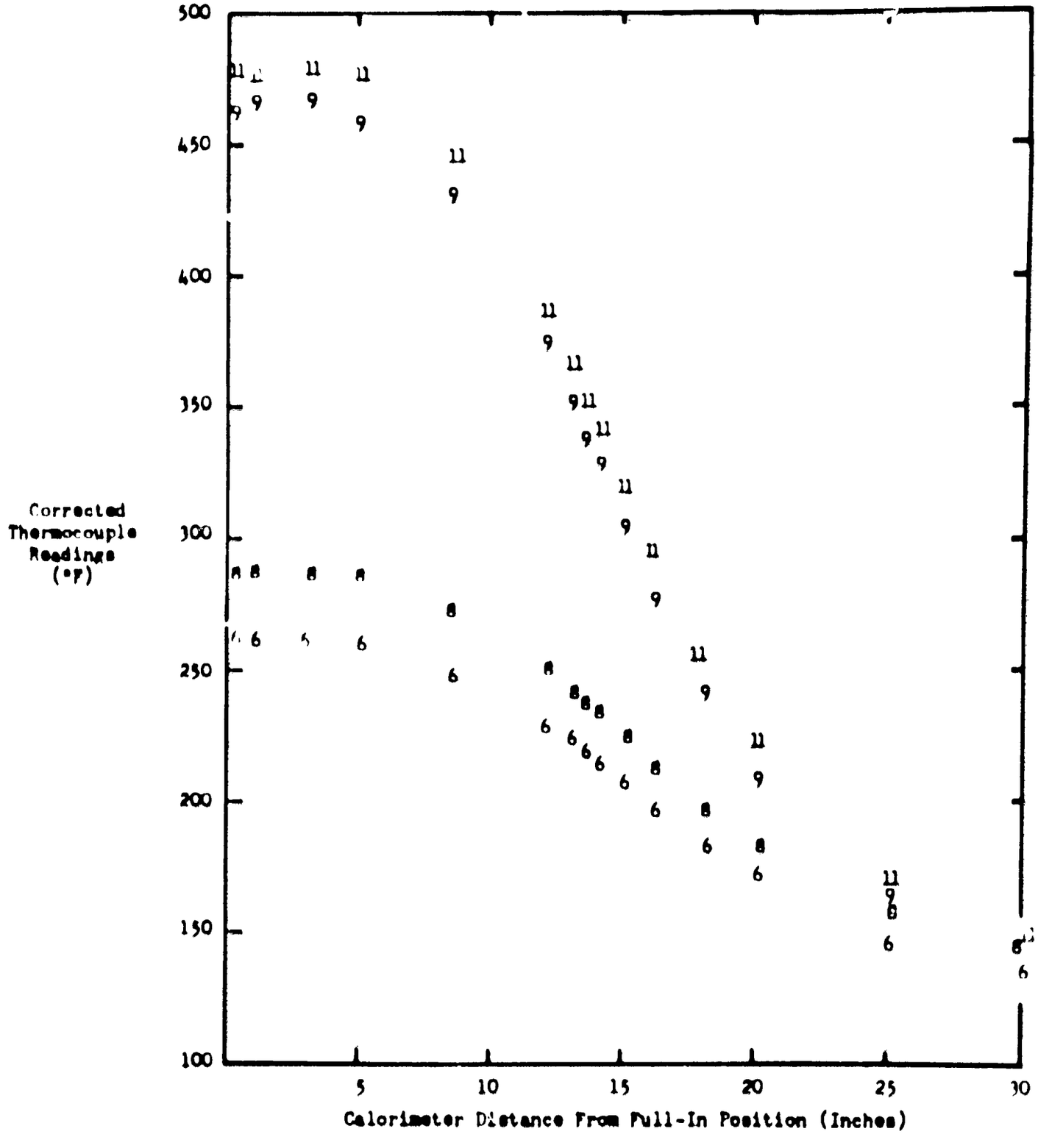


FIGURE 5 Corrected Thermocouple Readings As A Function of Calorimeter Position On September 13 (Thermocouples 6, 8, 9, 11)

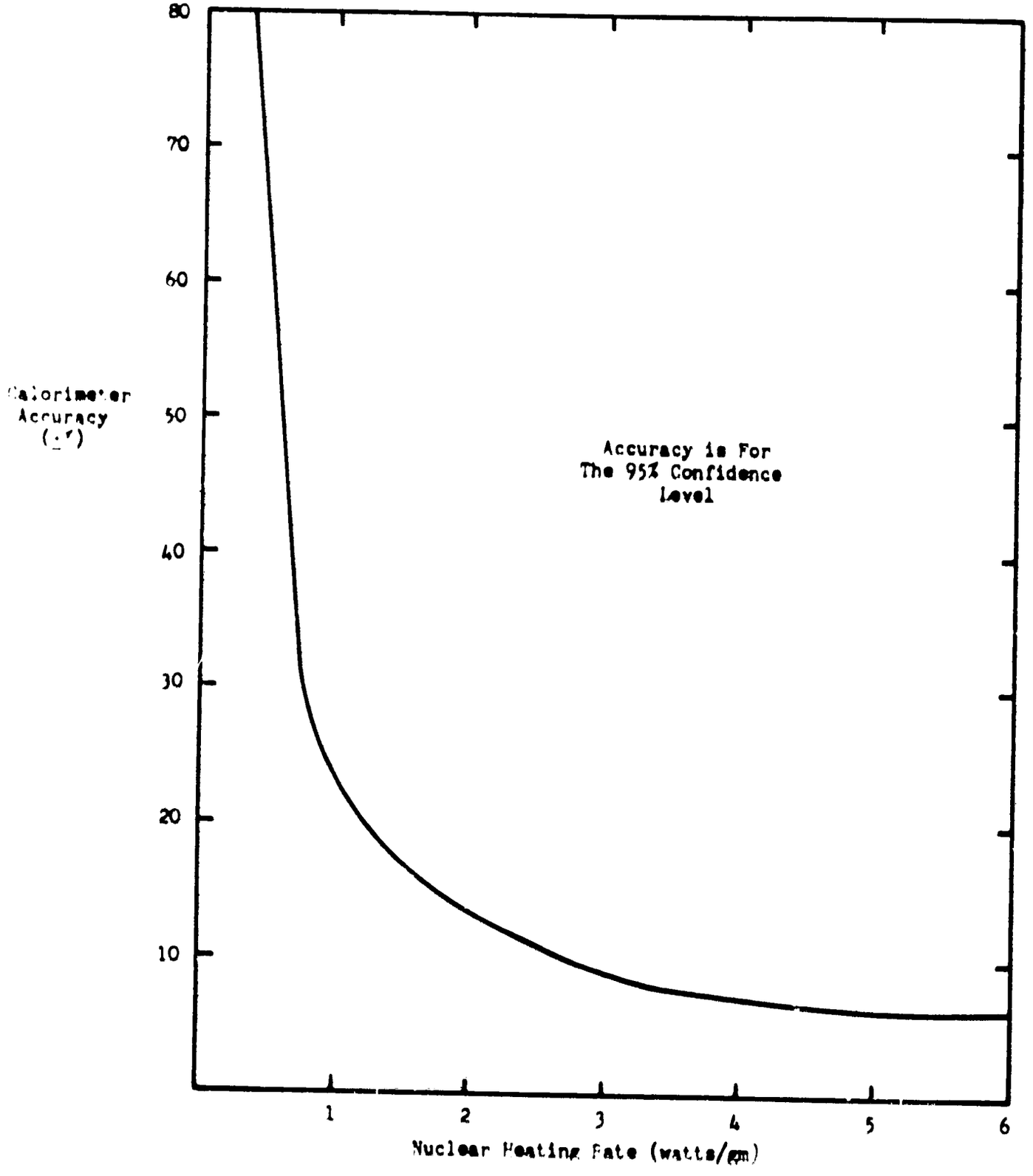


FIGURE 6 Calorimeter Accuracy Vs. Heating Rate

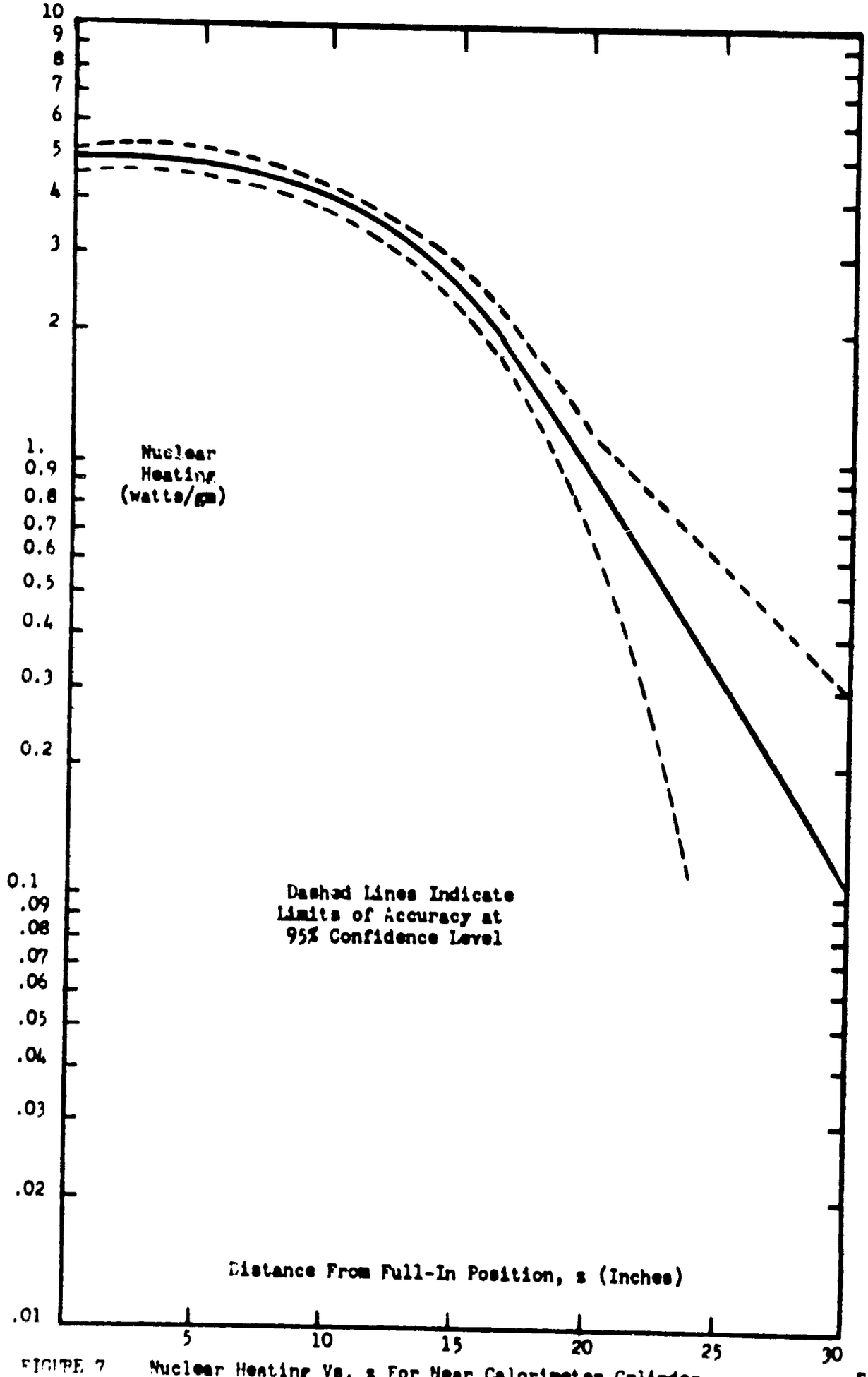


FIGURE 7 Nuclear Heating Vs. s For Near Calorimeter Cylinder

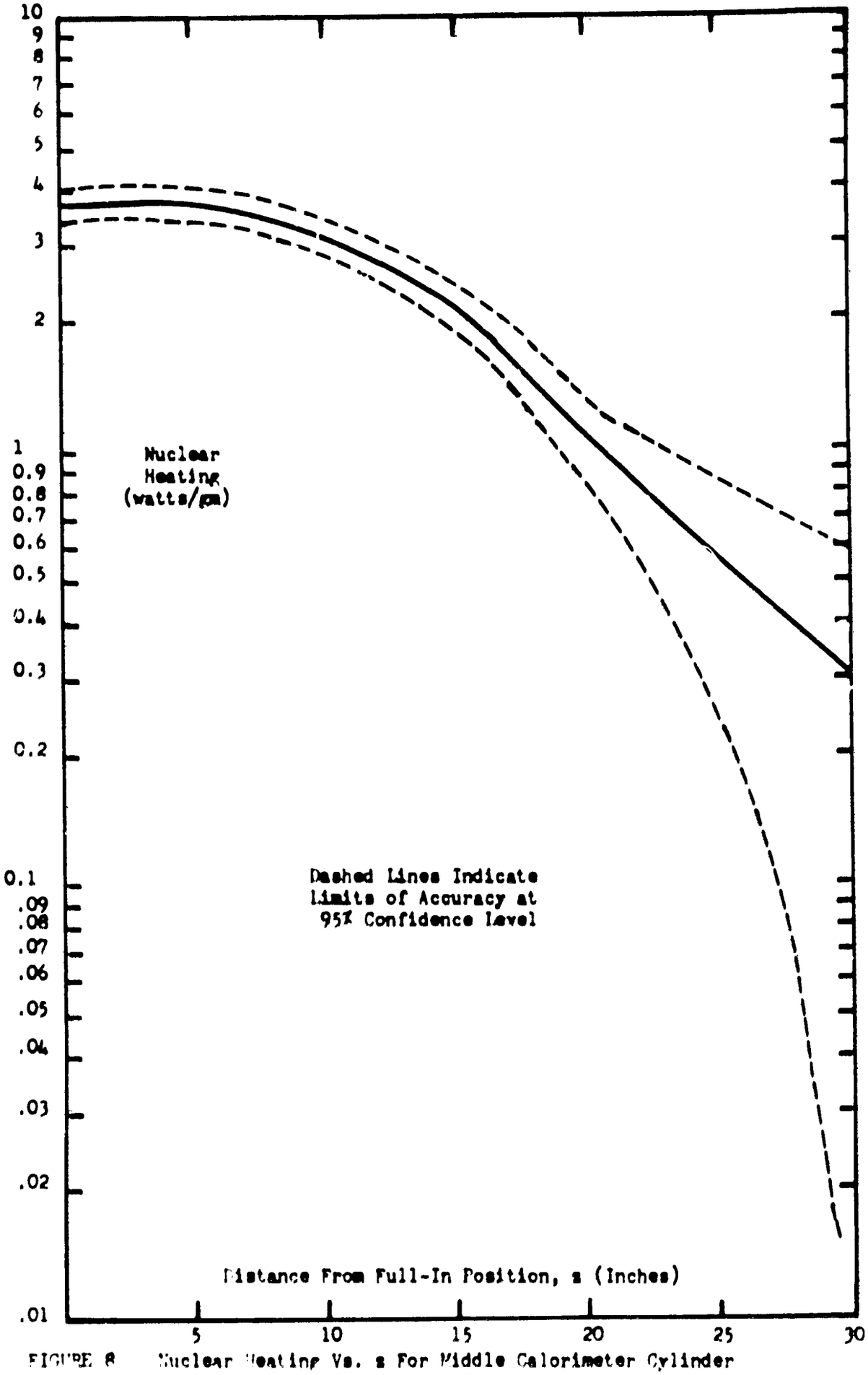


FIGURE 8 Nuclear Heating Vs. z For Middle Calorimeter Cylinder

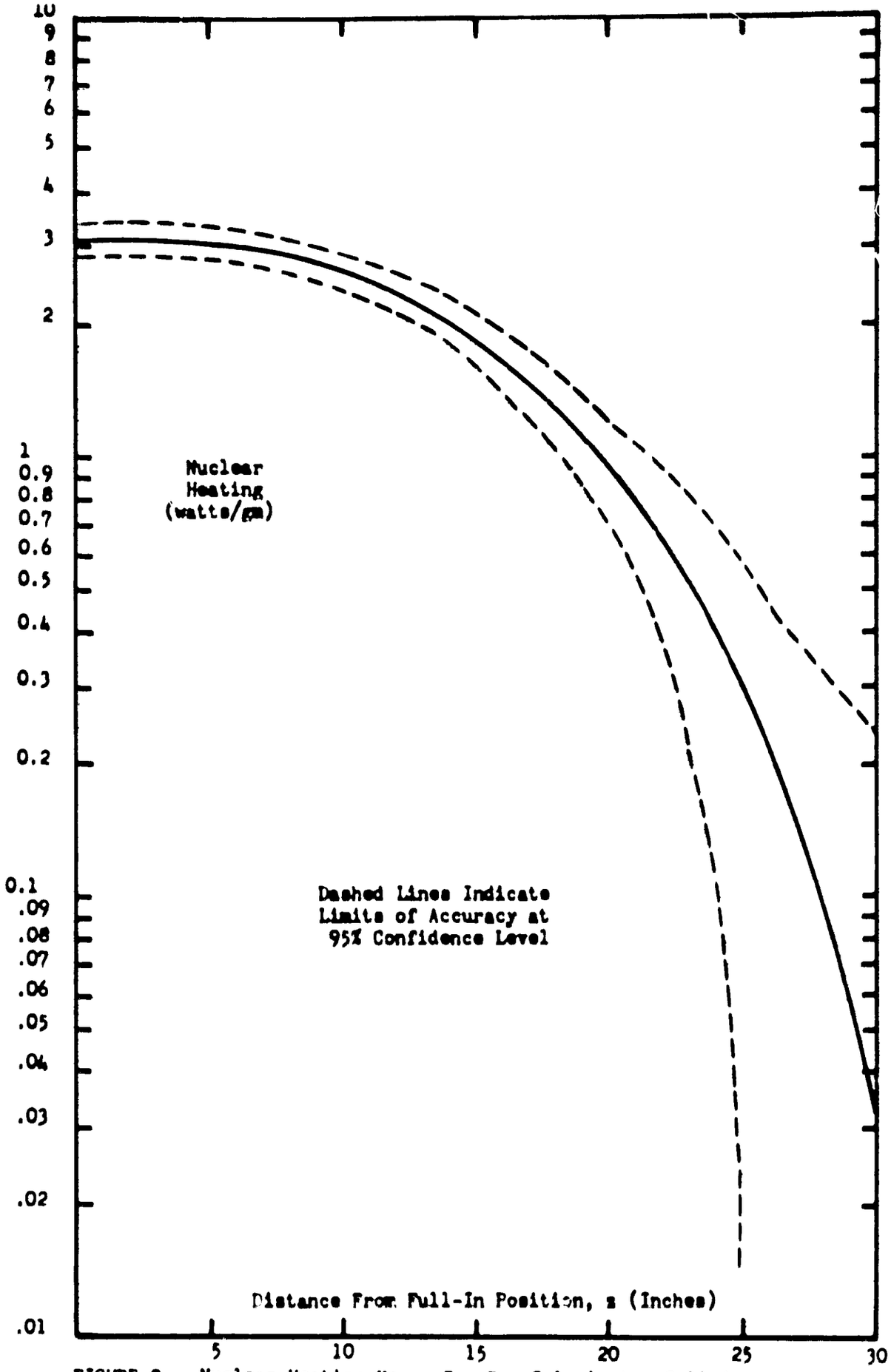


FIGURE 9 Nuclear Heating Vs. z For Far Calorimeter Cylinder

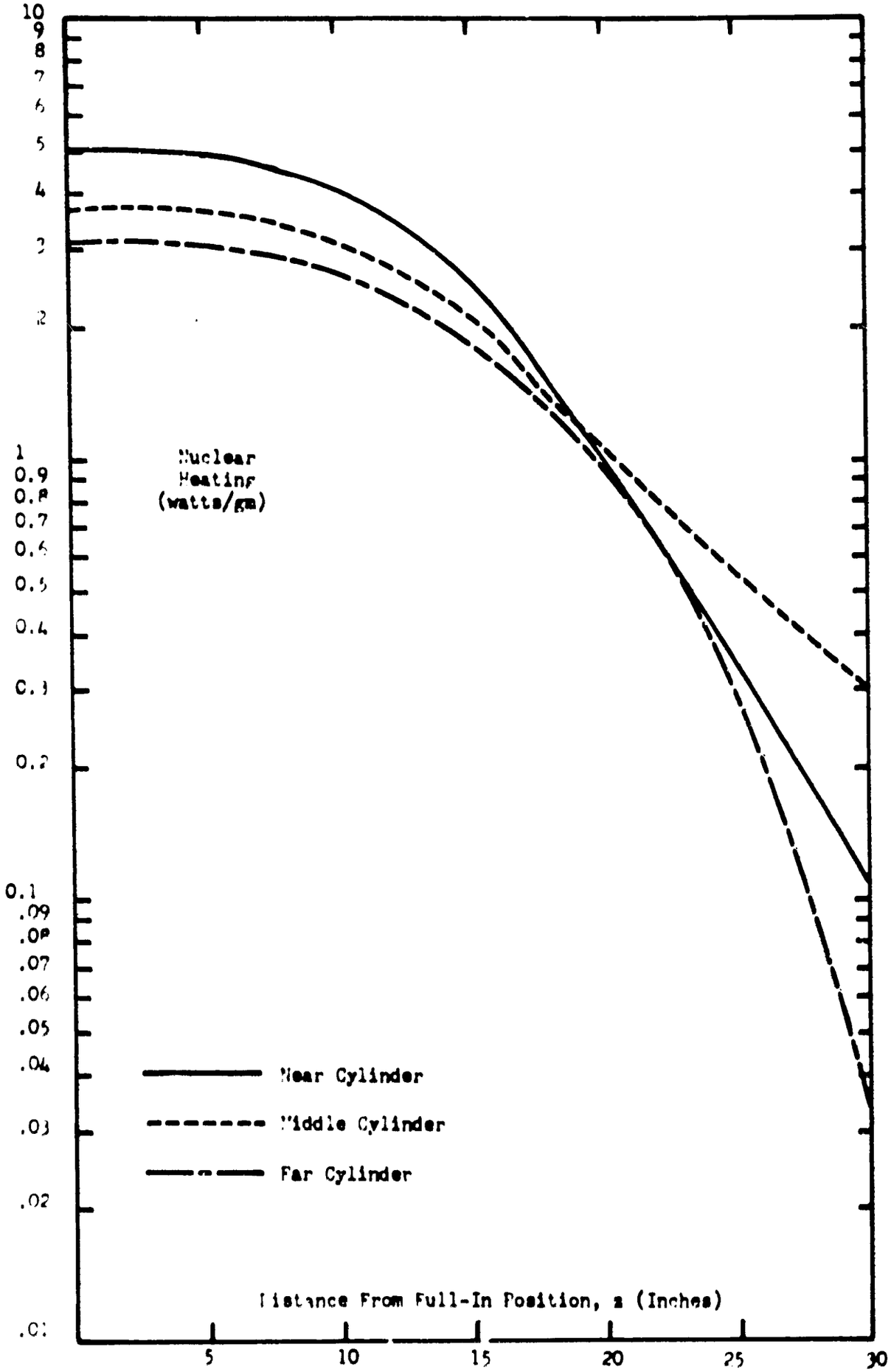


Fig. 10 Nuclear Heating Vs. z For All Three Calorimeter Cylinders

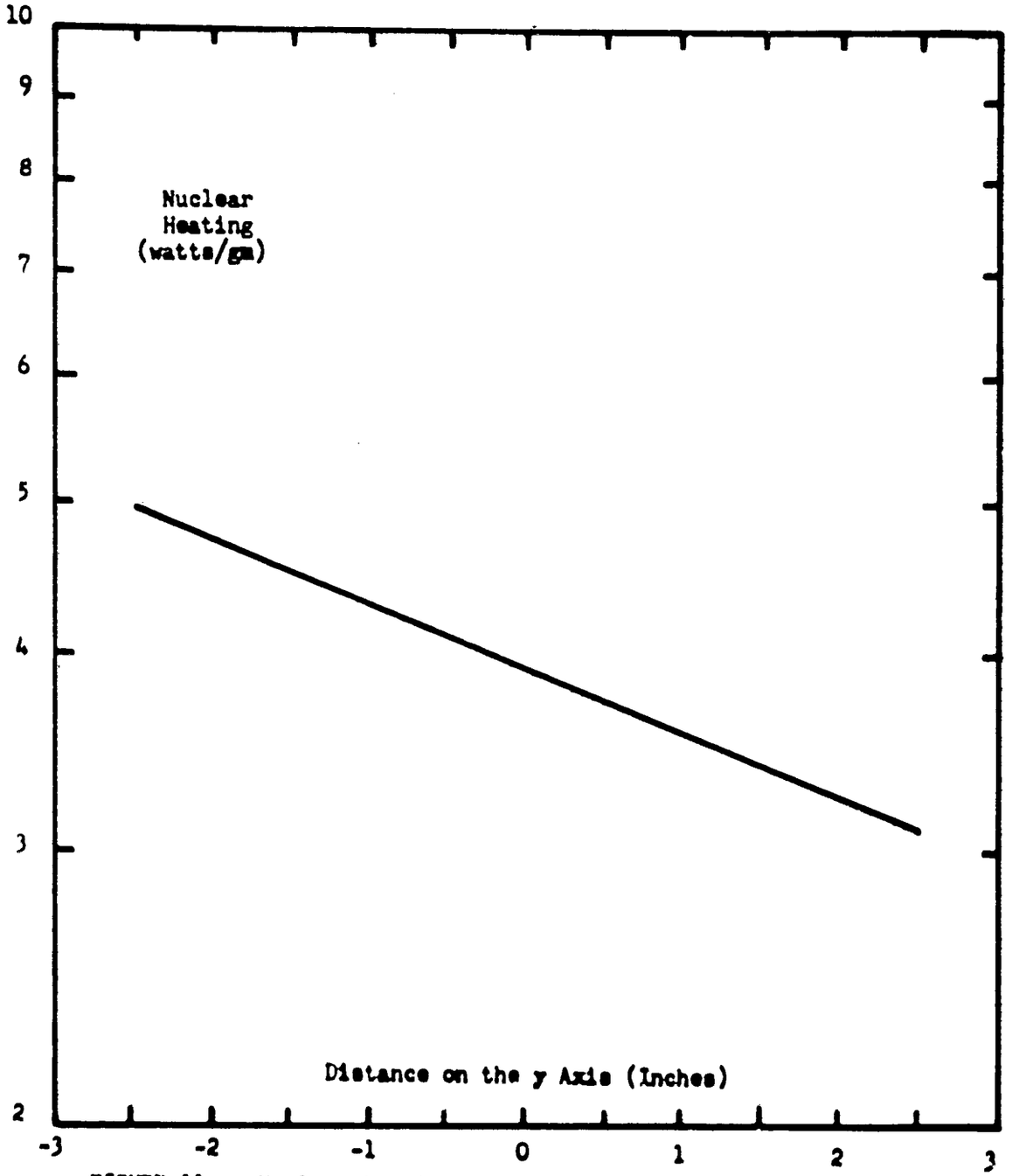


FIGURE 11 Nuclear Heating Vs. y, The Horisontal Line Perpendicular to z

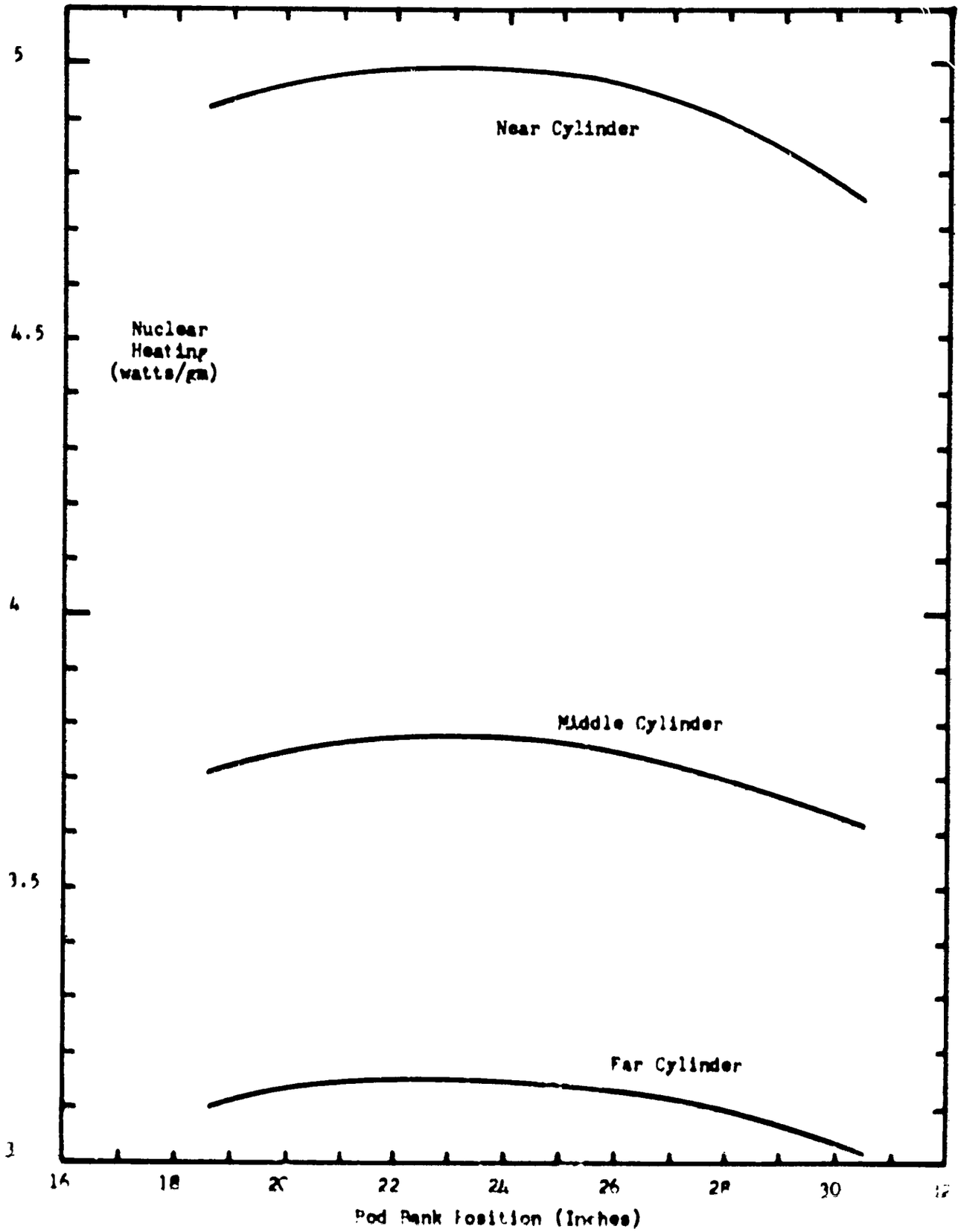


FIGURE 12 Nuclear Heating Vs. x, Rod Bank Position