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STEADY-STATE PLASMA AND REACTOR PARAMETERS FOR ELLIPTICAL CROSS SECTION TOKAMAKS WITH VERY LARGE POWER RATINGS

June 1975

John L. Usher and James R. Powell

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INFORMAL REPORT

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STEADY-STATE PLASMA AND REACTOR PARAMETERS FOR ELLIPTICAL CROSS SECTION TOKAMAKS WITH VERY LARGE POWER RATINGS

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Work performed under the auspices of the U. S. Energy Research and Development Administration.

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ABSTRACT

Controlled thermonuclear reactors (CTR's) have been primarily considered for central station generation of electricity where maximum power ratings are typically 5000 MW (th). Multipurpose CTR's (electricity, H_2 production, process heat generation, etc.) can have much larger ratings and still be compatible with existing power grids. The economic advantages of operation at very high power ratings [12.5 GW (th) to 50 GW (th)] have been discussed in a previous report.[1] An additional study[2] has pointed out the technological advantages of these large reactors.

In previous studies only circular cross section reactor plasmas were considered. The purpose of this research is to examine the effects of elliptical plasma cross sections. Several technological benefits have been determined. Maximum magnetic field strength requirements are 30 to 65% less than for 5000 MW (th) reactors and may be as much as 40% less than for circular cross section reactors of comparable size. Very large $n\tau$ values are found (10^{15} to 10^{17} sec/cm^3), which produce large burn-up fractions (15 to 60%). There is relatively little problem with impurity build-up. Long confinement times (60 to 500 seconds) are found. Finally, the elliptical cross section reactors exhibit a major toroidal radius reduction of as large as 30% over circular reactors operating at comparable power levels.

Chapter 1

INTRODUCTION

The purpose of this research is the determination of the plasma and engineering parameters which represent the operating sequences of very large CTR's. The computations are based on elliptical cross section tokamaks with rectangular first walls. The D-T fuel cycle is used and trapped ion mode confinement scaling is assumed. Steady-state global properties are calculated over a wide range of plasma and engineering parameters. Two separate fueling models are to be examined: (1) pellet fueling with beam heating and (2) beam fueling only. In the pellet-fueling case the total fuel source is the sum of pellet and beam sources, and the beam also serves to supplementally heat the plasma. In the case of beam fueling only, the beam is the sole fuel source as well as again providing supplemental heating.

Chapter 2 contains a brief summary of the calculational model utilized to compute the global properties. A detailed analysis of the differences between circular and elliptical cross section plasmas is included. A four species plasma is considered -- fuel ions, alpha particles, impurity ions (agron) and electrons. Loss of energetic alphas and beam ions is accounted for in terms of energy loss only due to the large values of confinement times encountered. For a more detailed summary of the calculational model the reader should refer to a previous report.[2]

Chapter 3 presents the results of the calculations performed based on the model of Chapter 2. The absolute values of the steady-state variables are presented as well as a discussion of the variations of the parameters with the remaining plasma and engineering properties. The steady-state results obtained are tabulated in the Appendix and a special nomenclature explaining the terms used in the Appendix immediately precedes it.

The most significant portion of the research is contained in Chapter 4. The basic conclusions drawn from the report are presented here. A summary of the advantages of these very large CTR's is presented as well as a summary of the advantages of the elliptical cross section configuration. A nomenclature listing the terms used in the main text of this report follows Chapter 4.

Chapter 2

CALCULATIONAL MODEL

A calculational model used to determine both the plasma and engineering parameters for the case of circular cross sections has been detailed in a previous report.[2] This model is again utilized except for those specific terms which are altered by the geometric differences encountered here. Two basic types of variables are to be examined -- (1) plasma properties: temperatures, densities, source strengths and energies, confinement times, and energy properties; and (2) engineering parameters: magnetic field strengths, plasma current, physical reactor dimensions, first wall loads and thermal power levels. Certain other properties are also calculated which tend to interconnect these two sets of variables, e.g., plasma beta and safety factor.

The plasma model is considered first. The elliptical geometry produces no changes in the plasma relationships from the previous report:[2]

$$\frac{dn_f}{dt} = S_t - \frac{n_f}{\tau} - \frac{n_f^2}{2} \langle \sigma v \rangle, \tag{1}$$

$$\frac{dn_\alpha}{dt} = \frac{n_f^2}{4} \langle \sigma v \rangle + S_b \, f_{TCT} - \frac{n_\alpha}{\tau}, \tag{2}$$

$$\frac{d}{dt}\ \frac{3}{2}\, n_i T_i = \frac{n_f^2}{4}\langle\sigma v\rangle Q_\alpha U_{\alpha i} + S_b V_b U_{bi}$$

$$+ S_b f_{TCT} Q_\alpha U_{\alpha i} + W_{ei} - \frac{3}{2}\ \frac{n_i T_i}{\tau}$$

$$- \frac{n_b \bar{E}_b}{\tau} U_{bi} - n_\alpha \frac{\tau_{SD}^{\alpha}}{\tau^2} \bar{E}_\alpha U_{\alpha i} \quad , \qquad (3)$$

$$\frac{d}{dt}\frac{3}{2} N_e T_e = \frac{n_f^2}{4}\langle\sigma v\rangle Q_\alpha\ (1-U_{\alpha i}) + S_b V_b\ (1-U_{bi})$$

$$+ S_b f_{TCT} Q_\alpha\ (1-U_{\alpha i}) - W_{ei} - \frac{3}{2}\frac{n_e T_e}{\tau} - P_b - P_s \qquad (4)$$

$$- \frac{n_b \bar{E}_b}{\tau}\ (1-U_{bi}) - n_\alpha \frac{\tau_{SD}^{\alpha}}{\tau^2} \bar{E}_\alpha\ (1-U_{\alpha i}).$$

The terms in the above equations have all been previously defined and are included in the nomenclature at the end of this report. Particle losses during slowing-down have been neglected but energy losses during slowing-down have been accounted for. Beam-plasma fusion interactions have also been included in the expressions. Electron and impurity concentrations may be determined via the following relationships:

$$n_e = n_f + 2\, n_\alpha + Z_I\, n_I, \qquad (5)$$

and

$$P_b = 1.2\, \frac{n_f^2 \langle\sigma v\rangle}{4} Q_\alpha, \qquad (6)$$

where argon is again the impurity species considered. The steady-state versions of Equations (1) through (4) along with Equations (5) and (6) and expressions for bremsstrahlung and synchrotron radiation as well as the energetics model of Houlberg[3] complete the specification of the plasma model. Once again it should be mentioned that a slightly modified version of trapped-ion scaling[4] is presumed. It is assumed that the only changes in the value of $n\tau$ thus calculated are due to the effects of the geometrical factors on various engineering parameters as described below.

The elliptical geometry does produce several alterations in expressions which relate engineering parameters to each other and to the plasma properties. The area of an ellipse with minor semiaxis equal to a and major semiaxis equal to b is equal to πab while the circumference is approximately

$$s \cong 2\pi \sqrt{\frac{a^2 + b^2}{2}} \quad . \tag{7}$$

In addition to these relationships values for the aspect ratio,

$$A = R/a \ , \tag{8}$$

and the height-to-width ratio,

$$\kappa = b/a \ , \tag{9}$$

are also utilized. Expressions for the total fusion power and wall loading are now given by

$$P_t = \frac{n_f^2}{4} \langle \sigma v \rangle \, E_{fus} \, 2\pi^2 Rab. \tag{10}$$

and

$$p_w = \frac{n_f^2}{4} \langle \sigma v \rangle E_{fus} \frac{\pi ab}{s_w} . \tag{11}$$

s_w is the circumference of the first wall which for this report is assumed to be rectangular with dimensions (a_w, b_w) where

$$a_w = a + 1 \text{ meter} \tag{12a}$$

and $b_w = b + 1$ meter. (12b)

While the first wall is assumed to be rectangular for simplicity of calculation, only s_w is actually needed for the calculations, hence any geometry which produces a circumference equal to s_w could be substituted without altering the results. In addition to the changes in the power expressions, relationships for the safety factor and plasma current also change. The general expression for plasma safety factor

$$q = \frac{s}{2\pi R} \frac{B_t}{B_p} \tag{13a}$$

reduces to the well known

$$q = \frac{a}{R} \frac{B_t}{B_p} \tag{13b}$$

for circular cross section plasmas but must now be expressed as

$$q \cong \frac{1}{R} \sqrt{\frac{a^2+b^2}{2}} \frac{B_t}{B_p} , \tag{13c}$$

or alternatively as

$$q \cong \frac{a}{R} \frac{B_t}{B_p} \sqrt{\frac{1+\kappa^2}{2}} \tag{13d}$$

for elliptical cross sections. The general expression for plasma current

$$I = \frac{sB_p}{\mu_o} \tag{14a}$$

reduces to

$$I = \frac{2\pi}{\mu_o} aB_p \tag{14b}$$

for circular cross sections, but must be expressed as

$$I = \frac{2\pi}{\mu_o} aB_p \sqrt{\frac{1+\kappa^2}{2}} \tag{14c}$$

for elliptical cross section plasmas. The changes in these properties will directly affect the calculation of the trapped ion confinement estimate

$$n_e\tau = c_\tau \frac{KI^4 b_t{}^2 \beta_{pe}{}^2 Z_{eff} A'^{5/2}}{T_e{}^{11/2}} \left(1+\frac{T_e}{T_i}\right)^2 . \tag{15}$$

Once the model has been established, the computational procedures detailed in the previous report[2] are again followed. A non-linear least-square minimization technique is utilized to calculate the solutions to the system of non-linear algebraic equations which result from the reduction of the calculational model.

Chapter 3

STEADY-STATE RESULTS

Again following the procedure of the previous study,[2] the system of non-linear equations is reduced via a series of restrictions on certain of the input variables. These restrictions are summarized in Table 1. The beam-energy restrictions apply only to the pellet-fueling with beam-heating model. Cases of fixed burn-up are examined, and in these investigations c_τ is allowed to vary since τ has effectively been fixed by specifying a value for the fractional burn-up.

The initial properties which are determined are the plasma dimensions and the plasma fuel density. These values are listed in Table 2 for $\kappa=2$ and in Table 3 for $\kappa=3$. Fuel densities vary from 0.4 to 2.3×10^{14} ions/cm^3. The fuel ions are composed of a 50-50 deuterium-tritium mixture. The major toroidal radius varies from 7.7 m to 40.7 m for $\kappa=2$ and from 6.7 m to 35.3 m for $\kappa=3$. The plasma minor semiaxis may be determined from the aspect ratio,

$$A = R/a, \tag{16}$$

and the major semiaxis is determined using the relationship for κ. It can be seen from Tables 2 and 3 that fuel density increases with higher wall loadings but decreases as total power levels increase. Fuel density changes very little with increasing κ. Physical reactor dimensions increase as power levels rise but decrease with higher wall loadings. Toroidal major radius decreases as κ increases while b increases with κ by definition. These parameters are all determined independently of plasma β,q or fueling model and apply to each of the various cases which follow.

I. Pellet Fueling With Beam Heating

Subject to the restrictions indicated in Table 1 a self-consistent set of plasma and engineering parameters was calculated for the pellet-fueling case. These results are listed in separate tables according to values of κ, V_b (beam energy), and p_w. A special nomenclature precedes these tables in the Appendix. The values calculated for the pellet-fueling model appear in Tables A1 through A12. As in the previous report, a full set of solutions which cover the entire variable range of interest is not found due to too-short as well as too-long confinement times. A large number of solutions are found, however, which do cover a significant portion of the range of investigation. Species densities are all related to the fuel densities given in Tables 2 and 3: the electron density varies from 1.5 to 2.5 times the fuel density while alpha particles range from 10 to 75% of the steady-state fuel ion concentrations.

Impurity (argon) concentrations are typically 2% or less of the fuel ion density. Confinement times range between 60 and 500 seconds with corresponding fractional burn-ups of 15% to 60%. Pellet and beam source strengths are typically 6×10^{10} to 4×10^{12} ions/cm^3/sec. The plasma current ranges from 30 to 100 megamperes. All of the above quantities have roughly the same range of variation independent of the value of $\varkappa$. Maximum B-field variations exhibit dependence on $\varkappa$ as well as the wall-loading chosen. Typical ranges of B_{max} are from 20 to 65 kGauss for 1.0 MW/m^2 wall load and $\varkappa=2$ and 15 to 50 kGauss for $\varkappa=3$. For 3.0 MW/m^2 and $\varkappa=2$ the range is from 50 to 140 kG and from 30 to 110 kG for $\varkappa=3$. For 6.0 MW/m^2 and $\varkappa=2$, B_{max} varies from 75 to 250 kG and from 60 to 240 kG for $\varkappa=3$.

The second interesting facet of these results is their variation as a function of the other plasma and engineering parameters. The previous report[2] has summarized these variations for circular cross section plasmas. In this report only changes in fluctuations or new dependences will be reported. The only new variable introduced into the computations was $\varkappa$. Electron temperature and density, alpha particle concentration, confinement time, fractional burn-up and plasma current all increase as $\varkappa$ rises. Impurity concentration, source strengths and magnetic field values all decrease as κ goes up. Figures 1 and 2 illustrate the variation of τ with power level, poloidal beta and wall loading for $\kappa=3$. Figures 3 and 4 illustrate the burn-up variations, and Figures 5 and 6 present the B_{max} variations again for $\kappa=3$ only. These figures were all prepared using values of c_T corresponding to 0.1.

II. Beam Fueling

Tables A13 through A18 present the results of the calculations performed for the beam-fueling model. The restrictions on these computations are again presented in Table 1 with the exception that the beam energy, V_b, is no longer specified. For this model the range of V_b is found to be from 40 to 200 keV. The ranges of the remaining variables and their variations with κ are found to be nearly identical with the pellet-fueling results. The required beam energy increases as κ rises. The variations of τ are illustrated in Figures 7 and 8, while the fluctuations of fractional burn-up and B_{max} are depicted in Figures 9 and 10 and Figures 11 and 12, respectively. Once again, these variations are restricted to $c_T = 0.1$ and $\kappa=3$.

III. Fixed Burn-up

For these computations the burn-up fraction is fixed at 20% which effectively fixes τ, and f_b is replaced as a variable in the calculations by c_T. The range of c_T variation is found to be from 0.2 to 0.7. c_T decreases as $\varkappa$ increases for both the pellet-fueling and beam-fueling models. Tables A19 through A30 present the plasma and reactor parameters for the pellet-fueling model for $\varkappa=2$ and $\varkappa=3$. The beam-fueling results are shown in Tables A31 through A36. The variations of c_T with reactor power, β_θ and wall load are illustrated in Figures 13 and 14 for pellet fueling and in Figures 17 and 18 for beam fueling. These results are depicted for $\varkappa=3$ only. Figures 15 and 16 illustrate the B_{max} variations for pellet fueling with the beam-fueling results shown in Figures 19 and 20. This essentially concludes the summary of steady-state results found for the various fueling models examined.

In the previous report[2] cases of pulsed operation were also examined. It was not necessary to repeat these calculations here due to the fact that no significant differences should result. The previous report should be consulted for any who may have a specific interest in long-pulse operation.

Chapter 4

CONCLUSIONS

The purpose of this research was to identify reactor operating regimes for elliptical cross section tokamaks with thermal power ratings between 12.5 and 50 GW(th). This research was to aid in the selection of particular reactor models for the purpose of a complete system design study. Several favorable combinations of system variables were determined in the previous paper[2] which are again noted in this study:

1. Low β_θ (relative to A) and low q combinations are desirable. Low β_θ means no problems with MHD instabilities and high burn-up fractions. Low q results in reduced magnetic field requirements and high burn-up.

2. Injection energies should be kept below 500 keV to produce lower total source strength requirements and lower beam source power levels. Optimal beam heating profiles tend to occur in this range of beam energies also.

3. A median range of power level and wall loading will need to be utilized to achieve an optimum design. Increased power rating increases the physical reactor dimensions while decreasing the magnetic field requirements. The effect of increased wall loading is just the opposite. Increased power

levels also decrease significantly the pellet and beam source rates. These factors will all need to be considered when a reactor model is chosen for a system analysis.

In addition to confirming the above conclusions reached previously, this report has also identified several advantages of the elliptical plasma cross section:

1. The value of β_θ may be raised due to the increase in the MHD stability criteria, i.e., β_θ may now be greater than A. Larger values of β_θ do not produce values of magnetic field strengths which are as large as for the circular model. Reductions in maximum magnetic field strengths may be as large as 40% over circular values at the same β_θ.

2. Major toroidal radius, R, is decreased for these elliptical plasmas. This results in decreases as large as 30% for $\kappa=3$. However, since $b=\kappa a$, the reactors are now taller than were the circular models.

The major conclusions reached in the previous study[2] are confirmed here with the exception of the pulsed operation results, which were not reexamined.

1. Maximum magnetic field strengths are between 25 and 50% less for these large CTR's than in the case of 5000 MW(th) reactors which have been the study of previous design analysis. The transition to elliptical cross section may produce an additional reduction in required field strength of 40%.

2. These larger CTR's represent a regime of high $n_e\tau$ product (typically 10^{15} to 10^{17} sec/cm^3) with associated high burn-up fractions (15 to 60%) which indicate excellent power production capabilities as well as efficient fuel use.

3. There is relatively little problem with impurity build-up and this problem may be further alleviated via use of the pulsed reactor concept modeled in the previous report.

4. Long confinement times (60 to 500 seconds) are found throughout most of the reactor regimes.

5. While fueling using the pellet concept may present some difficulties, this is alleviated via use of the pulsed operation scheme.

6. The utility of the control mechanism for thermal instability has been shown to be excellent while not consuming a significant fraction of the reactor thermal power.

These factors when coupled with the benefits of elliptical plasma cross section provide a most optimistic outlook for these large CTR's.

In addition to the technological advantages of operation at these very large power ratings covered in the above analysis, another previous report[1] has indicated economic and environmental advantages associated with these very large CTR's when they are used in conjunction with synthetic fuels production and process heat generation in addition to electricity production.

It is this last fact which is perhaps most significant because it indicates the mechanism whereby these very large CTR's can be used in conjunction with existing power grids.

References

1. J. Powell et al., BNL 18430 (1974).

2. J. Usher and J. Powell, BNL 19947 (1975).

3. W.A. Houlberg, "Thermalization of an Energetic Heavy Ion in a Multispecies Plasma", Report UWFDM-103, Madison, Wisconsin (1974).

4. S.O. Dean et al., WASH-1295 (1974).

NOMENCLATURE

a	plasma minor semiaxis
a_w	first wall minor semiaxis
A	aspect ratio $(=R/a)$
A'	reduced aspect ratio $(=A/3)$
b	plasma major semiaxis
b_w	first wall major semiaxis
b_t	reduced toroidal field $(=B_t/50\ \mathrm{kG})$
B_{max}	maximum magnetic field at superconductor
B_p	poloidal magnetic field
B_t	toroidal magentic field
c_τ	coefficient of trapped ion scaling
D	deuterium
e	subscript identifying electrons
$\bar{E}_b$	average energy of beam particle
$\bar{E}_\alpha$	average energy of slowing-down alpha particle
E_{fus}	total energy released in fusion reaction and subsequent events
f	subscript identifying fuel ions
f_b	fractional burn-up
f_{TCT}	per-particle probability of beam-plasma fusion while slowing down
i	subscript identifying plasma ions
I	plasma current, subscript identifying impurity ions

n_b	beam ion density ($=S_b\ \tau_{SD}^{b}$)
n_e	electron density
n_f	fuel ion density
n_i	ion density
n_I	impurity density
n_α	alpha particle density
p_w	wall loading
P_b	bremsstrahlung power
P_s	synchrotron power
P_t	total reactor thermal power rating
q	plasma safety factor
Q_α	equivalent to $E_{\alpha o}$, energy of alpha particle born in fusion reaction
R	plasma major radius
s	circumference
s_w	first wall circumference
S	pellet source strength
S_b	beam source strength
S_t	total source strength ($= S + S_b$)
t	time variable
T	Tritium
T_e	electron temperature
T_i	ion temperature

U_{bi}	fractional multiplier to determine amount of beam energy transferred to ions
$U_{\alpha i}$	fractional multiplier to determine amount of alpha energy transferred to ions
v	relative velocity
V_b	beam particle initial energy (= E_{bo})
W_{ei}	energy transfer rate from electrons to ions
Z_i	electronic charge of ion species i
α	subscript identifying alpha particles
β	ratio of plasma pressure to total magentic pressure
β_{pe}	ratio of plasma electron pressure to poloidal magnetic pressure
β_t	ratio of plasma pressure to toroidal magnetic pressure (= β)
β_θ	ratio of plasma pressure to poloidal magentic pressure
κ	ratio of major to minor semiaxes of plasma
μ_o	permeability of free space
σ	reaction cross section
$\langle \sigma v \rangle$	reaction probability
τ	confinement time (= $a^2/4D$)
τ_B	Bohm confinement time prediction
τ^b_{SD}	beam slowing-down time
τ^α_{SD}	alpha slowing-down time

Table 1

RESTRICTIVE CONDITIONS

Power - GW(th)		
12.5	25.0	50.0

Wall Load - MW/m^2		
1.0	3.0	6.0

q:	1.5	2.0	2.5
β_θ:	1.0	1.5	2.0
c_τ:	0.1	1.0	10.0

E_f = 20 MeV

T_i = 10 keV

A = 2.6

κ:	2.0	3.0

For Beam and Pellet Case Only

V_b - keV	
200	500

Table 2

POWER-RESTRICTED PARAMETERS

$\kappa=2$

Wall Load (MW/m^2)	Power (GW)	Fuel Density ($10^{13}cm^{-3}$)	a (M)	b (M)	R (M)
1.0	12.5	5.5	7.7	15.3	19.9
	25.0	4.5	11.0	21.9	28.5
	50.0	3.7	15.6	31.3	40.7
3.0	12.5	13.1	4.3	8.6	11.2
	25.0	10.6	6.2	12.4	16.1
	50.0	8.7	8.9	17.8	23.1
6.0	12.5	23.0	2.9	5.9	7.7
	25.0	18.5	4.3	8.6	11.2
	50.0	15.0	6.2	12.4	16.1

Table 3

POWER-RESTRICTED PARAMETERS

$\kappa=3$

Wall Load (MW/m^2)	Power (GW)	Fuel Density ($10^{13}cm^{-3}$)	a (m)	b (m)	R (m)
1.0	12.5	5.5	6.7	20.0	17.3
	25.0	4.5	9.5	28.6	24.8
	50.0	3.8	13.6	40.7	35.3
3.0	12.5	13.0	3.8	11.3	9.8
	25.0	10.7	5.4	16.2	14.0
	50.0	8.8	7.7	23.2	20.1
6.0	12.5	22.8	2.6	7.8	6.7
	25.0	18.4	3.8	11.3	9.8
	50.0	15.1	5.4	16.2	14.0

Figure 1	τ-Confinement Time - Seconds Pellet-Fueling (V_b = 500 keV) P_w = 1.0 MW/m^2
Figure 2	τ-Confinement Time - Seconds Pellet-Fueling (V_b = 500 keV) P_w Variation
Figure 3	F_B-Burn-up - Percent Pellet-Fueling (V_b = 500 keV) P_w = 1.0 MW/m^2
Figure 4	F_B = Burn-up - Percent Pellet-Fueling (V_b = 500 keV) P_w Variation
Figure 5	B_{MAX}-Kilogauss Pellet-Fueling (V_b = 500 keV) P_w = 1.0 MW/m^2
Figure 6	B_{MAX}-Kilogauss Pellet-Fueling (V_b = 500 keV) P_w Variation
Figure 7	τ-Confinement Time - Seconds Beam-Fueling P_w = 1.0 MW/m^2
Figure 8	τ-Confinement Time - Seconds Beam-Fueling P_w Variation
Figure 9	F_B-Burn-up - Percent Beam-Fueling P_w = 1.0 MW/m^2
Figure 10	F_B-Burn-up - Percent Beam-Fueling P_w Variation

Figure 11	B_{MAX}-Kilogauss Beam-Fueling $P_w = 1.0$ MW/m^2
Figure 12	B_{MAX}-Kilogauss Beam-Fueling P_w Variation
Figure 13	C_T-Percent Pellet-Fueling ($V_b = 500$ keV) $P_w = 1.0$ MW/m^2, $F_b = 20\%$
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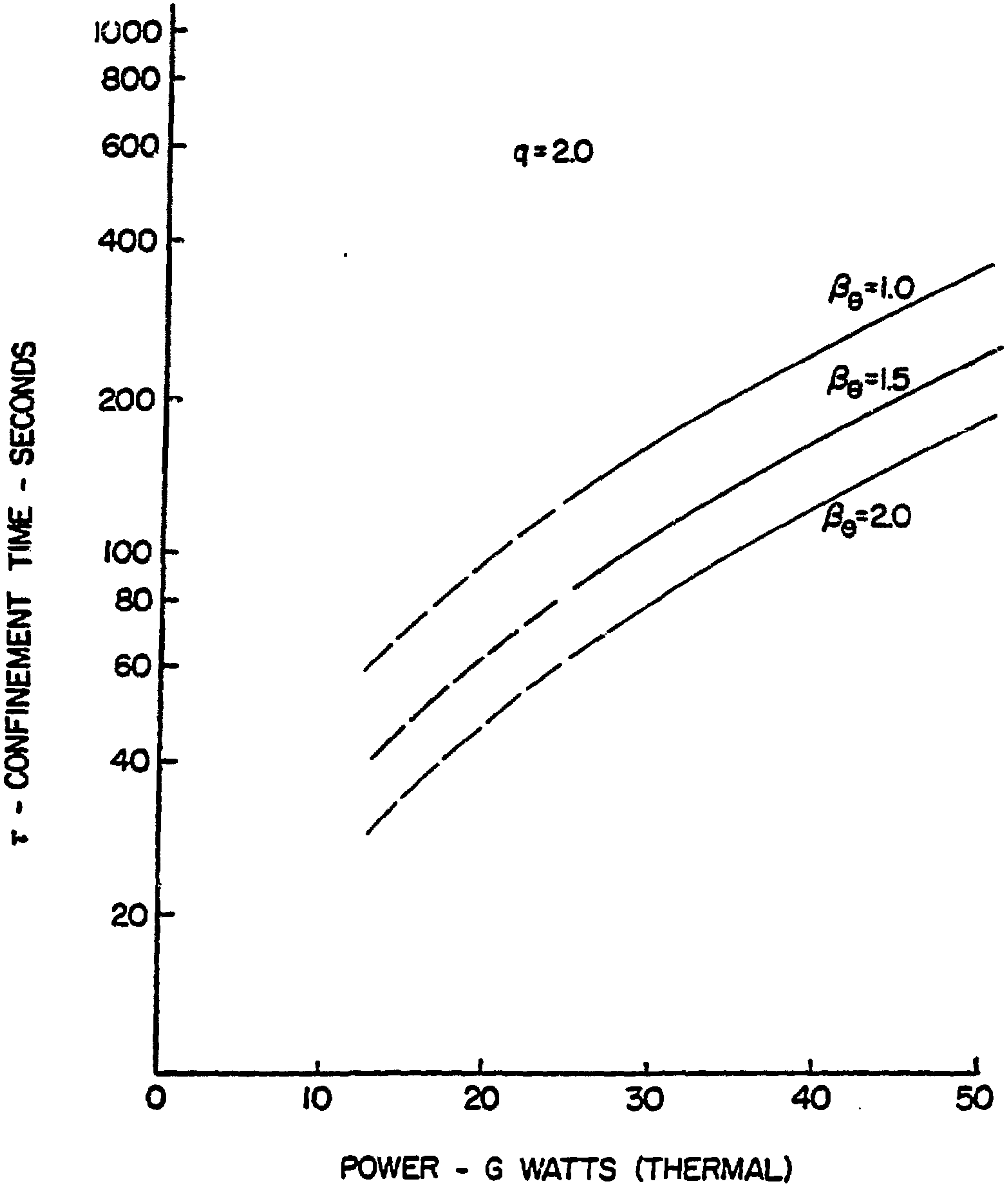
Figure 17	C_T-Percent Beam-Fueling ($F_b = 20\%$) $P_w = 1.0$ MW/m^2
Figure 18	C_T-Percent Beam-Fueling ($F_b = 20\%$) P_w Variation

Figure 19 B_{MAX}-Kilogauss
Beam-Fueling (F_b = 20%)
P_w = 1.0 MW/m^2

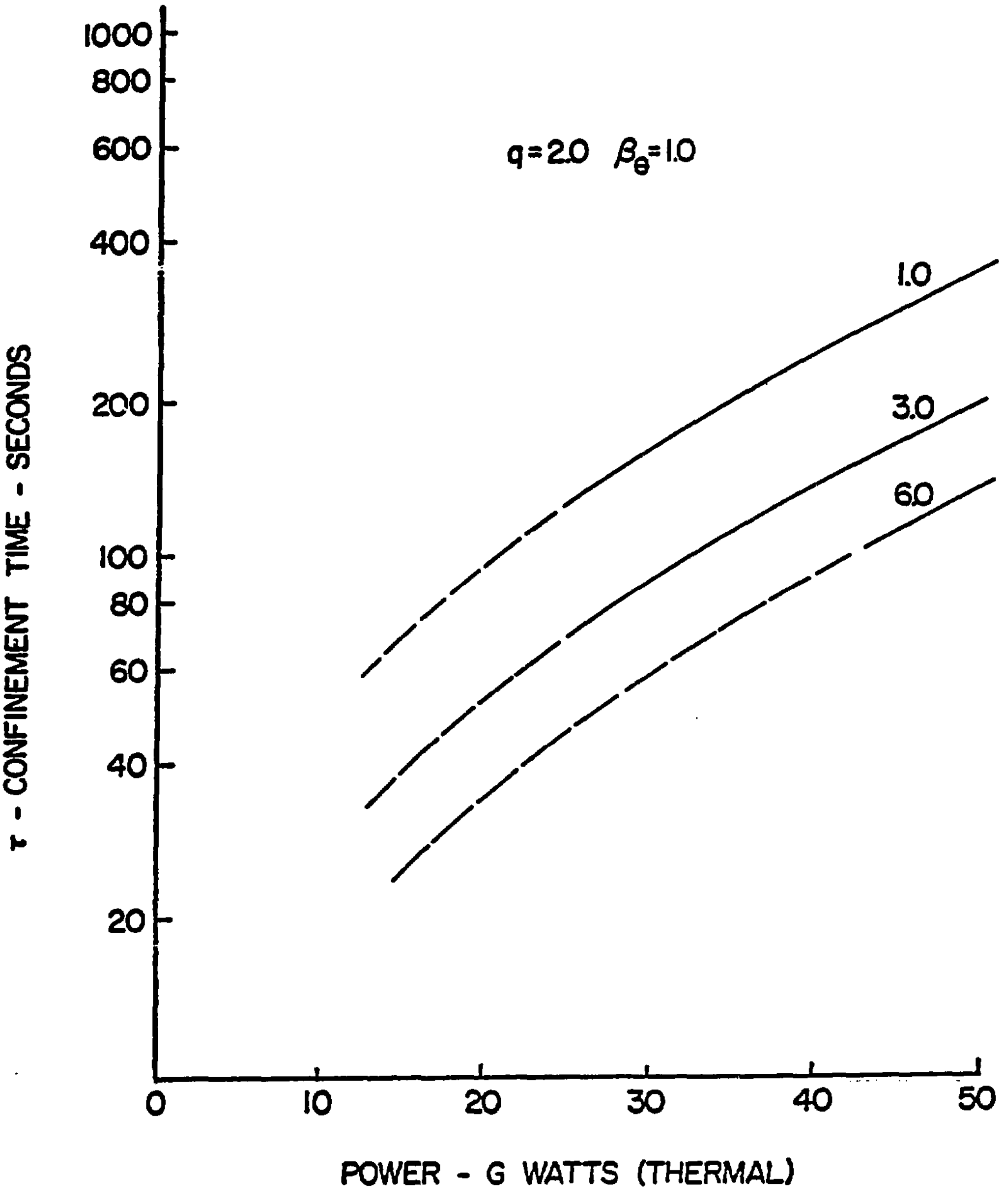
Figure 20 B_{MAX}-Kilogauss
Beam-Fueling (F_b = 20%)
P_w Variation



PELLET - FUELING (V_b=500 keV)

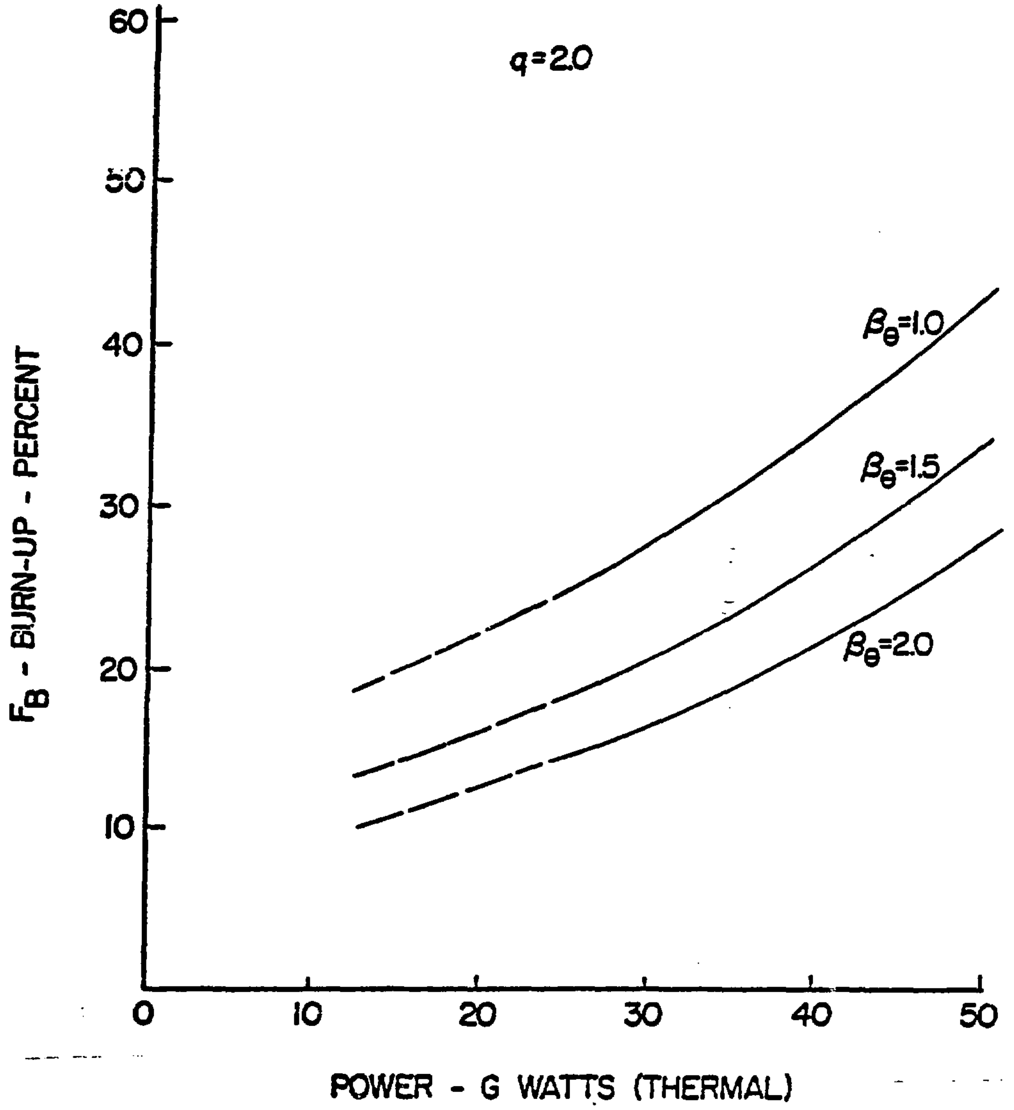
P_w=1.0 MW/m^2

Fig. 1



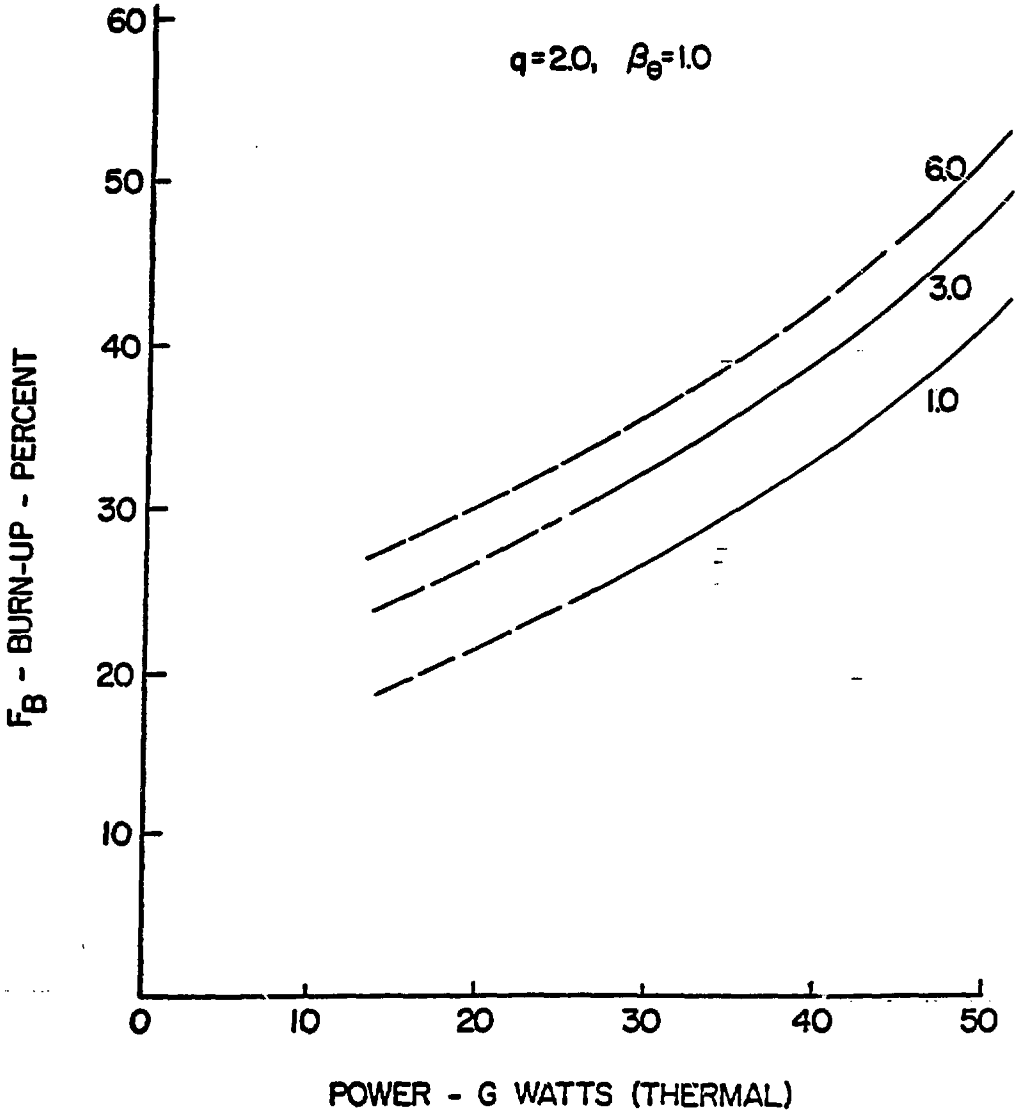
PELLET-FUELING (V_b=500 keV)
P_W VARIATION

Fig. 2



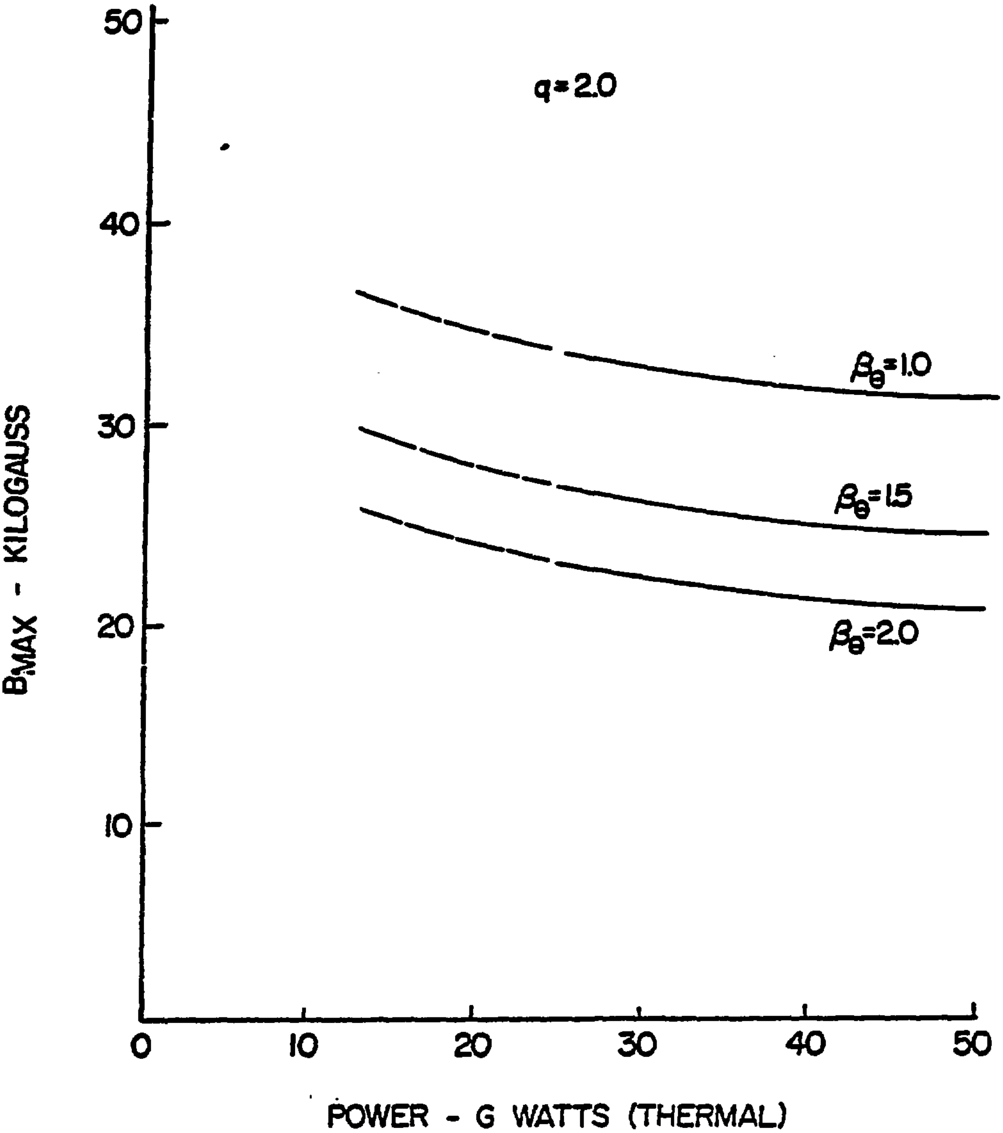
PELLET-FUELING (V_b=500 keV)
P_w=1.0 MW/m^2

Fig. 3



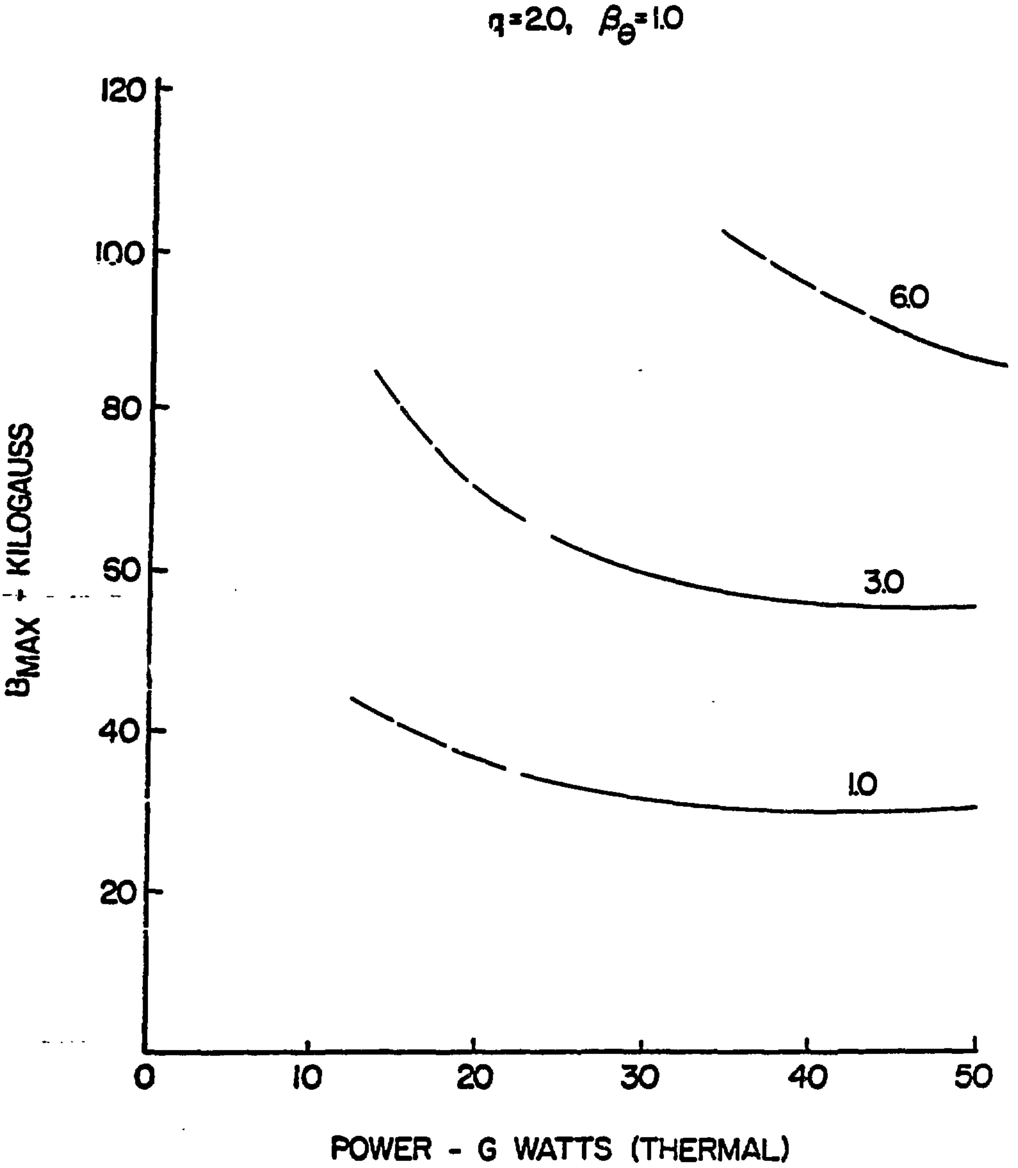
PELLET-FUELING (V_b=500 keV)
P_W VARIATION

Fig. 4



PELLET-FUELING (V_b=500 keV)
P_w = 1.0 MW/m^2

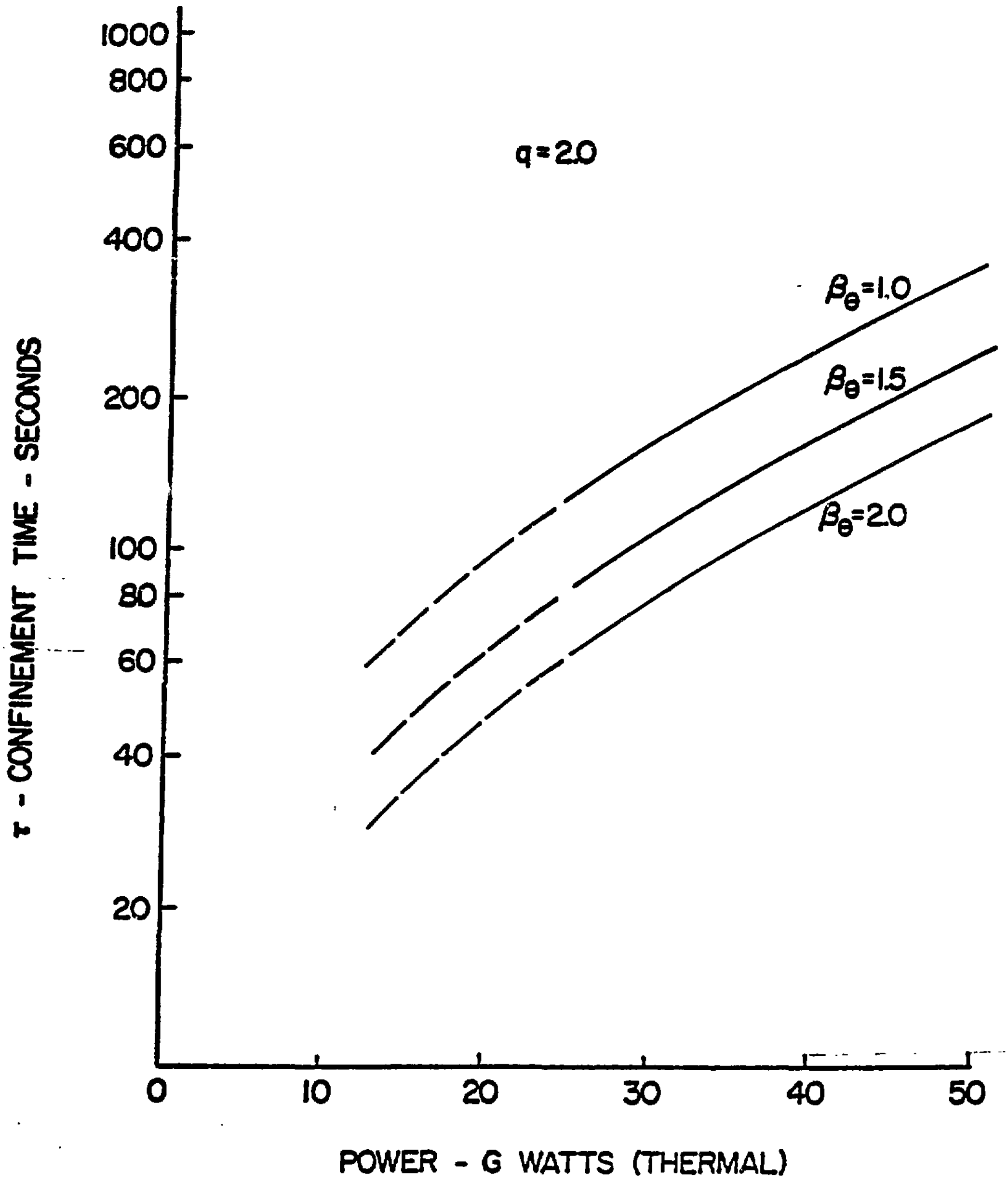
Fig. 5



PELLET-FUELING (V_b=500 keV)

P_W VARIATION

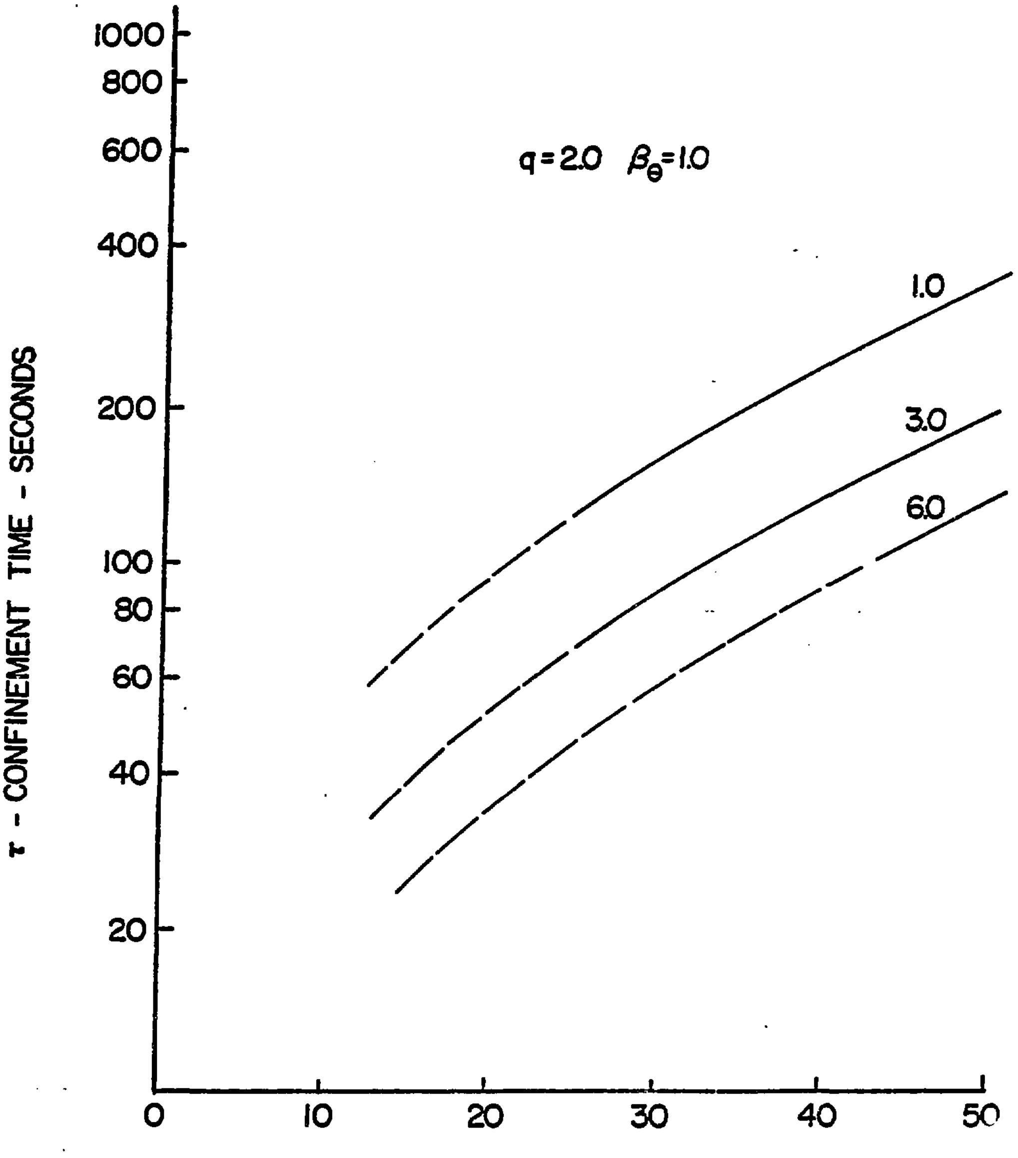
Fig. 6



BEAM - FUELING

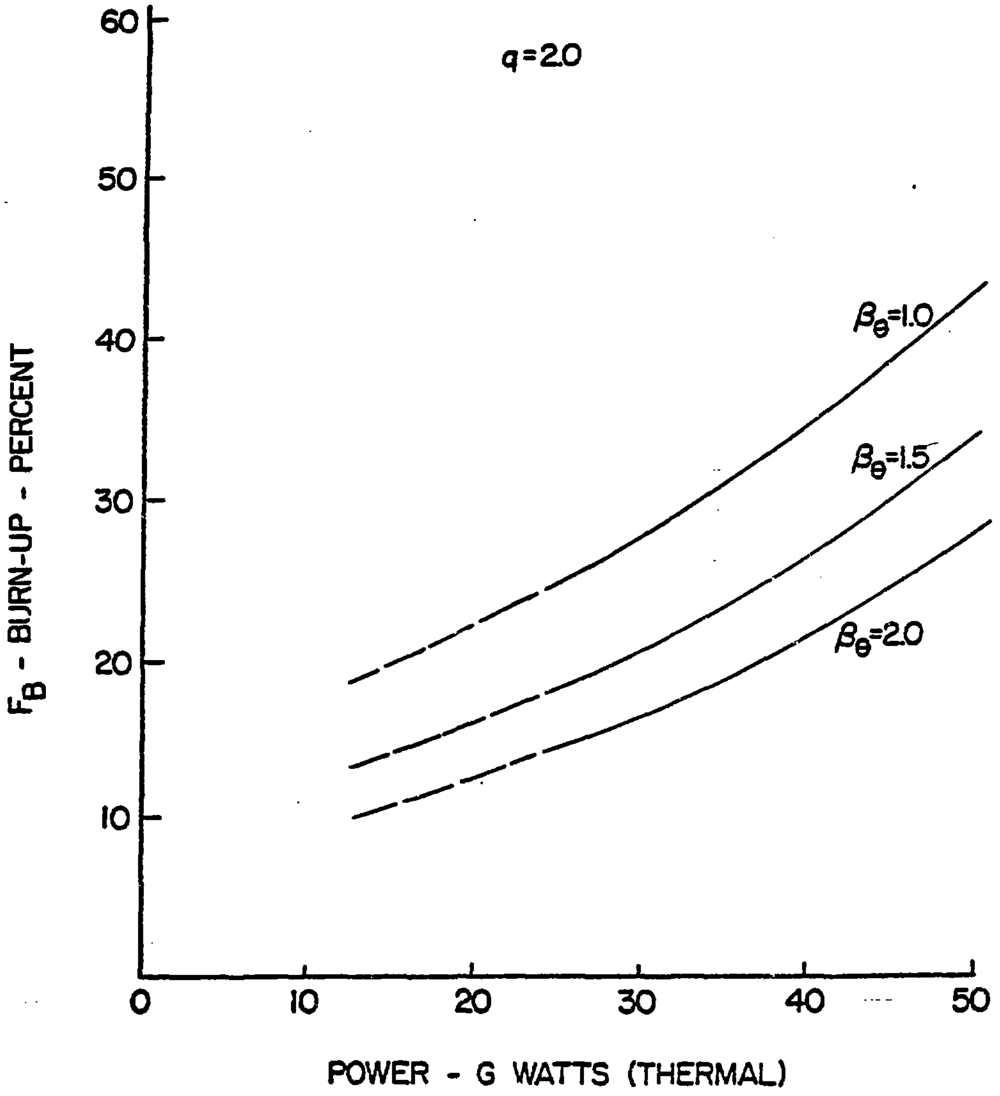
$P_W = 1.0\ MW/m^2$

Fig. 7



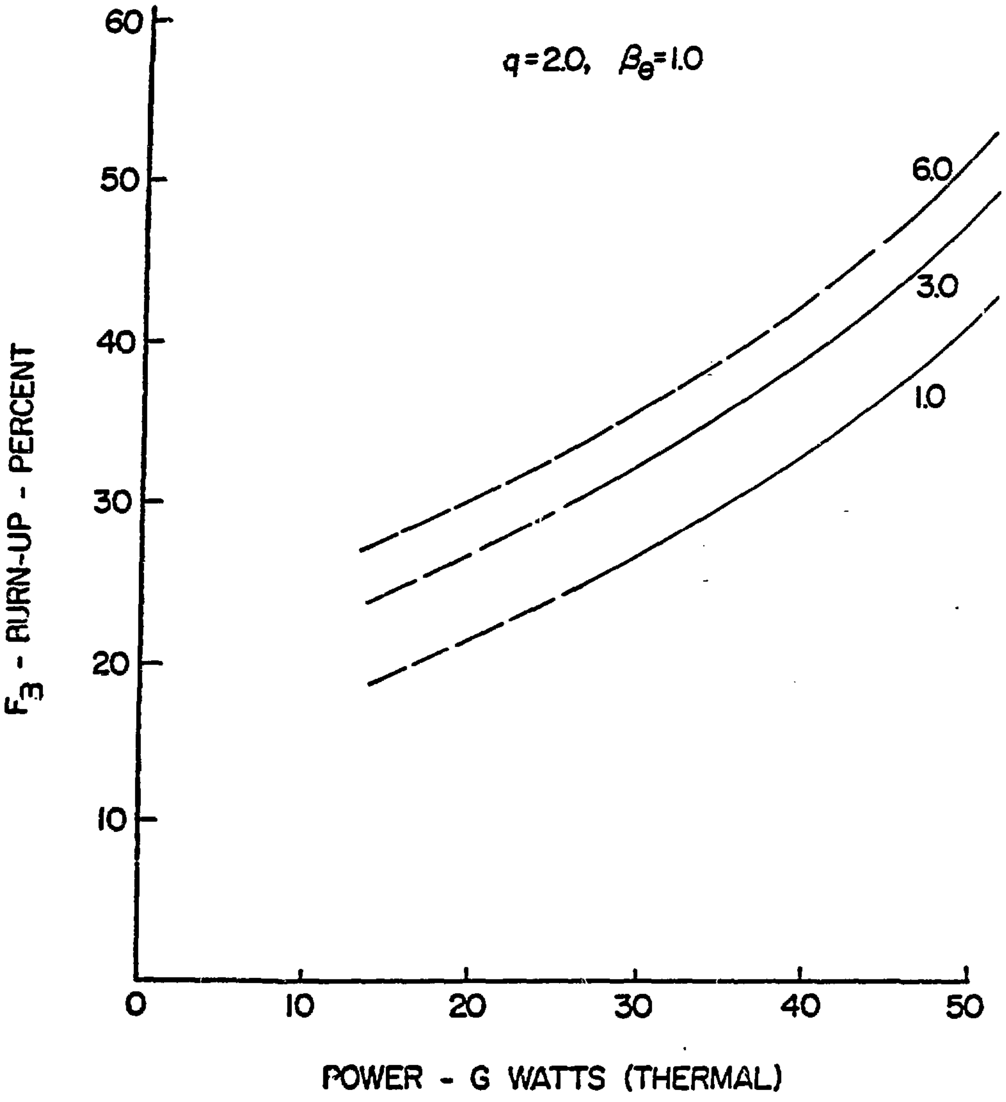
BEAM-FUELING
P_W VARIATION

Fig. 8



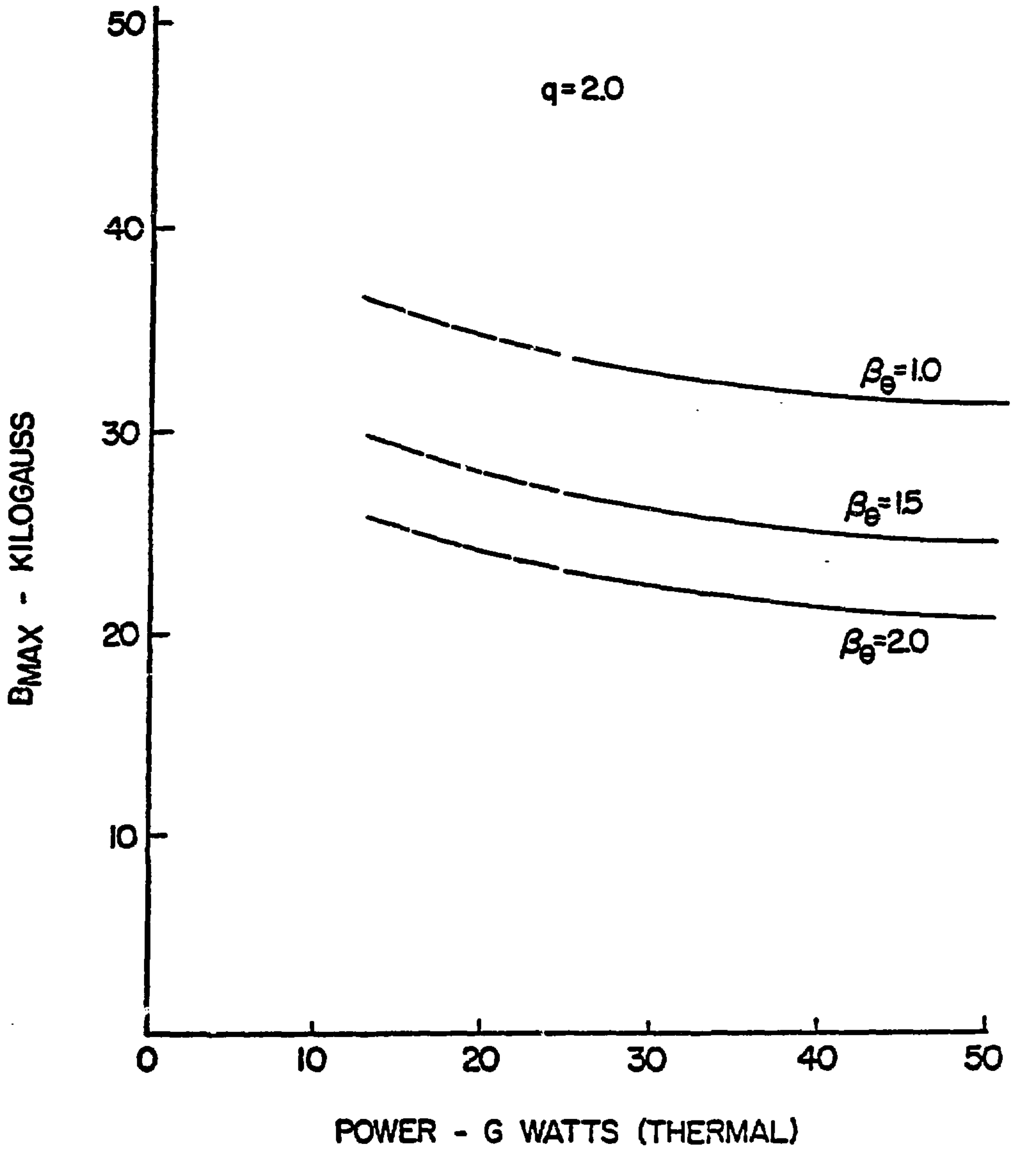
BEAM-FUELING
$P_w = 1.0\ \mathrm{MW/m^2}$

Fig. 9



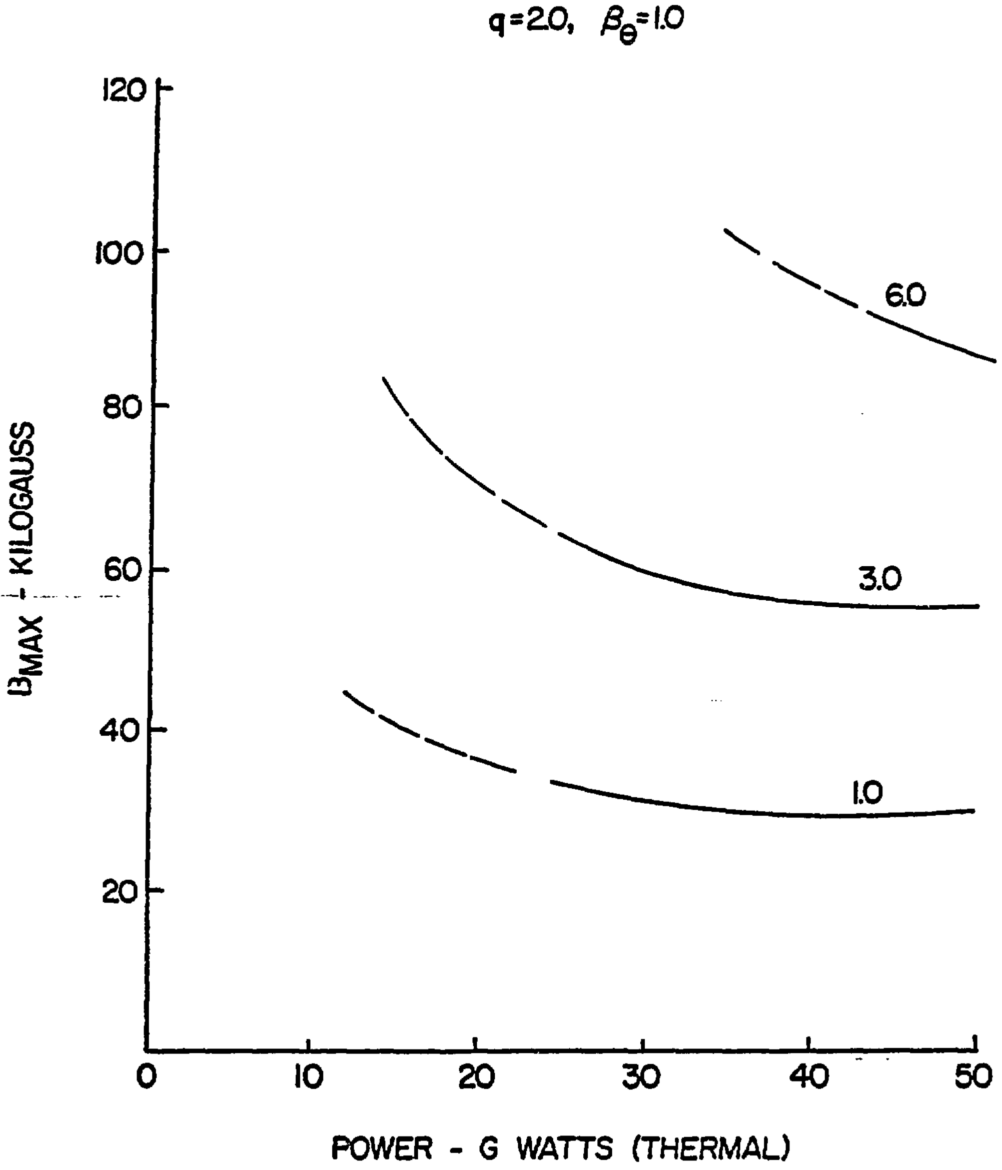
BEAM-FUELING
P_W VARIATION

Fig. 10



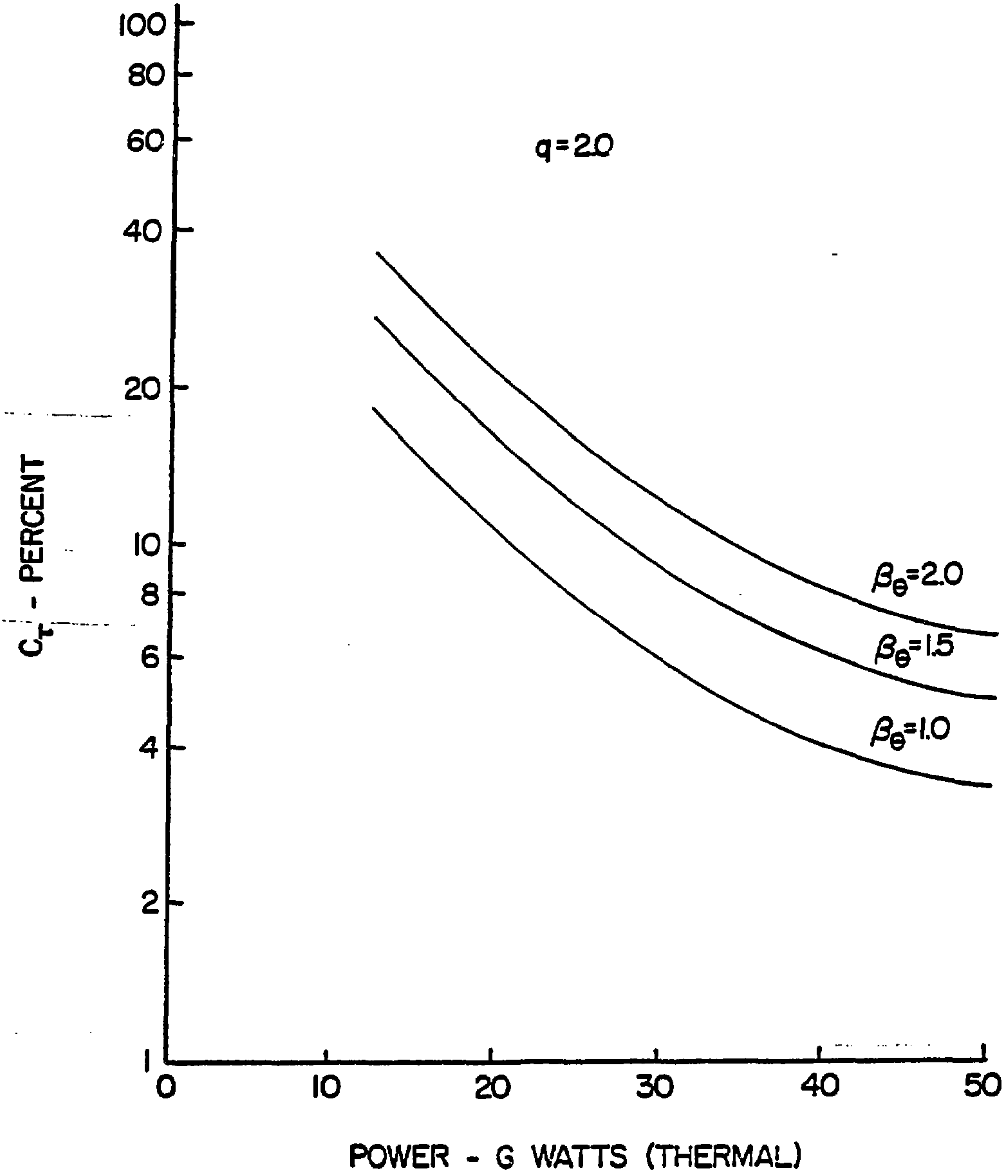
BEAM-FUELING
P_W=1.0 MW/m^2

Fig. 11



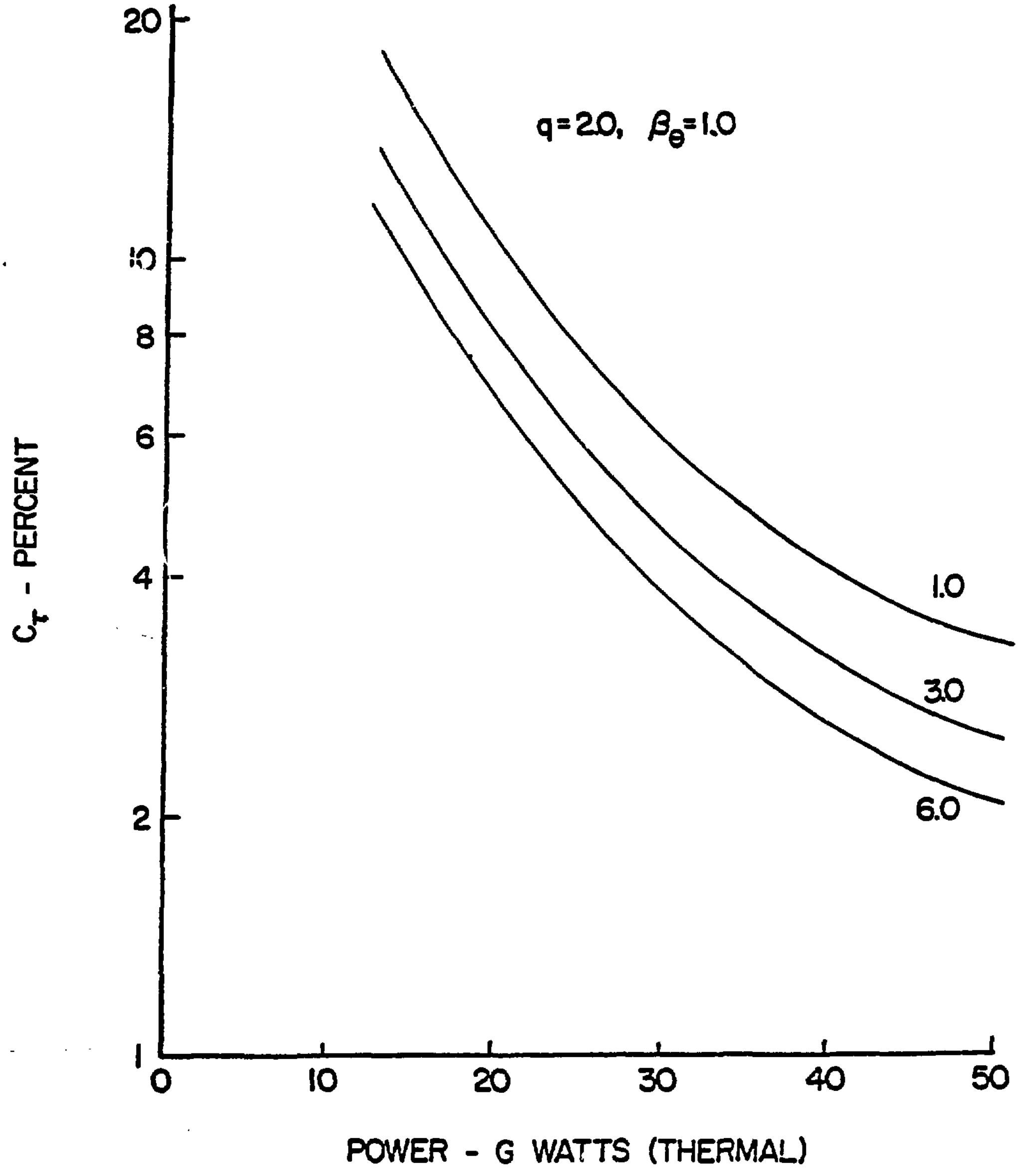
BEAM-FUELING
P_W VARIATION

Fig. 12



PELLET-FUELING (V_b=500 keV)
P_w=1.0 MW/m^2, F_b=20%

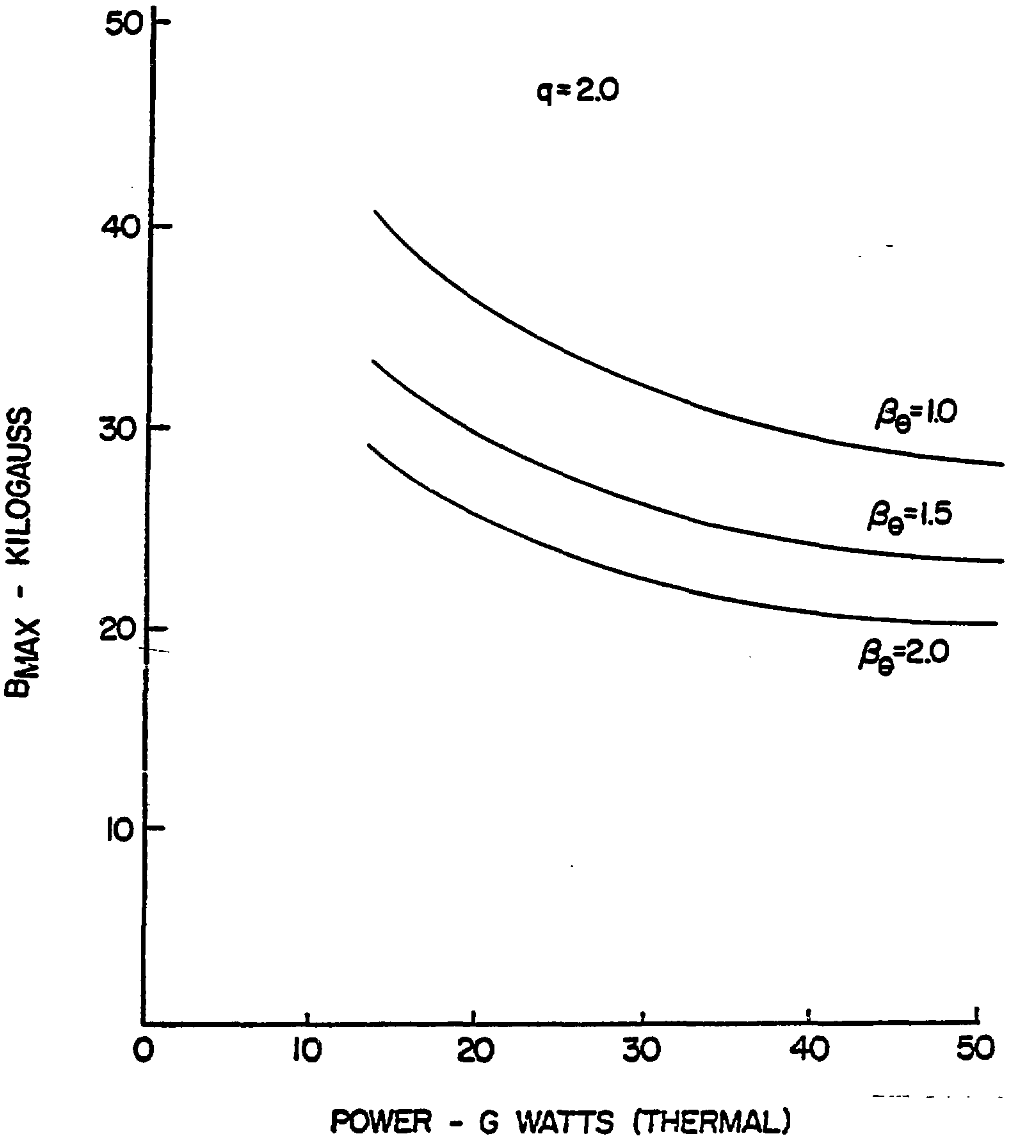
Fig. 13



PELLET-FUELING (V_b=500 keV)

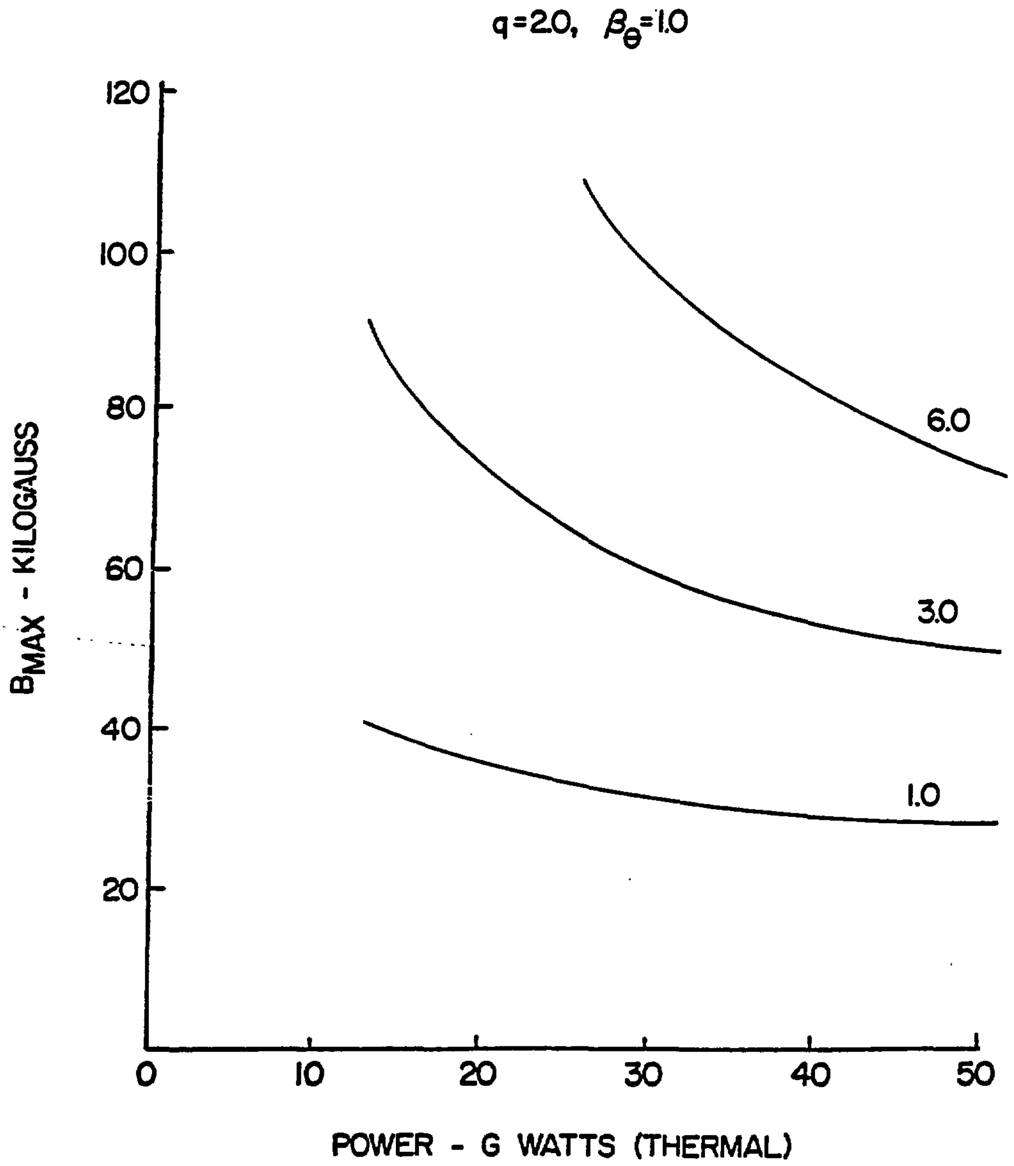
P_w VARIATION, F_b=20%

Fig. 14



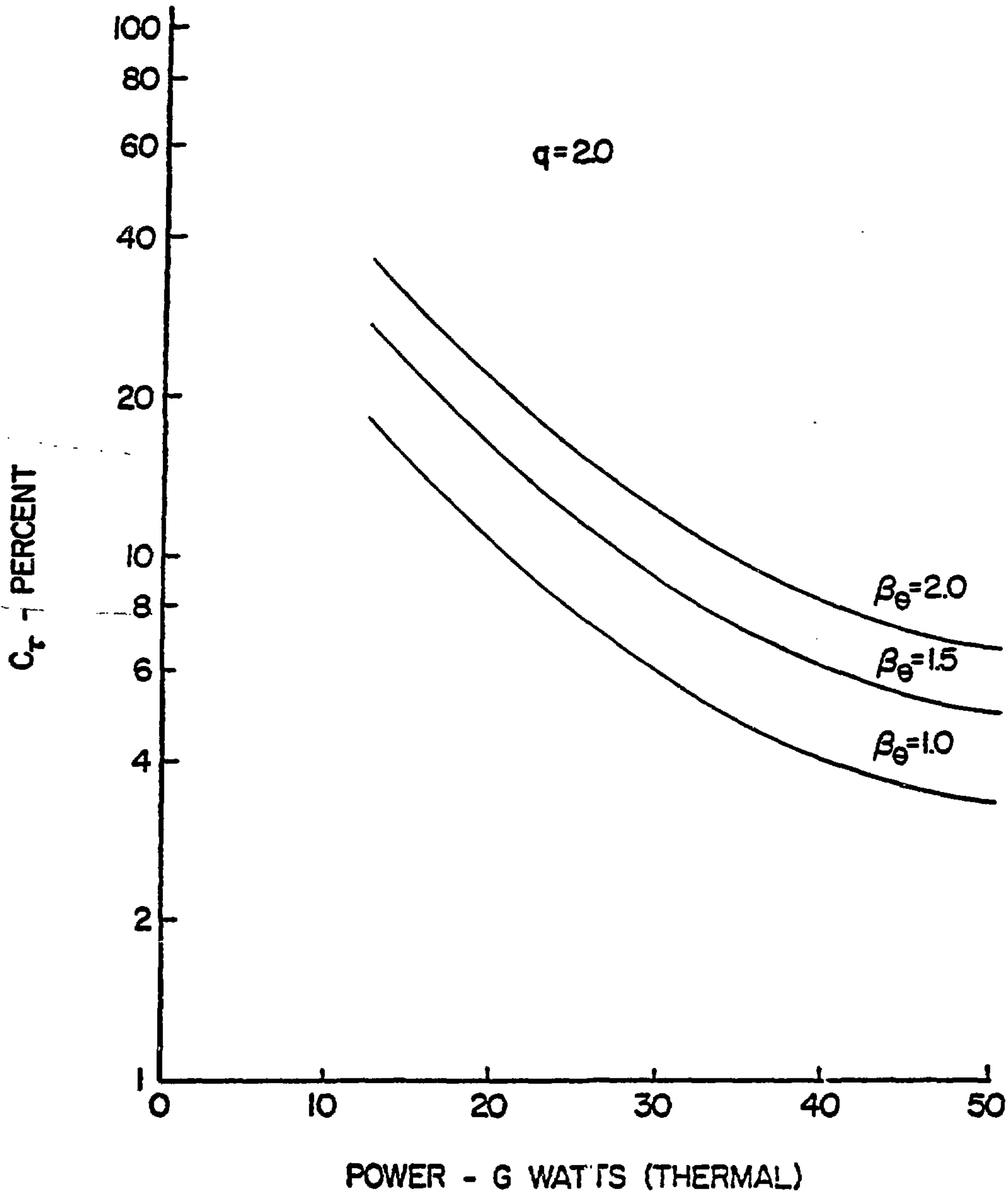
PELLET-FUELING (V_b=500 keV)
P_w = 1.0 MW/m^2, F_b=20%

Fig. 15



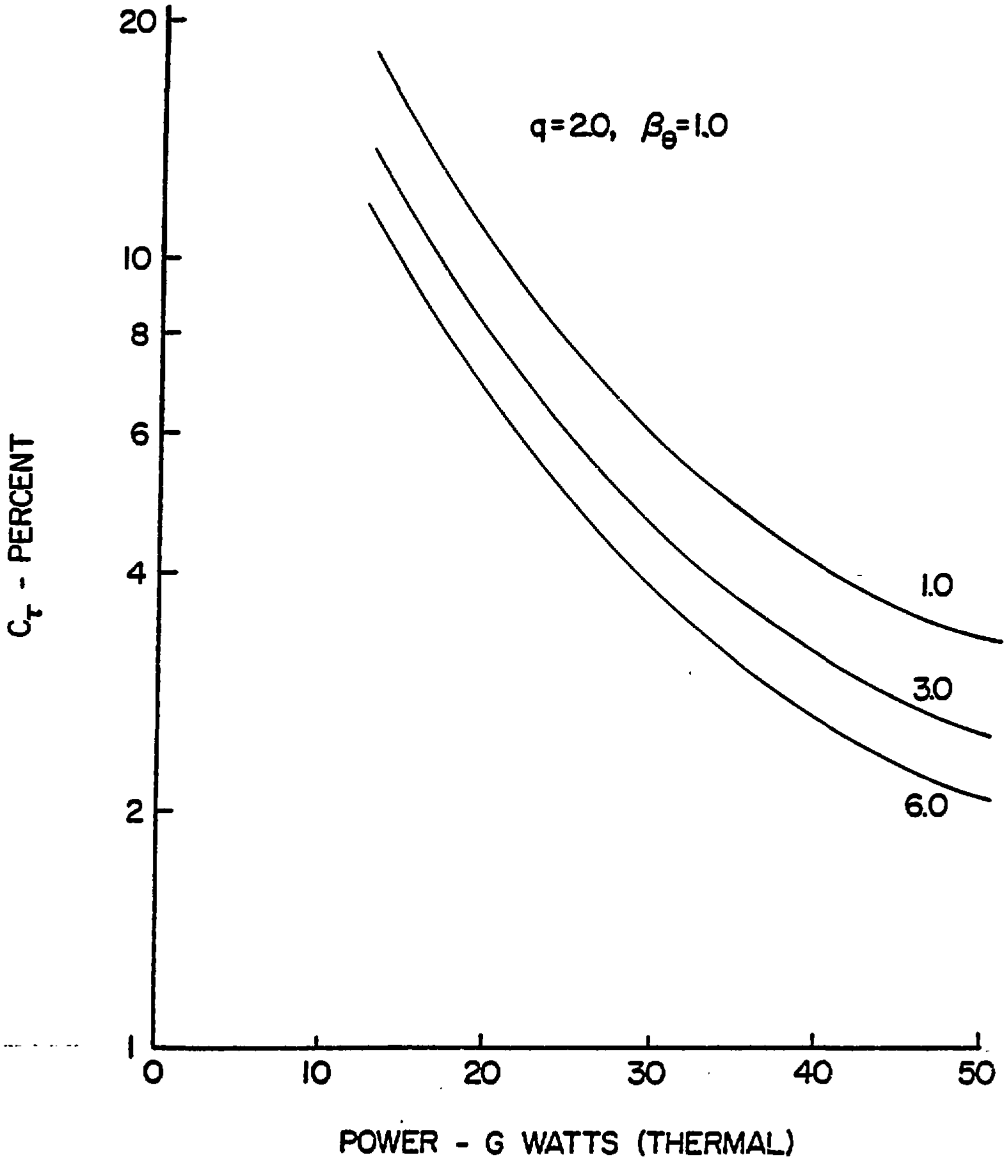
PELLET-FUELING (V_b=500 keV)
P_W VARIATION, F_b=20%

Fig. 16



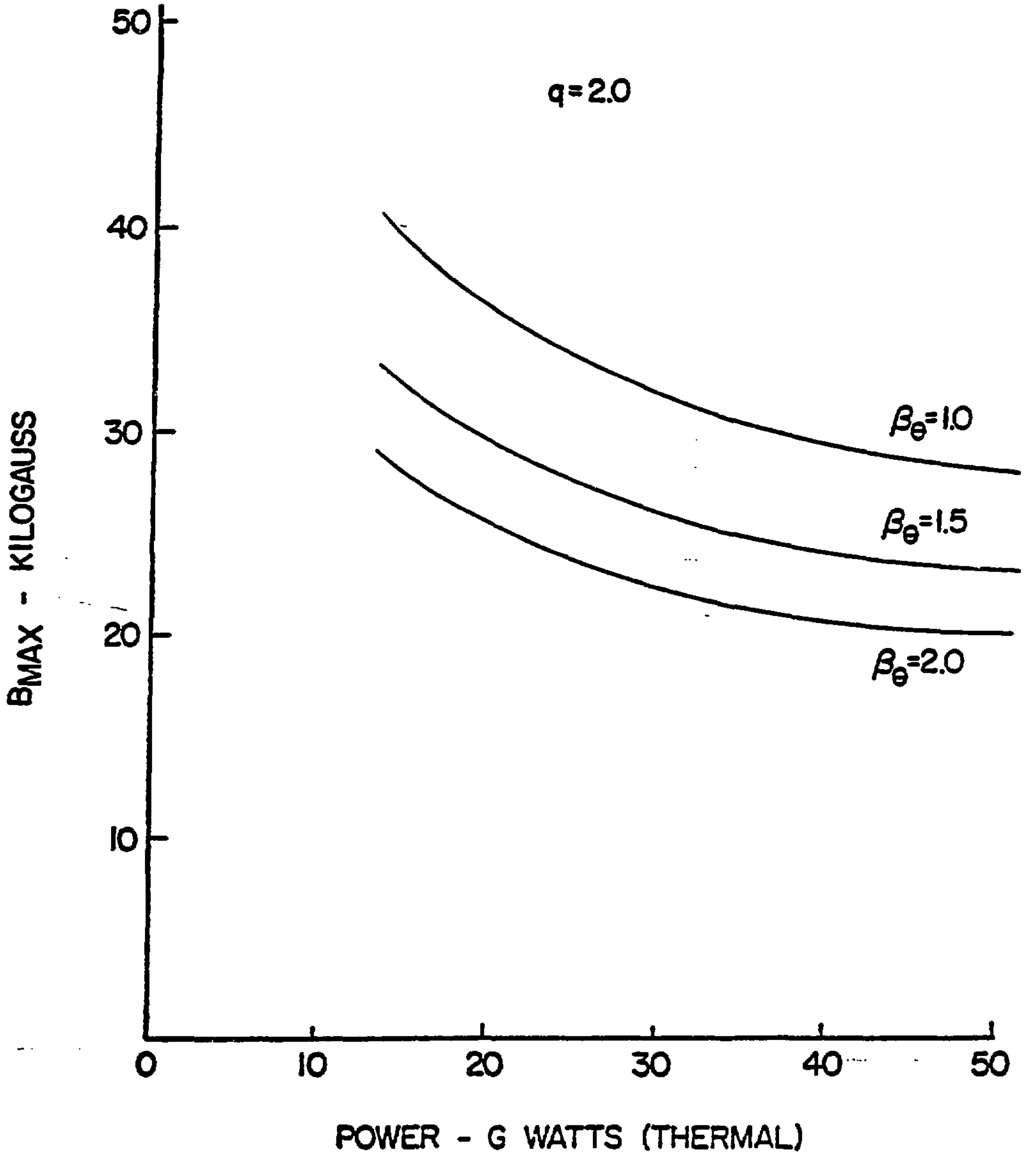
BEAM-FUELING (F_b=20%)
P_w=1.0 MW/m^2

Fig. 17



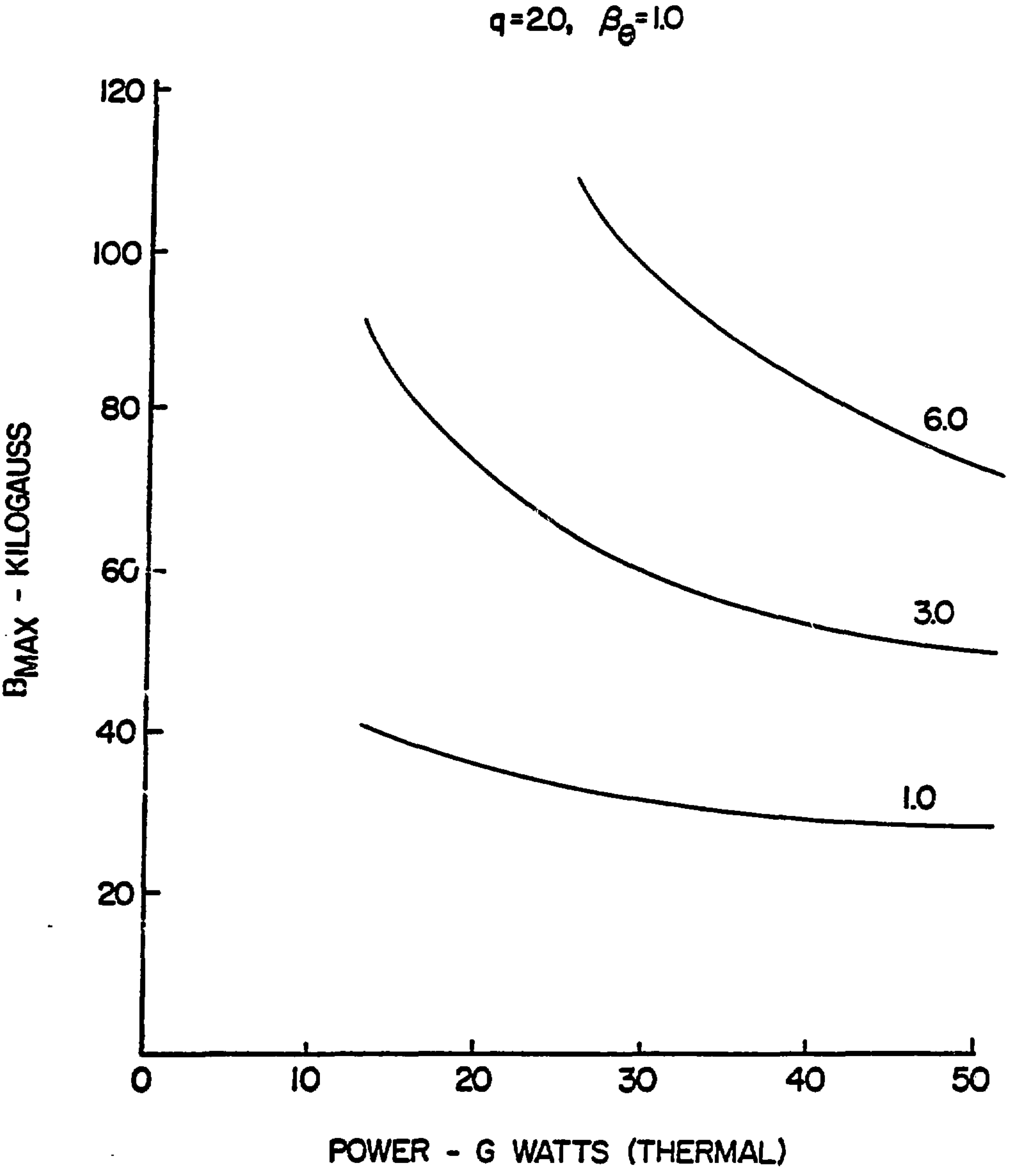
BEAM-FUELING (F_b=20%)
P_w VARIATION

Fig. 18



BEAM-FUELING (F_b=20%)
P_w = 1.0 MW/m^2

Fig. 19



BEAM-FUELING (F_b=20%)
P_W VARIATION

Fig. 20

SPECIAL NOMENCLATURE

PT	(P_t)	total reactor thermal power rating
Q	(q)	plasma safety factor
BO	(β_θ)	ratio of plasma pressure to poloidal magnetic pressure
TE	(T_e)	electron temperature
NE	(n_e)	electron density
NA	(n_α)	alpha particle density
NI	(n_I)	impurity density
FB	(f_b)	fractional burn-up
CT	(c_τ)	coefficient of trapped-ion scaling
TAU	(τ)	confinement time
T/TB	(τ/τ_B)	ratio of actual confinement time to Bohm confinement time prediction
SP	(S)	pellet source strength
SB	(S_b)	beam source strength
ST	(S_t)	total source strength
VB	(V_b)	beam particle initial energy
I	(I)	plasma current
BT	(B_t)	toroidal magnetic field
BMAX	(B_{max})	maximum magnetic field at superconductor

APPENDIX

STEADY-STATE RESULTS

Note: Due to an error in the reference from which the expression for the Bohm confinement time was taken, the values of τ/τ_B presented in the tables are in error. Multiplying the tabulated values by 64.0 should produce the correct ratio.

TABLE A1

PELLET-FUELING MODEL, PW = 1.0 MW/20.0. , KAPPA = 2.. AND VR = 263.0 KEV.

PT GW	Q	RO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TI	SE 10^{11}	SA 10^{11}	SI 10^{11}	I MA	BT KG	BMAX KG
12.5	2.5	1.0	8.96	.85	.56	1.07	.161	.1	62.	6.1	6.54	5.38	10.52	45.4	32.9	66.5
	1.5	1.0	9.10	1.04	1.87	.66	.396	1.0	212.	52.1	1.57	2.99	4.27	50.3	20.5	44.1
	1.5	1.5	9.05	.95	1.27	.94	.738	1.0	144.	27.8	2.35	3.14	5.49	39.3	16.1	34.5
	1.5	2.0	9.02	.91	.97	.94	.252	1.0	119.	24.9	3.40	3.30	6.72	33.3	13.5	29.2
	2.0	1.0	9.19	1.25	3.21	.32	.629	1.0	364.	44.3	.24	2.35	5.13	54.9	29.4	64.1
	2.0	1.5	9.12	1.09	2.20	.57	.435	1.0	249.	34.[illegible]	.33	2.96	3.89	42.0	22.8	49.1
	2.0	2.0	9.04	1.01	1.68	.72	.370	1.0	190.	32.9	1.55	3.13	4.57	35.1	19.3	41.2
	2.5	1.5	9.19	1.27	3.34	.29	.539	1.0	378.	38.7	.18	2.36	5.14	45.1	30.6	65.9
	2.5	2.0	9.14	1.14	2.55	.48	.472	1.0	259.	35.7	.64	2.44	3.54	37.2	25.2	54.4
25.0	1.5	1.0	8.96	.69	.39	.91	.141	.1	64.	5.7	5.39	2.79	8.13	59.1	16.7	32.9
	2.0	1.0	9.00	.74	.69	.81	.224	.1	113.	7.3	2.78	2.38	5.16	60.7	22.3	45.5
	2.0	1.5	8.94	.70	.46	.89	.162	.1	76.	6.2	4.47	2.64	7.19	48.6	18.3	36.0
	2.5	1.0	9.03	.79	1.05	.69	.338	.1	174.	8.8	1.52	2.23	4.75	62.8	29.6	58.2
	2.5	1.5	9.00	.74	.71	.80	.231	.1	117.	7.5	2.64	2.36	5.03	49.7	23.4	46.5
	2.5	2.0	8.94	.71	.54	.86	.185	.1	89.	6.6	3.73	2.52	6.25	42.4	20.3	39.2
	1.5	1.0	9.26	1.16	3.46	.09	.595	1.0	575.	41.1	.11	1.93	1.94	75.9	21.4	42.1
	1.5	1.5	9.18	.99	2.39	.33	.503	1.0	396.	37.1	.35	1.34	2.33	57.3	16.2	31.8
	1.5	2.0	9.13	.93	1.82	.47	.436	1.0	393.	34.8	.67	1.38	2.65	47.5	13.4	26.4
	2.0	2.0	9.23	1.11	3.11	.16	.569	1.0	517.	40.3	.10	1.93	2.87	52.3	19.7	38.8
50.0	1.5	1.0	9.03	.63	.74	.62	.273	.1	177.	8.2	1.38	1.53	2.91	80.0	16.0	29.0
	1.5	1.5	9.00	.61	.56	.69	.202	.1	120.	6.9	2.26	1.67	3.93	63.6	12.8	23.5
	1.5	2.0	8.98	.58	.38	.74	.161	.1	90.	6.1	3.14	1.81	4.94	54.3	10.9	20.1
	2.0	1.0	9.09	.71	1.28	.46	.395	.1	308.	10.1	.59	1.42	2.01	94.7	22.7	41.7
	2.0	1.5	9.25	.65	.87	.58	.307	.1	209.	8.8	1.10	1.49	2.59	66.3	17.7	32.6
	2.0	2.0	9.02	.62	.66	.64	.251	.1	158.	7.8	1.00	1.56	3.16	56.1	15.0	27.6
	2.5	1.0	9.15	.82	1.95	.28	.498	.1	469.	11.7	.17	1.42	1.59	98.4	30.2	55.7
	2.5	1.5	9.10	.72	1.33	.44	.404	.1	320.	10.3	.55	1.42	1.97	69.5	23.2	42.4
	2.5	2.0	9.06	.67	1.01	.53	.346	.1	243.	9.3	.88	1.46	2.34	58.2	19.5	35.9

TABLE A2

PELLET-FUELING MODEL, PW = 3.0 MW/SQ.M. , KAPPA = 2.0 AND VB = 200.0 KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CI	TAU SEC	T/TB	SP 10^{11}	SB 10^{11}	SI 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.14	2.73	6.01	1.18	.468	1.0	119.	35.5	3.39	16.73	2 .72	45.5	33.2	95.2
	1.5	1.5	9.08	2.44	4.11	1.70	.375	1.0	81.	31.1	8.62	17.24	25.66	35.2	25.7	73.6
	1.5	2.0	9.05	2.29	3.12	1.99	.313	1.0	62.	28.0	13.09	17.90	30.99	29.6	21.6	61.9
	2.0	1.5	9.17	2.89	7.65	.92	.507	1.0	139.	37.3	2.44	16.67	19.11	38.2	37.2	106.5
	2.0	2.0	9.12	2.65	5.39	1.34	.440	1.0	106.	34.2	5.18	16.83	22.01	31.6	30.8	88.2
	2.5	2.0	9.20	3.06	8.16	.65	.544	1.0	161.	38.9	1.12	16.71	17.83	34.0	41.4	119.6
25.0	2.0	1.0	9.02	1.79	2.08	1.75	.272	.1	62.	8.2	10.91	12.41	23.32	53.4	35.8	83.6
	2.5	1.0	9.06	1.95	3.20	1.41	.365	.1	96.	9.7	5.46	11.92	17.39	55.7	46.7	108.9
	2.5	1.5	9.02	1.80	2.17	1.72	.280	.1	65.	8.3	10.32	12.34	22.66	43.8	36.7	85.6
	1.5	1.5	9.23	2.56	7.16	.40	.564	1.0	216.	39.8	.76	10.54	11.24	52.0	26.1	61.3
	1.5	2.0	9.17	2.30	5.50	.79	.498	1.0	166.	36.9	2.07	10.67	12.74	42.7	21.5	59.1
50.0	1.5	1.0	9.06	1.56	2.26	1.27	.331	.1	100.	9.1	5.15	7.93	13.08	71.4	25.0	51.6
	1.5	1.5	9.02	1.45	1.54	1.50	.251	.1	68.	7.8	8.79	8.48	17.27	56.4	19.8	43.7
	2.0	1.0	9.13	1.80	3.92	.82	.460	.1	173.	11.1	1.80	7.59	9.39	76.7	35.9	73.9
	2.0	1.5	9.08	1.62	2.66	1.16	.368	.1	118.	9.7	3.99	7.78	11.77	59.4	27.8	57.2
	2.0	2.0	9.05	1.52	2.02	1.35	.306	.1	89.	8.8	6.07	8.36	14.13	49.9	23.4	48.1
	2.5	1.5	9.14	1.83	4.05	.78	.470	.1	179.	11.3	1.62	7.59	9.20	63.0	36.8	75.9
	2.5	2.0	9.10	1.68	3.09	1.04	.403	.1	137.	10.3	3.05	7.67	10.72	52.4	30.6	63.1

TABLE A3

PELLET-FUELING MODEL, PW = 6.0 MW/SQ.M. , KAPPA = 2.0 AND VB = 200.0 KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.17	5.07	12.37	1.61	.568	1.0	79.	37.3	7.79	51.10	58.89	42.5	45.1	211.8
	2.0	1.5	9.20	5.40	14.48	1.11	.547	1.0	93.	39.0	3.56	51.11	54.67	35.8	50.6	226.6
	2.0	2.0	9.15	4.87	11.09	1.93	.480	1.0	71.	36.1	10.99	51.26	62.25	29.5	41.7	186.6
25.0	2.5	1.0	9.04	3.59	6.83	2.12	.412	.1	67.	10.4	11.08	35.81	46.89	52.3	63.6	182.2
	1.5	2.0	9.21	4.34	11.63	.90	.547	1.0	115.	39.0	3.29	32.09	35.38	40.5	29.6	84.8
50.0	1.5	1.0	9.08	2.77	4.58	1.98	.369	.1	69.	9.7	11.71	22.78	34.49	66.4	33.4	77.9
	2.0	1.0	9.16	3.27	7.87	1.10	.561	.1	118.	11.7	3.24	22.13	25.37	72.0	48.2	112.6
	2.0	1.5	9.10	2.89	5.38	1.75	.407	.1	81.	10.5	8.80	22.44	31.24	55.4	37.1	86.6
	2.0	2.0	9.06	2.70	4.10	2.12	.343	.1	62.	9.3	13.39	23.08	37.07	46.4	31.1	72.5
	2.5	1.5	9.17	3.32	8.17	1.03	.511	.1	123.	11.8	2.75	22.15	24.90	59.2	49.6	115.7
	2.5	2.0	9.12	3.02	6.25	1.52	.444	.1	94.	10.9	6.44	22.23	28.67	49.0	41.0	95.7

TABLE A4

PELLET-FUELING MODEL, PH = 1.0 MW/SQ.M. , KAPPA = 2.0 AND VO = 500.0 KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TR	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	2.5	1.0	9.13	.85	.52	1.08	.155	.1	60.	6.0	9.13	1.75	11.88	45.8	31.0	66.9
	1.5	1.0	9.20	1.63	1.81	.68	.390	1.0	207.	31.7	3.04	1.29	4.33	50.2	20.4	44.0
	1.5	1.5	9.17	.94	1.22	.85	.302	1.0	146.	27.3	4.24	1.36	5.60	39.4	16.0	34.5
	1.5	2.0	9.15	.90	.92	.94	.246	1.0	126.	24.3	5.43	1.44	6.86	33.3	13.6	29.2
	2.0	1.0	9.27	1.23	3.11	.34	.525	1.0	357.	38.0	1.95	1.27	3.22	54.7	29.7	63.9
	2.0	1.5	9.21	1.08	2.12	.59	.430	1.0	244.	33.6	2.66	1.28	3.94	41.9	22.7	49.0
	2.0	2.0	9.19	1.60	1.61	.73	.364	1.0	185.	30.5	3.34	1.31	4.65	35.0	19.0	41.0
	2.5	1.5	9.27	1.25	3.23	.31	.534	1.0	371.	33.4	1.89	1.27	3.16	45.6	30.5	65.7
	2.5	2.0	9.23	1.13	2.46	.50	.467	1.0	283.	35.4	2.35	1.27	3.62	37.1	25.2	54.3
25.0	1.5	1.0	9.14	.69	.37	.91	.136	.1	62.	5.6	7.25	1.23	8.47	59.4	16.8	33.0
	2.0	1.0	9.14	.73	.65	.81	.218	.1	139.	7.2	4.26	1.04	5.30	60.9	23.0	45.1
	2.0	1.5	9.14	.70	.44	.89	.157	.1	73.	6.0	6.18	1.16	7.34	48.8	18.4	36.2
	2.5	1.0	9.15	.78	1.01	.70	.302	.1	169.	8.6	2.86	.97	3.83	62.9	29.6	58.2
	2.5	1.5	9.14	.73	.68	.81	.225	.1	114.	7.3	4.10	1.03	5.13	49.9	23.5	46.2
	2.5	2.0	9.14	.71	.51	.86	.179	.1	86.	6.4	5.34	1.10	6.44	42.5	20.0	39.4
	1.5	1.0	9.33	1.14	3.36	.10	.591	1.0	566.	40.9	1.12	.83	1.95	75.6	21.4	42.0
	1.5	1.5	9.26	.98	2.31	.34	.498	1.0	389.	36.8	1.48	.84	2.32	57.2	16.2	31.8
	1.5	2.0	9.22	.89	1.76	.49	.431	1.0	296.	33.7	1.83	.86	2.68	47.4	13.4	26.4
	2.0	2.0	9.31	1.09	3.02	.18	.565	1.0	508.	39.7	1.21	.83	2.64	52.2	19.7	38.6
50.0	1.5	1.0	9.16	.63	.71	.62	.267	.1	172.	8.1	2.31	.66	2.97	80.1	16.1	29.6
	1.5	1.5	9.14	.60	.48	.70	.197	.1	115.	6.8	3.31	.73	4.04	63.8	12.8	23.6
	1.5	2.0	9.14	.58	.36	.74	.156	.1	87.	6.0	4.31	.79	5.11	54.6	16.9	20.2
	2.0	1.0	9.19	.71	1.23	.47	.389	.1	330.	10.0	1.43	.62	2.04	84.7	22.6	41.7
	2.0	1.5	9.17	.65	.83	.58	.301	.1	203.	8.6	2.00	.64	2.64	66.3	17.7	32.7
	2.0	2.0	9.15	.62	.63	.65	.245	.1	153.	7.7	2.56	.68	3.24	56.2	15.0	27.7
	2.5	1.0	9.24	.80	1.88	.29	.493	.1	459.	11.6	1.10	.61	1.61	90.2	30.1	55.5
	2.5	1.5	9.20	.71	1.28	.45	.398	.1	312.	10.2	1.38	.61	1.99	69.5	23.2	42.8
	2.5	2.0	9.17	.67	.97	.54	.334	.1	237.	9.2	1.75	.63	2.38	58.3	19.5	35.9

TABLE A5

PELLET-FUELING MODEL, PW = 3.0 MW/SQ.M. , KAPPA = 2.0 AND VB = 500.0 KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TH	SP 10^{11}	SA 10^{11}	ST 10^{11}	I MA	BI KG	GMAX KG
12.5	1.5	1.0	9.23	2.69	5.81	1.22	.463	1.0	116.	35.2	13.74	7.22	20.96	45.4	33.2	95.5
	1.5	1.5	9.19	2.41	3.95	1.73	.369	1.0	79.	30.7	18.82	7.45	26.27	35.2	25.7	73.6
	1.5	2.0	9.17	2.27	3.00	2.01	.307	1.0	60.	27.6	23.82	7.75	31.57	29.6	21.6	61.9
	2.0	1.0	9.32	3.34	9.94	.25	.596	1.0	149.	41.1	8.36	7.32	16.28	59.4	49.1	140.5
	2.0	1.5	9.25	2.85	6.81	.97	.503	1.0	136.	37.0	12.11	7.19	19.30	38.1	37.1	116.2
	2.0	2.0	9.22	2.60	5.19	1.38	.435	1.0	104.	33.9	15.02	7.26	22.28	31.6	30.7	88.1
	2.5	1.5	9.33	3.41	10.33	.16	.605	1.0	207.	41.5	8.68	7.35	16.03	41.5	56.5	144.7
	2.5	2.0	9.28	3.02	7.90	.71	.540	1.0	158.	38.7	10.77	7.20	17.97	53.9	41.3	118.3
25.0	2.0	1.0	9.15	1.78	1.99	1.76	.266	.1	61.	8.0	18.45	5.39	23.84	53.5	35.9	83.7
	2.5	1.0	9.17	1.93	3.07	1.44	.359	.1	94.	9.6	12.51	5.16	17.67	55.7	46.7	108.9
	2.5	1.5	9.15	1.79	2.67	1.74	.274	.1	63.	8.2	17.90	5.35	23.15	43.8	36.7	85.7
	1.5	1.5	9.30	2.53	6.95	.44	.560	1.0	213.	39.6	6.79	4.54	11.33	51.8	26.0	60.7
	1.5	2.0	9.25	2.27	5.32	.83	.494	1.0	163.	36.6	8.26	4.66	12.86	42.6	21.4	53.0
50.0	1.5	1.0	9.17	1.54	2.17	1.29	.325	.1	97.	9.0	9.88	3.43	13.32	71.5	25.1	51.6
	1.5	1.5	9.15	1.44	1.47	1.51	.245	.1	66.	7.7	13.99	3.68	17.67	56.5	19.8	40.8
	2.0	1.0	9.22	1.78	3.76	.85	.455	.1	169.	11.9	6.23	3.27	9.50	76.5	35.8	73.8
	2.0	1.5	9.18	1.60	2.56	1.18	.362	.1	115.	9.6	8.59	3.36	11.95	59.4	27.8	57.2
	2.0	2.0	9.16	1.51	1.94	1.36	.330	.1	87.	8.6	10.91	3.49	14.40	50.0	23.4	48.2
	2.5	1.0	9.29	2.09	5.73	.37	.559	.1	257.	12.5	4.39	3.34	7.73	82.6	48.3	99.6
	2.5	1.5	9.23	1.80	3.91	.81	.465	.1	176.	11.2	6.04	3.27	9.31	62.9	36.7	75.7
	2.5	2.0	9.20	1.66	2.98	1.06	.398	.1	133.	10.2	7.56	3.31	10.88	52.4	30.6	63.1

TABLE A6

PELLET-FUELING MODEL, PW = 6.0 MW/SQ.M. , KAPPA = 2.0 AND VB = 500.0 KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	SP 10^{11}	SA 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.25	5.60	11.97	1.70	.533	1.0	78.	37.0	37.43	22.03	59.46	42.4	45.0	221.3
	2.0	1.5	9.28	5.32	14.03	1.26	.542	1.0	91.	38.8	33.10	22.02	55.12	35.7	50.5	225.8
	2.0	2.0	9.24	4.81	10.72	2.61	.475	1.0	70.	35.8	40.41	22.11	62.92	29.4	41.6	186.2
	2.5	2.0	9.31	5.64	16.25	.72	.578	1.0	106.	40.4	29.51	22.16	51.67	31.8	56.4	252.2
25.0	2.5	1.0	9.19	3.55	6.54	2.17	.407	.1	86.	16.3	32.09	15.47	47.56	52.2	63.5	182.0
	1.5	1.5	9.34	4.83	14.69	.21	.607	1.0	148.	41.6	18.12	13.74	31.86	49.4	36.1	103.4
	1.5	2.0	9.29	4.28	11.27	.97	.542	1.0	113.	38.8	21.44	13.82	35.66	40.4	29.5	84.5
50.0	1.5	1.0	9.18	2.74	4.46	2.02	.363	.1	67.	9.6	25.19	9.85	35.44	66.4	33.4	77.9
	2.0	1.0	9.25	3.23	7.60	1.16	.496	.1	116.	11.6	16.38	9.54	25.62	71.8	48.1	112.3
	2.0	1.5	9.20	2.86	5.18	1.80	.401	.1	79.	10.2	21.99	9.69	31.68	55.3	37.1	86.5
	2.0	2.0	9.17	2.67	3.93	2.15	.337	.1	60.	9.2	27.73	9.99	37.72	46.4	31.1	72.6
	2.5	1.0	9.32	3.85	11.54	.25	.599	.1	176.	13.0	11.33	9.89	21.22	78.2	65.5	152.8
	2.5	1.5	9.25	3.28	7.90	1.38	.506	.1	121.	11.7	15.59	9.55	25.14	59.0	49.4	115.4
	2.5	2.0	9.21	2.99	6.02	1.56	.438	.1	92.	10.8	19.42	9.59	29.61	48.9	41.0	95.6

TABLE A7

PELLET-FUELING MODEL, PW = 1.0 MW/SQ.M. , KAPPA = 3.5 AND VB = 200.0 KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FR	CT	TAU SEC	T/TB	SP 10^{11}	SA 10^{11}	SI 10^{11}	I MA	WT KG	WMAX KG
12.5	2.5	1.0	8.98	.87	.64	1.65	.181	.1	71.	8.7	5.66	3.77	9.43	56.0	22.0	49.9
	1.5	1.0	9.12	1.09	2.17	.59	.431	1.0	243.	45.0	1.02	2.95	3.97	63.3	14.8	33.5
	1.5	1.5	9.07	.99	1.48	.78	.340	1.0	166.	39.2	1.95	3.08	5.03	49.3	11.5	26.1
	1.5	2.0	9.04	.94	1.13	.89	.281	1.0	126.	35.1	2.46	3.23	6.09	41.6	9.7	22.0
	2.0	1.0	9.23	1.33	3.76	.21	.564	1.0	416.	53.0	.16	2.87	3.03	69.7	21.7	49.2
	2.0	1.5	9.15	1.15	2.55	.49	.470	1.0	245.	47.5	.73	2.91	3.64	53.0	16.5	37.4
	2.0	2.0	9.10	1.06	1.94	.65	.404	1.0	218.	43.3	1.25	2.98	4.23	44.1	13.7	31.1
	2.5	1.5	9.24	1.35	3.85	.18	.573	1.0	431.	53.5	.11	2.87	2.98	57.4	22.3	50.6
	2.5	2.0	9.18	1.21	2.95	.39	.507	1.0	331.	49.7	.49	2.99	3.37	47.1	18.3	41.5
25.0	1.5	1.0	8.98	.71	.46	.89	.159	.1	74.	8.1	4.66	2.67	7.34	73.1	12.0	24.2
	2.0	1.0	9.02	.75	.79	.78	.249	.1	129.	17.4	2.39	2.31	4.69	75.4	16.5	33.3
	2.0	1.5	8.99	.72	.54	.87	.183	.1	87.	8.8	3.85	2.54	6.46	60.1	13.1	26.5
	2.0	2.0	8.97	.70	.41	.91	.145	.1	66.	7.7	5.31	2.78	8.09	51.4	11.2	22.7
	2.5	1.0	9.06	.82	1.22	.65	.338	.1	199.	12.4	1.30	2.16	3.46	78.3	21.4	43.2
	2.5	1.5	9.02	.76	.83	.77	.257	.1	134.	10.6	2.27	2.29	4.56	61.7	16.9	34.1
	2.5	2.0	9.00	.73	.63	.84	.207	.1	132.	9.4	3.21	2.44	5.65	52.5	14.3	29.6
	1.5	1.5	9.21	1.05	2.75	.25	.537	1.0	451.	51.4	.24	1.94	2.38	72.3	11.8	23.9
	1.5	2.0	9.15	.95	2.11	.40	.470	1.0	345.	47.5	.51	1.97	2.49	59.7	9.8	19.7
	2.0	2.0	9.27	1.18	3.58	.06	.601	1.0	587.	55.1	.93	1.91	1.95	66.3	14.5	23.3
50.0	1.5	1.0	9.05	.66	.87	.58	.304	.1	235.	11.6	1.16	1.50	2.66	100.3	11.5	21.7
	1.5	1.5	9.01	.62	.59	.67	.228	.1	138.	9.9	1.92	1.62	3.54	79.4	9.1	17.2
	1.5	2.0	8.99	.60	.45	.72	.183	.1	134.	8.7	2.67	1.75	4.42	67.7	7.8	14.6
	2.0	1.0	9.12	.75	1.49	.40	.431	.1	354.	14.2	.48	1.40	1.88	107.0	16.3	33.8
	2.0	1.5	9.07	.68	1.02	.54	.340	.1	241.	12.4	.92	1.46	2.38	83.2	12.7	24.0
	2.0	2.0	9.04	.64	.77	.61	.281	.1	183.	11.1	1.35	1.53	2.88	70.2	10.7	20.2
	2.5	1.0	9.20	.87	2.26	.21	.534	.1	537.	16.2	.13	1.38	1.51	115.0	21.9	41.4
	2.5	1.5	9.13	.76	1.55	.39	.440	.1	368.	14.4	.44	1.40	1.84	87.9	16.8	31.7
	2.5	2.0	9.09	.70	1.18	.49	.374	.1	280.	13.1	.72	1.43	2.16	73.3	14.0	26.4

TABLE A8

PELLET-FUELING MODEL, PW = 3.0 MW/SQ.M. , KAPPA = 3.0 AND VB = 200.0 KEV.

PT GW	Q	HQ	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	BT KG	PMAX KG
12.5	1.5	1.0	9.17	2.81	6.68	.99	.496	1.0	134.	49.1	3.15	16.09	19.24	57.1	23.8	77.2
	1.5	1.5	9.10	2.49	4.58	1.54	.402	1.0	92.	43.3	7.10	16.62	23.72	44.0	18.3	59.5
	1.5	2.0	9.06	2.33	3.49	1.86	.339	1.0	70.	39.1	10.36	17.22	28.14	36.9	15.3	49.8
	2.0	1.5	9.20	2.99	7.82	.71	.535	1.0	157.	51.4	1.86	15.97	17.83	48.1	26.6	86.6
	2.0	2.0	9.15	2.71	5.99	1.16	.469	1.0	120.	47.4	4.16	16.21	20.37	39.7	22.0	71.5
	2.5	2.0	9.24	3.19	9.04	.43	.572	1.0	182.	53.4	.78	15.92	16.70	42.9	29.7	96.7
25.0	2.0	1.0	9.04	1.86	2.46	1.65	.305	.1	72.	11.6	9.14	12.10	21.24	67.1	25.7	64.4
	2.5	1.0	9.09	2.05	3.75	1.27	.402	.1	111.	13.7	4.56	11.55	16.11	70.3	33.8	84.4
	2.5	1.5	9.05	1.87	2.55	1.62	.313	.1	75.	11.8	8.64	12.33	20.67	55.0	26.4	65.9
	2.5	2.0	9.02	1.79	1.94	1.82	.257	.1	57.	10.5	12.63	12.62	25.22	46.5	22.3	55.8
	1.5	1.5	9.27	2.78	8.40	.15	.601	1.0	249.	55.1	.22	10.55	10.77	66.6	19.2	47.9
	1.5	2.0	9.21	2.47	6.46	.58	.537	1.0	191.	51.4	1.38	10.68	12.06	54.4	15.7	39.2
50.0	1.5	1.0	9.08	1.62	2.63	1.18	.364	.1	115.	12.9	4.23	7.79	12.02	89.6	18.0	38.7
	1.5	1.5	9.04	1.50	1.79	1.43	.280	.1	78.	11.1	7.37	8.28	15.65	70.4	14.2	30.4
	1.5	2.0	9.01	1.43	1.36	1.57	.227	.1	59.	9.9	10.47	8.80	19.27	59.7	12.0	25.8
	2.0	1.0	9.17	1.91	4.52	.67	.496	.1	198.	15.5	1.39	7.43	8.82	97.0	26.0	55.9
	2.0	1.5	9.10	1.69	3.09	1.05	.402	.1	135.	13.7	3.24	7.64	10.88	74.7	20.0	43.0
	2.0	2.0	9.06	1.58	2.30	1.26	.338	.1	163.	12.4	5.02	7.91	12.93	62.6	16.8	36.1
	2.5	1.5	9.17	1.93	4.69	.63	.505	.1	205.	15.7	1.24	7.42	8.66	79.7	26.7	57.5
	2.5	2.0	9.13	1.76	3.59	.91	.439	.1	157.	14.4	2.44	7.54	9.98	66.0	22.2	47.6

TABLE A9

PELLET-FUELING MODEL, PW = 6.0 MW/SQ.M., KAPPA = 3.0 AND VB = 200.0 KEV.

PT GW	C	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FR	CT	TAU SEC	T/TR	SP 10^{11}	SA 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.21	5.30	14.01	1.18	.541	1.0	91.	51.7	5.36	48.94	54.30	53.9	32.6	192.3
	1.5	1.5	9.13	4.61	9.62	2.27	.447	1.0	63.	46.1	15.56	50.14	65.70	41.1	24.9	146.9
	2.0	1.5	9.24	5.67	16.37	.64	.579	1.0	107.	53.9	1.95	48.75	50.70	45.5	36.7	216.5
	2.0	2.0	9.18	5.07	12.57	1.52	.514	1.0	42.	50.1	7.98	49.18	57.16	37.3	30.1	177.5
25.0	2.5	1.0	9.12	3.70	7.63	1.88	.441	.1	76.	14.5	9.64	33.69	43.33	65.6	45.4	147.7
	1.5	2.0	9.24	4.55	13.02	.56	.576	1.0	131.	53.7	1.94	31.28	33.21	51.3	21.3	69.3
50.0	1.5	1.0	9.10	2.90	5.34	1.79	.404	.1	79.	13.7	9.45	22.45	31.90	83.7	24.1	60.2
	2.0	1.0	9.20	3.48	9.13	.82	.537	.1	136.	16.3	2.33	21.67	24.00	91.4	35.1	87.9
	2.0	1.5	9.13	3.64	6.26	1.53	.443	.1	93.	14.5	6.98	22.12	29.10	69.9	26.8	67.1
	2.0	2.0	9.09	2.82	4.78	1.94	.377	.1	71.	13.2	11.41	22.74	34.15	58.3	22.4	56.0
	2.5	1.5	9.21	3.54	9.46	.74	.546	.1	141.	16.4	1.93	21.66	23.59	75.2	36.1	90.3
	2.5	2.0	9.15	3.19	7.26	1.27	.480	.1	108.	15.2	4.98	21.88	26.86	62.0	29.8	74.4

TABLE A10

PELLET-FUELING MODEL, PW = 1.0 MW/SQ.M. , KAPPA = 3.0 AND VB = 500.0 KEV.

PT GW	Q	HO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FD	CT	TAU SEC	T/TC	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	2.5	1.0	9.14	.86	.61	1.05	.176	.1	69.	8.5	8.07	1.65	9.72	56.9	22.1	50.1
	1.5	1.0	9.22	1.48	2.09	.60	.425	1.0	238.	44.6	2.75	1.27	4.02	63.2	14.8	33.5
	1.5	1.5	9.18	.98	1.42	.80	.334	1.0	161.	38.6	3.78	1.33	5.12	49.3	11.5	26.1
	1.5	2.0	9.16	.93	1.08	.90	.275	1.0	122.	34.5	4.41	1.40	6.21	41.6	9.7	22.0
	2.0	1.0	9.30	1.31	3.59	.23	.559	1.0	408.	52.7	1.82	1.24	3.06	69.5	21.0	49.0
	2.0	1.5	9.24	1.13	2.46	.51	.465	1.0	280.	47.6	2.42	1.25	3.68	52.9	16.5	37.7
	2.0	2.0	9.20	1.04	1.87	.67	.399	1.0	213.	42.8	3.31	1.29	4.29	44.0	13.7	31.1
	2.5	1.5	9.31	1.23	3.73	.26	.569	1.0	424.	53.2	1.77	1.24	3.00	57.2	22.2	50.4
	2.5	2.0	9.26	1.20	2.85	.41	.592	1.0	324.	49.3	2.16	1.24	3.40	47.0	18.3	41.4
25.0	1.5	1.0	9.14	.76	.43	.89	.154	.1	71.	7.9	6.41	1.17	7.58	73.4	12.0	24.3
	2.0	1.0	9.15	.75	.76	.79	.244	.1	125.	10.2	3.90	1.06	4.87	75.6	16.5	33.4
	2.0	1.5	9.14	.71	.51	.87	.178	.1	84.	8.5	5.48	1.11	6.59	66.4	13.2	26.7
	2.0	2.0	9.14	.70	.38	.91	.140	.1	63.	7.5	7.15	1.22	8.37	51.7	11.3	22.8
	2.5	1.0	9.17	.81	1.17	.66	.332	.1	183.	12.2	2.59	.93	3.52	78.4	21.4	43.2
	2.5	1.5	9.15	.75	.79	.78	.251	.1	130.	10.4	3.67	.99	4.66	61.9	16.9	34.2
	2.5	2.0	9.14	.73	.62	.84	.202	.1	98.	9.2	4.74	1.06	5.80	52.7	14.4	29.1
	1.5	1.5	9.29	1.04	2.66	.26	.532	1.0	443.	51.1	1.36	.83	2.20	72.1	11.8	23.9
	1.5	2.0	9.24	.94	2.04	.42	.465	1.0	338.	47.1	1.66	.85	2.51	59.5	9.8	19.7
	2.0	2.0	9.34	1.16	3.47	.08	.598	1.0	578.	54.9	1.13	.82	1.96	66.1	14.4	29.2
50.0	1.5	1.0	9.17	.65	.82	.59	.298	.1	159.	11.4	2.06	.65	2.71	100.4	11.5	21.7
	1.5	1.5	9.15	.61	.56	.68	.222	.1	134.	9.7	2.93	.71	3.63	79.7	9.1	17.2
	1.5	2.0	9.14	.59	.42	.72	.177	.1	111.	8.5	3.79	.76	4.56	68.0	7.8	14.7
	2.0	1.0	9.21	.74	1.44	.42	.425	.1	346.	14.1	1.30	.60	1.90	146.9	16.3	30.8
	2.0	1.5	9.18	.67	.98	.55	.334	.1	235.	12.2	1.79	.63	2.42	83.3	12.7	24.0
	2.0	2.0	9.16	.64	.74	.62	.275	.1	177.	10.9	2.27	.66	2.94	70.3	10.7	20.3
	2.5	1.0	9.28	.86	2.19	.22	.529	.1	527.	16.1	.93	.59	1.52	114.6	21.9	41.3
	2.5	1.5	9.22	.75	1.49	.40	.434	.1	360.	14.3	1.26	.60	1.86	87.7	16.7	31.6
	2.5	2.0	9.19	.70	1.14	.50	.369	.1	273.	12.9	1.57	.62	2.19	73.3	14.0	26.4

TABLE A11

PELLET-FUELING MODEL, PW = 3.0 MW/SQ.M. , KAPPA = 3.0 AND VA = 500.0 KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CI	TAU SEC	T/TA	SP 10^{11}	SA 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.25	2.78	6.46	1.03	.491	1.0	131.	48.7	12.49	6.94	19.43	57.0	23.7	77.1
	1.5	1.5	9.20	2.47	4.41	1.58	.397	1.0	90.	42.8	16.48	7.18	24.06	44.0	18.3	59.4
	1.5	2.0	9.18	2.31	3.35	1.88	.333	1.0	68.	38.5	21.22	7.45	28.67	36.9	15.3	49.9
	2.0	1.0	9.36	3.53	11.01	.06	.622	1.0	224.	56.3	3.97	6.88	15.35	63.7	35.3	114.9
	2.0	1.5	9.28	2.95	7.57	.76	.531	1.0	154.	51.3	11.10	6.88	17.98	47.9	26.6	86.4
	2.0	2.0	9.24	2.67	5.79	1.21	.464	1.0	118.	47.0	13.60	6.99	20.59	53.6	21.9	71.3
	2.5	2.0	9.31	3.14	8.77	.49	.567	1.0	179.	53.2	9.37	6.46	16.43	42.8	29.6	96.3
25.0	2.0	1.0	9.16	1.84	2.35	1.67	.299	.1	76.	11.4	16.42	5.24	21.66	67.1	25.8	64.5
	2.5	1.0	9.19	2.03	3.61	1.30	.396	.1	108.	13.5	11.35	4.99	16.34	70.3	33.7	84.3
	2.5	1.5	9.16	1.86	2.45	1.64	.307	.1	73.	11.6	15.46	5.21	21.07	55.0	26.4	66.0
	2.5	2.0	9.15	1.77	1.85	1.83	.251	.1	55.	10.4	20.32	5.48	25.80	46.6	22.4	55.9
	1.5	1.5	9.34	2.74	8.16	.19	.597	1.0	245.	54.9	6.29	4.54	10.83	66.3	19.1	47.7
	1.5	2.0	9.28	2.43	6.26	.62	.512	1.0	188.	51.1	7.56	4.60	12.16	54.2	15.6	39.1
50.0	1.5	1.0	9.19	1.60	2.53	1.20	.358	.1	112.	12.7	8.84	3.37	12.21	89.6	18.0	38.7
	1.5	1.5	9.16	1.48	1.71	1.44	.274	.1	76.	10.9	12.39	3.59	15.98	70.5	14.2	30.5
	1.5	2.0	9.15	1.42	1.29	1.58	.221	.1	57.	9.7	15.93	3.83	19.76	59.9	12.1	25.9
	2.0	1.0	9.25	1.88	4.37	.70	.491	.1	194.	15.4	5.71	3.20	8.91	96.8	26.0	55.8
	2.0	1.5	9.20	1.67	2.98	1.07	.396	.1	132.	13.5	7.73	3.30	11.03	74.6	20.0	43.0
	2.0	2.0	9.18	1.56	2.26	1.28	.333	.1	100.	12.2	9.73	3.42	13.15	62.6	16.8	36.1
	2.5	1.0	9.33	2.24	6.62	.18	.594	.1	294.	17.3	4.17	3.20	7.37	135.2	35.3	75.8
	2.5	1.5	9.26	1.91	4.54	.66	.541	.1	212.	15.6	5.54	3.20	8.74	79.5	26.7	57.3
	2.5	2.0	9.22	1.74	3.46	.94	.433	.1	154.	14.3	6.85	3.25	10.10	65.9	22.1	47.5

Table A12

PELLET-FUELING MODEL, PW = 6.0 MW/SQ.M. , KAPPA = 3.0 AND VA = 500.0 KEV.

PT GW	Q	QO	TE KEV	NF 10^{14}	NA 10^{13}	NI 10^{12}	FR	CT	TAU SEC.	T/TB	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.28	5.22	13.57	1.27	.537	1.0	96.	51.4	33.66	21.09	54.75	53.7	32.5	191.7
	1.5	1.5	9.22	4.56	9.29	2.34	.442	1.0	61.	45.6	44.35	21.63	66.48	41.1	24.9	146.7
	2.0	1.5	9.31	5.59	15.88	.74	.575	1.0	105.	53.0	35.06	20.99	51.15	45.3	36.6	215.7
	2.0	2.0	9.26	5.00	12.16	1.61	.509	1.0	81.	49.7	36.49	21.25	57.69	37.2	30.0	177.1
	2.5	2.0	9.34	5.99	18.38	.20	.610	1.0	122.	55.6	27.12	20.99	48.11	40.6	40.9	241.4
25.0	2.5	1.0	9.21	3.66	7.33	1.94	.436	.1	74.	14.7	29.33	14.54	43.87	65.5	45.4	147.5
	1.5	2.0	9.31	4.48	12.64	.64	.572	1.0	128.	53.4	19.98	13.47	33.45	51.1	21.2	69.9
50.0	1.5	1.0	9.26	2.87	5.15	1.83	.398	.1	78.	13.6	22.66	9.70	32.36	83.6	24.1	60.2
	2.0	1.0	9.28	3.44	8.84	.88	.552	.1	133.	16.2	14.86	9.34	24.20	91.2	35.0	87.5
	2.0	1.5	9.22	3.01	6.04	1.58	.438	.1	91.	14.3	19.91	9.54	29.45	69.8	26.8	67.6
	2.0	2.0	9.19	2.79	4.61	1.98	.371	.1	69.	13.0	24.85	9.83	34.68	58.3	22.4	56.0
	2.5	1.5	9.29	3.49	9.18	.79	.542	.1	139.	16.3	14.45	9.33	23.78	75.0	36.0	99.0
	2.5	2.0	9.24	3.15	7.02	1.33	.475	.1	136.	15.1	17.71	9.44	27.15	61.8	29.7	74.2

Table A13

BEAM-FUELING MODEL, PW = 1.0 MW/SQ.M. , KAPPA = 2.0

PT GW	Q	RO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CI	TAU SEC	T/TB	SB 10^{11}	VB KEV	I MA	BT KG	BMAX KG
12.5	2.5	1.0	9.01	.86	[illegible]	1.16	.158	.1	61.	[illegible]	10.57	47.1	45.7	31.0	66.8
	1.5	1.0	9.08	1.05	1.91	.65	.396	1.0	213.	32.1	4.26	127.0	56.4	20.5	44.1
	1.5	1.5	9.04	.96	1.42	.83	.308	1.0	144.	27.7	5.49	95.2	39.4	16.0	34.5
	1.5	2.0	9.02	.92	1.61	.92	.252	1.0	119.	24.6	6.72	75.5	33.4	13.6	29.2
	2.0	1.0	9.38	1.25	3.23	.32	.524	1.0	364.	38.3	3.19	181.6	54.9	29.8	64.2
	2.0	1.5	9.11	1.10	2.23	.57	.435	1.0	249.	34.0	3.39	141.8	42.0	22.8	49.1
	2.0	2.0	9.07	1.02	1.72	.71	.370	1.0	136.	30.4	4.57	117.2	35.1	19.1	41.1
	2.5	1.5	9.19	1.27	3.35	.29	.539	1.0	378.	38.7	3.14	186.1	45.2	32.6	66.0
	2.5	2.0	9.14	1.15	2.58	.48	.472	1.0	299.	45.7	3.58	156.5	37.3	25.3	54.4
25.0	1.5	1.0	9.65	.79	.43	.89	.138	.1	63.	5.0	4.46	37.6	59.4	16.8	33.0
	2.0	1.0	9.01	.74	.72	.80	.223	.1	112.	7.3	5.18	67.8	60.9	23.0	45.1
	2.0	1.5	9.03	.71	.50	.87	.160	.1	75.	6.1	7.21	45.2	48.8	18.4	36.1
	2.5	1.0	9.02	.79	1.09	.68	.308	.1	174.	8.8	3.75	100.8	63.6	29.7	58.3
	2.5	1.5	9.01	.74	.75	.79	.230	.1	117.	7.4	5.12	75.4	49.9	23.5	46.2
	2.5	2.0	9.02	.72	.58	.85	.183	.1	88.	6.5	6.31	53.3	42.5	22.0	39.4
	1.5	1.0	9.26	1.16	3.46	.08	.595	1.0	575.	41.1	1.94	196.5	75.9	21.4	42.1
	1.5	1.5	9.17	.99	2.41	.32	.503	1.0	337.	37.1	2.29	162.5	57.4	16.2	31.9
	1.5	2.0	9.12	.91	1.85	.47	.437	1.0	313.	34.3	2.64	138.6	47.6	13.4	26.4
	2.0	2.0	9.23	1.10	3.12	.16	.569	1.0	517.	45.0	2.03	187.7	52.4	19.7	38.8
50.0	1.5	1.0	9.03	.64	.77	.61	.273	.1	177.	8.2	2.31	83.4	80.2	16.1	29.6
	1.5	1.5	9.02	.63	.53	.68	.201	.1	119.	6.9	3.96	58.4	63.8	12.8	23.6
	1.5	2.0	9.04	.59	.41	.72	.158	.1	89.	6.0	5.02	43.9	54.5	11.9	23.2
	2.0	1.0	9.08	.72	1.36	.45	.395	.1	338.	10.1	2.31	128.6	84.9	22.7	41.8
	2.0	1.5	9.04	.66	.98	.57	.307	.1	209.	8.7	2.59	95.5	66.4	17.0	32.7
	2.0	2.0	9.02	.63	.69	.63	.251	.1	158.	7.8	3.17	75.6	56.2	15.1	27.7
	2.5	1.0	9.15	.82	1.96	.28	.499	.1	409.	11.7	1.59	173.4	90.5	30.3	55.7
	2.5	1.5	9.69	.72	1.35	.44	.405	.1	321.	10.3	1.36	132.2	64.6	23.3	42.9
	2.5	2.0	9.05	.68	1.04	.53	.340	.1	243.	9.3	2.33	107.8	58.4	19.5	36.0

TABLE A14

STAR-FUELING MODEL, PW = 3. MW/SQ.M. , KAPPA = 2.0

PT	Q	IG	TE	NE	NA	NI	FR	CT	TAU	T/TC	SB	VB	I	BT	BMAX
GW			KEV	10^{14}	10^{13}	10^{12}			SEC		10^{11}	KEV	MA	KG	KG
12.5	1.5	1.0	9.15	2.74	6.04	1.16	.464	1.0	119.	55.5	26.71	152.9	45.6	33.3	95.7
	1.5	1.5	9.07	2.43	4.2	1.67	.375	1.0	91.	51.1	25.94	114.4	35.3	25.7	73.8
	1.5	2.0	9.64	2.31	3.25	1.36	.313	1.0	62.	27.9	31.98	96.5	29.6	21.6	62.0
	2.0	1.0	9.25	3.33	15.25	.19	.607	1.6	232.	41.3	16.17	212.5	50.6	49.2	141.1
	2.0	1.5	9.17	2.83	7.1	.41	.538	1.6	139.	37.3	19.10	168.8	38.2	37.2	106.6
	2.0	2.0	9.11	2.64	5.47	1.32	.441	1.0	106.	34.2	22.30	142.5	31.7	30.8	89.3
	2.5	1.5	9.26	3.45	10.61	.11	.668	1.6	210.	41.7	15.33	217.7	41.7	53.7	145.2
	2.5	2.0	9.20	3.06	8.13	.05	.544	1.0	161.	33.9	17.32	184.7	34.0	41.4	118.7
25.0	2.0	1.0	9.02	1.33	2.17	1.72	.272	.1	62.	8.2	23.14	85.4	57.6	35.9	83.8
	2.0	1.6	9.05	1.96	3.27	1.39	.366	.1	96.	9.7	17.36	121.2	55.8	46.8	109.1
	2.5	1.5	9.62	1.82	2.25	1.76	.289	.1	65.	8.3	22.67	88.4	43.9	36.4	85.8
	1.5	1.5	9.23	2.57	7.19	.39	.565	1.9	216.	34.8	11.34	184.7	52.0	26.1	61.0
	1.5	2.0	9.17	2.31	5.55	.75	.449	1.0	166.	36.9	12.73	163.3	42.8	21.5	50.2
50.0	1.5	1.0	9.55	1.57	2.33	1.26	.331	.1	100.	9.1	13.17	123.6	71.6	25.1	51.7
	1.5	1.5	9.02	1.46	1.61	1.48	.263	.1	67.	7.8	17.33	75.1	56.5	19.8	43.8
	2.0	1.0	9.12	1.81	3.95	.81	.461	.1	173.	11.1	9.19	153.1	76.8	35.9	74.0
	2.0	1.5	9.07	1.63	2.73	1.14	.368	.1	118.	9.7	11.76	117.1	59.5	27.8	57.3
	2.0	2.0	9.04	1.53	2.19	1.37	.326	.1	99.	8.7	14.12	94.8	50.1	23.4	48.2
	2.5	1.0	9.21	2.12	5.52	.53	.564	.1	262.	12.6	7.67	202.6	82.9	48.5	99.8
	2.5	1.5	9.13	1.83	4.10	.77	.470	.1	186.	11.3	9.20	157.1	63.1	36.9	76.0
	2.5	2.0	9.09	1.69	3.15	1.02	.404	.1	137.	10.3	10.71	137.4	52.5	30.7	63.2

TABLE A15

BEAM-FUELLING MODEL, PH = 6.0 MW/SQ.M. , KAPPA = 2.0

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FP	CI	TAU SEC	T/TB	SB 10^{11}	VB KEV	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.17	5.44	12.47	1.59	.508	1.0	79.	37.3	58.46	167.7	42.5	45.2	262.0
	2.0	1.5	9.20	5.41	14.53	1.10	.547	1.0	93.	39.0	54.66	184.1	35.8	[illegible]	226.7
	2.0	2.0	9.14	4.89	[illegible]	1.91	.480	1.0	71.	36.5	62.21	156.9	29.5	41.8	186.9
	2.5	2.0	9.24	5.76	16.76	.63	.583	1.0	137.	40.6	51.10	201.7	32.0	56.6	253.1
25.0	2.5	1.0	9.07	3.61	6.91	2.04	.413	.1	67.	13.4	46.84	142.3	52.3	63.7	182.5
	1.5	1.5	9.28	4.90	15.12	.13	.611	1.0	150.	41.7	31.07	201.8	44.6	36.3	163.8
	1.5	2.0	9.21	4.35	11.68	.88	.547	1.0	115.	39.4	35.37	177.3	40.6	29.6	84.8
50.0	1.5	1.0	9.07	2.79	4.69	1.95	.369	.1	63.	9.7	34.45	116.9	65.6	33.5	78.1
	2.0	1.0	9.16	3.28	7.95	1.09	.561	.1	139.	11.7	25.36	168.9	72.1	48.3	112.7
	2.0	1.5	9.09	2.91	5.48	1.73	.407	.1	81.	16.3	31.21	131.1	55.5	37.2	86.7
	2.0	2.0	9.05	2.72	4.21	2.09	.343	.1	62.	9.3	37.65	107.6	46.5	31.1	72.7
	2.5	1.0	9.25	3.91	11.86	.19	.603	.1	179.	13.1	21.09	222.0	78.4	65.7	153.3
	2.5	1.5	9.16	3.33	8.23	1.62	.511	.1	123.	11.8	24.89	174.1	59.2	49.6	115.8
	2.5	2.0	9.11	3.64	6.33	1.50	.444	.1	94.	10.9	28.64	165.1	49.1	41.1	95.9

TABLE A16

BEAM-FUELLING MODEL, PW = 1.0 MW/SQ.M. , KAPPA = 4.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FP	CI	TAU SEC	T/TB	SB 10^{11}	VB KEV	I MA	BT KG	BMAX KG
12.5	2.5	1.0	9.02	.87	.69	1.13	.179	.1	70.	8.0	9.52	52.5	56.8	22.1	50.1
	1.5	1.0	9.11	1.10	2.21	.58	.431	1.0	244.	45.3	3.97	137.0	63.4	14.8	33.6
	1.5	1.5	9.06	.99	1.52	.77	.340	1.0	166.	39.1	5.13	175.3	49.4	11.6	26.1
	1.5	2.0	9.03	.94	1.17	.88	.281	1.0	126.	35.0	6.09	84.9	41.7	9.7	22.0
	2.0	1.0	9.23	1.33	3.71	.21	.564	1.0	416.	53.3	3.13	187.1	69.7	21.7	49.2
	2.0	1.5	9.14	1.15	2.56	.48	.475	1.0	286.	47.4	3.63	151.2	53.1	16.5	37.4
	2.0	2.0	9.10	1.05	1.98	.64	.404	1.0	218.	43.3	4.23	127.5	44.2	13.7	31.2
	2.5	1.5	9.23	1.35	3.85	.18	.573	1.0	431.	53.5	2.38	190.9	57.4	22.3	50.6
	2.5	2.0	9.17	1.21	2.97	.38	.507	1.0	331.	49.7	3.37	164.8	47.2	18.3	41.6
25.0	1.5	1.0	9.04	.71	.49	.88	.157	.1	72.	8.9	7.46	43.5	73.4	12.0	24.3
	2.0	1.0	9.02	.76	.83	.77	.249	.1	129.	15.3	4.70	75.2	75.6	16.5	33.4
	2.0	1.5	9.03	.72	.57	.85	.181	.1	86.	8.6	6.46	51.7	60.3	13.2	26.6
	2.0	2.0	9.05	.71	.44	.89	.142	.1	64.	7.6	8.26	38.3	51.7	11.3	22.8
	2.5	1.0	9.05	.82	1.25	.64	.338	.1	199.	12.3	3.46	107.7	78.5	21.4	43.3
	2.5	1.5	9.02	.76	.86	.76	.256	.1	134.	10.5	4.56	77.9	61.9	16.9	34.2
	2.5	2.0	9.02	.74	.66	.82	.206	.1	101.	9.3	5.68	60.3	52.7	14.4	29.1
	1.5	1.5	9.20	1.05	2.77	.24	.537	1.0	451.	51.4	2.18	172.6	72.4	11.9	24.0
	1.5	2.0	9.15	.95	2.13	.40	.471	1.0	346.	47.4	2.48	149.4	59.7	9.8	19.8
	2.0	2.0	9.27	1.18	3.58	.06	.601	1.0	587.	55.1	1.95	196.0	66.3	14.5	29.3
50.0	1.5	1.0	9.04	.66	.90	.58	.304	.1	205.	11.6	2.66	93.2	100.6	11.5	21.7
	1.5	1.5	9.02	.62	.62	.66	.227	.1	138.	9.8	3.55	66.9	79.7	9.1	17.2
	1.5	2.0	9.03	.60	.48	.71	.181	.1	103.	8.6	4.47	51.2	68.0	7.8	14.7
	2.0	1.0	9.11	.75	1.52	.40	.431	.1	354.	14.2	1.87	138.0	107.2	16.4	30.9
	2.0	1.5	9.06	.69	1.05	.53	.340	.1	241.	12.4	2.38	165.6	83.4	12.7	24.0
	2.0	2.0	9.03	.65	.80	.60	.280	.1	182.	11.1	2.88	85.1	70.4	10.7	20.3
	2.5	1.0	9.19	.87	2.27	.21	.534	.1	537.	16.2	1.51	174.2	115.0	22.0	41.4
	2.5	1.5	9.12	.76	1.57	.38	.440	.1	368.	14.4	1.83	141.5	88.0	16.8	31.7
	2.5	2.0	9.08	.71	1.21	.48	.375	.1	281.	13.1	2.16	117.8	73.5	14.5	26.5

TABLE A17

BEAM-FUELING MODEL, PH = 3.0 MW/M3.0 , KAPPA = 3.0

PT	Q	RO	TE	NE	NA	NI	FP	CT	TAU	T/TB	NB	VI	I	BI	BMAX
GW			KEV	10^{14}	10^{13}	10^{12}			SEC		10^{11}	KEV	MA	KG	KG
12.5	1.5	1.0	9.16	2.42	6.76	.37	.436	1.0	134.	49.3	19.23	160.0	57.2	23.8	77.3
	1.5	1.5	9.09	2.51	4.17	1.52	.463	1.0	92.	43.2	23.76	120.8	44.1	18.3	59.6
	1.5	2.0	9.06	2.35	3.59	1.43	.339	1.0	75.	39.	28.16	104.6	37.0	15.4	50.0
	2.0	1.5	9.21	3.00	7.80	.70	.536	1.6	157.	51.3	17.93	174.5	48.1	26.7	86.7
	2.0	2.0	9.14	2.72	6.96	1.15	.464	1.0	126.	47.4	20.35	153.1	39.7	22.0	71.6
	2.5	2.0	9.23	3.10	9.00	.43	.572	1.0	182.	53.4	16.71	184.5	42.9	29.0	96.7
25.0	2.0	1.0	9.04	1.87	2.54	1.03	.395	.1	72.	11.6	21.24	94.6	67.2	25.8	64.5
	2.5	1.0	9.08	2.16	3.83	1.26	.462	.1	111.	13.6	15.19	130.7	76.4	33.6	84.6
	2.5	1.5	9.04	1.89	2.06	1.66	.313	.1	75.	11.8	20.67	97.6	55.1	26.4	66.1
	2.5	2.0	9.02	1.64	2.04	1.79	.256	.1	57.	10.5	25.26	77.4	46.6	22.4	55.9
	1.5	1.5	9.27	2.79	8.47	.14	.601	1.3	249.	55.1	13.76	195.1	66.6	19.2	47.9
	1.5	2.0	9.20	2.47	6.50	.57	.537	1.0	192.	51.4	12.35	172.1	54.5	15.7	38.2
50.0	1.5	1.0	9.07	1.63	2.70	1.16	.764	.1	115.	12.9	12.31	113.8	89.8	19.1	39.8
	1.5	1.5	9.03	1.51	1.86	1.41	.279	.1	78.	11.5	15.66	84.6	76.6	14.2	30.5
	1.5	2.0	9.02	1.45	1.43	1.55	.226	.1	59.	9.8	19.35	66.5	59.9	12.1	25.9
	2.0	1.0	9.16	1.91	4.56	.66	.496	.1	138.	15.5	8.42	161.4	97.1	26.1	56.5
	2.0	1.5	9.07	1.71	3.15	1.37	.402	.1	135.	13.7	10.47	127.2	74.8	20.1	43.1
	2.0	2.0	9.06	1.59	2.42	1.24	.339	.1	103.	12.3	12.32	104.9	62.7	16.8	36.2
	2.5	1.0	9.26	2.27	6.81	.14	.598	.1	209.	17.4	7.32	206.6	105.6	35.4	76.1
	2.5	1.5	9.17	1.94	4.75	.62	.506	.1	216.	15.7	8.65	165.0	79.8	26.8	57.5
	2.5	2.0	9.12	1.77	3.64	.94	.439	.1	157.	14.4	9.97	145.2	66.2	22.2	47.7

TABLE A18

[illegible]A-FUELING MODEL, PW = [illegible] MW/30.M. , KAPPA = [illegible]

PT GW	P	PO	TE KEV	NP 10^{14}	LA 10^{13}	LI 10^{12}	FB	CF	TAU SEC	T/TB	SB 10^{11}	VI KEV	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.20	5.71	14.08	1.16	.541	[illegible]	92.	31.7	54.29	173.9	57.9	32.6	192.5
	1.5	1.5	9.12	4.64	9.76	2.24	.447	1.0	63.	45.0	65.65	142.1	41.2	25.0	147.1
	2.0	1.5	9.24	5.68	16.4	.54	.579	1.0	137.	53.9	54.70	194.6	45.5	36.7	216.5
	2.0	2.0	9.14	[illegible]	12.66	1.50	.514	1.0	82.	56.1	57.14	165.9	37.3	36.1	177.7
	2.5	2.0	9.28	6.38	18.4	.16	.614	1.0	123.	65.8	47.83	204.8	46.7	41.1	242.4
25.0	2.5	1.0	9.11	3.72	7.71	1.65	.442	.1	76.	14.4	45.29	145.6	65.7	45.5	147.9
	1.5	2.0	9.24	4.66	13.66	.55	.576	1.0	151.	53.7	35.21	185.8	51.3	21.3	64.3
51.5	1.5	1.0	9.29	2.93	5.45	1.76	.404	.1	79.	13.7	31.88	127.5	83.8	24.1	66.4
	2.0	1.0	9.24	3.44	9.17	.81	.537	.1	136.	16.3	23.99	170.3	91.5	35.1	87.9
	2.0	1.5	9.12	3.25	6.36	1.51	.443	.1	93.	14.5	29.07	141.3	73.6	26.9	67.2
	2.3	2.0	9.08	2.87	4.89	1.91	.377	.1	71.	13.1	34.12	118.2	58.4	22.4	56.1
	2.5	1.5	9.21	3.55	9.52	.73	.546	.1	141.	16.4	23.58	180.6	75.3	36.1	93.4
	2.5	2.0	9.15	3.23	7.34	1.26	.480	.1	158.	15.2	26.84	154.7	62.1	29.8	74.5

TABLE A19

PELLET-FUELING MOD-1, PW = 1.0 MW/SQ.M. , KAPPA = 2.0 AND VO = 200 KEV.

PT GW	Q	Q0	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	SP 10^{11}	SA 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	8.99	.87	.72	1.02	.20	.367	81.	13.2	4.47	3.58	8.45	46.2	18.8	40.5
	1.5	1.5	9.00	.87	.72	1.02	.20	.551	81.	15.2	4.49	3.56	8.45	37.7	15.7	33.0
	1.5	2.0	9.00	.87	.72	1.02	.20	.735	81.	14.7	4.9	3.55	8.45	32.6	13.2	29.6
	2.0	1.0	8.99	.87	.72	1.02	.20	.206	81.	9.9	4.83	3.67	8.45	46.2	25.0	53.9
	2.0	1.5	8.99	.87	.72	1.02	.20	.309	81.	12.1	4.86	3.59	8.45	37.7	20.4	44.0
	2.0	2.0	8.99	.87	.72	1.02	.20	.413	81.	14.0	4.88	3.57	8.45	32.6	17.7	38.1
	2.5	1.0	8.99	.87	.72	1.02	.20	.132	81.	7.9	4.76	3.69	8.45	46.1	31.3	67.4
	2.5	1.5	8.99	.87	.72	1.02	.20	.198	81.	9.7	4.82	3.67	8.45	37.7	25.6	55.0
	2.5	2.0	8.99	.87	.72	1.02	.20	.264	81.	11.2	4.85	3.61	8.45	32.6	22.1	47.7
25.0	1.5	1.0	9.00	.72	.61	.84	.20	.154	98.	8.5	3.33	2.44	5.77	60.2	17.0	23.5
	1.5	1.5	9.00	.72	.61	.84	.20	.231	98.	10.5	3.34	2.43	5.77	49.2	13.9	27.3
	1.5	2.0	9.00	.72	.6	.84	.20	.308	98.	12.1	3.35	2.43	5.77	42.6	12.0	23.7
	2.0	1.0	8.99	.72	.61	.84	.20	.087	98.	6.4	3.30	2.47	5.77	60.2	22.7	44.6
	2.0	1.5	8.99	.72	.61	.84	.20	.130	98.	7.8	3.33	2.45	5.77	49.2	18.5	36.4
	2.0	2.0	9.10	.72	.61	.84	.20	.173	98.	9.1	3.33	2.44	5.77	42.6	16.1	31.6
	2.5	1.0	8.98	.72	.61	.84	.20	.055	98.	5.1	3.27	2.51	5.77	60.2	28.4	55.8
	2.5	1.5	8.99	.72	.61	.84	.20	.083	99.	6.3	3.30	2.47	5.77	49.2	23.2	45.5
	2.5	2.0	8.99	.72	.61	.84	.20	.111	98.	7.3	3.32	2.45	5.77	42.6	20.1	39.4
50.0	1.5	1.0	9.00	.60	.49	.70	.20	.066	119.	5.6	2.30	1.68	3.97	77.8	15.6	28.8
	1.5	1.5	9.00	.60	.49	.70	.20	.099	119.	6.8	2.30	1.67	3.97	63.5	12.7	23.5
	1.5	2.0	9.00	.60	.49	.70	.20	.131	119.	7.9	2.30	1.67	3.97	55.0	11.1	20.3
	2.0	1.0	8.99	.60	.49	.70	.20	.037	118.	4.2	2.28	1.7	3.97	77.8	20.8	38.3
	2.0	1.5	9.00	.60	.49	.70	.20	.055	118.	5.1	2.29	1.64	3.97	63.5	17.0	31.3
	2.0	2.0	9.00	.60	.49	.70	.20	.074	118.	5.9	2.30	1.69	3.97	55.0	14.7	27.1
	2.5	1.0	8.99	.60	.49	.70	.20	.024	119.	3.3	2.25	1.72	3.97	77.8	26.0	47.9
	2.5	1.5	8.99	.60	.49	.70	.20	.035	119.	4.1	2.28	1.7	3.97	63.5	21.3	39.1
	2.5	2.0	8.99	.60	.49	.70	.20	.047	119.	4.7	2.29	1.69	3.97	55.0	18.4	33.9

TABLE A 20

PELLET-FUELING MODEL, PW = 3.0 MW/SQ.M. , KAPPA = [illegible] AND VQ = 2 [illegible] KEV.

PT	Q	UO	TE	NE	NA	NI	FB	CT	TAU	T/TO	SP	SB	ST	I	WT	WMAX
GW			KEV	10^{14}	10^{13}	10^{12}			SEC		10^{11}	10^{11}	10^{11}	MA	KG	KG
12.5	1.5	1.0	8.99	2.19	1.73	2.44	.20	.2[illegible]	34.	11.3	27.92	20.56	48.48	41.[illegible]	29.2	83.7
	1.5	1.5	8.99	2.19	1.73	2.44	.20	.4[illegible]	34.	13.[illegible]	28.[illegible]	20.45	48.48	32.7	23.9	68.3
	1.5	2.0	8.99	2.19	1.73	2.44	.20	.578	34.	16.[illegible]	28.[illegible]	20.4[illegible]	48.48	28.3	20.7	59.2
	2.0	1.0	8.98	2.19	1.73	2.44	.20	.151	34.	9.5	27.64	20.85	48.48	4[illegible]	39.[illegible]	111.6
	2.0	1.5	8.99	2.19	1.73	2.44	.20	.226	34.	1[illegible].4	27.86	20.62	48.48	32.7	31.8	91.1
	2.0	2.0	8.99	2.19	1.73	2.44	.20	.3[illegible]2	34.	12.	27.96	20.52	48.48	28.7	27.5	78.9
	2.5	1.0	8.98	2.19	1.73	2.44	.20	.096	34.	6.4	27.27	21.25	48.48	4[illegible]	48.7	134.5
	2.5	1.5	8.98	2.19	1.73	2.44	.20	.145	34.	8.3	27.61	20.87	48.48	32.7	39.8	123.9
	2.5	2.0	8.99	2.19	1.73	2.44	.20	.193	34.	9.6	27.78	20.7[illegible]	48.48	28.7	34.4	98.6
25.0	1.5	1.0	8.99	1.70	1.4[illegible]	1.97	.20	.118	42.	7.5	18.30	13.44	31.74	52.[illegible]	20.[illegible]	61.[illegible]
	1.5	1.5	8.99	1.70	1.4[illegible]	1.97	.20	.176	42.	9.1	18.36	13.38	31.74	42.5	21.3	49.8
	1.5	2.0	9.00	1.70	1.4[illegible]	1.97	.20	.235	42.	11.6	18.79	13.35	31.74	36.8	18.5	43.1
	2.0	1.0	8.99	1.70	1.4[illegible]	1.97	.20	.066	42.	5.6	18.14	13.61	31.74	52.0	34.8	81.3
	2.0	1.5	8.99	1.70	1.4[illegible]	1.97	.20	.099	42.	6.9	18.27	13.47	31.74	42.5	28.5	66.4
	2.0	2.0	8.99	1.70	1.4[illegible]	1.97	.20	.132	42.	7.9	18.33	13.42	31.75	30.8	24.6	57.5
	2.5	1.0	8.98	1.70	1.4[illegible]	1.97	.20	.042	42.	4.5	17.91	13.83	31.74	52.0	43.6	1[illegible]1.6
	2.5	1.5	8.99	1.70	1.41	1.97	.20	.063	42.	5.5	18.13	13.61	31.74	42.5	35.6	8[illegible].0
	2.5	2.0	8.99	1.70	1.4[illegible]	1.97	.20	.085	42.	6.3	18.23	13.51	31.74	36.8	3[illegible].9	71.9
50.0	1.5	1.0	8.99	1.40	1.15	1.63	.20	.049	51.	4.8	12.49	9.14	21.63	67.8	23.8	49.[illegible]
	1.5	1.5	9.00	1.40	1.15	1.63	.20	.074	51.	5.9	12.52	9.11	21.63	55.3	19.4	4[illegible].0
	1.5	2.0	9.00	1.40	1.15	1.63	.20	.099	51.	6.8	12.54	9.09	21.63	47.9	16.8	34.6
	2.0	1.0	8.99	1.40	1.15	1.63	.20	.028	51.	3.6	12.79	9.24	21.63	67.8	31.7	65.3
	2.0	1.5	8.99	1.40	1.15	1.63	.20	.042	51.	4.4	12.46	9.16	21.62	55.3	25.9	53.3
	2.0	2.0	8.99	1.40	1.15	1.63	.20	.056	51.	5.1	12.5[illegible]	9.13	21.63	47.9	22.4	46.2
	2.5	1.0	8.98	1.40	1.15	1.63	.20	.018	51.	2.9	12.25	9.38	21.63	67.7	39.6	81.6
	2.5	1.5	8.99	1.40	1.15	1.63	.20	.027	51.	3.6	12.38	9.25	21.63	55.3	32.3	66.6
	2.5	2.0	8.99	1.40	1.15	1.63	.20	.036	51.	4.1	12.44	9.13	21.63	47.9	28.[illegible]	57.7

TABLE A21

PELLET-FUELING MODEL, PW = 6.0 MW/SQ.M. , KAPPA = 2.0 AND VB = 2 [illegible] KEV.

PT GW	Q	RO	TF KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	MT KG	MMAX KG
12.5	1.5	1.0	8.93	3.68	3.03	4.28	.20	.226	19.	1[illegible].4	86.[illegible]2	63.42	149.44	36.3	38.6	172.7
	1.5	1.5	8.93	3.68	3.07	4.28	.20	.34	19.	12.7	86.77	63.09	149.45	29.7	31.5	141.[illegible]
	1.5	2.0	8.94	3.68	3.07	4.28	.20	.453	19.	14.7	86.52	62.92	149.44	25.7	27.3	122.1
	2.0	1.0	8.95	3.68	3.03	4.28	.20	.127	19.	7.9	85.12	64.32	149.44	36.7	51.5	23[illegible].2
	2.0	1.5	8.99	3.68	3.03	4.28	.23	.191	19.	9.5	85.82	63.62	149.44	29.7	42.[illegible]	186.[illegible]
	2.0	2.0	8.99	3.68	3.03	4.28	.20	.255	19.	11.[illegible]	86.14	63.3[illegible]	149.44	25.7	36.4	162.8
	2.5	1.0	8.97	3.68	3.04	4.28	.20	.081	19.	6.7	83.41	65.67	149.44	36.3	64.3	287.7
	2.5	1.5	8.98	3.68	3.03	4.28	.20	.122	19.	7.6	85.[illegible]3	64.41	149.44	29.7	52.6	254.9
	2.5	2.0	8.99	3.68	3.03	4.28	.20	.163	19.	8.9	85.59	63.85	149.44	25.7	45.5	2[illegible]5.5
25.0	1.5	1.0	8.99	2.96	2.44	3.44	.20	.095	24.	6.7	55.72	40.95	96.68	47.6	34.7	19.5
	1.5	1.5	8.99	2.96	2.44	3.44	.20	.143	24.	8.2	55.92	40.77	96.69	38.8	28.4	81.2
	1.5	2.0	8.99	2.96	2.44	3.44	.20	.191	24.	9.5	56.[illegible]1	40.65	96.69	33.6	2[illegible].6	7[illegible].3
	2.0	1.0	8.98	2.96	2.44	3.44	.23	.054	24.	5.	55.21	41.48	96.69	47.5	46.3	132.6
	2.0	1.5	8.99	2.96	2.44	3.44	.23	.08[illegible]	24.	6.2	55.61	41.28	96.63	38.8	37.8	1[illegible]8.5
	2.0	2.0	8.99	2.96	2.44	3.44	.20	.1[illegible]7	24.	7.1	55.79	40.89	96.68	33.6	32.7	93.8
	2.5	1.0	8.99	2.96	2.44	3.44	.20	.034	24.	[illegible]	54.46	42.22	96.68	47.5	57.9	165.8
	2.5	1.5	8.98	2.96	2.44	3.44	.20	.051	24.	4.9	55.16	41.51	96.69	38.8	47.3	175.4
	2.5	2.0	8.99	2.96	2.44	3.44	.20	.069	24.	5.7	55.48	41.21	96.69	33.6	4[illegible].9	117.2
50.0	1.5	1.0	8.99	2.4[illegible]	1.98	2.79	.20	.041	29.	4.4	36.68	26.88	63.56	61.9	31.1	72.6
	1.5	1.5	8.99	2.4[illegible]	1.98	2.79	.20	.062	29.	5.4	36.79	26.77	63.56	5[illegible].5	25.4	59.3
	1.5	2.0	9.[illegible]	2.4[illegible]	1.98	2.79	.23	.083	29.	6.3	36.44	26.72	63.56	43.8	22.[illegible]	51.3
	2.0	1.0	8.99	2.4[illegible]	1.98	2.79	.23	.023	29.	3.3	36.38	27.18	63.56	61.9	41.5	96.8
	2.0	1.5	8.99	2.4[illegible]	1.98	2.79	.23	.035	29.	4.1	36.61	26.95	63.56	5[illegible].5	33.9	79.[illegible]
	2.0	2.0	8.99	2.4[illegible]	1.98	2.79	.23	.047	29.	4.7	36.72	26.83	63.57	43.8	24.2	68.4
	2.5	1.0	8.98	2.4[illegible]	1.98	2.79	.20	.015	29.	2.7	35.96	27.6	63.56	61.9	51.8	12[illegible].9
	2.5	1.5	8.99	2.4[illegible]	1.98	2.79	.20	.022	29.	3.7	36.75	27.21	63.56	5[illegible].5	42.3	98.8
	2.5	2.0	8.99	2.4[illegible]	1.98	2.79	.20	.03[illegible]	29.	3.8	36.54	27.03	63.57	43.8	36.6	85.5

TABLE A22

PELLET-FUELING MODEL, PW = 1.0 MW/SQ.M. , KAPPA = 2.0 AND VB = 500.0 KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FR	CT	TAU SEC	T/TH	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.14	.87	.71	1.11	.20	.380	81.	13.3	6.91	1.55	8.45	46.4	18.9	41.7
	1.5	1.5	9.14	.87	.71	1.11	.20	.571	81.	16.4	6.91	1.54	8.45	37.9	15.4	37.2
	1.5	2.0	9.14	.87	.71	1.11	.20	.761	81.	18.9	6.92	1.53	8.45	32.8	17.4	28.8
	2.0	1.0	9.14	.87	.71	1.11	.20	.214	81.	[illegible]	6.89	1.57	8.45	46.4	25.2	54.2
	2.0	1.5	9.14	.87	.71	1.11	.20	.321	81.	12.3	6.90	1.55	8.45	37.9	21.6	44.3
	2.0	2.0	9.14	.87	.71	1.11	.20	.428	81.	14.2	6.91	1.54	8.45	32.8	17.8	36.3
	2.5	1.0	9.13	.87	.71	1.11	.20	.136	81.	9.	6.86	1.6	8.45	46.4	31.5	67.8
	2.5	1.5	9.14	.87	.71	1.11	.20	.205	81.	9.8	6.88	1.57	8.45	37.9	25.7	55.3
	2.5	2.0	9.14	.87	.71	1.11	.20	.274	81.	11.3	6.90	1.56	8.45	32.8	27.3	47.9
25.0	1.5	1.0	9.14	.72	.59	.84	.20	.159	98.	8.6	4.72	1.15	5.77	60.6	17.1	33.6
	1.5	1.5	9.14	.72	.59	.84	.20	.239	98.	10.6	4.72	1.05	5.77	49.5	[illegible]	27.5
	1.5	2.0	9.14	.72	.59	.84	.20	.319	98.	12.2	4.72	1.05	5.77	42.8	12.1	23.8
	2.0	1.0	9.14	.72	.59	.84	.20	.097	98.	6.5	4.71	1.07	5.77	60.6	22.8	44.9
	2.0	1.5	9.14	.72	.59	.84	.20	.134	98.	7.9	4.72	1.06	5.77	49.5	19.6	38.6
	2.0	2.0	9.14	.72	.59	.84	.20	.179	98.	9.2	4.72	1.05	5.77	42.8	16.1	31.7
	2.5	1.0	9.13	.72	.59	.84	.20	.057	98.	5.2	4.69	1.08	5.77	60.6	28.5	56.1
	2.5	1.5	9.14	.72	.59	.84	.20	.086	98.	6.3	4.71	1.07	5.77	49.5	23.3	45.8
	2.5	2.0	9.14	.72	.59	.84	.20	.115	98.	7.7	4.71	1.06	5.77	42.8	20.2	39.7
50.0	1.5	1.0	9.14	.60	.49	.69	.20	.068	118.	5.6	3.25	.72	3.97	78.2	[illegible]	28.9
	1.5	1.5	9.14	.60	.49	.69	.20	.102	118.	6.9	3.25	.72	3.97	63.9	12.8	27.6
	1.5	2.0	9.15	.60	.49	.69	.20	.136	118.	[illegible]	3.25	.72	3.97	55.3	11.1	21.4
	2.0	1.0	9.14	.60	.49	.69	.20	.038	118.	4.2	3.24	.73	3.97	78.2	20.9	38.6
	2.0	1.5	9.14	.60	.49	.69	.20	.057	118.	5.2	3.25	.72	3.97	63.9	17.1	31.5
	2.0	2.0	9.14	.60	.49	.69	.20	.077	118.	[illegible]	3.25	.72	3.97	55.3	14.8	27.3
	2.5	1.0	9.13	.60	.49	.69	.20	.024	118.	3.4	3.23	.74	3.97	78.2	26.2	48.2
	2.5	1.5	9.14	.60	.49	.69	.20	.037	118.	4.1	3.24	.73	3.97	63.9	21.4	39.3
	2.5	2.0	9.14	.60	.49	.69	.20	.049	118.	4.8	3.24	.73	3.97	55.3	18.5	34.1

TABLE A23

PELLET-FUELING MODEL, PH = 3. MW/SQ.M. , KAPPA = 2.0 AND VB = 5[illegible].0 KEV.

PT GW	Q	RO	TE KEV	NE 10^{14}	IA 10^{13}	NT 10^{12}	FP	ST	TAU SEC	T/T0	SP 10^{11}	SD 10^{11}	ST 10^{11}	I MA	WT KG	WMAX KG
12.5	1.5	1.0	9.14	2.19	1.73	2.42	.20	.278	34.	11.4	39.6[illegible]	8.84	48.48	41.2	29.4	84.2
	1.5	1.5	9.14	2.19	1.7	2.42	.20	.418	34.	14.	39.65	8.83	48.48	32.8	24.[illegible]	66.7
	1.5	2.0	9.14	2.19	1.73	2.42	.20	.557	34.	15.1	39.67	8.81	48.48	28.5	21.8	59.5
	2.0	1.0	9.13	2.19	1.73	2.43	.20	.156	34.	4.6	39.47	9.01	48.48	41.2	39.2	112.2
	2.0	1.5	9.14	2.19	1.73	2.42	.20	.275	34.	11.5	39.47	8.91	48.48	32.8	32.[illegible]	91.6
	2.0	2.0	9.14	2.19	1.73	2.42	.20	.313	34.	12.1	39.62	8.96	48.48	28.5	27.7	79.2
	2.5	1.0	9.13	2.19	1.73	2.43	.20	.1[illegible]4	34.	6.8	39.29	9.19	43.48	41.2	49.[illegible]	140.3
	2.5	1.5	9.13	2.19	1.73	2.43	.20	.15[illegible]	34.	8.4	39.46	9.02	48.48	32.8	4[illegible]	114.5
	2.5	2.0	9.14	2.19	1.73	2.42	.20	.20[illegible]	34.	9.7	39.54	8.94	48.48	28.5	34.6	99.2
25.0	1.5	1.0	9.14	1.69	1.37	1.96	.20	.122	42.	7.5	25.94	5.8	31.74	52.3	26.3	61.3
	1.5	1.5	9.14	1.69	1.37	1.96	.20	.183	42.	9.3	25.97	5.78	31.75	42.7	21.5	5[illegible].1
	1.5	2.0	9.14	1.69	1.37	1.96	.20	.244	42.	1[illegible].7	25.98	5.75	31.74	37.0	18.6	43.4
	2.0	1.0	9.14	1.69	1.37	1.96	.20	.168	42.	5.7	25.87	5.88	31.75	52.3	35.[illegible]	81.8
	2.0	1.5	9.14	1.69	1.37	1.96	.20	.1[illegible]3	42.	6.9	25.92	5.82	31.74	42.7	29.6	68.8
	2.0	2.0	9.14	1.69	1.37	1.96	.20	.137	42.	8.	25.95	5.79	31.74	37.[illegible]	24.8	57.8
	2.5	1.0	9.13	1.69	1.37	1.96	.20	.144	42.	4.5	25.76	5.99	31.74	52.3	43.4	1[illegible]2.2
	2.5	1.5	9.13	1.69	1.37	1.96	.20	.366	42.	5.5	25.86	5.89	31.74	42.7	35.8	83.5
	2.5	2.0	9.14	1.69	1.37	1.96	.20	.288	42.	6.4	25.90	5.84	31.74	37.1	31.1	72.3
51.0	1.5	1.0	9.14	1.39	1.13	1.62	.20	.051	51.	4.9	17.68	3.95	21.63	68.1	23.9	49.2
	1.5	1.5	9.14	1.39	1.13	1.62	.20	.077	51.	6.	17.7[illegible]	3.93	21.63	55.6	19.5	41.2
	1.5	2.0	9.14	1.39	1.13	1.62	.20	.1[illegible]2	51.	6.9	17.7[illegible]	3.92	21.62	48.2	16.9	34.8
	2.0	1.0	9.14	1.39	1.13	1.62	.20	.029	51.	3.7	17.64	3.99	21.63	68.1	31.9	65.7
	2.0	1.5	9.14	1.39	1.13	1.62	.20	.043	51.	4.5	17.67	3.95	21.63	55.6	26.[illegible]	53.6
	2.0	2.0	9.14	1.39	1.13	1.62	.20	.259	51.	5.2	17.69	3.94	21.63	48.2	22.5	46.4
	2.5	1.0	9.1[illegible]	1.39	1.13	1.62	.20	.018	51.	2.9	17.57	4.0[illegible]	21.62	68.1	39.4	82.1
	2.5	1.5	9.14	1.39	1.13	1.62	.20	.028	51.	3.6	17.63	4.0[illegible]	21.63	55.6	32.5	67.0
	2.5	2.0	9.14	1.39	1.13	1.62	.20	.037	51.	4.2	17.66	3.97	21.63	48.2	28.2	58.[illegible]

TABLE A24

PELLET-FUELING MODEL, PW = [illegible] MW/SQ.M. , KAPPA = [illegible] AND VA = [illegible] KEV.

PT GW	Q	QO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FR	CI	TAU SEC	T/TI	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	HT KG	HMAX KG
12.5	1.5	1.0	9.14	3.66	2.94	4.26	.20	.234	19.	11.5	122.[illegible]	27.39	149.39	36.5	34.8	173.6
	1.5	1.5	9.14	3.66	2.94	4.26	.2[illegible]	.352	19.	12.8	122.[illegible]	27.26	149.44	23.8	31.7	141.8
	1.5	2.0	9.14	3.66	2.94	4.26	.2[illegible]	.469	19.	14.4	122.[illegible]	27.17	149.47	25.8	27.4	122.9
	2.0	1.0	9.13	3.65	2.94	4.26	.2[illegible]	.132	19.	7.9	121.[illegible]	27.8[illegible]	149.4[illegible]	36.5	51.7	271.5
	2.0	1.5	9.14	3.66	2.98	4.26	.2[illegible]	.198	19.	9.[illegible]	122.[illegible]	27.49	149.49	29.8	42.[illegible]	199.1
	2.0	2.0	9.14	3.66	2.99	4.26	.24	.264	19.	11.1	122.1	27.34	149.44	25.9	36.0	163.7
	2.5	1.0	9.12	3.66	2.99	4.26	.2[illegible]	.084	19.	6.[illegible]	121.[illegible]	28.35	149.39	36.5	64.7	289.2
	2.5	1.5	9.13	3.66	2.98	4.26	.29	.126	19.	7.7	121.[illegible]	27.94	149.44	29.9	52.8	230.3
	2.5	2.0	9.13	3.66	2.99	4.26	.23	.169	19.	8.9	121.9[illegible]	27.51	149.49	25.8	45.7	2[illegible]4.6
25.0	1.5	1.0	9.14	2.95	2.4[illegible]	3.42	.2[illegible]	.059	24.	6.9	79.99	17.69	96.68	47.8	34.9	1[illegible]
	1.5	1.5	9.14	2.95	2.4[illegible]	3.42	.2[illegible]	.148	24.	9.7	79.[illegible]8	17.6[illegible]	96.68	39.[illegible]	28.5	41.7
	1.5	2.0	9.14	2.96	2.4[illegible]	3.42	.2[illegible]	.198	24.	9.6	79.12	17.56	96.68	33.8	24.7	7[illegible].7
	2.0	1.0	9.13	2.95	2.4[illegible]	3.42	.25	.055	24.	5.1	78.76	17.92	96.68	47.8	40.6	13[illegible].4
	2.0	1.5	9.14	2.95	2.4[illegible]	3.42	.25	.083	24.	6.2	78.44	17.74	96.68	39.[illegible]	38.[illegible]	1[illegible]8.9
	2.0	2.0	9.14	2.95	2.4[illegible]	3.42	.20	.111	24.	7.2	79.[illegible]2	17.65	96.68	33.8	32.9	96.3
	2.5	1.0	9.17	2.95	2.4[illegible]	3.43	.23	.[illegible]35	24.	4.1	78.42	18.26	96.69	47.8	58.7	166.7
	2.5	1.5	9.13	2.95	2.43	3.43	.26	.057	24.	5.[illegible]	79.74	17.95	96.69	39.[illegible]	47.5	136.1
	2.5	2.0	9.14	2.95	2.4[illegible]	3.42	.26	.171	24.	5.8	78.88	17.8	96.69	33.8	41.1	117.9
50.0	1.5	1.0	9.14	2.39	1.94	2.78	.20	.043	29.	4.6	51.95	11.61	63.56	62.2	31.3	73.[illegible]
	1.5	1.5	9.14	2.39	1.94	2.78	.2[illegible]	.064	29.	5.5	52.[illegible]	11.56	63.55	5[illegible].9	25.5	59.6
	1.5	2.0	9.14	2.39	1.94	2.78	.20	.086	29.	6.[illegible]	52.[illegible]2	11.54	63.56	44.[illegible]	22.1	51.6
	2.0	1.0	9.13	2.39	1.94	2.78	.20	.024	29.	3.4	51.82	11.74	63.56	62.2	41.7	97.3
	2.0	1.5	9.14	2.39	1.94	2.78	.20	.036	29.	4.1	51.92	11.64	63.56	5[illegible].8	34.[illegible]	79.4
	2.0	2.0	9.14	2.39	1.94	2.78	.2[illegible]	.048	29.	4.8	51.97	11.59	63.56	44.0	29.5	68.8
	2.5	1.0	9.13	2.39	1.94	2.78	.20	.015	29.	2.7	51.63	11.94	63.57	62.2	52.1	121.6
	2.5	1.5	9.13	2.39	1.94	2.78	.20	.023	29.	3.7	51.81	11.76	63.57	5[illegible].3	42.6	99.3
	2.5	2.0	9.14	2.39	1.94	2.78	.20	.031	29.	3.3	51.99	11.61	63.57	44.[illegible]	36.9	[illegible]

TABLE A25

PELLET-FUELING MODEL, PW = 1.[illegible] MW/SQ.M. , KAPPA = [illegible] AND V0 = 2 [illegible] KEV.

FT	Q	BO	TE	NE	NA	NI	FA	CI	TAU	T/TP	CA	CB	CT	I	BT	BMAX
GW			KEV	10^{14}	10^{13}	10^{12}			SEC		10^{11}	10^{11}	10^{11}	MA	KG	KG
12.5	1.5	1.0	9.[illegible]	.88	.72	1.12	.29	.315	8[illegible].	15.3	4.95	3.6[illegible]	8.55	57.[illegible]	13.7	[illegible].1
	1.5	1.5	9.0[illegible]	.88	.72	1.12	.2[illegible]	.473	8[illegible].	21.	4.96	3.54	8.55	46.5	1[illegible].9	24.6
	1.5	2.0	9.0	.88	.72	1.12	.2[illegible]	.631	8[illegible].	23.1	4.96	3.58	8.54	4[illegible].3	9.4	21.3
	2.0	1.0	8.99	.88	.72	1.12	.2[illegible]	.177	8[illegible].	12.2	4.93	3.62	8.54	57.0	17.7	4[illegible].2
	2.0	1.5	9.[illegible]	.88	.72	1.12	.2[illegible]	.266	8[illegible].	15.[illegible]	4.94	3.6[illegible]	8.54	46.5	14.[illegible]	32.8
	2.0	2.0	9.[illegible]	.88	.72	1.12	.2[illegible]	.355	8[illegible].	17.3	4.95	3.59	8.55	4[illegible].3	12.5	28.4
	2.5	1.0	8.97	.88	.73	1.12	.2[illegible]	.113	8[illegible].	9.8	4.9[illegible]	3.65	8.54	57.[illegible]	22.2	5[illegible].2
	2.5	1.5	8.99	.88	.73	1.12	.20	.170	8[illegible].	12.	4.93	3.62	8.54	46.5	18.1	41.0
	2.5	2.0	9.0[illegible]	.88	.72	1.12	.2[illegible]	.227	8[illegible].	13.4	4.94	3.61	8.55	4[illegible].3	15.7	35.5
25.0	1.5	1.0	9.0[illegible]	.73	.6	.85	.2[illegible]	.133	97.	1[illegible].6	3.39	2.45	5.85	74.1	12.1	2[illegible].5
	1.5	1.5	9.0	.73	.61	.85	.2[illegible]	.199	97.	15.[illegible]	3.39	2.45	5.85	6[illegible].5	9.9	2[illegible]
	1.5	2.0	9.0	.73	.61	.85	.20	.266	97.	15.[illegible]	3.4[illegible]	2.45	5.85	52.4	9.[illegible]	17.3
	2.0	1.0	9.02	.73	.6[illegible]	.85	.20	.075	97.	[illegible].9	3.38	2.47	5.85	74.1	16.2	[illegible]2.7
	2.0	1.5	9.0	.73	.61	.85	.2[illegible]	.112	97.	9.7	3.39	2.46	5.85	61.5	13.2	26.7
	2.0	2.0	9.02	.73	.6[illegible]	.85	.2[illegible]	.149	97.	11.2	3.39	2.46	5.85	52.4	11.4	22.1
	2.5	1.0	8.99	.73	.6[illegible]	.85	.2[illegible]	.048	97.	6.7	3.36	2.49	5.85	74.1	2[illegible].2	4[illegible].9
	2.5	1.5	9.0[illegible]	.73	.61	.85	.20	.072	97.	7.9	3.38	2.47	5.85	61.5	16.5	[illegible].4
	2.5	2.0	9.0[illegible]	.73	.6	.85	.20	.096	97.	9.	3.38	2.47	5.85	52.4	14.3	28.9
50.0	1.5	1.0	9.0[illegible]	.6[illegible]	.5	.7[illegible]	.20	.056	117.	6.9	2.34	1.7[illegible]	4.[illegible]4	96.3	11.[illegible]	2[illegible].8
	1.5	1.5	9.0[illegible]	.6[illegible]	.5[illegible]	.79	.20	.084	117.	[illegible].4	2.34	1.69	4.[illegible]4	78.7	9.[illegible]	17.[illegible]
	1.5	2.0	9.0	.6[illegible]	.5[illegible]	.7[illegible]	.20	.112	117.	9.7	2.34	1.69	4.[illegible]4	68.1	7.8	14.7
	2.0	1.0	9.0[illegible]	.62	.5[illegible]	.79	.20	.032	117.	5.[illegible]	2.32	1.7[illegible]	4.[illegible]4	96.3	14.7	27.6
	2.0	1.5	9.0[illegible]	.6[illegible]	.5[illegible]	.7[illegible]	.20	.047	117.	6.3	2.34	1.7	4.[illegible]4	78.7	12.	2[illegible].7
	2.0	2.0	9.0[illegible]	.62	.5[illegible]	.7[illegible]	.20	.063	117.	7.3	2.34	1.7[illegible]	4.[illegible]4	68.1	1[illegible].4	19.6
	2.5	1.0	8.99	.6[illegible]	.5[illegible]	.7[illegible]	.2[illegible]	.02[illegible]	117.	4.1	2.32	1.71	4.[illegible]4	96.3	19.4	[illegible].7
	2.5	1.5	9.0[illegible]	.62	.5[illegible]	.7[illegible]	.20	.03[illegible]	117.	5.1	2.33	1.7[illegible]	4.[illegible]4	78.7	15.	2[illegible].3
	2.5	2.0	9.0	.62	.5[illegible]	.79	.2[illegible]	.04[illegible]	117.	5.8	2.34	1.7	4.[illegible]4	68.1	13.[illegible]	2[illegible].5

TABLE A26

PELLET-FUELING MODEL, PW = 3.0 MW/SQ.M. , KAPPA = 1.6 AND VB = 200 KEV.

PT GW	Q	RO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FA	CI	TAU SEC	T/TO	CP 10^{11}	CB 10^{11}	CT 10^{11}	I MA	RT KG	MMAX KG
12.5	1.5	1.0	8.99	2.08	1.71	2.42	.20	.237	34.	14.2	27.64	20.1	47.74	49.3	21.5	56.6
	1.5	1.5	9.00	2.08	1.71	2.42	.20	.356	34.	[illegible]	27.69	20.05	47.74	40.2	16.7	64.4
	1.5	2.0	9.00	2.08	1.71	2.42	.20	.475	34.	[illegible]	27.71	[illegible]	47.74	34.8	14.5	47.1
	2.0	1.0	8.99	2.08	1.71	2.42	.20	[illegible]	34.	[illegible]	27.52	20.22	47.74	49.3	27.3	48.8
	2.0	1.5	8.99	2.08	1.71	2.42	.20	[illegible]	34.	13.	27.61	[illegible]	47.74	40.2	22.3	72.5
	2.0	2.0	9.00	2.08	1.71	2.42	.20	.267	34.	15.	27.66	20.08	47.74	34.8	19.2	62.8
	2.5	1.0	8.99	2.08	1.71	2.42	.20	.345	34.	9.5	27.34	[illegible]	47.75	49.3	[illegible]	[illegible]
	2.5	1.5	8.99	2.08	1.71	2.42	.20	.128	34.	[illegible]	[illegible]	20.24	47.74	40.2	27.9	[illegible]
	2.5	2.0	8.99	2.08	1.71	2.42	.20	.171	34.	[illegible]	27.58	20.16	47.74	34.8	[illegible]	78.5
25.0	1.5	1.0	9.00	1.71	1.41	1.99	.20	[illegible]	41.	9.2	18.74	13.61	32.35	64.4	18.5	46.4
	1.5	1.5	9.00	1.71	1.41	1.99	.20	.149	41.	11.2	18.76	13.59	32.34	52.6	15.1	37.8
	1.5	2.0	9.00	1.71	1.41	1.99	.20	.199	41.	[illegible]	18.78	13.57	32.35	45.5	13.1	35.8
	2.0	1.0	8.99	1.71	1.41	1.99	.20	.156	41.	6.9	18.66	13.68	32.34	64.4	24.7	61.8
	2.0	1.5	9.00	1.71	1.41	1.99	.20	.094	41.	9.4	18.72	13.62	32.34	52.6	[illegible]	[illegible]
	2.0	2.0	9.00	1.71	1.41	1.99	.20	.112	41.	9.7	18.75	13.60	32.35	45.5	17.5	43.7
	2.5	1.0	8.99	1.71	1.41	1.99	.20	.136	41.	5.5	18.56	13.79	32.35	64.4	[illegible]	77.3
	2.5	1.5	8.99	1.71	1.41	1.99	.20	.054	41.	6.7	18.66	13.69	32.35	52.6	25.2	63.1
	2.5	2.0	8.99	1.71	1.41	1.99	.20	.072	41.	7.6	[illegible]	13.64	32.34	45.5	21.8	54.6
50.0	1.5	1.0	9.00	1.41	1.16	1.64	.20	.042	[illegible]	6.1	12.68	9.2	21.88	83.7	16.8	36.2
	1.5	1.5	9.00	1.41	1.16	1.63	.20	.063	[illegible]	7.3	12.70	9.19	21.89	68.3	13.8	29.5
	1.5	2.0	9.00	1.41	1.16	1.63	.20	.085	50.	9.5	[illegible]	9.17	21.87	59.2	11.9	25.6
	2.0	1.0	8.99	1.41	1.16	1.64	.20	.124	50.	[illegible]	12.64	9.24	21.88	83.7	22.5	48.2
	2.0	1.5	9.00	1.41	1.16	1.64	.20	.036	50.	5.5	12.67	9.21	21.88	68.3	18.3	39.4
	2.0	2.0	9.00	1.41	1.16	1.64	.20	.048	53.	6.3	12.69	9.19	21.88	59.2	15.9	34.1
	2.5	1.0	8.99	1.41	1.16	1.64	.20	.115	[illegible]	3.6	12.57	[illegible]	21.87	83.7	28.1	[illegible]
	2.5	1.5	8.99	1.41	1.16	1.64	.20	.023	53.	4.4	12.63	9.25	21.88	68.3	22.9	49.2
	2.5	2.0	9.00	1.41	1.16	1.64	.20	[illegible]	53.	5.1	12.66	9.22	21.88	59.2	19.8	42.6

TABLE A27

PELLET-FUELING MODEL, PW = 6. MW/SQ.M. , KAPPA = [illegible] AND VO = 2 [illegible] KEV.

PT GW	Q	BO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	BT KG	BMAX KG
12.5	1.5	1.0	8.99	3.64	3.01	4.24	.20	.196	19.	12.8	[illegible]	61.95	146.85	44.9	27.2	[illegible]
	1.5	1.5	8.99	3.64	[illegible]	4.24	.20	.293	19.	15.7	85.15	61.7	146.85	76.7	22.2	[illegible]
	1.5	2.0	8.99	3.64	[illegible]	4.24	.20	.391	19.	18.7	85.22	61.63	146.85	51.8	19.2	113.4
	2.0	1.0	8.99	3.64	3.01	4.24	.20	[illegible]	19.	9.6	84.6	62.26	146.86	44.9	[illegible]	[illegible]
	2.0	1.5	8.99	3.64	[illegible]	4.24	.20	.165	19.	11.8	84.91	61.94	146.85	36.7	29.6	174.6
	2.0	2.0	8.99	3.64	[illegible]	4.24	.20	.221	19.	13.6	[illegible]	61.8	146.85	31.7	[illegible]	[illegible]
	2.5	1.0	8.99	3.65	3.01	4.24	.20	[illegible]	19.	[illegible]	[illegible]	62.84	146.85	44.9	45.3	[illegible]
	2.5	1.5	8.99	3.64	[illegible]	4.24	.20	.106	19.	9.4	84.56	[illegible]	146.86	36.7	[illegible]	218.2
	2.5	2.0	8.99	3.64	[illegible]	4.24	[illegible]	.141	19.	[illegible]	[illegible]	62.15	146.86	31.7	32.1	[illegible]
25.0	1.5	1.0	8.99	2.94	2.42	3.42	.20	.084	24.	8.4	[illegible]	[illegible]	95.64	58.6	24.4	79.3
	1.5	1.5	9.00	2.94	2.42	3.42	.20	.126	24.	19.3	55.48	[illegible]	95.64	47.9	19.9	64.7
	1.5	2.0	9.00	2.94	2.42	3.42	.20	.168	24.	11.9	55.52	[illegible]	95.65	41.5	17.2	56.1
	2.0	1.0	8.99	2.94	2.43	3.42	.20	.047	24.	6.3	55.16	40.48	95.64	58.6	32.5	[illegible]
	2.0	1.5	8.99	2.94	2.42	3.42	.20	.071	24.	7.7	55.34	[illegible]	95.64	47.9	26.9	[illegible]
	2.0	2.0	8.99	2.94	2.42	3.42	.20	.094	24.	8.9	55.42	[illegible]	95.64	41.5	[illegible]	74.7
	2.5	1.0	8.99	2.94	2.43	3.42	.20	[illegible]	24.	[illegible]	54.83	40.81	95.64	58.6	[illegible]	[illegible]
	2.5	1.5	8.99	2.94	2.43	3.42	.20	.045	24.	6.2	55.14	[illegible]	95.64	47.9	[illegible]	[illegible]
	2.5	2.0	8.99	2.94	2.42	3.42	.20	.060	24.	7.1	55.28	[illegible]	95.64	41.5	28.8	93.4
50.0	1.5	1.0	8.99	2.41	1.99	2.81	.20	.035	29.	5.5	37.32	27.09	64.41	76.5	[illegible]	55.1
	1.5	1.5	9.00	2.41	1.99	2.81	.20	.053	29.	6.7	[illegible]	27.04	64.42	62.5	[illegible]	[illegible]
	1.5	2.0	9.00	2.41	1.99	2.81	.20	.071	29.	7.7	[illegible]	27.01	[illegible]	54.1	15.6	38.9
	2.0	1.0	8.99	2.41	1.99	2.81	.20	.026	29.	4.1	37.19	27.22	[illegible]	76.5	29.4	73.4
	2.0	1.5	8.99	2.41	1.99	2.81	.20	.030	29.	[illegible]	37.29	27.12	[illegible]	62.5	[illegible]	[illegible]
	2.0	2.0	9.00	2.41	1.99	2.81	.20	.040	29.	5.0	37.34	27.07	64.41	54.1	[illegible]	51.9
	2.5	1.5	8.99	2.41	1.99	2.81	.20	.019	29.	[illegible]	37.18	27.24	64.42	62.5	[illegible]	74.9
	2.5	2.0	8.99	2.41	1.99	2.81	.20	.026	29.	4.6	37.26	27.15	64.41	54.1	[illegible]	64.5

TABLE A28

PELLET-FUELING MODEL, PW = 1.[illegible] MW/SQ.M. , KAPPA = [illegible] AND VB = 5[illegible] KEV.

PI GW	D	DO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FQ	CT	TAU SEC	T/TQ	SP 10^{11}	SQ 10^{11}	ST 10^{11}	I MA	WT KG	WMAX KG
12.5	1.5	1.0	9.14	.88	.71	1.02	.20	.327	8[illegible].	1[illegible].5	6.99	1.55	8.55	57.3	13.4	71.3
	1.5	1.5	9.14	.88	.71	1.02	.22	.491	8[illegible].	20.2	7.[illegible]	1.55	8.55	46.8	1[illegible].9	34.7
	1.5	2.0	9.14	.88	.71	1.02	.2[illegible]	.65[illegible]	8[illegible].	23.7	7.[illegible]	1.55	8.54	4[illegible].5	9.5	21.4
	2.0	1.0	9.14	.88	.71	1.02	.23	.164	83.	12.4	6.98	1.56	8.55	57.3	17.8	41.4
	2.0	1.5	9.14	.88	.71	1.02	.21	.275	83.	15.1	6.99	1.55	8.55	46.8	14.6	33.[illegible]
	2.0	2.0	9.14	.88	.71	1.02	.20	.367	81.	17.5	6.99	1.55	8.54	4[illegible].5	12.6	28.6
	2.5	1.0	9.14	.88	.71	1.02	.23	.117	83.	9.9	6.97	1.57	8.54	57.7	22.3	51.5
	2.5	1.5	9.14	.88	.71	1.02	.20	.176	83.	12.1	6.98	1.56	8.55	46.8	18.2	41.3
	2.5	2.0	9.14	.88	.71	1.02	.2[illegible]	.235	8[illegible].	14.[illegible]	6.99	1.56	8.55	4[illegible].5	15.8	35.7
25.0	1.5	1.0	9.14	.72	.59	.84	.20	.138	97.	1[illegible].7	4.79	1.06	5.85	74.5	12.2	24.7
	1.5	1.5	9.15	.72	.59	.84	.20	.206	97.	13.1	4.79	1.06	5.85	6[illegible].8	1[illegible].	2[illegible].1
	1.5	2.0	9.15	.72	.59	.84	.20	.275	97.	15.1	4.79	1.[illegible]	5.85	52.7	8.6	17.4
	2.0	1.0	9.14	.72	.59	.84	.22	.377	97.	9.[illegible]	4.78	1.07	5.85	74.5	16.3	32.9
	2.0	1.5	9.14	.72	.59	.84	.20	.116	97.	9.4	4.78	1.0[illegible]	5.85	6[illegible].8	13.[illegible]	26.9
	2.0	2.0	9.14	.72	.59	.84	.23	.155	97.	11.[illegible]	4.79	1.0[illegible]	5.85	52.7	11.5	23.2
	2.5	1.0	9.14	.72	.59	.84	.20	.049	97.	6.4	4.77	1.04	5.85	74.5	2[illegible].3	4[illegible].1
	2.5	1.5	9.14	.72	.59	.84	.20	.374	97.	7.9	4.78	1.07	5.85	63.8	16.6	33.6
	2.5	2.0	9.14	.72	.59	.84	.20	.[illegible]99	97.	9.1	4.78	1.05	5.85	52.7	14.4	29.1
50.0	1.5	1.0	9.15	.66	.49	.70	.20	.358	117.	7.	3.3[illegible]	.77	4.[illegible]4	96.9	11.1	21.9
	1.5	1.5	9.15	.66	.49	.70	.22	.087	117.	4.5	3.3	.77	4.[illegible]4	79.1	9.1	17.1
	1.5	2.0	9.15	.66	.49	.70	.20	.116	117.	9.8	3.31	.73	4.[illegible]4	68.5	7.6	14.8
	2.0	1.0	9.14	.66	.49	.70	.2[illegible]	.033	117.	5.[illegible]	3.3[illegible]	.74	4.[illegible]4	96.8	14.8	27.9
	2.0	1.5	9.14	.6[illegible]	.49	.70	.22	.749	117.	6.4	3.31	.73	4.[illegible]4	79.1	12.1	22.8
	2.0	2.0	9.15	.66	.49	.70	.23	.265	117.	7.4	3.30	.73	4.[illegible]4	68.5	1[illegible].5	19.7
	2.5	1.0	9.14	.66	.49	.70	.20	.321	117.	4.2	3.[illegible]	.74	4.[illegible]4	96.8	18.[illegible]	[illegible]4.9
	2.5	1.5	9.14	.66	.49	.70	.20	.031	117.	5.1	3.3[illegible]	.74	4.[illegible]4	79.1	15.1	26.5
	2.5	2.0	9.14	.6	.49	.70	.20	.042	117.	5.9	3.3[illegible]	.7[illegible]	4.[illegible]4	68.5	13.1	24.7

TABLE A29

PELLET-FUELING MODEL, PW = 3. MW/SQ.M. , KAPPA = 7.0 AND VR = 5 . . KEV.

PT GW	Q	RO	TE KEV	NF 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/T	SP 10^{11}	SB 10^{11}	ST 10^{11}	I MA	DT KG	BMAX KG
12.5	1.5	1.0	9.14	2.57	1.64	2.41	.2	.246	34.	14.3	39. 6	8.64	47.74	49.5	2 .6	67.0
	1.5	1.5	9.14	2.57	1.64	2.41	.21	.369	34.	17.5	39.08	8.66	47.74	4 .5	16.8	64.7
	1.5	2.0	9.14	2.57	1.64	2.41	.2	.492	34.	2 .2	39.10	8.65	47.74	35.	14.6	47.4
	2.0	1.0	9.14	2.57	1.64	2.41	.20	.178	34.	1 .7	39. 1	8.74	47.74	49.5	27.5	49.3
	2.0	1.5	9.14	2.57	1.68	2.41	.25	.2 7	34.	13.1	39. 5	8.69	47.74	47.5	22.6	72.9
	2.0	2.0	9.14	2.57	1.64	2.41	.26	.277	34.	15.2	39. 7	8.67	47.74	35.0	19.4	63.2
	2.5	1.0	9.14	2.57	1.64	2.41	.22	.388	34.	9.6	38.93	8.82	47.75	49.5	34.3	111.0
	2.5	1.5	9.14	2.57	1.69	2.41	.23	.133	34.	10.5	39.	8.74	47.74	41.5	28.	91.2
	2.5	2.0	9.14	2.57	1.64	2.41	.20	.177	34.	12.1	39. 4	8.71	47.75	35.0	24.3	78.9
25.0	1.5	1.0	9.14	1.76	1.39	1.98	.26	.1 3	41.	9.3	26.47	5.98	32.75	64.7	18.6	46.0
	1.5	1.5	9.14	1.75	1.39	1.98	.22	.155	41.	11.4	26.48	5.95	32.54	52.8	15.2	36.1
	1.5	2.0	9.14	1.76	1.39	1.98	.23	.2 7	41.	13.1	26.49	5.86	32.35	45.8	13.2	33.
	2.0	1.0	9.14	1.76	1.39	1.98	.26	.358	41.	7.	26.44	5.91	32.55	64.7	24.9	62.1
	2.0	1.5	9.14	1.76	1.39	1.98	.2	.387	41.	9.5	26.46	5.84	32.34	52.8	2 .3	57.7
	2.0	2.0	9.14	1.76	1.39	1.98	.25	.116	41.	9.8	26.47	5.87	32.34	45.8	17.6	47.9
	2.5	1.0	9.14	1.76	1.39	1.98	.24	.037	41.	5.6	26.39	5.96	32.35	64.7	31.1	77.7
	2.5	1.5	9.14	1.77	1.39	1.98	.23	.356	41.	6.8	26.43	5.91	32.74	52.8	25.4	63.4
	2.5	2.0	9.14	1.76	1.39	1.98	.22	.374	41.	7.9	26.45	5.83	32.34	45.8	22.0	54.9
50.0	1.5	1.0	9.14	1.46	1.14	1.63	.20	.344	51.	6.	17.91	3.97	21.88	84.1	16.9	36.4
	1.5	1.5	9.14	1.46	1.14	1.63	.27	.066	51.	7.4	17.91	3.96	21.87	68.7	13.8	29.7
	1.5	2.0	9.14	1.46	1.14	1.63	.26	.388	51.	9.5	17.92	3.95	21.88	59.5	12.	25.7
	2.0	1.0	9.14	1.46	1.14	1.63	.21	.125	51.	4.5	17.89	3.99	21.88	84.1	22.6	48.5
	2.0	1.5	9.14	1.46	1.14	1.63	.29	.937	51.	5.5	17.92	3.97	21.88	68.7	18.4	39.6
	2.0	2.0	9.14	1.46	1.14	1.63	.22	.249	51.	6.4	17.91	3.97	21.88	59.5	16.1	34.3
	2.5	1.0	9.14	1.46	1.14	1.63	.2	.016	51.	3.6	17.86	4.02	21.88	84.1	28.2	61.6
	2.5	1.5	9.14	1.46	1.14	1.63	.20	.024	51.	4.4	17.88	3.99	21.87	69.7	23.1	49.5
	2.5	2.0	9.14	1.46	1.14	1.63	.21	.032	51.	5.1	17.9	3.98	21.88	59.5	2 .	42.9

TABLE A30

PELLET-FUELING MODEL, PW = 6. MW/SQ.M. , KAPPA = 1.6 AND VA = 5 .0 KEV.

PT GW	Q	RQ	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FR	CI	TAU SEC	T/TR	SF 10^{11}	SB 10^{11}	ST 10^{11}	I MA	MT KG	MMAX KG
12.5	1.5	1.0	9.14	3.63	2.95	4.22	.20	.203	19.	13.	120.10	26.71	146.81	45.2	27.4	161.2
	1.5	1.5	9.14	3.63	2.95	4.22	.20	.034	19.	15.9	120.20	26.64	146.84	36.9	22.3	131.6
	1.5	2.0	9.14	3.63	2.95	4.22	.20	.045	19.	19.4	120.30	26.61	146.91	31.9	19.3	114.[illegible]
	2.0	1.0	9.14	3.63	2.95	4.22	.20	.114	19.	9.7	120.00	26.89	146.89	45.2	36.5	215.[illegible]
	2.0	1.5	9.14	3.63	2.95	4.22	.20	.171	19.	11.9	120.10	26.75	146.85	36.9	29.8	175.5
	2.0	2.0	9.14	3.63	2.95	4.22	.20	.228	19.	13.8	120.20	26.69	146.89	31.9	25.8	152.0
	2.5	1.0	9.14	3.63	2.95	4.22	.20	.373	19.	7.4	119.70	27.15	146.85	45.2	45.6	268.7
	2.5	1.5	9.14	3.63	2.95	4.22	.20	.109	19.	9.5	119.90	26.91	146.81	36.9	37.2	219.4
	2.5	2.0	9.14	3.63	2.95	4.22	.20	.146	19.	11.7	120.1[illegible]	26.8[illegible]	146.92	31.9	32.3	19[illegible]
25.0	1.5	1.0	9.14	2.93	2.34	3.41	.20	.097	24.	9.5	78.26	17.38	95.64	59.2	24.5	79.7
	1.5	1.5	9.14	2.93	2.34	3.41	.20	.131	24.	10.4	78.30	17.34	95.64	48.1	[illegible]	64.1
	1.5	2.0	9.14	2.93	2.34	3.41	.20	.173	24.	12.[illegible]	78.27	17.37	95.64	41.7	17.3	56.4
	2.0	1.0	9.14	2.93	2.34	3.41	.20	.349	24.	6.4	78.16	17.48	95.64	59.[illegible]	32.7	106.3
	2.0	1.5	9.14	2.93	2.34	3.41	.20	.373	24.	7.8	78.24	17.4	95.64	48.1	26.7	86.9
	2.0	2.0	9.14	2.93	2.34	3.41	.20	.098	24.	9.[illegible]	78.28	17.37	95.65	41.7	23.1	75.1
	2.5	1.0	9.14	2.93	2.34	3.41	.20	.131	24.	5.1	78.01	17.63	95.64	59.[illegible]	40.9	132.8
	2.5	1.5	9.14	2.93	2.34	3.41	.20	.047	24.	6.2	78.15	17.49	95.64	48.1	33.4	108.5
	2.5	2.0	9.14	2.93	2.34	3.41	.20	.362	24.	7.2	78.21	17.43	95.64	41.7	28.9	93.9
50.0	1.5	1.0	9.14	2.41	1.96	2.86	.20	.377	29.	5.5	52.72	11.70	64.42	76.9	22.1	55.4
	1.5	1.5	9.14	2.41	1.95	2.80	.20	.455	29.	6.9	52.74	11.67	64.41	62.8	18.1	45.2
	1.5	2.0	9.14	2.41	1.95	2.8[illegible]	.20	.273	29.	7.8	52.75	11.66	64.41	54.4	15.7	39.2
	2.0	1.0	9.14	2.41	1.96	2.80	.20	.321	29.	4.1	52.66	11.76	64.42	76.9	29.5	73.8
	2.0	1.5	9.14	2.41	1.96	2.8[illegible]	.20	.331	29.	5.1	52.70	11.71	64.41	62.8	24.1	60.3
	2.0	2.0	9.14	2.41	1.95	2.8[illegible]	.20	.341	29.	5.9	52.72	11.69	64.41	54.4	20.9	52.2
	2.5	1.0	9.14	2.41	1.96	2.86	.20	.317	29.	3.3	52.57	11.84	64.41	76.9	36.9	92.3
	2.5	1.5	9.14	2.41	1.96	2.86	.20	.32[illegible]	29.	4.1	52.65	11.76	64.41	62.8	30.1	75.4
	2.5	2.0	9.14	2.41	1.96	2.86	.20	.726	29.	4.7	52.69	11.73	64.42	54.4	26.1	65.3

TABLE A31

BEAM-FUELING MODEL, PW = 1.0 MW/SQ.M. , KAPPA = 2.0

PF GW	Q	PO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FA	CI	TAU SEC	T/TB	SB 10^{11}	VB KEV	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.02	.84	.77	1.00	.20	.370	81.	13.2	8.45	58.8	46.3	18.9	40.6
	1.5	1.5	9.02	.84	.77	1.00	.20	.556	81.	16.2	8.45	58.3	37.8	15.4	33.2
	1.5	2.0	9.02	.88	.77	1.00	.20	.741	81.	18.7	8.45	58.1	32.8	13.3	28.7
	2.0	1.0	9.01	.81	.77	1.00	.20	.208	81.	9.9	8.45	60.1	46.3	25.1	54.1
	2.0	1.5	9.02	.84	.77	1.00	.20	.312	81.	12.1	8.45	59.1	37.8	20.5	44.2
	2.0	2.0	9.02	.89	.77	1.00	.20	.417	81.	14.0	8.45	59.6	32.8	17.8	38.3
	2.5	1.0	9.00	.88	.77	1.00	.20	.133	81.	7.9	8.45	62.0	46.3	31.4	67.6
	2.5	1.5	9.01	.88	.77	1.00	.20	.199	81.	9.7	8.45	60.3	37.8	25.6	55.2
	2.5	2.0	9.01	.89	.77	1.00	.20	.266	81.	11.2	8.45	59.4	32.8	22.2	47.8
25.0	1.5	1.0	9.02	.73	.64	.83	.20	.155	98.	8.5	5.77	58.6	60.5	17.1	33.6
	1.5	1.5	9.02	.73	.64	.82	.20	.233	98.	10.5	5.77	58.2	49.4	14.0	27.4
	1.5	2.0	9.02	.73	.64	.82	.20	.311	98.	12.1	5.77	59.0	42.8	12.1	23.8
	2.0	1.0	9.01	.73	.64	.83	.20	.087	98.	6.4	5.77	59.9	60.5	22.8	44.8
	2.0	1.5	9.02	.73	.64	.83	.20	.131	98.	7.8	5.77	58.9	49.4	18.6	36.6
	2.0	2.0	9.02	.71	.64	.83	.20	.175	98.	9.1	5.77	58.5	42.8	16.1	31.7
	2.5	1.0	9.00	.71	.64	.83	.20	.056	98.	5.1	5.77	61.5	60.5	28.5	56.0
	2.5	1.5	9.01	.73	.64	.83	.20	.084	98.	6.3	5.77	59.9	49.4	23.3	45.7
	2.5	2.0	9.02	.73	.64	.83	.20	.112	98.	7.2	5.77	59.2	42.8	20.1	39.6
50.0	1.5	1.0	9.02	.60	.53	.68	.20	.066	118.	5.6	3.97	58.5	78.1	15.7	29.9
	1.5	1.5	9.02	.60	.53	.68	.20	.100	118.	6.8	3.97	58.1	63.8	12.8	23.6
	1.5	2.0	9.02	.60	.53	.68	.20	.133	118.	7.9	3.97	57.9	55.2	11.1	23.4
	2.0	1.0	9.01	.60	.53	.68	.20	.037	118.	4.2	3.97	59.5	78.1	20.9	39.5
	2.0	1.5	9.02	.60	.53	.68	.20	.056	118.	5.1	3.97	58.7	63.8	17.1	31.4
	2.0	2.0	9.02	.60	.53	.68	.20	.075	118.	5.9	3.97	58.4	55.2	14.8	27.2
	2.5	1.0	9.00	.60	.53	.69	.20	.024	118.	3.3	3.97	61.0	78.1	26.1	48.1
	2.5	1.5	9.01	.60	.53	.68	.20	.036	118.	4.1	3.97	59.7	63.8	21.3	39.3
	2.5	2.0	9.02	.60	.53	.68	.20	.048	118.	4.7	3.97	59.6	55.2	18.5	34.0

TABLE A32

BEAM-FUELING MODEL, PW = 3.0 MW/SQ.M. , KAPPA = 2.0

PT GW	Q	QO	TF KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	[illegible] 10^{11}	VB KEV	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.02	2.11	1.85	2.39	.20	.271	34.	11.3	48.48	58.9	46.2	29.3	84.0
	1.5	1.5	9.02	2.11	1.85	2.39	.20	.407	34.	13.8	48.48	59.4	32.8	27.9	68.5
	1.5	2.0	9.02	2.11	1.85	2.39	.20	.543	34.	16.0	48.48	59.1	28.4	26.7	59.4
	2.0	1.0	9.01	2.11	1.85	2.39	.20	.152	34.	8.5	48.48	60.4	43.2	39.1	112.0
	2.0	1.5	9.01	2.11	1.85	2.39	.20	.229	34.	10.4	48.48	59.2	32.8	31.9	91.5
	2.0	2.0	9.02	2.11	1.85	2.39	.20	.305	34.	12.0	48.48	58.7	28.4	27.6	79.2
	2.5	1.0	8.99	2.11	1.85	2.39	.20	.097	34.	6.8	48.48	62.5	46.1	48.8	139.9
	2.5	1.5	9.01	2.11	1.85	2.39	.20	.146	34.	8.3	48.48	60.5	32.8	39.9	114.3
	2.5	2.0	9.01	2.11	1.85	2.39	.20	.195	34.	9.6	48.48	59.6	28.4	34.6	99.3
25.0	1.5	1.0	9.02	1.71	1.56	1.94	.20	.119	42.	7.5	31.74	58.7	52.2	26.2	61.2
	1.5	1.5	9.02	1.71	1.56	1.94	.20	.178	42.	9.1	31.74	59.3	42.6	21.4	51.0
	1.5	2.0	9.02	1.71	1.56	1.94	.20	.237	42.	10.6	31.74	59.0	36.9	18.6	43.3
	2.0	1.0	9.01	1.71	1.56	1.94	.20	.067	42.	5.6	31.74	60.0	52.2	35.0	81.6
	2.0	1.5	9.02	1.71	1.56	1.94	.20	.100	[illegible]	6.9	31.74	59.0	42.6	28.6	66.7
	2.0	2.0	9.02	1.71	1.56	1.94	.20	.133	42.	7.9	31.74	58.6	36.9	24.7	57.7
	2.5	1.0	9.00	1.71	1.56	1.94	.20	.042	42.	4.5	31.74	61.8	52.2	43.7	102.0
	2.5	1.5	9.01	1.71	1.56	1.94	.20	.064	42.	5.5	31.74	60.1	42.6	35.7	83.3
	2.5	2.0	9.01	1.71	1.56	1.94	.20	.085	42.	6.3	31.74	59.3	36.9	30.9	72.1
50.0	1.5	1.0	9.02	1.41	1.23	1.60	.20	.050	51.	4.8	21.63	58.6	68.0	23.9	49.2
	1.5	1.5	9.02	1.41	1.23	1.60	.20	.075	51.	5.9	21.63	58.2	55.5	19.5	40.1
	1.5	2.0	9.02	1.41	1.23	1.60	.20	.100	51.	6.8	21.63	58.0	48.1	16.9	34.8
	2.0	1.0	9.01	1.41	1.23	1.60	.20	.028	51.	3.6	21.63	59.7	68.0	31.8	65.5
	2.0	1.5	9.02	1.41	1.23	1.60	.20	.042	51.	4.4	21.63	58.8	55.5	26.0	53.5
	2.0	2.0	9.02	1.41	1.23	1.60	.20	.056	51.	5.1	21.63	58.5	48.1	22.5	46.3
	2.5	1.0	9.00	1.41	1.23	1.60	.20	.018	51.	2.9	21.63	61.3	68.0	39.7	81.9
	2.5	1.5	9.01	1.41	1.23	1.60	.20	.027	51.	3.6	21.63	59.8	55.5	32.5	66.9
	2.5	2.0	9.02	1.41	1.23	1.60	.20	.036	51.	4.1	21.63	59.1	48.1	28.1	57.9

TABLE A33

[illegible]AN-BURNING MODEL, PW = [illegible] MW/SQ.M. , KAPPA = 2.0

PT	A	Q0	T	N	NA	NT	CB	CI	TAU	T/TL	S	VH	I	BT	BMAX
GW			KEV	10^{14}	10^{13}	10^{12}			SEC		10^{11}	KEV	MA	KG	KG
12.5	1.5	1.0	9.01	3.71	3.26	4.26	.20	.228	19.	10.4	149.40	59.0	36.5	38.7	173.5
	1.5	1.5	9.02	3.71	3.26	4.26	.20	.347	19.	12.7	149.40	54.4	29.8	31.6	141.5
	1.5	2.0	9.02	3.71	3.26	4.26	.20	.467	19.	14.7	149.40	56.2	25.8	27.4	122.6
	2.0	1.0	9.01	3.71	3.26	4.26	.20	.120	19.	7.8	149.40	64.5	36.5	51.6	231.0
	2.0	1.5	9.01	3.71	3.26	4.26	.20	.142	19.	9.6	149.40	59.3	29.8	42.2	188.7
	2.0	2.0	9.01	3.71	3.26	4.26	.20	.267	19.	11.3	149.40	55.8	25.8	36.5	163.4
	2.5	1.0	8.99	3.71	3.26	4.26	.20	.087	19.	6.2	149.40	62.7	36.5	64.5	288.7
	2.5	1.5	9.01	3.71	3.26	4.26	.20	.123	19.	7.6	149.40	6[illegible].7	29.8	52.7	235.8
	2.5	2.0	9.01	3.71	3.26	4.26	.20	.166	19.	8.8	149.40	59.7	25.8	45.6	204.2
20.0	1.5	1.0	9.02	2.94	2.61	3.38	.20	.096	24.	6.7	96.69	59.8	47.7	34.9	94.8
	1.5	1.5	9.02	2.94	2.61	3.38	.20	.144	24.	8.2	96.69	58.3	39.0	28.5	81.5
	1.5	2.0	9.02	2.94	2.61	3.38	.20	.133	24.	9.5	96.69	58.1	33.8	24.6	70.6
	2.0	1.0	9.01	2.94	2.61	3.38	.20	.056	24.	5.3	96.69	60.1	47.7	46.5	133.1
	2.0	1.5	9.01	2.94	2.61	3.38	.20	.091	24.	6.2	96.69	59.1	39.0	37.9	108.7
	2.0	2.0	9.02	2.94	2.61	3.38	.20	.124	24.	7.1	96.69	58.6	33.8	32.9	94.1
	2.5	1.0	9.00	2.94	2.61	3.38	.20	.034	24.	4.0	96.69	62.0	47.7	58.1	166.3
	2.5	1.5	9.01	2.94	2.61	3.38	.20	.052	24.	4.9	96.69	63.3	39.0	47.4	135.8
	2.5	2.0	9.01	2.94	2.61	3.38	.20	.069	24.	5.7	96.69	59.5	33.8	41.1	117.7
26.7	1.5	1.0	9.02	2.42	2.12	2.74	.20	.042	29.	4.4	63.56	58.7	62.1	31.2	72.8
	1.5	1.5	9.02	2.42	2.12	2.74	.20	.063	29.	5.4	63.56	59.2	50.7	25.5	59.5
	1.5	2.0	9.02	2.42	2.12	2.74	.20	.044	29.	6.3	63.56	58.0	43.9	22.1	51.5
	2.0	1.0	9.01	2.42	2.12	2.74	.20	.023	29.	3.5	63.56	59.8	62.1	41.6	97.1
	2.0	1.5	9.02	2.42	2.12	2.74	.20	.035	29.	4.1	63.56	58.9	50.7	34.0	79.3
	2.0	2.0	9.02	2.42	2.12	2.74	.20	.047	29.	4.7	63.56	58.5	43.9	29.4	68.7
	2.5	1.0	9.00	2.42	2.12	2.74	.20	.015	29.	2.7	63.56	61.5	62.1	52.0	121.4
	2.5	1.5	9.01	2.42	2.12	2.74	.20	.023	29.	3.3	63.56	59.9	50.7	42.5	99.1
	2.5	2.0	9.01	2.42	2.12	2.74	.20	.030	29.	3.8	63.56	59.2	43.9	36.8	85.8

TABLE A34

BEAM-FUELING MODEL, PW = 1.0 MW/SQ.M. , KAPPA = 3.0

PI GW	Q	QO	TF KEV	NF 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	SI 10^{11}	VB KEV	I MA	BT KG	BMAX KG
12.5	1.5	1.0	9.02	.89	.78	1.00	.20	.318	80.	16.3	8.55	59.1	57.2	13.5	30.3
	1.5	1.5	9.02	.89	.78	1.00	.20	.477	80.	20.0	8.55	57.9	46.7	10.9	24.7
	1.5	2.0	9.02	.89	.78	1.00	.20	.637	80.	23.0	8.55	57.8	40.5	9.4	21.4
	2.0	1.0	9.02	.89	.78	1.00	.20	.179	80.	12.2	8.55	58.7	57.2	17.8	40.3
	2.0	1.5	9.02	.89	.78	1.00	.20	.268	80.	15.0	8.55	58.2	46.7	14.5	32.9
	2.0	2.0	9.02	.89	.78	1.00	.20	.358	80.	17.3	8.55	58.0	40.5	12.6	28.5
	2.5	1.0	9.01	.89	.78	1.00	.20	.114	80.	9.8	8.55	59.6	57.2	22.2	50.4
	2.5	1.5	9.02	.89	.78	1.00	.20	.172	80.	12.6	8.55	58.8	46.7	18.2	41.2
	2.5	2.0	9.02	.89	.78	1.00	.20	.229	80.	13.8	8.55	58.4	40.5	15.7	35.7
25.0	1.5	1.0	9.02	.73	.64	.83	.20	.134	97.	10.6	5.85	58.0	74.3	12.2	24.6
	1.5	1.5	9.02	.73	.64	.83	.20	.201	97.	13.0	5.85	57.8	60.7	9.9	20.1
	1.5	2.0	9.03	.73	.64	.83	.20	.268	97.	15.0	5.85	57.7	52.6	8.6	17.4
	2.0	1.0	9.02	.73	.64	.83	.20	.075	97.	7.9	5.85	58.6	74.3	16.2	32.8
	2.0	1.5	9.02	.73	.64	.83	.20	.113	97.	9.7	5.85	58.2	60.7	13.3	26.8
	2.0	2.0	9.02	.73	.64	.83	.20	.151	97.	11.2	5.85	58.0	52.6	11.5	23.2
	2.5	1.0	9.02	.73	.64	.83	.20	.048	97.	6.3	5.85	59.3	74.3	20.3	41.0
	2.5	1.5	9.02	.73	.64	.83	.20	.072	97.	7.8	5.85	58.6	60.7	16.6	33.5
	2.5	2.0	9.02	.73	.64	.83	.20	.096	97.	9.0	5.85	58.3	52.6	14.4	29.0
50.0	1.5	1.0	9.02	.61	.53	.69	.20	.057	117.	6.9	4.04	58.0	96.7	11.1	20.9
	1.5	1.5	9.03	.61	.53	.69	.20	.085	117.	8.4	4.04	57.8	79.0	9.9	17.1
	1.5	2.0	9.03	.61	.53	.69	.20	.113	117.	9.7	4.04	57.7	68.4	7.8	14.8
	2.0	1.0	9.02	.61	.53	.69	.20	.032	117.	5.2	4.04	58.4	96.7	14.8	27.9
	2.0	1.5	9.02	.61	.53	.69	.20	.048	117.	6.3	4.04	58.1	79.0	12.1	22.8
	2.0	2.0	9.02	.61	.53	.69	.20	.064	117.	7.3	4.04	57.9	68.4	10.4	19.7
	2.5	1.0	9.02	.61	.53	.69	.20	.020	117.	4.1	4.04	59.1	96.7	18.4	34.8
	2.5	1.5	9.02	.61	.53	.69	.20	.031	117.	5.1	4.04	58.5	79.0	15.1	28.4
	2.5	2.0	9.02	.61	.53	.69	.20	.041	117.	5.8	4.04	58.2	68.4	13.1	24.6

TABLE A35

BEAM-FUELING MODEL, PW = 3.0 MW/SQ.M. , KAPPA = 3.0

PT	Q	BO	TE	NE	NA	NI	FF	CT	TAU	T/TI	SN	VB	I	BI	BMAX
GW			KEV	10^{14}	10^{13}	10^{12}			SEC		10^{11}	KEV	MA	KG	KG
12.5	1.5	1.0	9.02	2.09	1.83	2.37	.20	.240	34.	14.1	47.74	58.2	49.5	20.6	66.9
	1.5	1.5	9.02	2.09	1.83	2.37	.20	.360	34.	17.7	47.74	57.9	40.4	16.8	54.6
	1.5	2.0	9.02	2.09	1.83	2.37	.20	.480	34.	20.0	47.74	57.8	35.0	14.6	47.3
	2.0	1.0	9.02	2.09	1.83	2.37	.20	.135	34.	10.6	47.74	58.8	49.5	27.4	89.2
	2.0	1.5	9.02	2.09	1.83	2.37	.20	.202	34.	13.0	47.74	58.3	40.4	22.4	72.8
	2.0	2.0	9.02	2.09	1.83	2.37	.20	.270	34.	15.0	47.74	58.1	35.0	19.4	63.1
	2.5	1.0	9.01	2.09	1.83	2.37	.20	.086	34.	8.5	47.74	59.7	49.5	34.3	111.4
	2.5	1.5	9.02	2.09	1.83	2.37	.20	.129	34.	10.4	47.74	58.9	40.4	28.0	91.0
	2.5	2.0	9.02	2.09	1.83	2.37	.20	.173	34.	12.0	47.74	58.5	35.0	24.2	78.8
25.0	1.5	1.0	9.02	1.72	1.51	1.95	.20	.101	41.	9.2	32.34	58.1	64.6	18.6	46.5
	1.5	1.5	9.02	1.72	1.51	1.95	.20	.151	41.	11.2	32.34	57.9	52.8	15.2	38.0
	1.5	2.0	9.02	1.72	1.51	1.95	.20	.201	41.	13.0	32.34	57.8	45.7	13.2	32.9
	2.0	1.0	9.02	1.72	1.51	1.95	.20	.057	41.	6.9	32.34	58.6	64.6	24.8	62.0
	2.0	1.5	9.02	1.72	1.51	1.95	.20	.085	41.	8.4	32.34	58.2	52.8	20.3	50.7
	2.0	2.0	9.02	1.72	1.51	1.95	.20	.113	41.	9.7	32.34	58.0	45.7	17.5	43.9
	2.5	1.0	9.01	1.72	1.51	1.95	.20	.036	41.	5.5	32.34	59.5	64.6	31.0	77.5
	2.5	1.5	9.02	1.72	1.51	1.95	.20	.054	41.	6.7	32.34	58.7	52.8	25.3	63.3
	2.5	2.0	9.02	1.72	1.51	1.95	.20	.072	41.	7.8	32.34	58.3	45.7	21.9	54.8
50.0	1.5	1.0	9.02	1.42	1.24	1.61	.20	.043	50.	6.0	21.88	58.0	84.0	16.9	36.3
	1.5	1.5	9.02	1.42	1.24	1.61	.20	.064	50.	7.3	21.88	57.8	68.6	13.8	29.6
	1.5	2.0	9.02	1.42	1.24	1.61	.20	.085	50.	8.4	21.88	57.7	59.4	12.0	25.7
	2.0	1.0	9.02	1.42	1.24	1.61	.20	.024	50.	4.5	21.88	58.5	84.0	22.5	48.4
	2.0	1.5	9.02	1.42	1.24	1.61	.20	.036	50.	5.5	21.88	58.1	68.6	18.4	39.5
	2.0	2.0	9.02	1.42	1.24	1.61	.20	.048	50.	6.3	21.88	58.0	59.4	15.9	34.2
	2.5	1.0	9.01	1.42	1.24	1.61	.20	.015	50.	3.6	21.88	59.2	84.0	28.2	60.5
	2.5	1.5	9.02	1.42	1.24	1.61	.20	.023	50.	4.4	21.88	58.6	68.6	23.0	49.4
	2.5	2.0	9.02	1.42	1.24	1.61	.20	.031	50.	5.1	21.88	58.2	59.4	19.9	42.8

TABLE A36

BEAM-FUELING MODEL, PW = 6.0 MW/SQ.M. , KAPPA = 3.0

PT GW	Q	RO	TE KEV	NE 10^{14}	NA 10^{13}	NI 10^{12}	FB	CT	TAU SEC	T/TB	SN 10^{11}	VB KEV	I MA	WT KG	WMAX KG
12.5	1.5	1.0	9.02	3.67	3.22	4.16	.20	.197	19.	12.8	146.90	58.2	45.1	27.3	161.0
	1.5	1.5	9.02	3.67	3.22	4.16	.20	.296	19.	15.7	146.90	58.0	36.8	22.3	131.4
	1.5	2.0	9.02	3.67	3.22	4.16	.20	.395	19.	18.2	146.90	57.8	31.9	19.3	113.8
	2.0	1.0	9.01	3.67	3.22	4.16	.20	.111	19.	9.6	146.90	58.9	45.1	36.4	214.6
	2.0	1.5	9.02	3.67	3.22	4.16	.20	.167	19.	11.8	146.90	58.4	36.8	29.7	175.2
	2.0	2.0	9.02	3.67	3.22	4.16	.20	.222	19.	13.6	146.90	58.1	31.9	25.7	151.8
	2.5	1.0	9.01	3.67	3.22	4.16	.20	.071	19.	7.7	146.90	59.9	45.1	45.5	268.2
	2.5	1.5	9.01	3.67	3.22	4.16	.20	.107	19.	9.4	146.90	53.0	36.8	37.1	219.0
	2.5	2.0	9.02	3.67	3.22	4.16	.20	.143	19.	10.9	146.90	58.5	31.9	32.2	189.7
25.0	1.5	1.0	9.02	2.96	2.60	3.36	.20	.085	24.	8.4	95.64	58.1	58.9	24.5	79.6
	1.5	1.5	9.02	2.96	2.60	3.36	.20	.127	24.	10.3	95.64	57.9	48.1	20.0	65.0
	1.5	2.0	9.02	2.96	2.60	3.36	.20	.169	24.	11.9	95.64	57.8	41.6	17.3	56.3
	2.0	1.0	9.02	2.96	2.60	3.36	.20	.047	24.	6.3	95.64	58.7	58.8	32.6	106.1
	2.0	1.5	9.02	2.96	2.60	3.36	.20	.071	24.	7.7	95.64	58.2	48.1	26.6	86.6
	2.0	2.0	9.02	2.96	2.60	3.36	.20	.095	24.	8.9	95.64	58.0	41.6	23.1	75.0
	2.5	1.0	9.01	2.96	2.60	3.36	.20	.030	24.	5.3	95.64	59.6	58.8	40.8	132.6
	2.5	1.5	9.02	2.96	2.60	3.36	.20	.046	24.	6.2	95.64	58.8	48.0	33.3	108.3
	2.5	2.0	9.02	2.96	2.60	3.36	.20	.061	24.	7.1	95.64	58.4	41.6	28.9	93.8
50.0	1.5	1.0	9.02	2.43	2.13	2.76	.20	.036	29.	5.5	64.41	58.0	76.8	22.[illegible]	55.3
	1.5	1.5	9.02	2.43	2.13	2.76	.20	.054	29.	6.7	64.41	57.8	62.7	18.1	45.1
	1.5	2.0	9.02	2.43	2.13	2.76	.20	.072	29.	7.7	64.41	57.8	54.3	15.6	39.1
	2.0	1.0	9.02	2.43	2.13	2.76	.20	.020	29.	4.1	64.41	58.6	76.8	29.5	73.7
	2.0	1.5	9.02	2.43	2.13	2.76	.20	.030	29.	5.0	64.41	58.2	62.7	24.1	60.2
	2.0	2.0	9.02	2.43	2.13	2.76	.20	.040	29.	5.8	64.41	58.0	54.3	20.8	52.1
	2.5	1.0	9.01	2.43	2.13	2.76	.20	.013	29.	3.3	64.41	59.3	76.8	36.8	92.1
	2.5	1.5	9.02	2.43	2.13	2.76	.20	.019	29.	4.[illegible]	64.41	58.6	62.7	30.1	75.2
	2.5	2.0	9.02	2.43	2.13	2.76	.20	.026	29.	4.6	64.41	58.3	54.3	26.1	65.2