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常陽MK-Iの燃焼特性解析(1)

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動力炉・核燃料開発事業団
大洗工学センター

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要　旨

「常陽」MK-I炉心の照射後試験のデータ全てをデータベース化した。PIEが行われた集合体は、炉心燃料集合体28体、ブランケット燃料集合体11体であった。また、試料数としては、炉心燃料147個（燃焼度は最高5 (a/o)）、軸ブランケット燃料28個、径ブランケット燃料43個であった。

作成したPIEデータファイルをもとに、炉心燃料については同位体組成比およびプルトニウム含有率を燃焼率について整理した。また、ブランケット燃料については、プルトニウム生成量を燃焼率および位置について整理した。

三次元モデルによる18群修正粗メッシュ拡散計算によって燃焼解析を行い、以下の燃焼特性について実測データと比較した。使用した群定数は、JFS3－JENDL-2である。各特性の計算値と実測値の比 (C/E) は以下の通りであった。

① 燃焼係数 (50MW·day当たりの反応度低下)

C/E＝1.02　+7～－13%

② 炉心部の燃焼率に対する組成変化率

Pu239/Pu	C/E＝1.05	±2%
Pu240/Pu	C/E＝1.06	±4%
Pu242/Pu	C/E＝1.14	±5%
U235/U	C/E＝1.11	±1%
U236/U	C/E＝1.08	±2%
U238/U	C/E＝1.11	±1%

③ 径ブランケット部のPu生成量

第5層	C/E＝1.01～1.06	±7%
第6層	C/E＝1.02～1.14	±7%
第7層	C/E＝1.07	±7%
第8層	C/E＝1.02	±7%

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Study on Burn-up Performances of JOYO Mk-1

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Abstract

All of post irradiation experiment (PIE) data of JOYO Mk-1 were collected and arranged to data base. The number of core fuel assemblies performed PIE is 28, the number of blanket fuel assemblies performed PIE is 11. The number of PIE data of core fuel is 147 (maximum burnup is to about 5(a/o)), the number of axial blanket fuel PIE data is 28, the number of PIE data of radial blanket fuel is 43.

We performed 3 dimensional diffusion calculation based on modified coarse mesh method and burnup calculation, and compared the calculation value of bellow burn-up Performances with PIE data. JFS3-JENDL2 cross section library is used.

The C/E value of burn-up Performances are as follows ;

① Burnup coefficient (reactivity loss for 50MW·day)

C/E=1.02 +7~-13%

② Relative change of isotope ratio to burnup(a/o)

Pu239/Pu	C/E=1.05	±2%
Pu240/Pu	C/E=1.06	±4%
Pu242/Pu	C/E=1.14	±5%
U235/U	C/E=1.11	±1%
U236/U	C/E=1.08	±2%
U238/U	C/E=1.11	±1%

③ Pu build-up in radial blanket

5th layer	C/E=1.01~1.06	±7%
6th layer	C/E=1.02~1.14	±7%
7th layer	C/E=1.07	±7%
8th layer	C/E=1.02	±7%

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1. はじめに

動力炉で燃焼した燃料の照射後試験から得られる質量分析等のデータは実際の炉内の中性子束分布を反映した情報を含んでおり、炉心の核特性の評価のために活用することは非常に重要である。照射済燃料の分析データを積極的に利用･活用していくことは、臨界実験装置を用いた模擬炉心における実験とその解析から得られる情報の活用と合せて、燃焼特性の予測精度向上に大いに役立つものである。

「常陽」MK-1の運転が終了し、28体の炉心燃料集合体(ペレット最高燃焼度が5万MWd/t)、11体のブランケット燃料集合体からの質量分析データが蓄積されている。

本研究の目的は、(1)「常陽」MK-1の運転時に装荷された燃料から得られたP.I.Eデータ(質量分析データ)を整理し、(2)P.I.Eデータより得られた燃焼特性を解析値と比較することである。

P.I.Eデータの整理は、これまで文献(1)で行われているが、整理手法として適切でない点があったので、今回それを見直した。また、扱ったP.I.Eデータの数についても、データ全数の約半分であった。一方、燃焼特性解析は、これまでに文献(2),(3),(4)で実施されている。しかし、扱ったP.I.Eデータの燃焼度が3万5千MWd/tと比較的低く、P.I.Eデータの数も、今回扱った数の半分であった。これまでの成果をふまえ、本研究では更に燃焼度の高いP.I.Eデータを加え、より精度の高い検討を実施した。

2. 照射後試験(PIE)データ

「常陽」MK-Ⅰの燃料の照射後試験(PIE)は、AGFにおいて実施された。その試験項目の1つに燃焼率測定がある(図2.1)。この測定過程において、U、Puの抽出および質量分析が実施されている。このため、以下のデータが存在している(表2.1)。

・全重核に対するPuの原子数比(a/o): $\dfrac{N(Pu)}{N(Pu)+N(U)}$

・Pu同位体組成比(a/o): $\dfrac{N(Pu238)}{N(Pu)}$、$\dfrac{N(Pu239)}{N(Pu)}$、$\dfrac{N(Pu240)}{N(Pu)}$、$\dfrac{N(Pu241)}{N(Pu)}$、$\dfrac{N(Pu242)}{N(Pu)}$

・U同位体組成比(a/o): $\dfrac{N(U234)}{N(U)}$、$\dfrac{N(U235)}{N(U)}$、$\dfrac{N(U236)}{N(U)}$、$\dfrac{N(U238)}{N(U)}$

・燃焼率(a/o): $\dfrac{N(FP)}{N(Pu)+N(U)+N(FP)}$

以上のデータおよびその照射履歴をすべての試料について収集しデータベース化した。さらに、燃焼率に対してそれぞれの量の整理を実施した。

表2.1　燃焼率測定結果（例）

S/A NO.(FAB) ; PPJX13	PIN NO.(PIE) ; 5346
SAMPLE NO. ; 5346B4	SAMPLE POSITION ; 272.6~278.0 (mm)*

VOLUME RATIO OF SPIKE SOLUTION TO SAMPLE SOLUTION ; 2.000

ISOTOPIC RATIO OF U,Pu,Nd IN (a)SAMPLE AND (b)SAMPLE-SPIKE MIXTURE ;

[U233/238]	[U234/238]	[U235/238]	[U236/238]	
0.000000	0.001643	0.262023	0.011563	-(a)
0.143452	0.003284	0.261758	0.011535	-(b)

[Pu238/239]	[Pu240/239]	[Pu241/239]	[Pu242/239]	
0.001807	0.266178	0.027147	0.007398	-(a)
0.001807	0.268121	0.027286	0.133399	-(b)

[Nd142/150]	[Nd143/150]	[Nd144/150]	[Nd145/150]	[Nd146/150]	[Nd148/150]	
0.020653	5.741766	4.690602	3.921584	3.204792	1.955789	-(a)
0.010854	4.354847	3.524246	2.979684	2.438000	1.489801	-(b)

ISOTOPIC COMPOSITION OF U,Pu,Nd IN SAMPLE (atom%) ;

[U233]	[U234]	[U235]	[U236]	[U238]
0.0000	0.1288	20.5471	0.9067	78.4173

[Pu238]	[Pu239]	[Pu240]	[Pu241]	[Pu242]
0.1387	76.7737	20.4355	2.0842	0.5680

[Nd142]	[Nd143]	[Nd144]	[Nd145]	[Nd146]	[Nd148]	[Nd150]
0.1006	27.9606	22.8418	19.0959	15.6063	9.5241	4.8697

Pu CONTENT (atom%)/(weight%) ; 17.433 / 17.548

NUMBER OF TOTAL HEAVY ELEMENT (atoms/sample) ; 2.8342E+21

		[Nd148]	[Nd146]	[Nd145]
NUMBER OF Nd NUCLIDE (atoms/sample)	;	2.6676E+18	4.3584E+18	5.3074E+18
EFFECTIVE FISSION YIELD	;	1.71E-02	2.78E-02	3.43E-02
NUMBER OF FISSIONS (fissions/sample)**	;	1.5600E+20	1.5678E+20	1.5474E+20
BURNUP (atom%)#	;	5.22	5.24	5.18
SPECIFIC BURNUP (MWD/MTM)##	;	50200	50400	49800

NOTE ; * Distance from core fuel bottom
** FISSIONS=NUMBER OF Nd/EFFECTIVE FISSION YIELD
# BURNUP=100*FISSIONS/(TOTAL HEAVY ELEMENT+FISSIONS)
1.04 atom% B.U=10000 MWD/MTM B.U

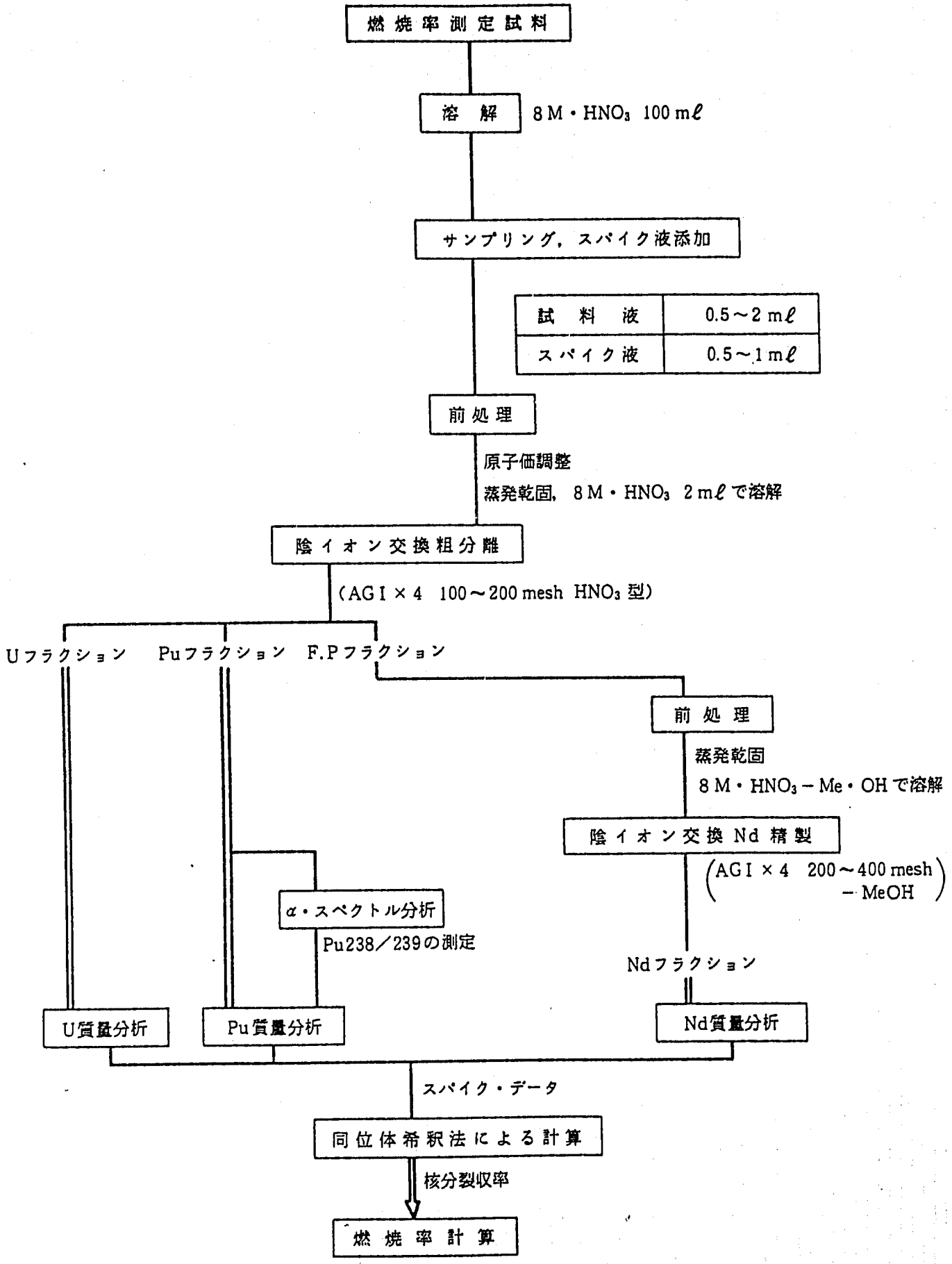


図2.1 Process for burnup measurement in AGS

2.1 PIEデータの収集

これまでに発行された「常陽」MK-I炉心の燃料製造およびPIE関連の報告書より以下のデータを集め、計算機に入力した。

① PIEを実施した試料の位置(集合体位置、ピン位置、軸方向位置)

② 照射後のU、Puの同位体組成比、Pu富化度および燃焼率

③ 集合体の炉内照射期間

④ U、Pu、Nd同位体組成比測定日

⑤ ウラン/プルトニウム混合粉末ロット名

⑥ 濃縮ウラン粉末ロット名およびプルトニウム粉末ロット名

④は、^{241}Puの量を集合体取出日に外挿するために必要となる。⑤、⑥は、PIEを実施した試料の製造時のロットを特定するものである。

各々の集合体について照射後試験報告書が作成されているため(表2.1.1~2)、同位体組成比はそれより引用した。また報告書に、記載されている照射期間については、集合体ごとにまとめて表2.1.3~4に示す。

ウラン、プルトニウム、ネオジムの同位体組成測定日は、文献(6)より引用した。これを表2.1.5、表2.1.6に示す。

各ペレットを製造した混合粉末ロット名は、文献(7)より、その混合粉末を製造した濃縮ウラン粉末およびプルトニウム粉末のロット名は、文献(5)等より引用した。これをPIEを実施したピン番号ごとに整理し表2.1.7に示す。

以上のデータをPIEを実施したすべての試料について入力し、付録1の形式でデータベース化した。このデータファイルをもとに試料の炉内位置、燃焼率について分類した。

PIEを実施した炉心燃料集合体は28体、径ブランケット集合体は11体であった。
また、試料数としては、炉心燃料147個、軸ブランケット燃料28個、径ブランケット燃料43個であった。

PIEを実施した集合体の炉内装荷位置を図2.1.1に示す。この図より、PIEを実施した炉心燃料集合体の多くは、中心付近(0~2層)に装荷されていた。また、D1方向には、0層から8層までブランケット燃料集合体を含む9体の集合体についてPIEが実施されている。PIEを実施した試料の軸方向位置を図2.1.2に示す。図より、炉心および径ブランケット燃料については中心面近傍の試料が多く、また、軸方向ブランケットの境界付近についてもPIEを実施している。軸方向ブランケットでは、下部の試料が多く、その中でも炉心近傍に集中している。

燃焼率とPIEデータ数の関係を図2.1.3、図2.1.4に示す。炉心燃料ペレットは、最大5.5(a/o)までの間に広く分布している。データ数的には、燃焼率が1.0~3.5(a/o)のものが多い。また、ブランケット燃料ペレットは、燃焼率が最大でも0.3(a/o)であり、燃焼率の低いペレットが多い。

表2.1.1 照射後試験報告書一覧（炉心燃料集合体）

S/A №	列	報告書番号
PPJD1A	5A3	SN941 82-174
PPJX15	1C1	同上
PPJX08	2E2	同上
PPJD29	5A4	同上
PPJD04	4B2	同上
PPJX14	1B1	同上
PPJX06	1E1	同上
PPJD22	3A2	同上
PPJX11	1A1	同上
PPJD1W	1E1	同上
PPJX09	2B1	SN941 82-200
PPJD2L	2D2	SN941 82-127
PPJD2B	2F2	SN941 82-241
PPJD39	1C1	SN941 82-258
PPJD1X	1E1	SN941 82-191
PPJX17	5F3	SN941 83-87
PPJW1H	1F1	SN941 83-162
PPJD0M	2F1	SN941 84-30
PPJD2U	2A1	SN941 83-86
PPJD0B	1B1	SN941 84-29
PPJX13	000	I941 85-08
PPJD18	4D3	I9410 86-015
PPJD25	4D1	I9410 86-021
PPJD2Y	3D1	I9410 87-011
PPJX12	1D1	I9410 87-013
PPJD2P	2A2	I9410 87-010
PPJD1J	5E3	I9410 87-012
PPJD2S	2D1	I9410 87-011

表2.1.2 照射後試験報告書一覧（ブランケット燃料集合体）

S/A №	列	報告書番号
NFJI0H	5A2	ZN941 81-200
NFJ04A	6F1	SN941 82-255
NFJM1S	6F4	SN941 84-02
NFJI0Q	5A1	SN941 84-01
NFJI0R	5C2	SN941 83-17
NFJM18	6E6	SN941 82-262
NFJI11	5D1	I941 85-07
NFJO4K	6D1	同上
NFJO64	7D1	同上
NFJO5L	8D1	同上
NFJI0U	5E1	I9410 86-001

表2.1.3 炉心燃料集合体の照射期間

S/A №	列	50MW cycle			75MW cycle						
		0	1	2	0	1	2	3	4	5	6
PPJX13	000	●	●	●	●	●	●	●	●	●	●
PPJX11	1A1	●	●	●	●	●	○				
PPJX14	1B1	●	●	●	○						
PPJD0B	1B1				●	●	●	●	●	●	●
PPJX15	1C1	●	○								
PPJD39	1C1		●	●	●	●	●	●			
PPJX12	1D1	●	●	●	●	●	●	●	●	●	●
PPJX06	1E1	●	●	●	●						
PPJD1W	1E1					●	※				
PPJD1X	1E1						●	●			
PPJW1H	1F1										●
PPJD2U	2A1	●	●	●	●	●	●	●	●	●	
PPJD2P	2A2	●	●	●	●	●	●	●	●	●	●
PPJX09	2B1	●	●	●	●	●	●	●			
PPJD2S	2D1	●	●	●	●	●	●	●	●	●	●
PPJD2L	2D2	●	●	●	●	●	○				
PPJX08	2E2	●	●	○							
PPJD0M	2F1	●	●	●	●	●	●	●	●	○	
PPJD2B	2F2	●	●	●	●	●	●	○			
PPJD22	3A2	●	●	●	●						
PPJD2Y	3D1	●	●	●	●	●	●	●	●	●	●
PPJD04	4B2	●	●	●	○						
PPJD25	4D1	●	●	●	●	●	●	●	●	●	●
PPJD18	4D3	●	●	●	●	●	●	●	●	●	●
PPJD1A	5A3	●									
PPJD29	5A4	●	●	○							
PPJD1J	5E3	●	●	●	●	●	●	●	●	●	●
PPJX17	5F3	●	●	●	●	●	●	○			

● 照射

○ ポットでの冷却期間

※ 75MW第1cycleと第2cycle の間の特殊運転の間(55MW 約2日間)のみポットに装荷

表2.1.4 ブランケット燃料集合体の照射期間

S/A №	列	50MW cycle			75MW cycle						
		0	1	2	0	1	2	3	4	5	6
NFJI0Q	5A1	●	●	●	●	○					
NFJI0H	5A2	●	●	●	○						
NFJI0R	5C2	●	●	●	●	●	●	●	●	○	
NFJI11	5D1		●	●	●	●	●	●	●	●	●
NFJI0U	5E1	●	●	●	●	●	●	●	●	●	●
NFJO4K	6D1	●	●	●	●	●	●	●	●	●	●
NFJM18	6E6	●	●	●	●	●	●	●	●	●	
NFJ04A	6F1	●	●	●	●	●	●				
NFJM1S	6F4	●	●	●	●	●	●	●			
NFJO64	7D1	●	●	●	●	●	●	●	●	●	●
NFJO5L	8D1	●	●	●	●	●	●	●	●	●	●

● 照射
○ ポットでの冷却期間

表2.1.5 炉心燃料集合体毎のU、Pu、Nd同位体組成測定日

S/A No.	U	Pu	Nd
PPJD1A	1979.10.11	1979.10.30	1979.10.18
PPJX15	1980. 2. 5	1980. 2. 7	1980. 2.12
PPJX08	1980. 4. 3	1980. 3.18	1980. 3.27
PPJD29	1980. 9.11	1980. 9.26	1980.10.21
PPJD04	1980. 9.11	1980. 9.26	1980.10.21
PPJX14	1980. 9.16	1980.10.13	1980.10.23
PPJX06	1981. 1.20	1981. 3.12	1980.12. 4
PPJD22	1981. 2.17	1981. 3.13	1981. 3.10
PPJX11	1981. 4.22	1981. 6. 9	1981. 5. 6
PPJD1W	1982. 1.12	1981.11.27	1981.11.29
PPJX09	1981. 7.29	1981. 8.10	1981. 8. 3
PPJD2L	1981.10.20	1981.10.12	1981. 9.17
PPJD2B	1981.10.20	1981.10.12	1981. 9.17
PPJD39	1981.11.26	1981.11.28	1981.11.29
PPJD1X	1982. 1.12	1981.11.28	1981.11.29
PPJX17	1982. 3.31	1982. 3.11	1982. 3.18
PPJW1H	1982.10.16	1982.10.15	1982.10.22
PPJD0M	1982.10.16	1982.10.15	1982.10.22
PPJD2U	1982.10.16	1982.10.15	1982.10.22
PPJD0B	1982.11.10	1982.11.13	1982.11.17
PPJX13	1983. 5.24	1983.10.20	1983. 8.15
PPJD18	1985. 7.27	1985. 7.25	1985. 7.22
PPJD25	1985. 6.25	1985. 6.18	1985. 6.17
PPJD2Y	1986. 4. 9	1986. 4. 8	1986. 3.31
PPJX12	1985. 9.17	1985. 9.12	1985.10. 1
PPJD2P	1986. 5. 7	1986. 5. 6	1986. 4.28
PPJD1J	1986. 5.29	1986. 5.30	1986. 5.27
PPJD2S	1986. 7. 8	1986. 7.18	1986. 7. 3

表2.1.6 ブランケット燃料集合体毎のU、Pu、Nd同位体組成測定日

S/A No.	U	Pu	Nd
NFJI0H	1981. 4.22	1981. 4.27	1981. 4.20
NFJ04A	1982. 3.29	1982. 3.12	1982. 3.18
NFJM1S	1982. 3.30	1982. 3.12	1982. 3.19
NFJI0Q	1982. 3.30	1982. 3.16	1982. 3.26
NFJI0R	1982. 7.27	1982. 7.30	1982. 8. 4
NFJM18	1982. 8. 4	1982. 7.30	1982. 8.11
NFJI11	1984. 5.26	1984. 6.11	1984. 6.13
NFJ04K	1984. 7.17	1984. 5.25	1984. 5.25
NFJ064	1984. 5.26	1984. 7. 2	1984. 6.19
NFJ05L	1984. 7.19	1984. 7.11	1984. 7. 6
NFJI0U	1985. 4.19	1985. 4.18	1985. 4.16

表2.1.7　ピン番号とロットの対応

S/A №	ピン番号	U･Pu混合粉末ロット名	プルトニウム粉末ロット名	濃縮ウラン粉末ロット名
PPJX17	3606	FM0128	PU8243	EU0002
	3608	FR0132	PU8243/93	EU0U30
	3625	FR0132	PU8243/93	EU0U30
	3646	FR0132	PU8243/93	EU0U30
	3667	FR0138	PU8245	EU0U30
	3684	FR0132	PU8243/93	EU0U30
	3686	FR0138	PU8245	EU0U30
PPJW1H	4746	FR0152	PU8243/4	EU0015
PPJD0M	3901	FM0107	PU8231	EU0013
	3946	FR0145	PU8245	EU0U30
	3991	FM0122	PU8232	EU0010
PPJD2U	4246	FR0210	PUJ001	EU0006
PPJD0B	4801	FM0119	PU8232	EU0012/3
	4846	FM0121	PU8232	EU0014
	4891	FM0119	PU8232	EU0012/3
PPJX13	5306	FM0106	PU8231	EU0013
	5346	FM0103	PU8230	EU0004
	5386	FM0107	PU8231	EU0013
PPJD18	6841	FR0154	PU8244	EU0015/6
	6846	FR0154	PU8244	EU0015/6
PPJD25	6006	FR0187	PU8253	EU000C
	6046	FR0190	PU8253	EU0018/C
	6086	FR0188	PU8253	EU000C
PPJD2Y	7601	FR0201	PU8255	EU000A
	7646	FR0217	PUJ001	EU0006
	7691	FR0214	PUJ001	EU0006
PPJX12	6706	FM0105	PU8230	EU0013
	6747	FM0110	PU8231	EU0013
	6786	FM0107	PU8231	EU0013
PPJD2P	7706	FR0207	PUJ001	EU0006
	7746	FR0203	PU8245	EU000C
PPJD1J	7201	FR0164	PU8251	EU0015/6
	7246	FR0167	PU8251	EU0017
	7291	FR0164	PU8251	EU0015/6
PPJD2S	7501	FR0207	PUJ001	EU0006
	7546	FR0207	PUJ001	EU0006
	7591	FR0202	PU8255	EU0012/C

表2.1.7　ピン番号とロットの対応

S/A №	ピン番号	U･Pu混合 粉末ロット名	プルトニウム 粉末ロット名	濃縮ウラン 粉末ロット名
PPJD1A	0206	FR0139	PU8245	EU0U30
	0236	FR0139	PU8245	EU0U30
	0286	FR0155	PU8251/44	EU0016
PPJX15	0506	FR0136	PU8244	EU0U30
	0546	FR0138	PU8245	EU0U30
	0584	FR0158	PU8251	EU0016
PPJX08	0801	FM0104	PU8230	EU0004
	0835	FM0104	PU8230	EU0004
	0880	FM0104	PU8230	EU0004
PPJD29	0946	FR0187	PU8253	EU000C
PPJD04	1246	FM0113	PU8231	EU0012
PPJX14	1306	FM0115	PU8231/2	EU0012
	1341	FR0130	PU8243	EU0U20
	1346	FR0145	PU8245	EU0U30
	1386	FM0120	PU8232	EU0014
PPJX06	1601	FM0105	PU8230	EU0013
	1646	FM0110	PU8231	EU0013
	1691	FM0101	PU8230	EU0003/4
PPJD22	1746	FR0185	PU8253	EU000C
PPJX11	1901	FM0105	PU8230	EU0013
	1946	FM0110	PU8231	EU0013
	1991	FM0120	PU8232	EU0014
PPJD1W	2246	FR0175	PU8252	EU0017/8
PPJX09	3001	FM0104	PU8230	EU0004
	3021	FM0104	PU8230	EU0004
	3046	FM0103	PU8230	EU0004
	3071	FM0110	PU8231	EU0013
	3091	FM0110	PU8231	EU0013
PPJD2L	2306	FR0206	PUJ001	EU0006
	2346	F00004	PU%%%%	EU%%%%
	2386	F00004	PU%%%%	EU%%%%
PPJD2B	2646	FR0176	PU8252	EU0018
PPJD39	2941	FR0221	PUJ001/2	EU0006
	2946	FR0221	PUJ001/2	EU0006
	2951	FR0221	PUJ001/2	EU0006
PPJD1X	3446	FR0180	PU8253	EU000B

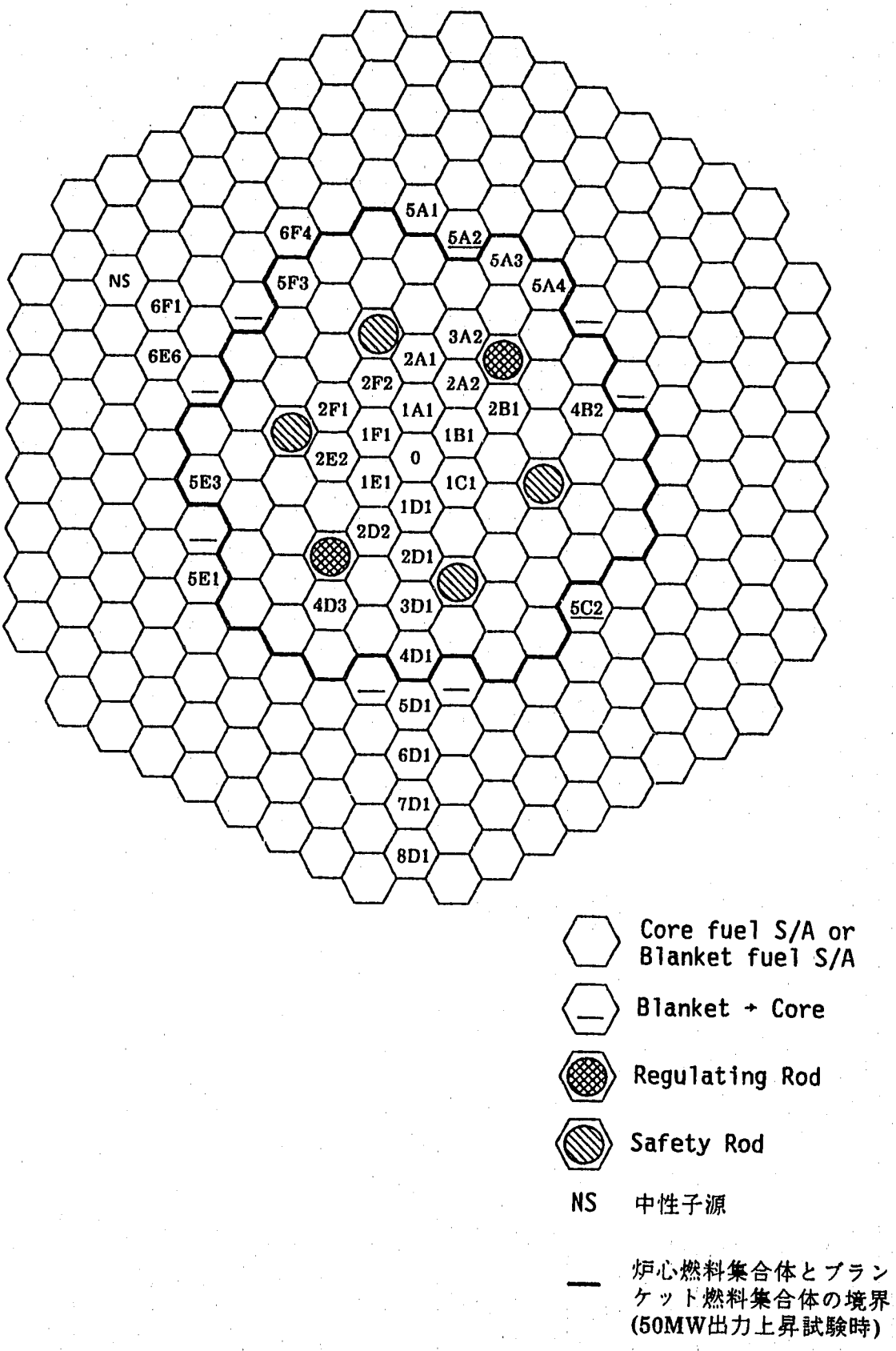


図2.1.1　ＰＩＥを実施した集合体装荷位置

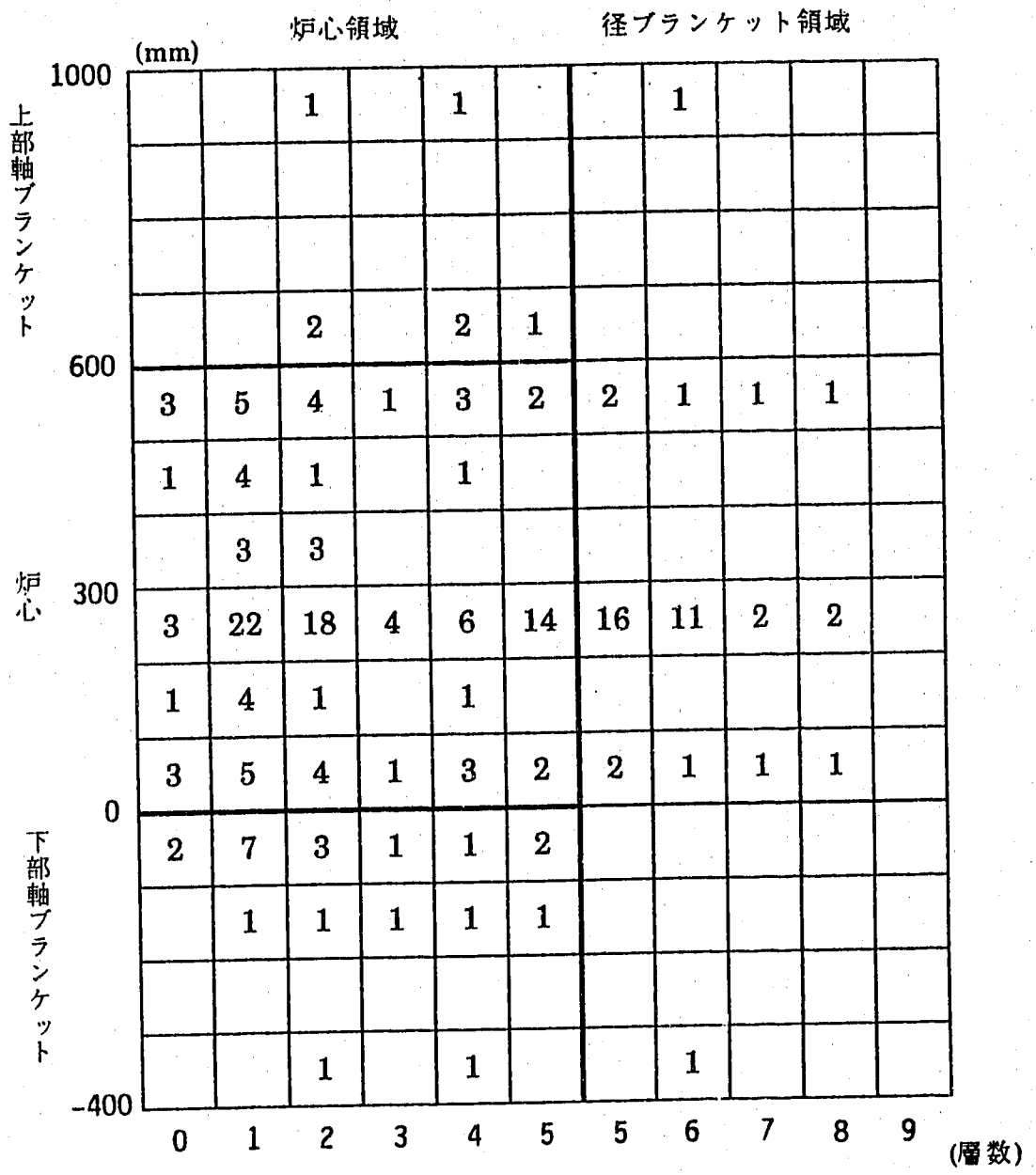


図2.1.2　　ＰＩＥを実施した試料の軸方向位置（R-Z体系）

注) □内の数字はその位置でのPIEデータの個数を示す。

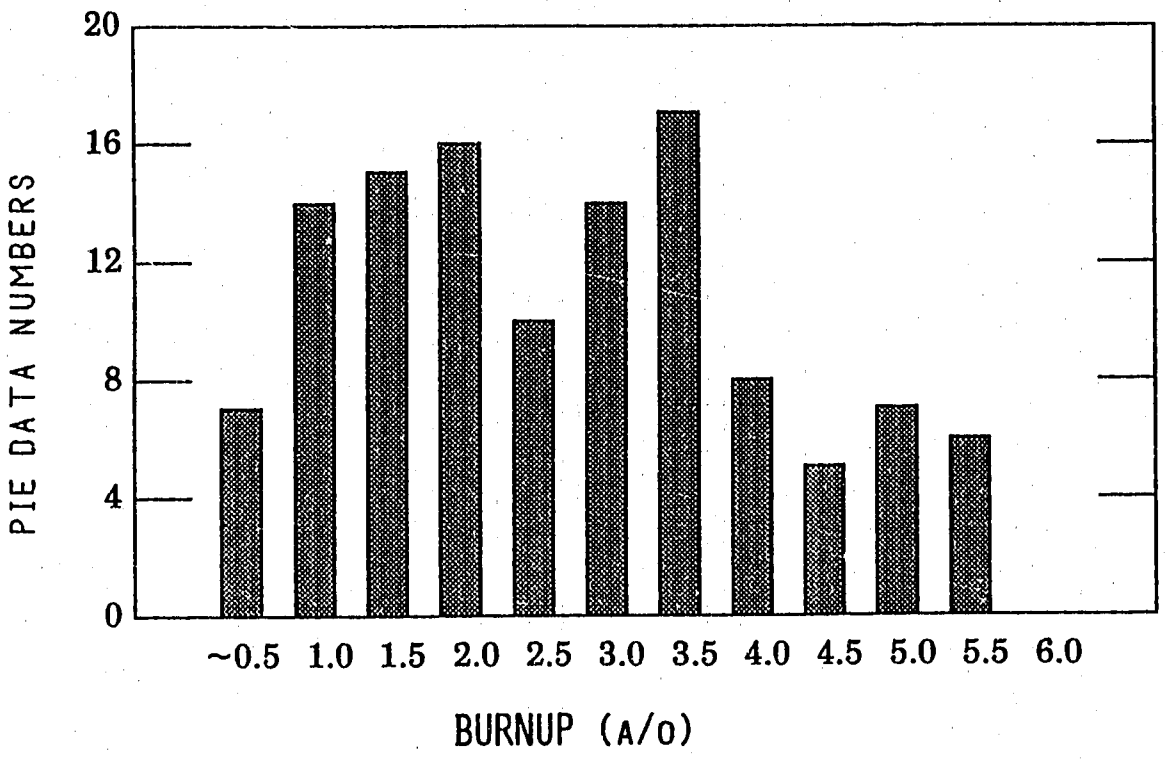


図2.1.3　燃焼率とＰＩＥデータ数の関係（炉心燃料ペレット）

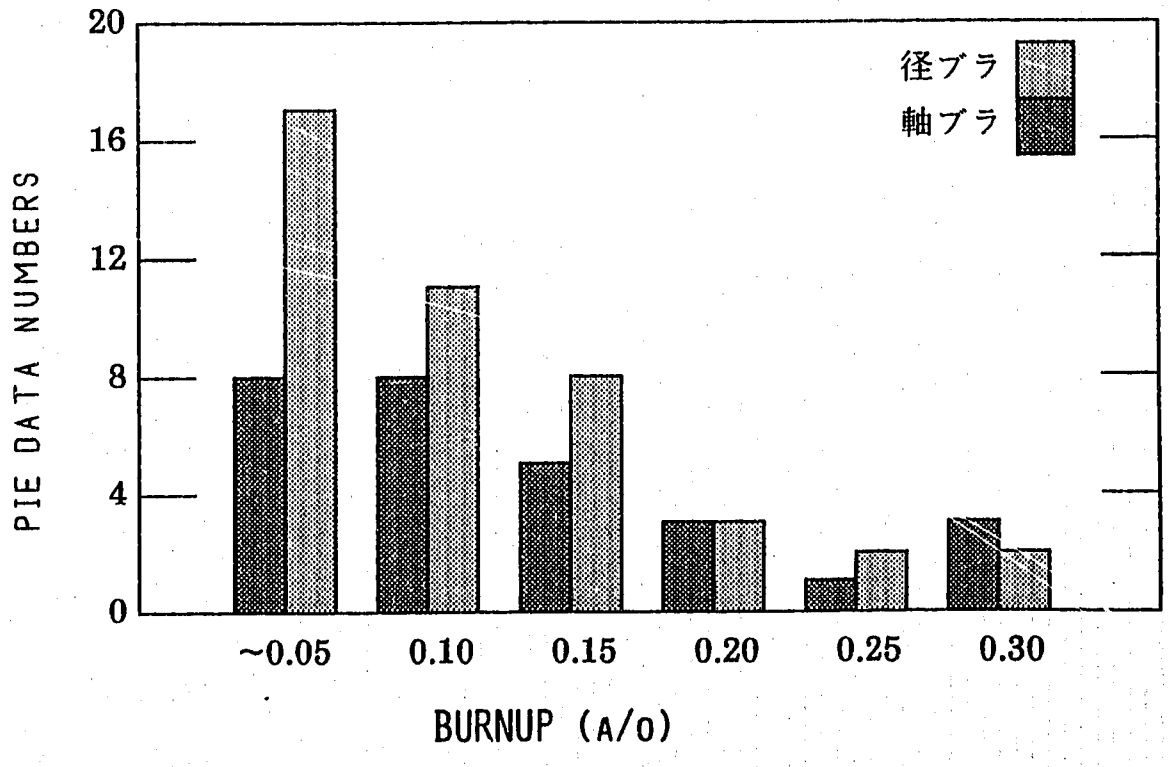


図2.1.4　燃焼率とＰＩＥデータ数の関係（ブランケット燃料ペレット）

2.2 PIEデータの整理および考察

作成したPIEデータファイルをもとに、炉心燃料については同位体組成比およびプルトニウム含有率を燃焼率について整理した。また、ブランケット燃料については、プルトニウム生成量を燃焼率および照射位置について整理した。

整理方法は、文献(1)にもとづき、炉心燃料については以下の作業を行った。

- ブランケット近傍において中性子スペクトルが大きく変化するためブランケット近傍のデータは区別した。
- ロットごとに組成のばらつきが大きいため(特にPu)、ロットごとにグループ化した。
- グループ化したデータについて、燃焼率と同位体組成比との関係を1次式で近似した。

以上の整理方法については、付録2において、妥当性を確認した。
また、PIEデータファイルを読み込み、以下の評価を行うプログラムを作成した(付録3)。

(1) 燃料同位体組成比

① プルトニウムの同位体組成比は、^{238}Pu、^{239}Pu、^{240}Pu、^{241}Pu、^{242}Puの5核種について得られている。この内^{241}Puは比較的半減期が短い(14.36年)ため、集合体取出日に換算し直した上、上記の5核種の和を100%に規格した。

$$^{241}Pu = {}^{241}Pu_e \times e^{\frac{-ln\,2}{14.36年} \times \left(取出日 - 測定日\right)}$$

$$S = {}^{238}Pu_e + {}^{239}Pu_e + {}^{240}Pu_e + {}^{241}Pu + {}^{242}Pu_e$$

$$^{i}Pu = \frac{{}^{i}Pu_e}{S} \times 100$$

燃焼率(a/o)は、ネオジム148から算出された値を用いた。

② 照射位置により炉心内部、軸方向ブランケット近傍、径方向ブランケット近傍の3領域に分類した。

- 軸方向ブランケットとの境界より5cm以内の領域 ..... 軸ブラ近傍
- 径方向ブランケットに接する集合体 ..... 径ブラ近傍
- それ以外の炉心領域 ..... 炉心内部

③ ロットごとに分類し、燃焼率との関係を各同位体組成ごとに図2.2.1~図2.2.21に示す。さらに、燃焼率Xと同位体組成比Yとの関係を最小二乗法により1次式にフィッティングした。

$$Y = A \cdot X + B$$

フィッティング式の傾きA(燃焼率に対する同位体組成の変化率)と切片B(初期組成)を表2.2.1~表2.2.18に示す。さらに、フィッティングによる値と実測値との残差平方和の平

方根εも合わせて示している。

$$\varepsilon=\sqrt{\frac{\sum\left\{Y-\left(aX+b\right)\right\}^2}{N}}$$

PIEデータとして3個以上存在するロットの種類は以下のとおりである。

領域	プルトニウム	ウラン
炉心内部	6 種類	5 種類
径ブラ近傍	4	3
軸ブラ近傍	4	4

^{241}Puについては、図2.2.3に示すように燃焼率と同位体組成の変化については、そのままでは1次式で表せない。これは、^{241}Puの半減期が14.36年と比較的短いため、その効果が中性子による生成･消滅に対して無視できないからである。従って、この効果を補正してやれば燃焼率との相関が現れてくると考えられる。

燃焼率に対する同位体組成比の変化率の符号は、次表のようになる。

核種	同位体組成比の変化率の符号	燃料中の組成比	数密度の変化量
^{239}Pu	負	13.503	消滅 大
^{240}Pu	正	3.404	生成 - 小
^{242}Pu	正	0.097	生成 小
^{235}U	負	19.164	消滅 大
^{236}U	正	0.000	生成 小
^{238}U	正	63.378	消滅 やや大

上表より^{239}Pu、^{235}Uは、核分裂物質であり、全重核種に対する割合が多く、消滅量も大きい。また、^{238}Uは捕獲断面積が大きく、含有割合も多いため、消滅量も大きい。プルトニウム全体の量は、^{239}Puの消滅量が大きいため燃焼とともに減少する。このため、^{239}Pu/Puは負、^{240}Pu/Pu、^{242}Pu/Puは正となる。ウラン全体の量は、^{235}Uと^{238}Uの消滅量が大きいため、燃焼とともに減少する。^{235}Uの消滅量は、^{238}Uより大きいため^{235}U/Uの変化率は負であるが、^{238}U/Uの変化率は正となる。

表2.2.1~18より領域ごとの燃焼率に対する同位体組成比の変化率の絶対値は、いずれの同位体についても炉心内部よりブランケット近傍が大きい。

表2.2.19~21よりPIEデータから得られた初期同位体組成比を製造時の測定値と比較すると、ほぼ0.1(a/o)以内で一致していることがわかる。

(2) プルトニウム含有率(炉心燃料)

炉心内部領域におけるプルトニウム含有率を燃焼率について整理した。
これを図2.2.22に示す。図より、プルトニウム含有率と燃焼率については、はっきりとした相関が現れていない。これは、燃焼による変化が質量分析の測定精度(±1%)に比べ小さいためと考えられる。

(3) プルトニウム含有率(ブランケット燃料)

軸ブランケット燃料

燃焼率とプルトニウム含有率との関係を図2.2.23に示す。
PIEされた試料の位置を炉心との境界では25mm、その他は50mm刻みに分類した。この図より、炉心から離れるに従ってプルトニウム含有率の変化が大きいことがわかる。

径ブランケット燃料

燃焼率とプルトニウム含有率との関係を図2.2.24に示す。
PIEされた試料の位置を4層と5層の境界付近、5層の中心付近、5層と6層の境界付近、6層の中心付近、その外側に分類した。この図より、軸ブランケットと同様に炉心から離れるに従ってプルトニウム含有率の変化が大きいことがわかる。

以上の整理の結果、以下の項目について計算値と比較することとした。

① PU8230,PU8231ロットの^{239}Pu,^{240}Pu,^{242}Puの燃焼率に対する同位体組成比の変化率(炉心中心面近傍)

② EU004,EU006ロットの^{235}U,^{236}U,^{238}Uの燃焼率に対する同位体組成比の変化率(炉心中心面近傍)

③ 径ブランケット燃料のプルトニウム生成量(炉心中心面近傍)

表2.2.1 ^{239}Pu同位体組成の予測評価（炉心内部）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8230	15	-0.3522±0.0023	78.4991±0.0071	0.0061
PU8231	13	-0.3510±0.0046	78.5236±0.0178	0.0135
PU8232	6	-0.3365±0.0136	78.4889±0.0439	0.0090
PU8244	3	-0.3755±0.0106	77.6257±0.0331	0.0018
PU8245	8	-0.3558±0.0080	77.6253±0.0186	0.0163
PUJ001	7	-0.3181±0.0703	76.8765±0.2818	0.2124

表2.2.2 ^{239}Pu同位体組成の予測評価（径プラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8243/93	6	-0.3589±0.0541	77.3759±0.0793	0.0132
PU8245	6	-0.2829±0.0206	77.5184±0.0177	0.0080
PU8251	3	-0.1590±0.0685	76.5319±0.2017	0.0036
PU8253	8	-0.3747±0.0124	77.1101±0.0322	0.0118

表2.2.3 ^{239}Pu同位体組成の予測評価（軸プラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8230	6	-0.4625±0.0111	78.6727±0.0271	0.0028
PU8231	12	-0.4243±0.0126	78.5913±0.0319	0.0390
PU8244	4	-0.7115±0.0206	78.3314±0.0475	0.0008
PUJ001	4	-0.8192±0.3385	78.2952±0.8884	0.1793

表2.2.4 ^{240}Pu同位体組成の予測評価（炉心内部）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8230	15	0.3531±0.0021	18.5740±0.0063	0.0049
PU8231	13	0.3541±0.0044	18.5644±0.0173	0.0127
PU8232	6	0.3747±0.0054	18.5392±0.0174	0.0014
PU8244	3	0.3971±0.0011	19.2544±0.0036	0.00002
PU8245	8	0.3622±0.0030	19.2710±0.0069	0.0022
PUJ001	7	0.3488±0.0505	19.6989±0.2024	0.1096

表2.2.5 ^{240}Pu同位体組成の予測評価（径ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8243/93	6	0.2620±0.0270	19.7027±0.0396	0.0033
PU8245	6	0.4214±0.0279	19.3032±0.0239	0.0147
PU8251	3	0.1460±0.0605	20.4229±0.1780	0.0028
PU8253	8	0.3800±0.0253	19.7658±0.0656	0.0489

表2.2.6 ^{240}Pu同位体組成の予測評価（軸ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8230	6	0.4235±0.0125	18.5646±0.0306	0.0036
PU8231	12	0.4068±0.0081	18.5777±0.0204	0.0160
PU8244	4	0.5678±0.0209	19.0500±0.0209	0.0008
PUJ001	4	0.6660±0.2606	18.9309±0.6841	0.1063

表2.2.7 ^{242}Pu同位体組成の予測評価（炉心内部）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8230	15	0.0131±0.0002	0.5005±0.0006	0.00005
PU8231	13	0.0139±0.0005	0.4993±0.0019	0.00015
PU8232	6	0.0126±0.0012	0.5006±0.0038	0.00007
PU8244	3	0.0167±0.0003	0.5389±0.0011	0.000002
PU8245	8	0.0144±0.0007	0.5392±0.0017	0.00014
PUJ001	7	0.0144±0.0042	0.5845±0.0167	0.00074

表2.2.8 ^{242}Pu同位体組成の予測評価（径ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8243/93	6	0.0096±0.0042	0.5642±0.0062	0.00008
PU8245	6	0.0103±0.0002	0.5420±0.0002	0.000001
PU8251	3	0.0137±0.0025	0.5758±0.0074	0.000005
PU8253	8	0.0156±0.0010	0.5729±0.0026	0.00008

表2.2.9 ^{242}Pu同位体組成の予測評価（軸ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
PU8230	6	0.0144±0.0009	0.5027±0.0021	0.00002
PU8231	12	0.0149±0.0004	0.4993±0.0011	0.00004
PU8244	4	0.0199±0.0014	0.5364±0.0032	0.000004
PUJ001	4	0.0293±0.0196	0.5404±0.0514	0.00060

表2.2.10 ^{235}U同位体組成の予測評価（炉心内部）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU0004	11	-0.4881±0.0023	23.0937±0.0071	0.0035
EU0006	10	-0.5173±0.0089	23.2814±0.0328	0.0085
EU0013	16	-0.4880±0.0052	23.2458±0.0199	0.0286
EU0014	3	-0.5060±0.0043	23.2940±0.0116	0.0001
EU0U30	8	-0.4856±0.0192	23.2063±0.0299	0.0407

表2.2.11 ^{235}U同位体組成の予測評価（径ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU000C	3	-0.5581±0.0288	23.3741±0.0715	0.0078
EU0018/C	5	-0.4040±0.0211	22.9625±0.0560	0.0034
EU0U30	11	-0.5289±0.0075	23.1866±0.0089	0.0051

表2.2.12 ^{235}U同位体組成の予測評価（軸ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU0004	6	-0.5511±0.0126	23.1725±0.0307	0.0036
EU0006	4	-0.6697±0.0236	23.5242±0.0620	0.0009
EU0013	12	-0.5334±0.0053	23.2748±0.0135	0.0070
EU0015/6	4	-0.6244±0.0371	23.4517±0.0856	0.0026

表2.2.13 ^{236}U同位体組成の予測評価（炉心内部）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU0004	11	0.1367±0.0005	0.1984±0.0015	0.0001
EU0006	10	0.1468±0.0043	0.1676±0.0161	0.0020
EU0013	16	0.1352±0.0016	0.1911±0.0062	0.0028
EU0014	3	0.1362±0.0005	0.1912±0.0015	0.000002
EU0U30	8	0.1369±0.0024	0.1896±0.0038	0.0007

表2.2.14 ^{236}U同位体組成の予測評価（径ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU000C	3	0.1569±0.0134	0.1774±0.0333	0.0017
EU0018/C	5	0.1131±0.0074	0.2891±0.0198	0.0004
EU0U30	11	0.1560±0.0036	0.1977±0.0043	0.0012

表2.2.15 ^{236}U同位体組成の予測評価（軸ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU0004	6	0.1599±0.0040	0.1894±0.0098	0.0004
EU0006	4	0.1962±0.0131	0.1029±0.0345	0.0003
EU0013	12	0.1573±0.0021	0.1851±0.0054	0.0011
EU0015/6	4	0.2161±0.0048	0.0546±0.0112	0.00005

表2.2.16 ^{238}U同位体組成の予測評価（炉心内部）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU0004	11	0.3507±0.0023	76.5825±0.0072	0.0035
EU0006	10	0.3683±0.0049	76.4454±0.0183	0.0026
EU0013	16	0.3521±0.0044	76.4334±0.0168	0.0203
EU0014	3	0.3695±0.0039	76.3849±0.0107	0.0001
EU0U30	8	0.3482±0.0176	76.4751±0.0276	0.0345

表2.2.17 ^{238}U同位体組成の予測評価（径ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU000C	3	0.4012±0.0159	76.3172±0.0393	0.0024
EU0018/C	5	0.2927±0.0155	76.6142±0.0411	0.0018
EU0U30	11	0.3713±0.0061	76.4878±0.0072	0.0034

表2.2.18 ^{238}U同位体組成の予測評価（軸ブラ近傍）

ロット名	データ数	燃焼率に対する変化率	初期組成	ε
EU0004	6	0.3905±0.0132	76.5131±0.0322	0.0039
EU0006	4	0.4754±0.0369	76.2540±0.0969	0.0021
EU0013	12	0.3760±0.0043	76.4086±0.0110	0.0046
EU0015/6	4	0.4108±0.0318	76.3565±0.0735	0.0019

表2.2.19 PU8230ロットの初期同位体組成比(a/o)の比較

同位体	PIEより予想された値	製造時の測定値†
Pu-238	–	0.09
Pu-239	78.4955±0.0159	78.518
Pu-240	18.5746±0.0143	18.423
Pu-241	–	2.471
Pu-242	0.5007±0.0019	0.488

† '72/3/23(製造測定時)から'77/4/24(燃料装荷時)のPu241の崩壊を補正

表2.2.20 PU8231ロットの初期同位体組成比(a/o)の比較

同位体	PIEより予想された値	製造時の測定値†
Pu-239	–	0.09
Pu-239	78.5155±0.0335	78.428
Pu-240	18.5650±0.0325	18.489
Pu-241	–	2.494
Pu-242	0.4986±0.0034	0.497

† '72/3/23(製造測定時)から'77/4/24(燃料装荷時)のPu241の崩壊を補正

表2.2.21 EU0004ロットの初期同位体組成比(a/o)の比較

同位体	PIEより予想された値	製造時の測定値
U-235	23.0937±0.0071	23.095
U-236	0.1984±0.015	–
U-238	76.5825±0.0072	76.905§

§ 100−(U-235測定値)で算出

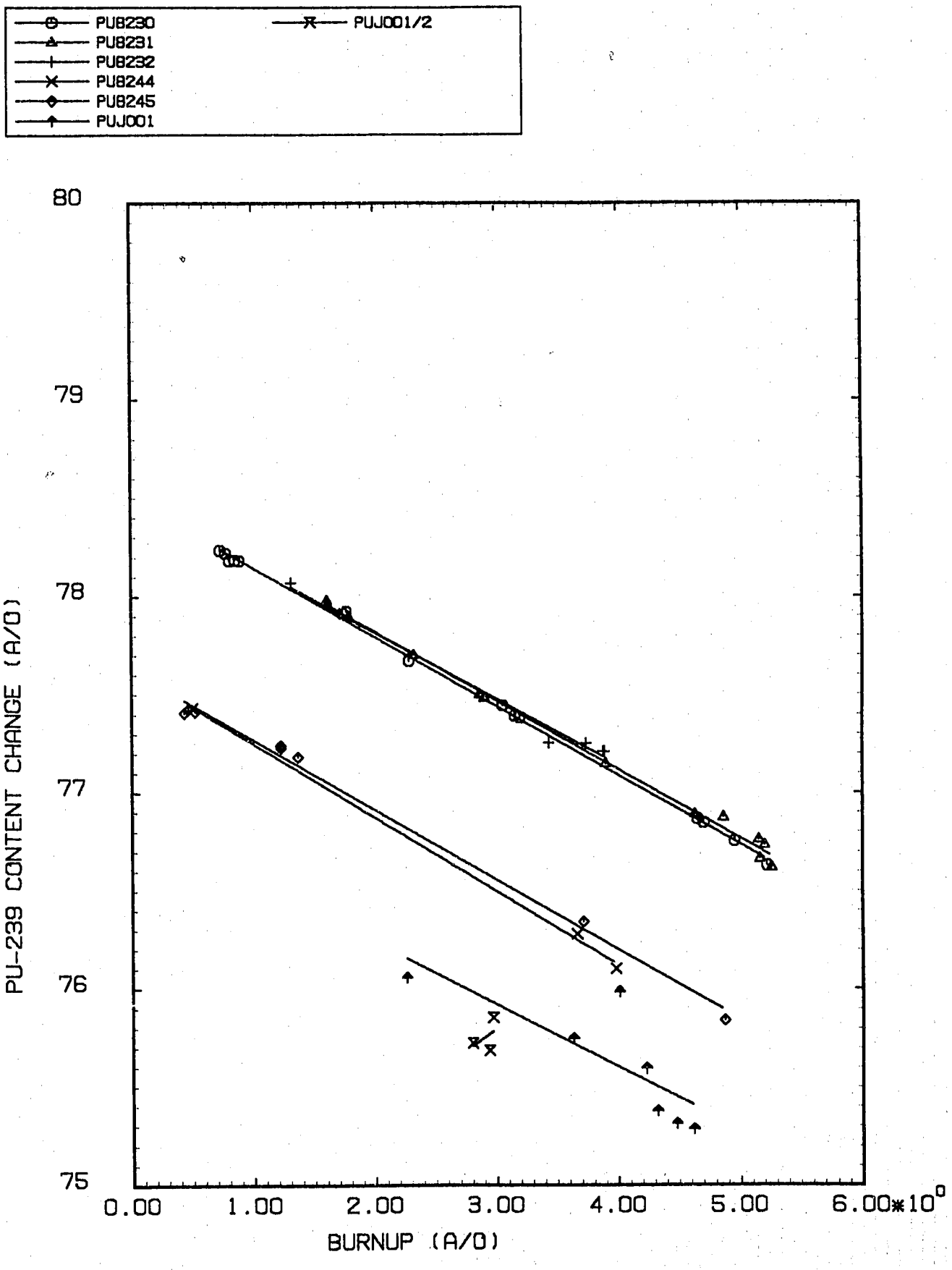


図2.2.1　^{239}Pu同位体組成（炉心内部）

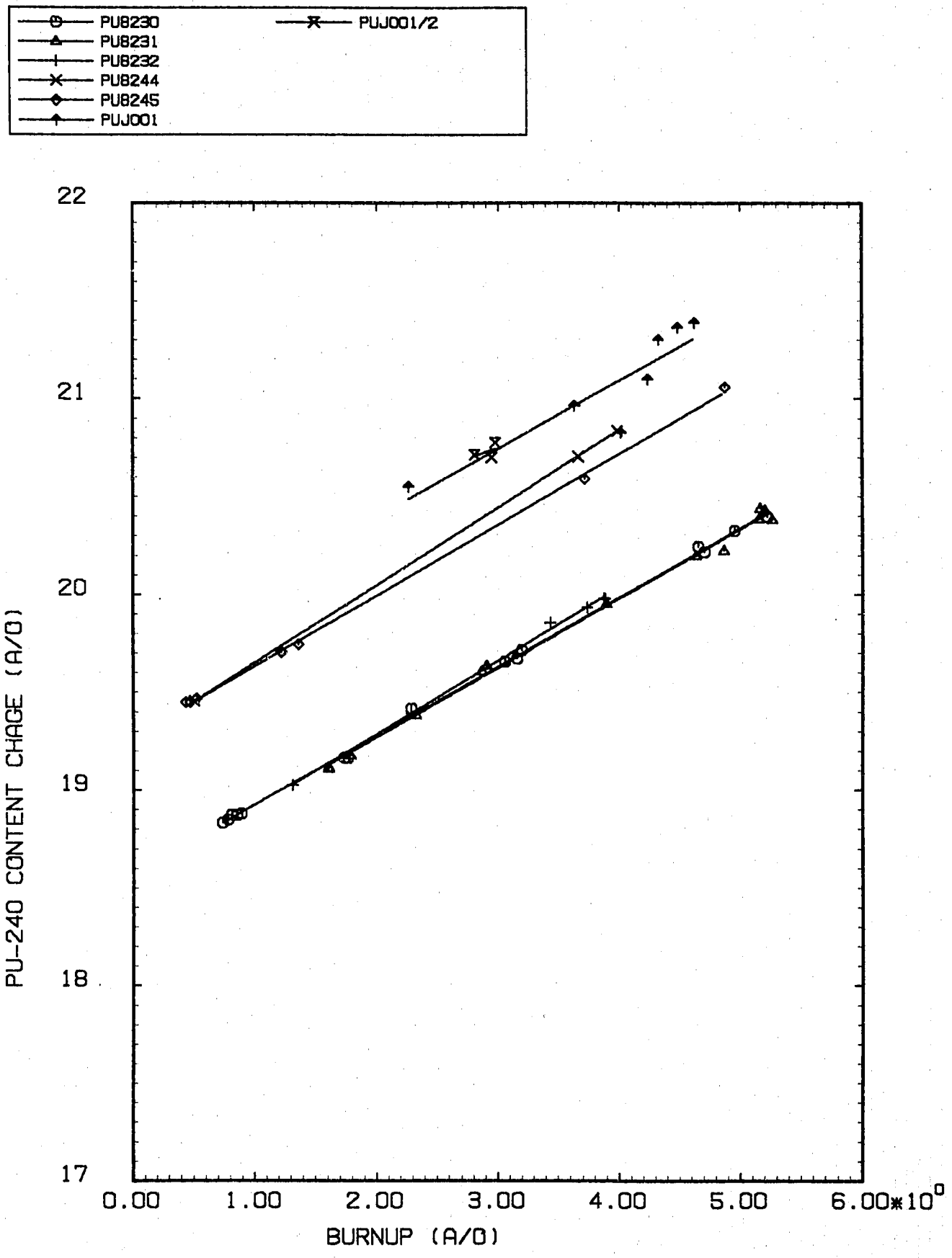


図2.2.2　^{240}Pu同位体組成（炉心内部）

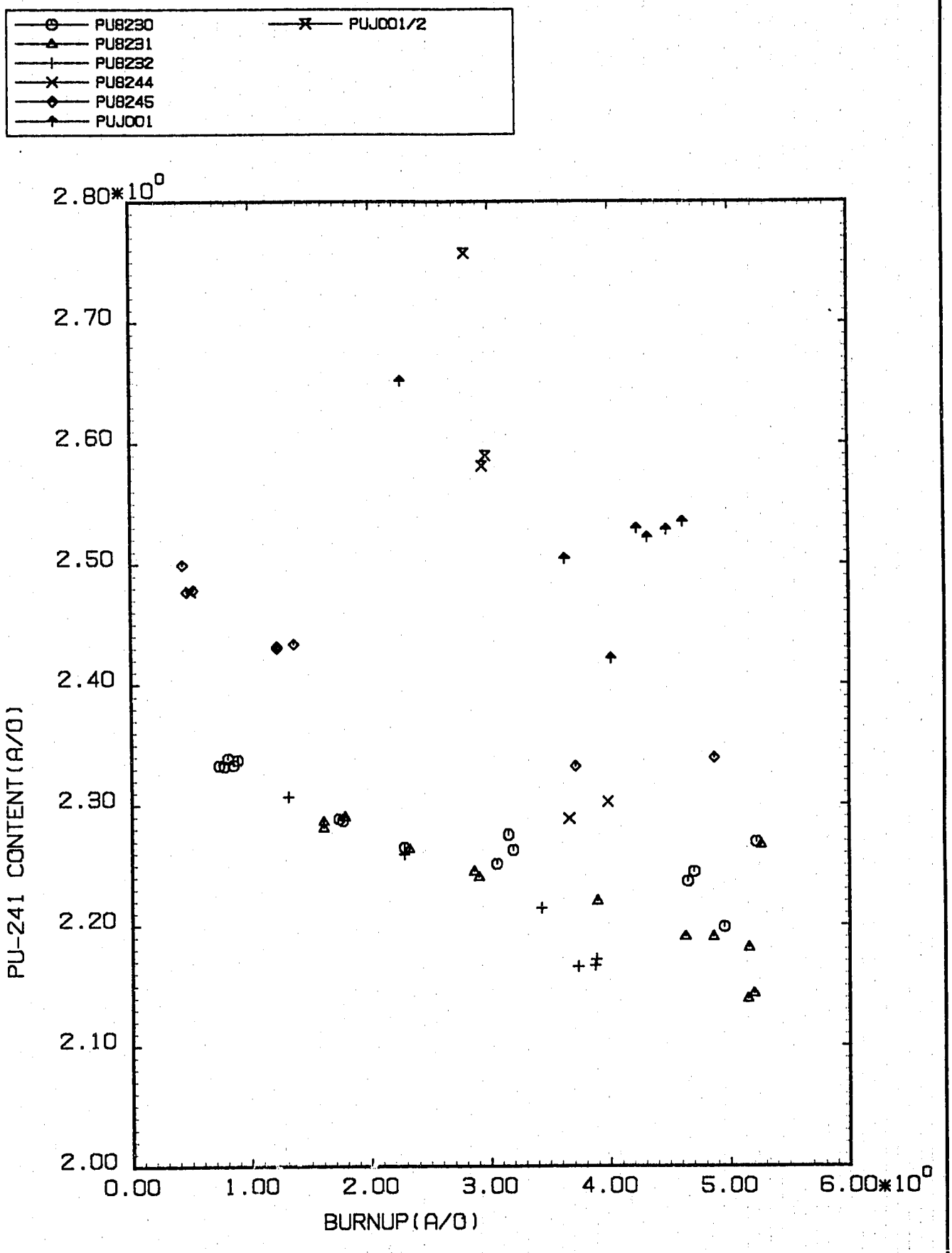


図2.2.3 ^{241}Pu同位体組成（炉心内部）

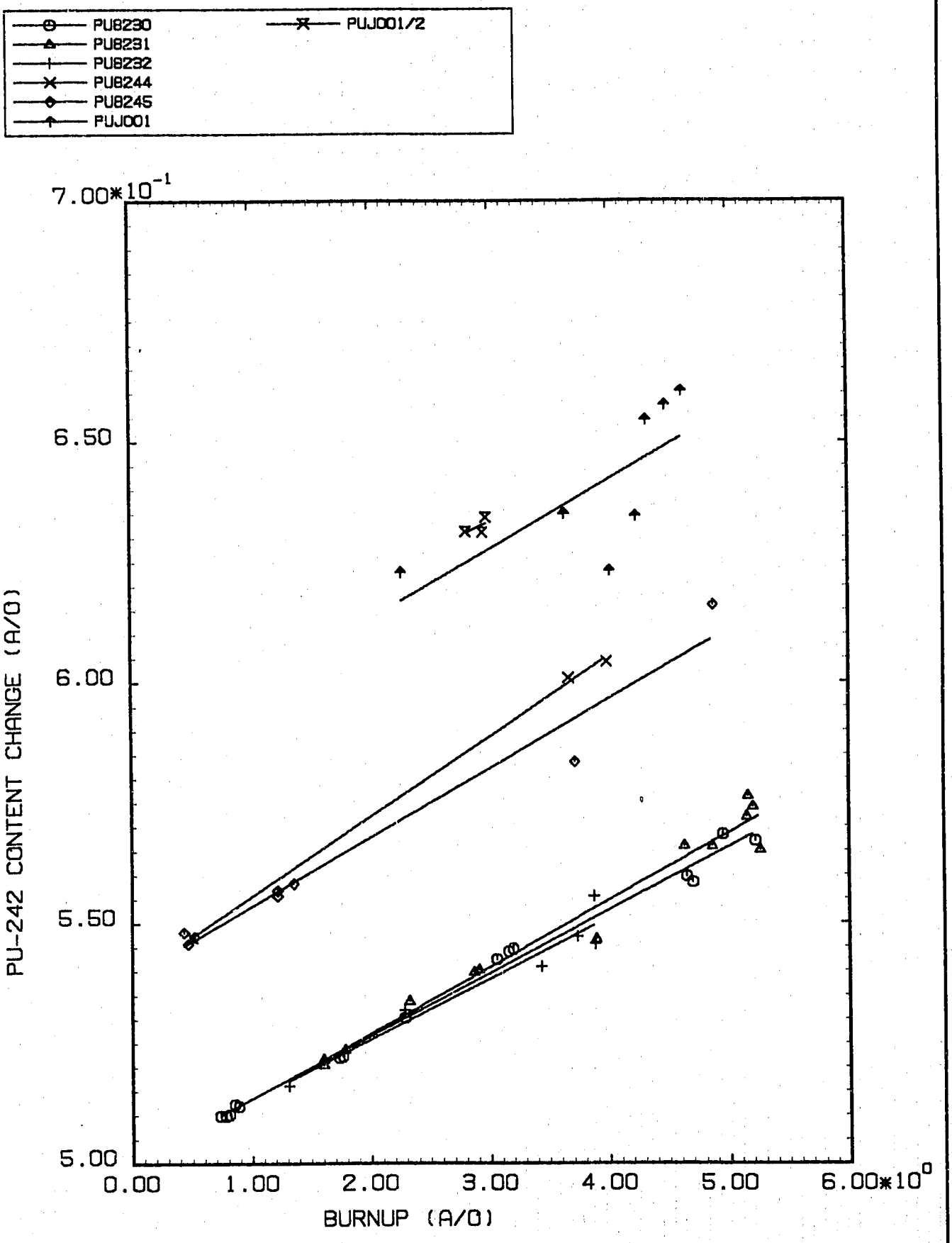


図2.2.4　^{242}Pu同位体組成（炉心内部）

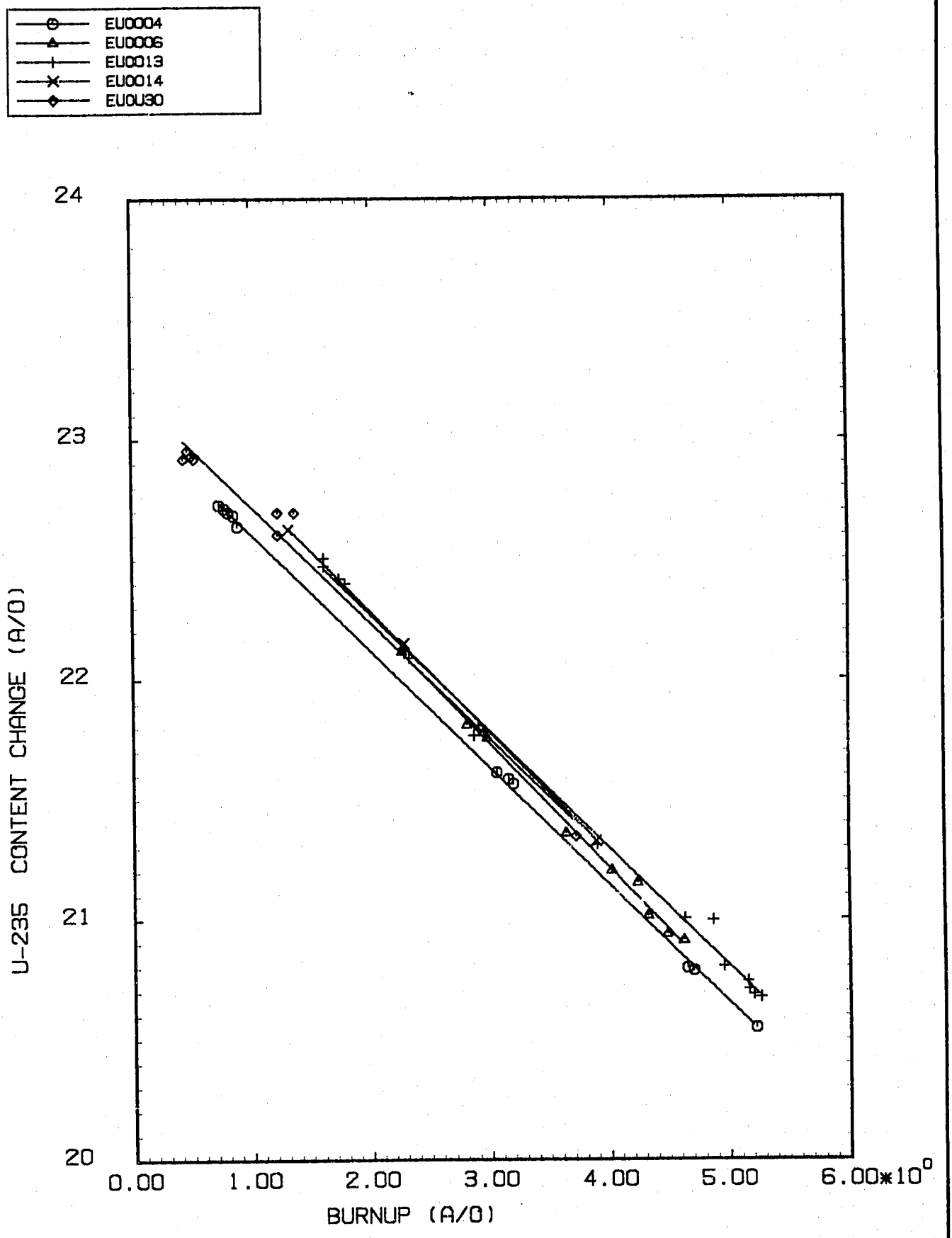


図2.2.5　^{235}U同位体組成（炉心内部）

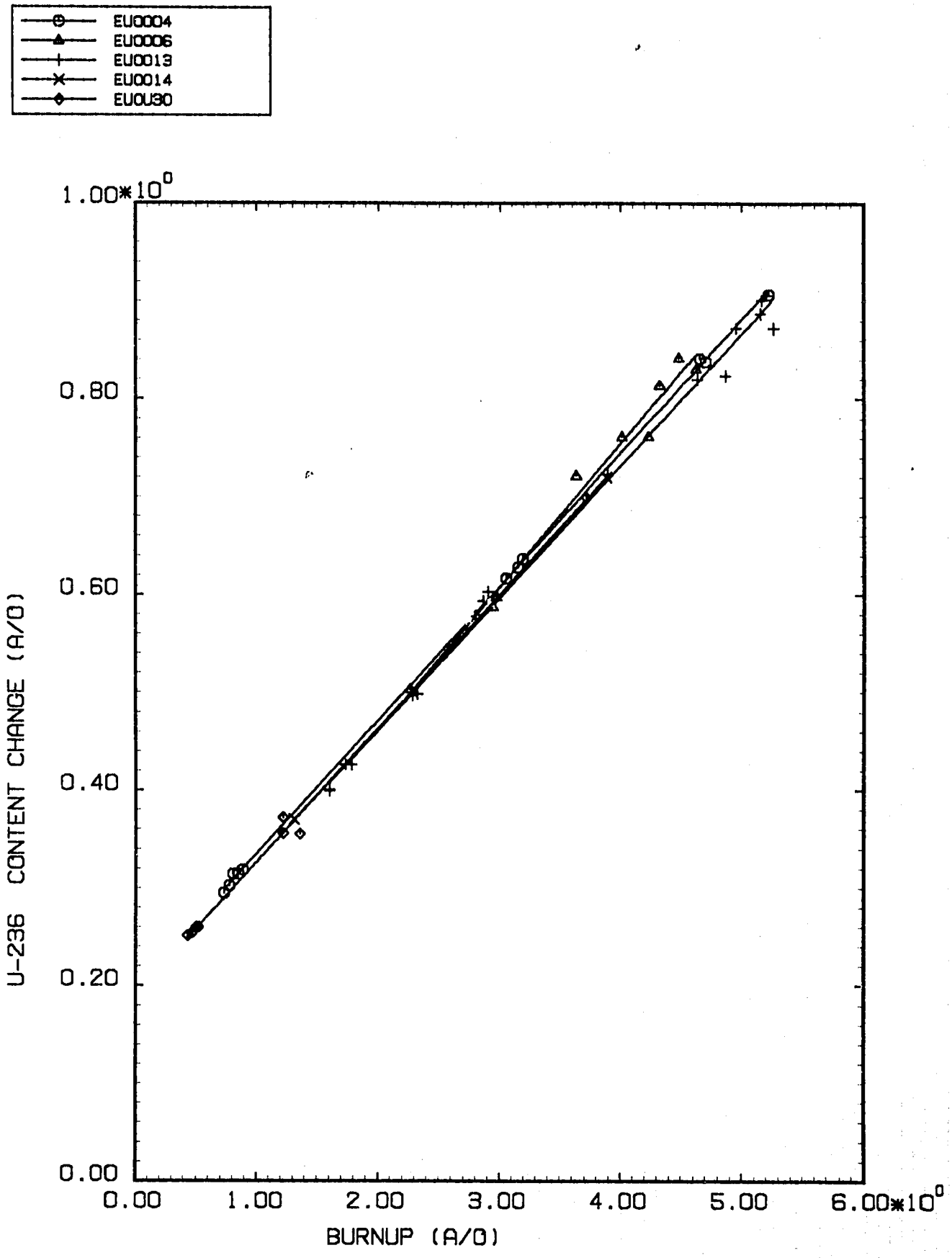


図2.2.6　^{236}U同位体組成（炉心内部）

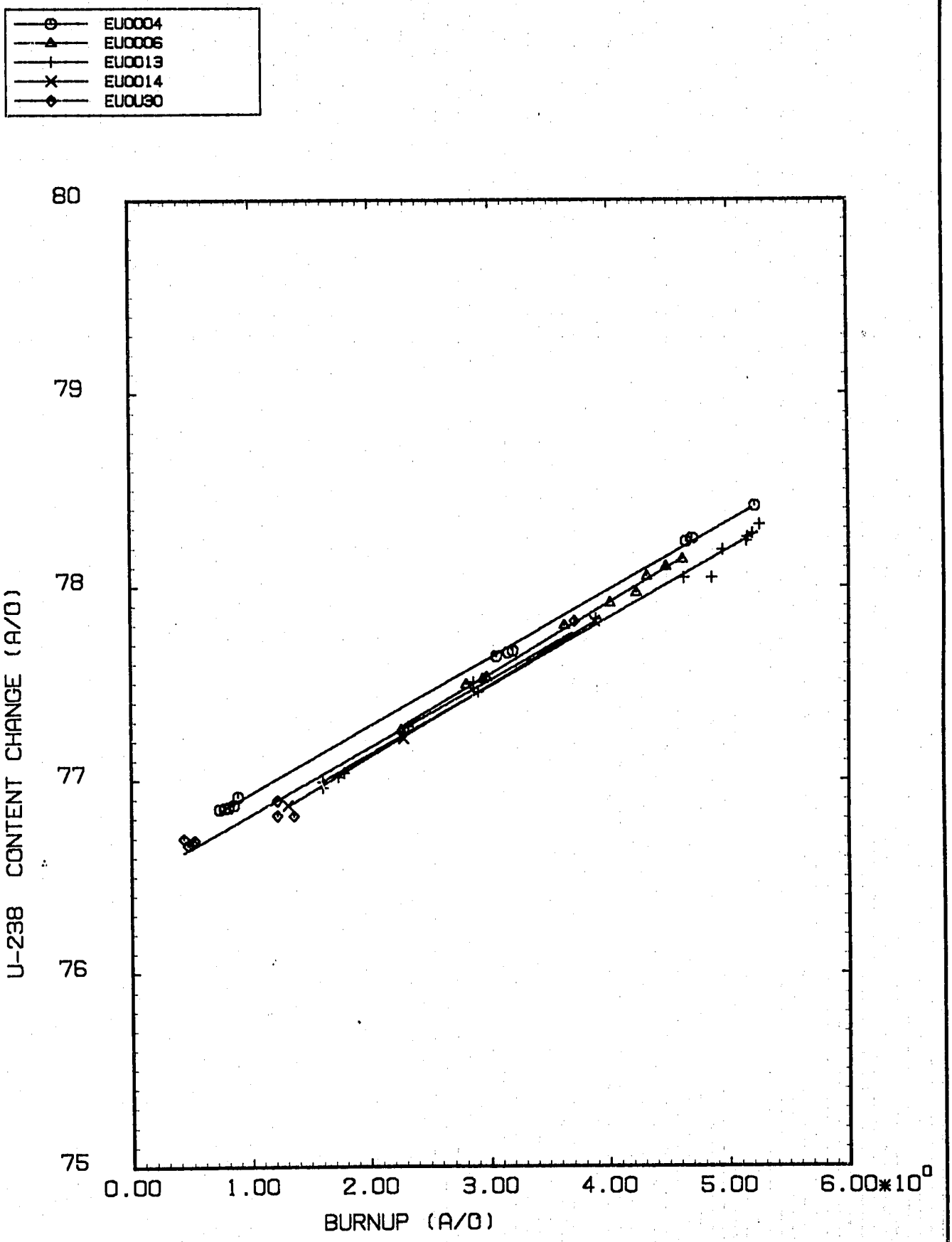


図2.2.7　^{238}U同位体組成（炉心内部）

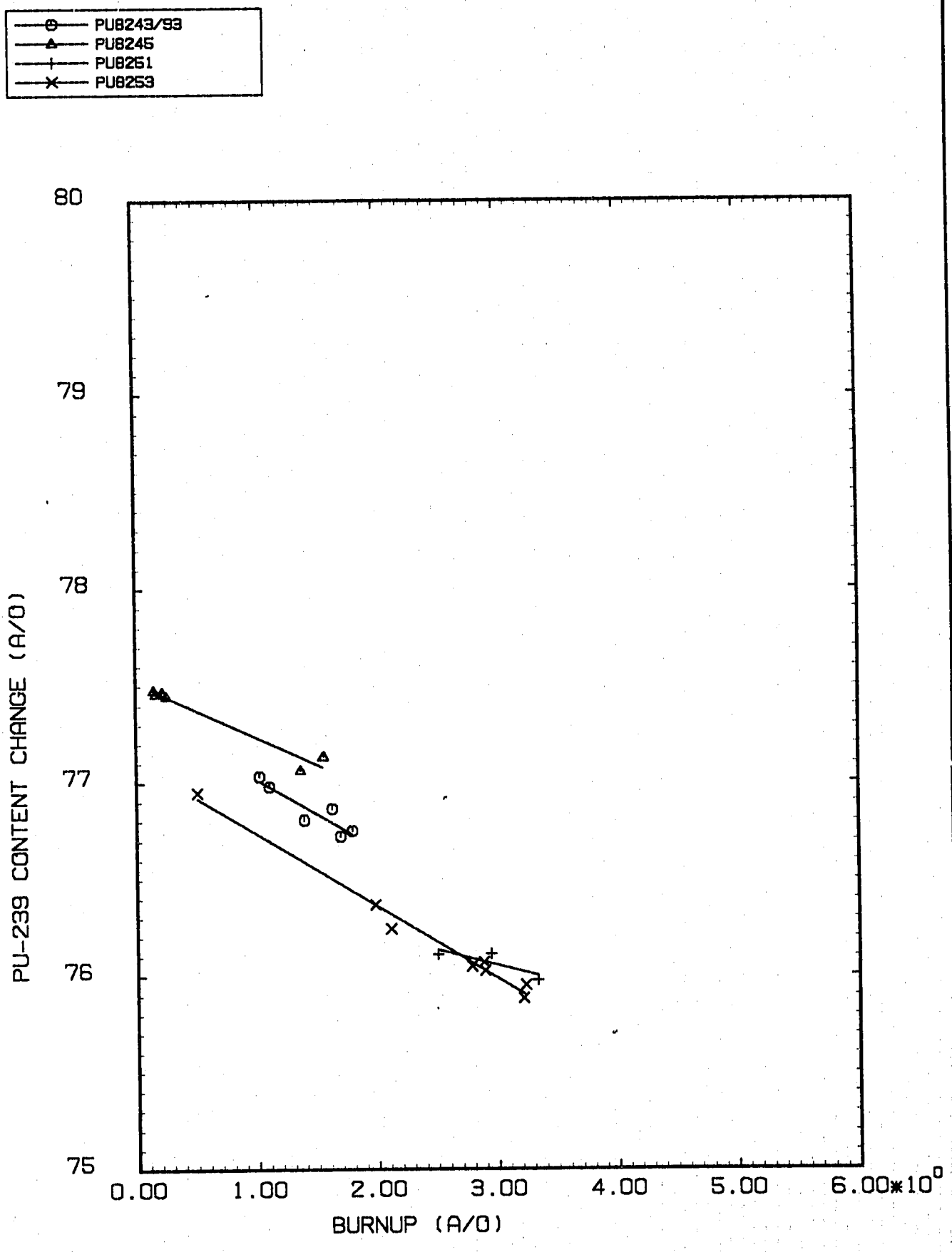


図2.2.8　^{239}Pu同位体組成（径プラ近傍）

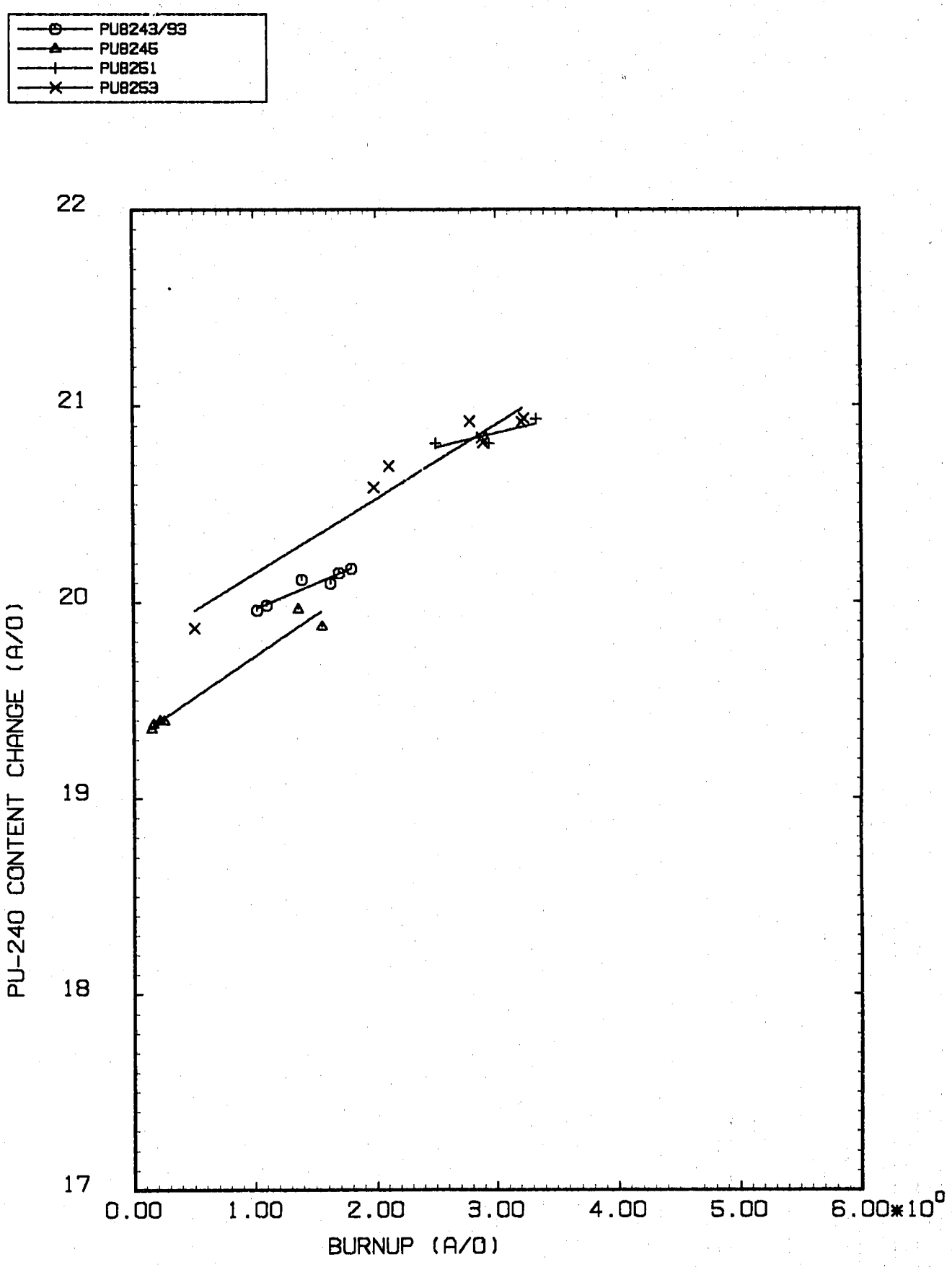


図2.2.9　^{240}Pu同位体組成（径プラ近傍）

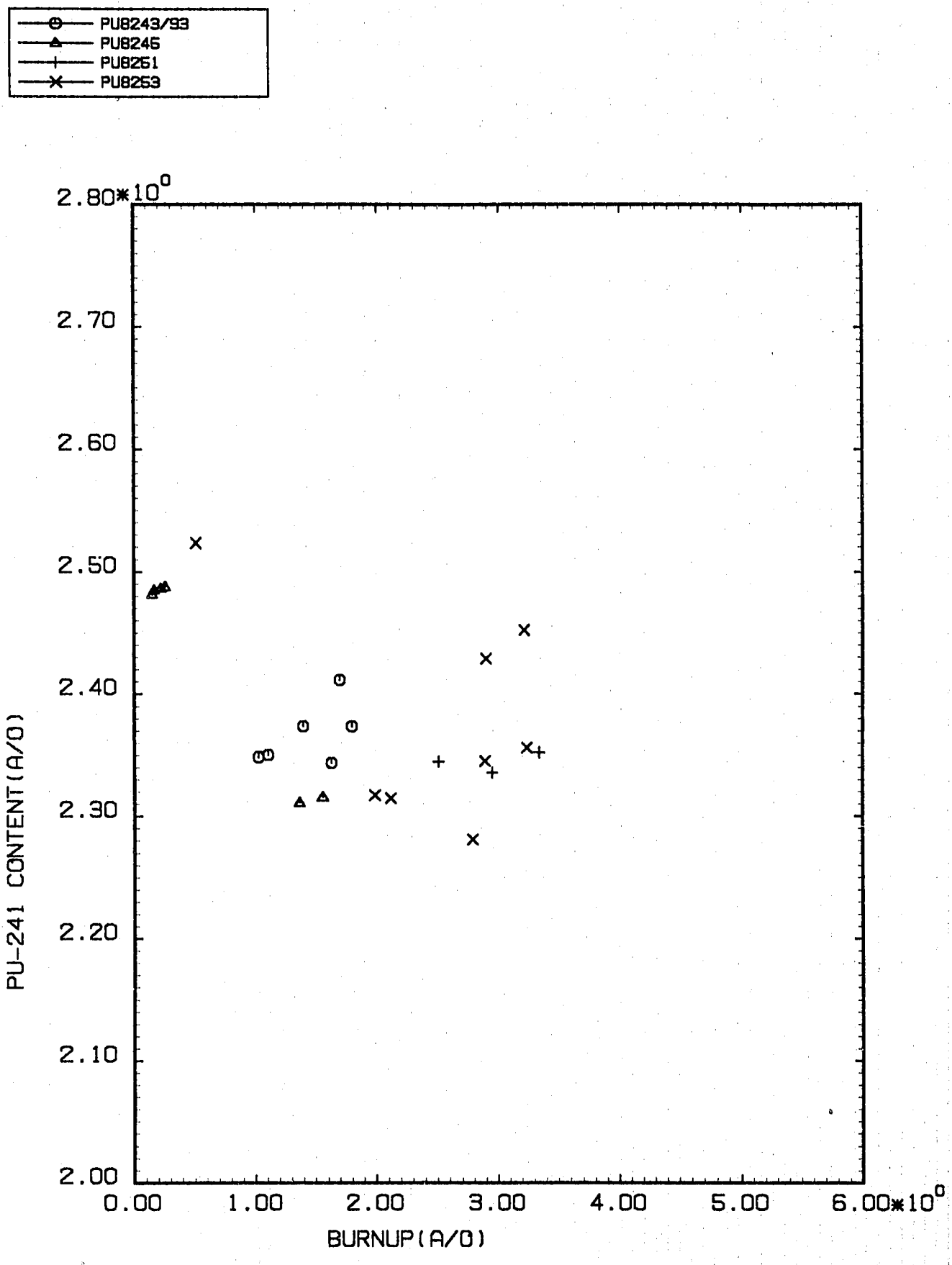


図2.2.10　^{241}Pu同位体組成（径プラ近傍）

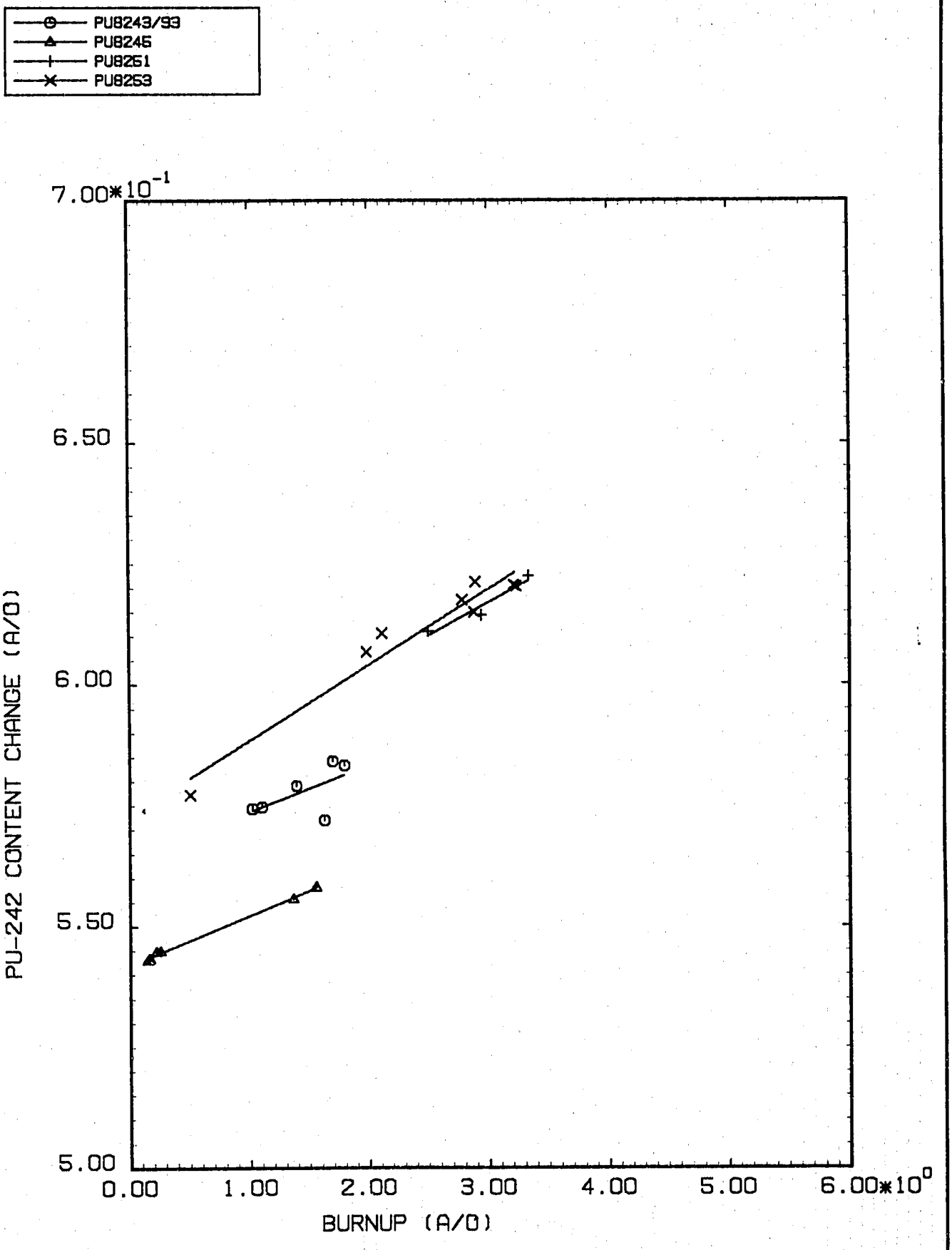


図2.2.11　^{242}Pu同位体組成（径プラ近傍）

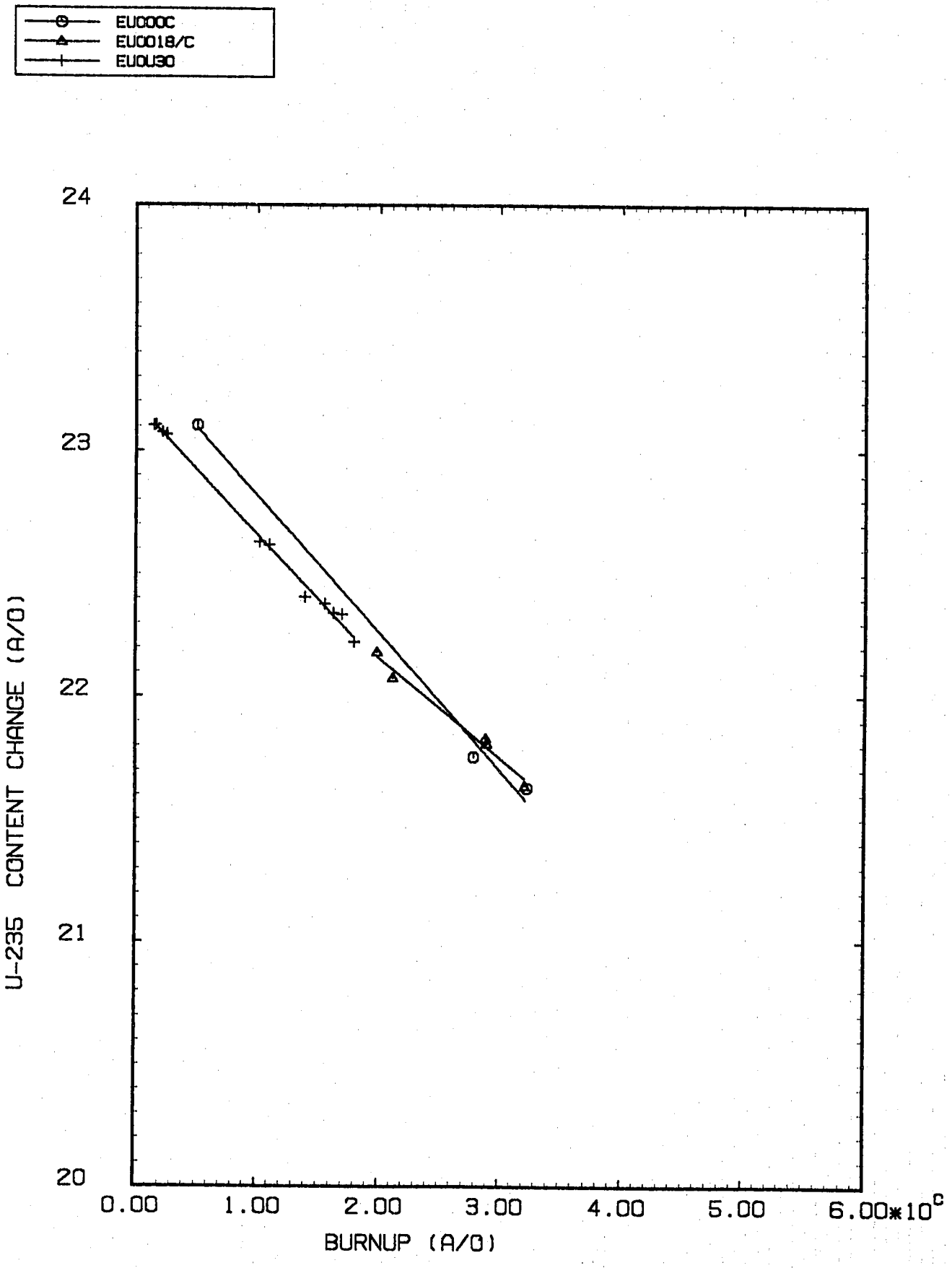


図2.2.12　^{235}U同位体組成（径ブラ近傍）

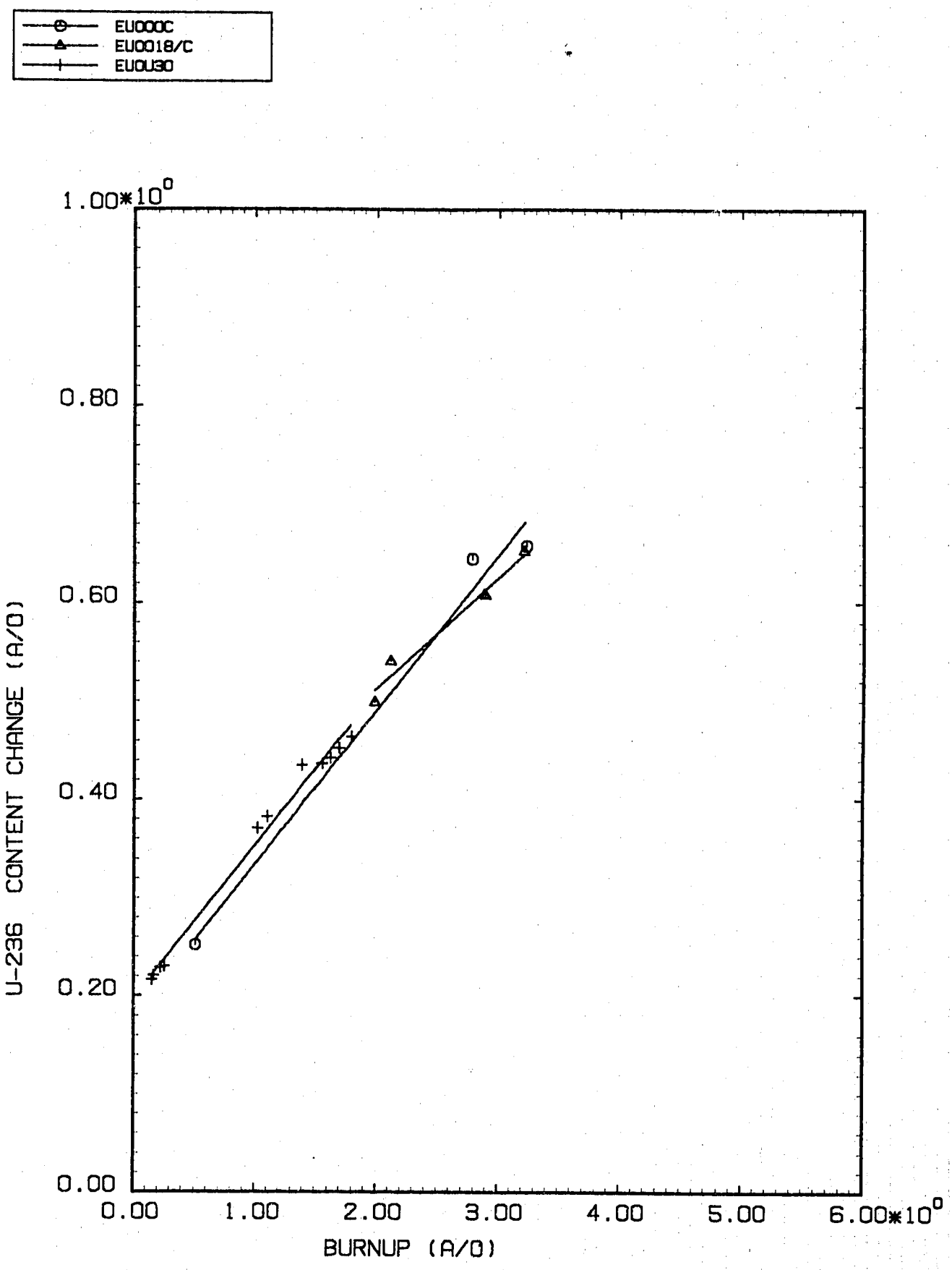


図2.2.13　^{236}U同位体組成（径プラ近傍）

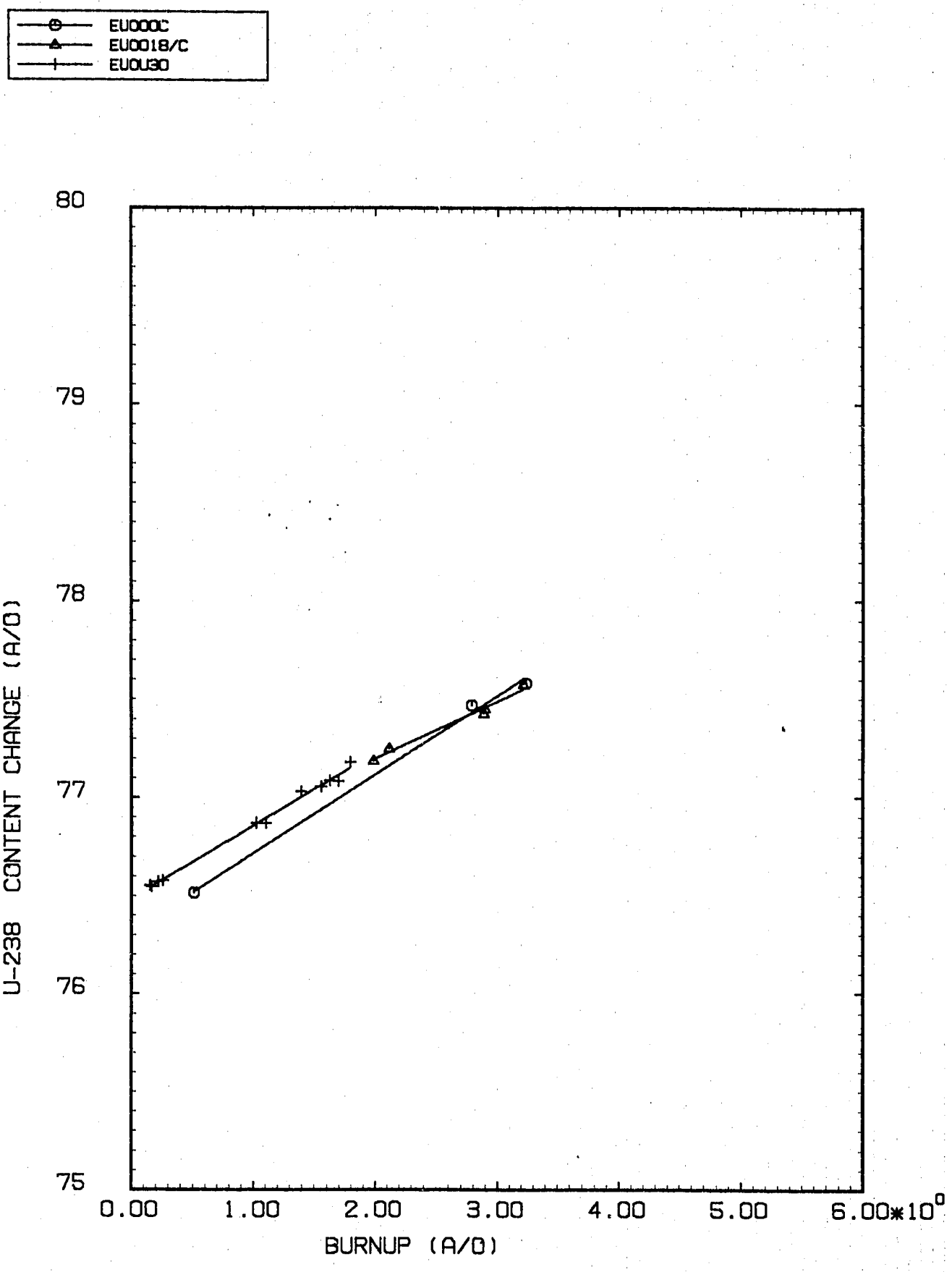


図2.2.14　^{238}U同位体組成（径ブラ近傍）

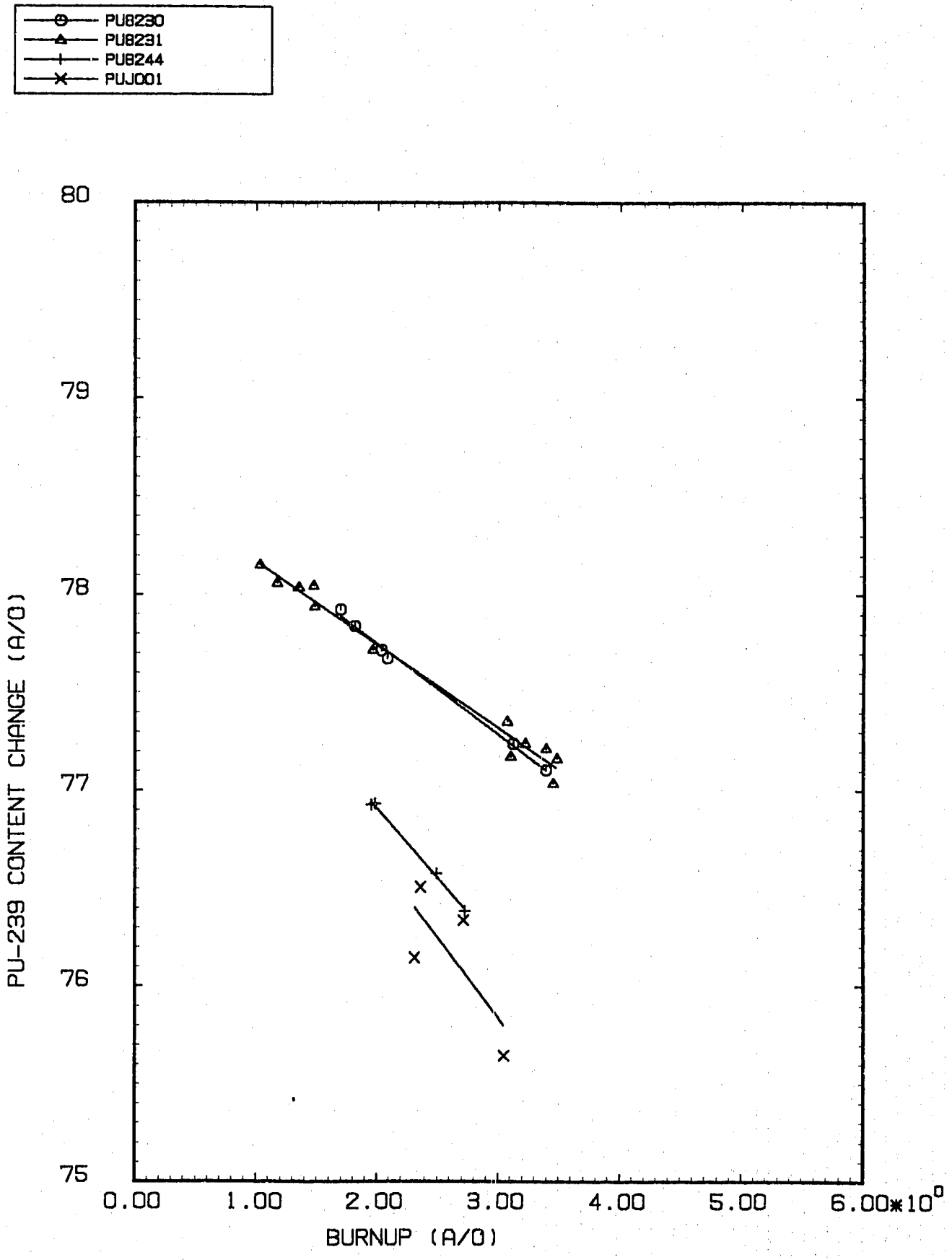


図2.2.15　^{239}Pu同位体組成（軸ブラ近傍）

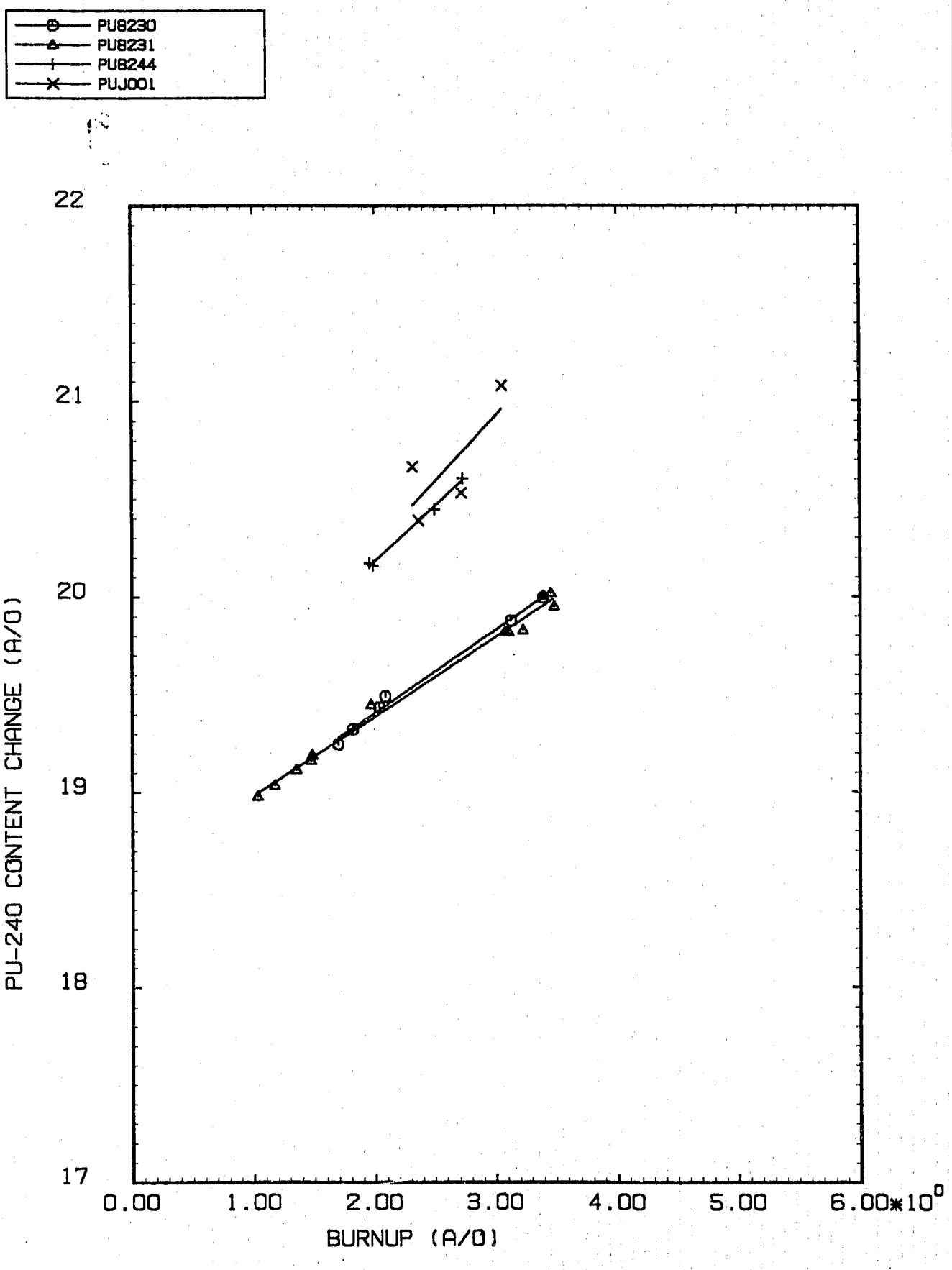


図2.2.16　^{240}Pu同位体組成（軸ブラ近傍）

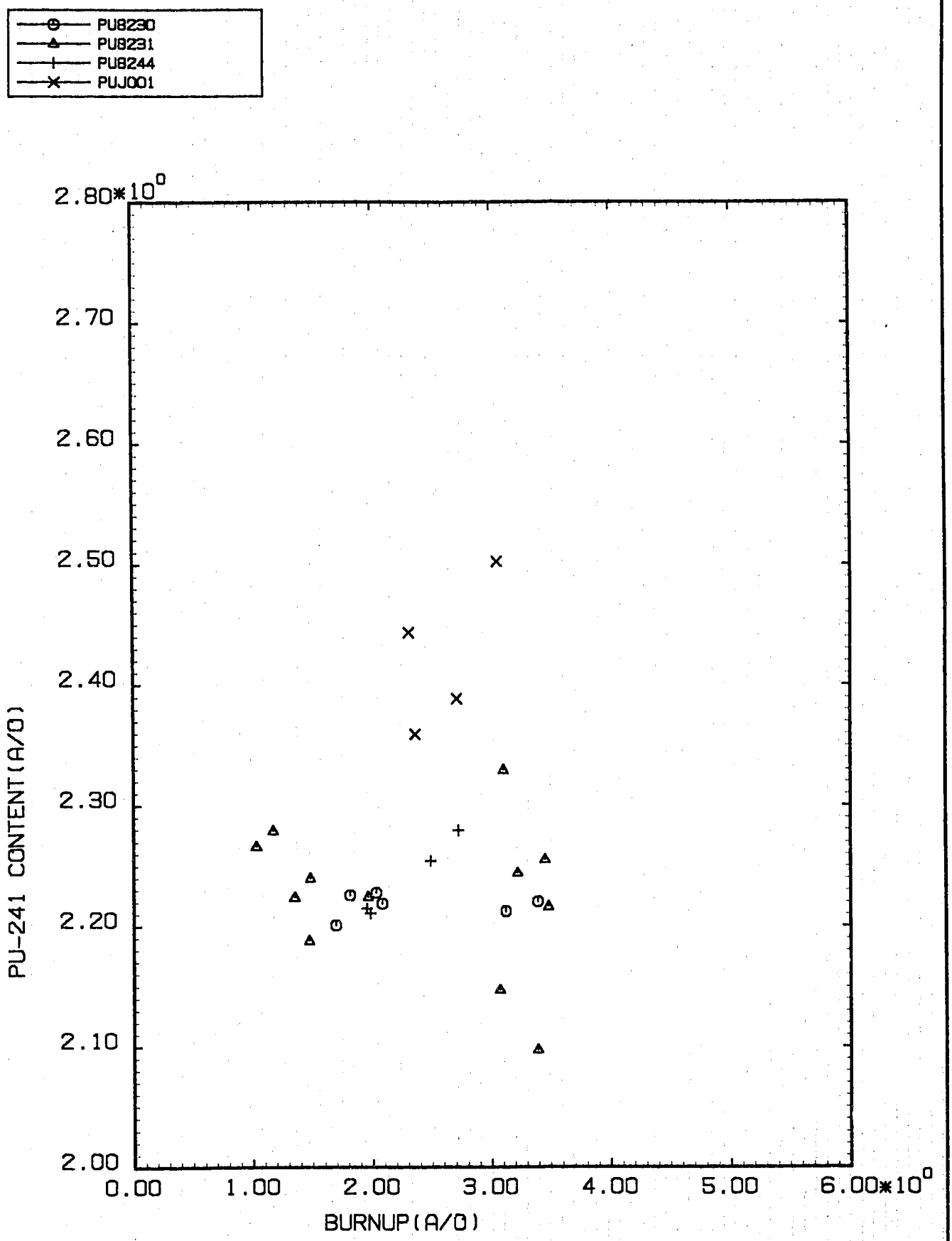


図2.2.17　^{241}Pu同位体組成（軸ブラ近傍）

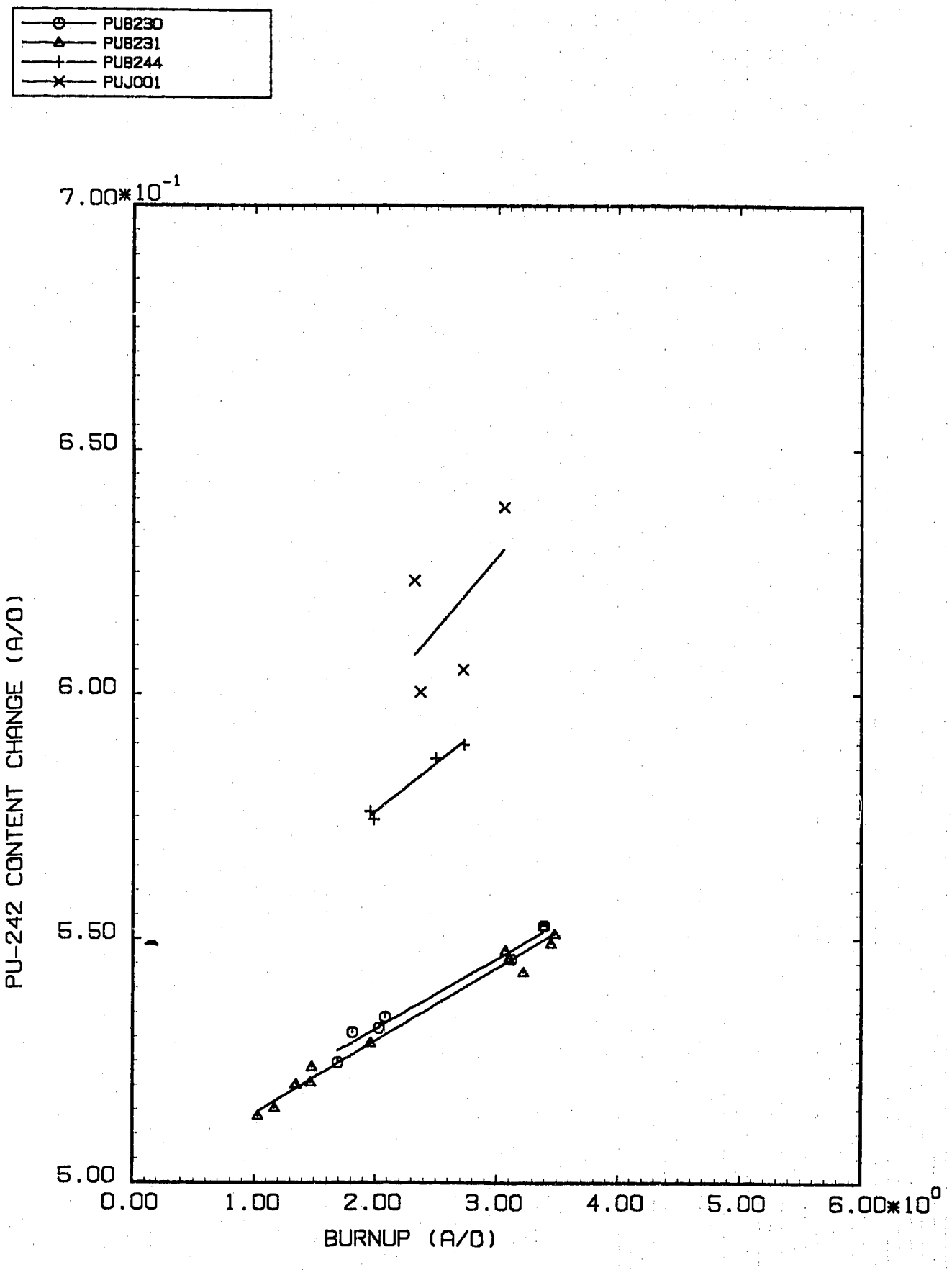


図2.2.18　^{242}Pu同位体組成（軸ブラ近傍）

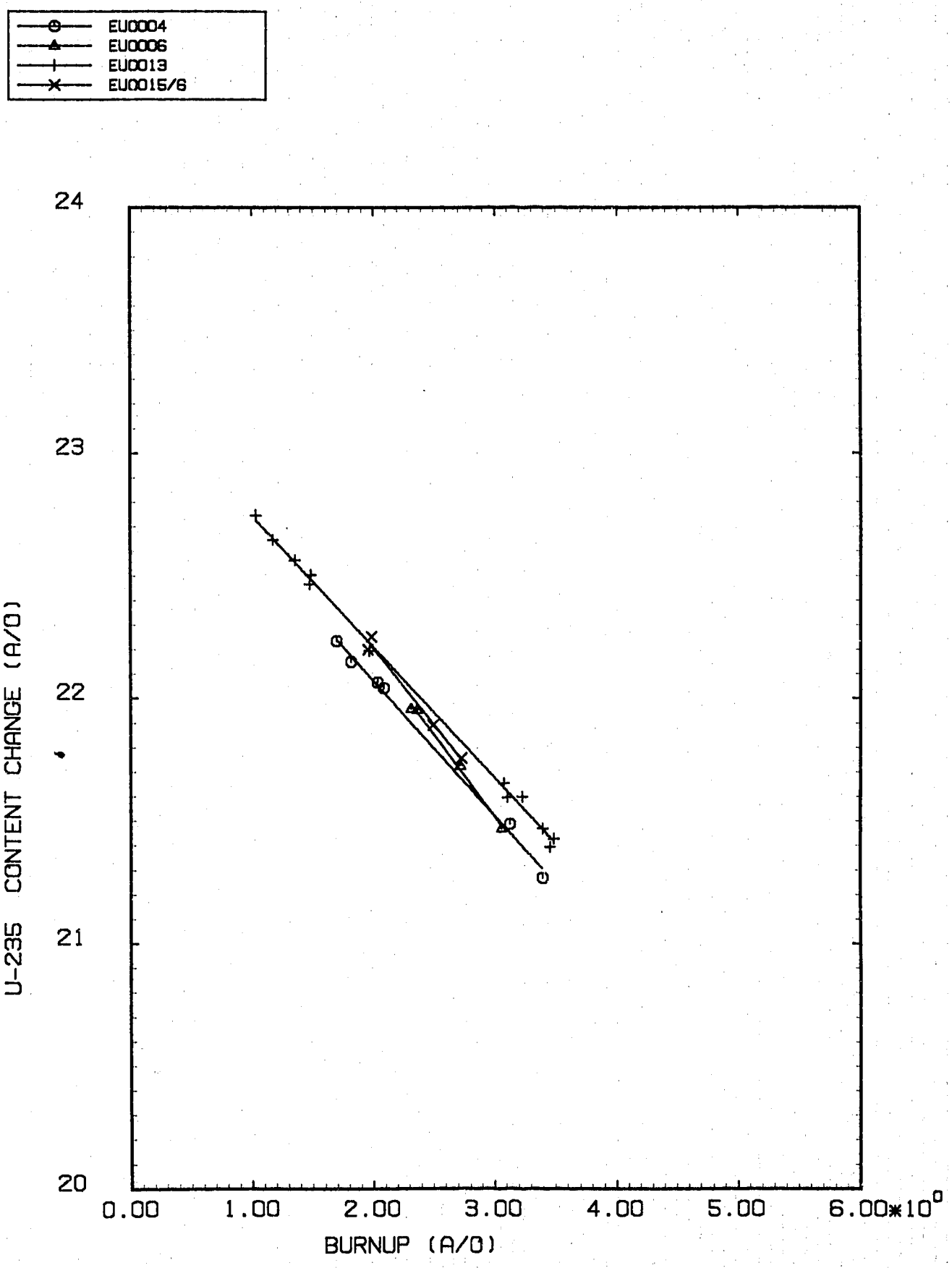


図2.2.19 ^{235}U同位体組成（軸ブラ近傍）

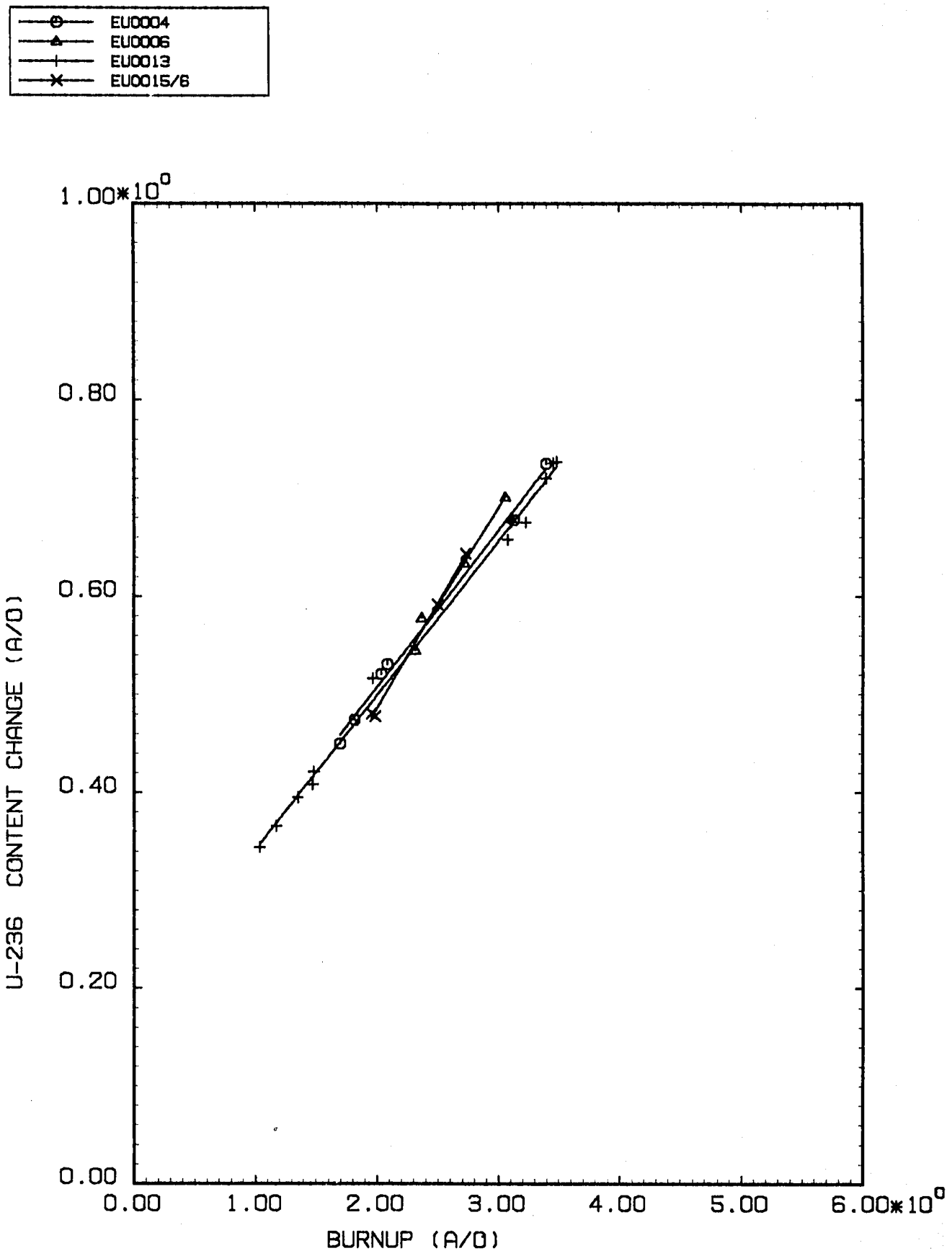


図2.2.20　^{236}U同位体組成（軸ブラ近傍）

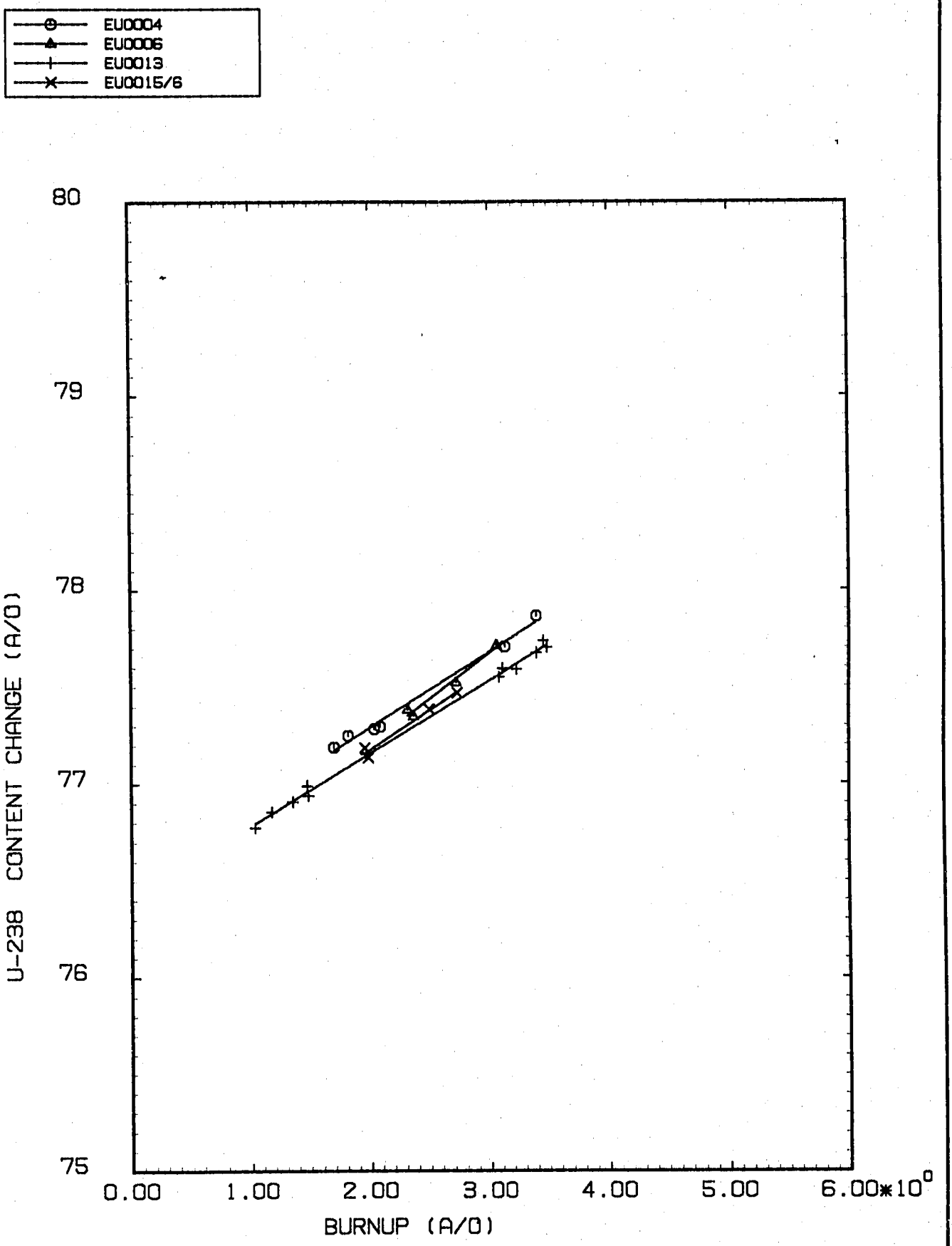


図2.2.21　^{238}U同位体組成（軸ブラ近傍）

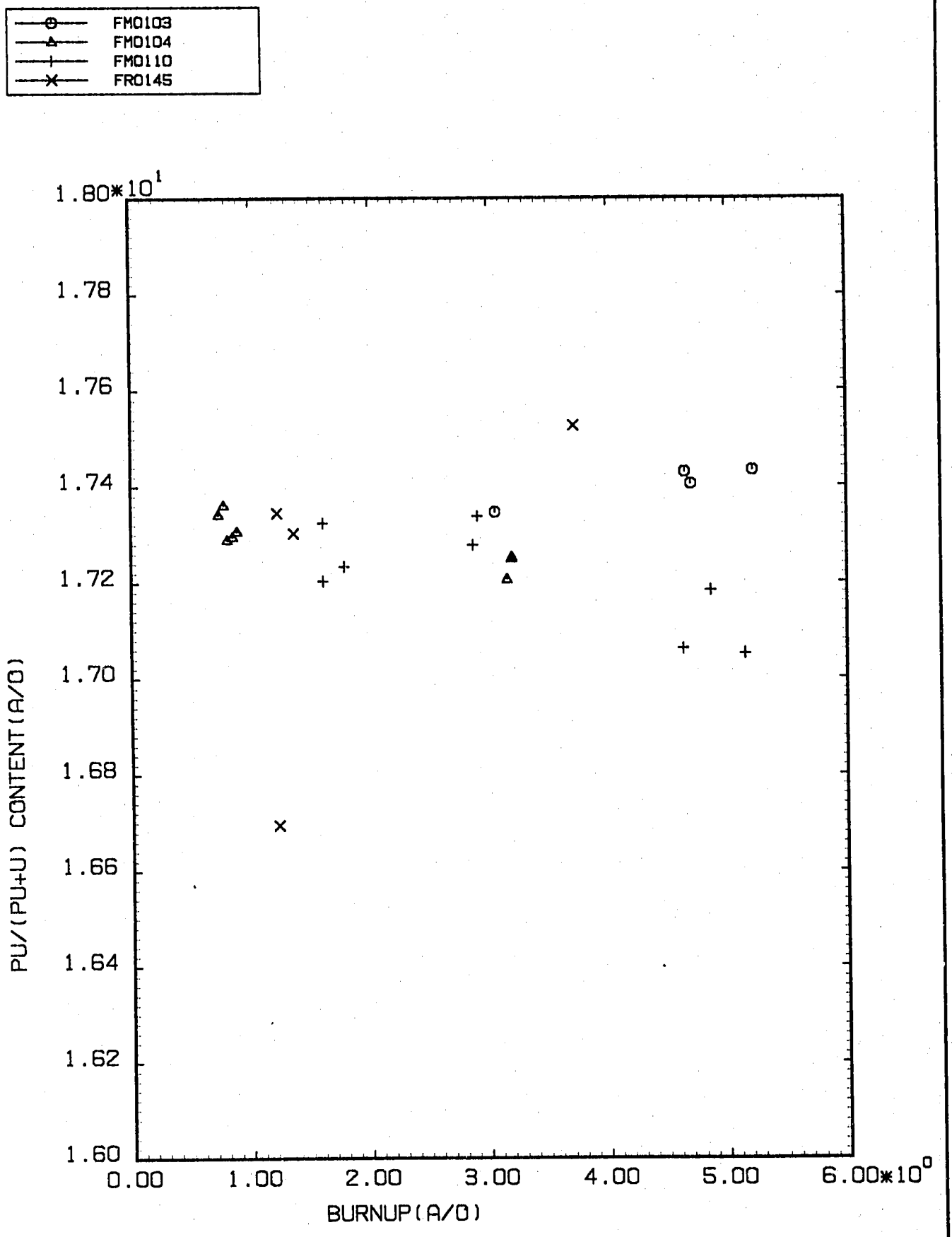


図2.2.22　Ｐｕ含有率（炉心燃料）

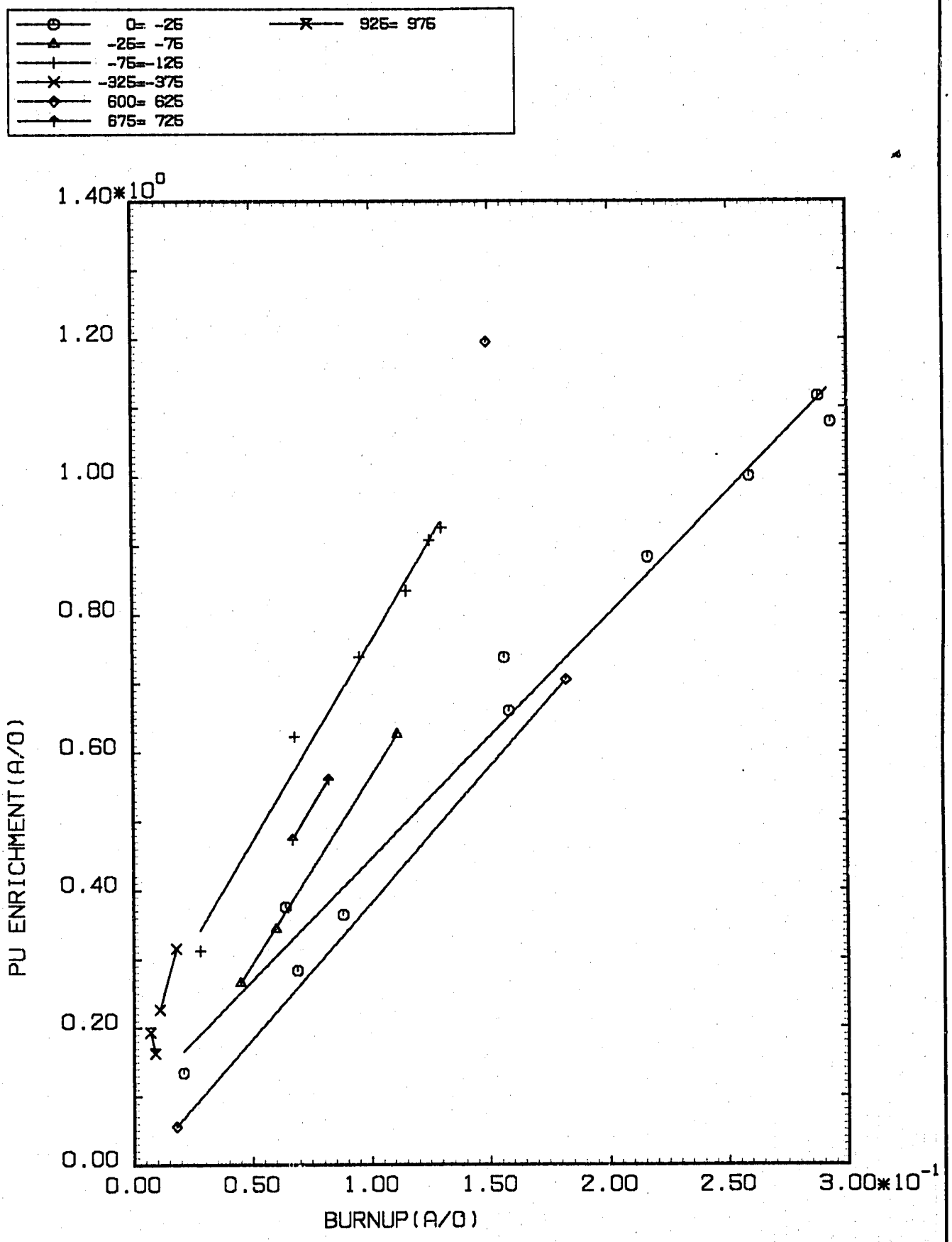


図2.2.23　Ｐｕ含有率（軸方向ブランケット燃料）

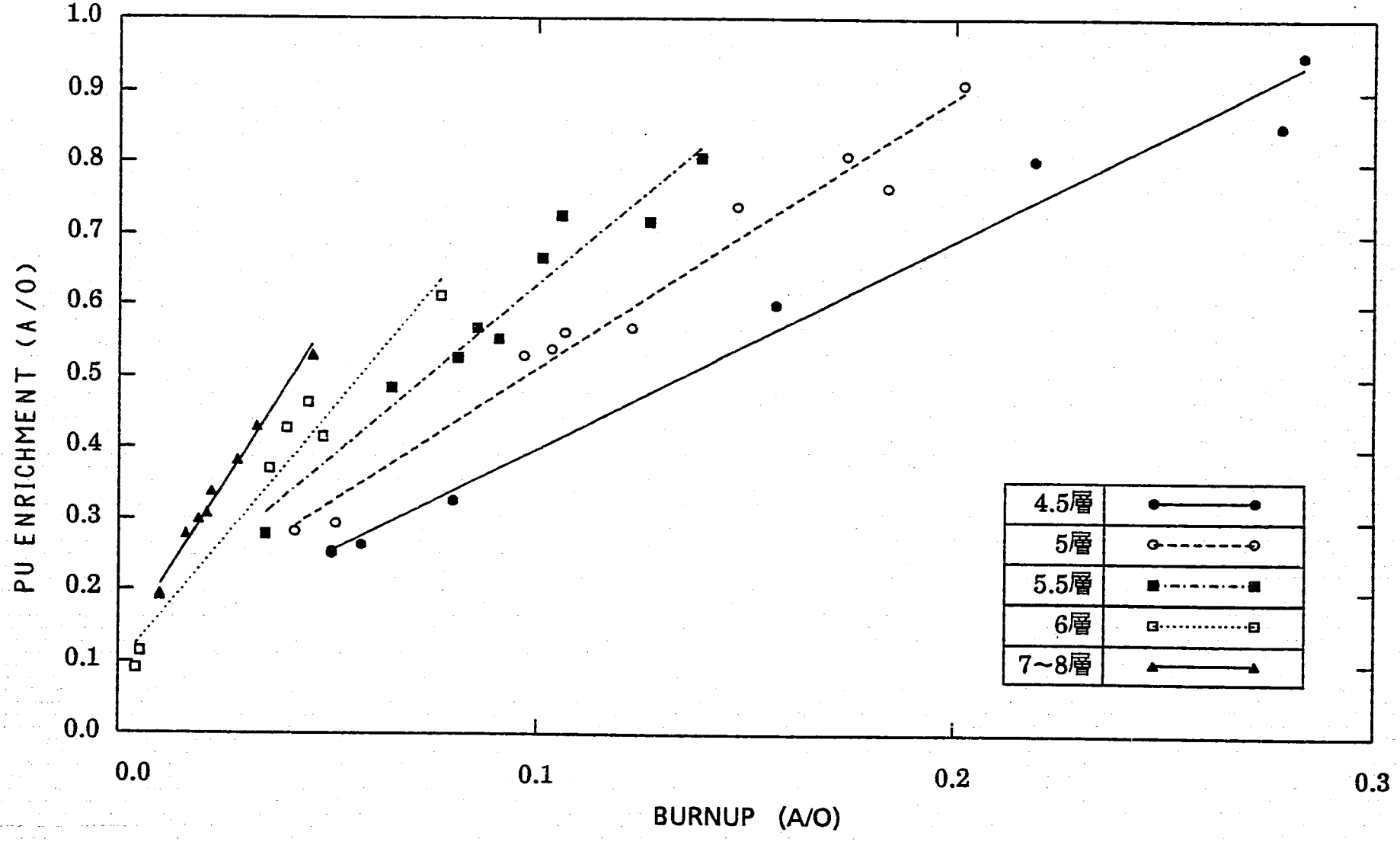


図2.2.24　Ｐｕ含有率（径方向ブランケット燃料）

3. 燃焼特性解析

PIEデータで得られた結果の内、以下の値について計算値と比較した。

- 炉心燃料については、各同位体組成の燃焼率に対する変化率
- ブランケット燃料については、プルトニウム含有率

である。

解析は、以下の手順で行った。

① MK-I 炉心の運転を3次元拡散·燃焼コードにより、燃料交換と制御棒位置をほぼ忠実に模擬し中性子束を求める。

② 上記中性子束と各核種の断面積および集合体の照射履歴により、PIEデータ位置での燃焼解析を別途実施する。

③ 解析で求めた同位体組成比およびプルトニウム含有率の変化を前章で求めたPIEデータの結果と比較する。

3.1 解析条件および手法

3.1.1 群定数

核定数ライブラリーは、JFS3-JENDL2[13]を使用した。

3.1.2 18群実効ミクロ断面積の作成

原子数密度および温度

各領域ごとの原子数密度を表3.1.1に示す。これは、各領域の平均的な組成である(文献(2)参照)。また、各領域の平均温度を表3.1.2に示す。

縮約計算体系

3次元拡散·燃焼計算で使用する18群実効断面積は、SLAROM[9]を使用して、均質セル計算を行い、CITATION[11]により各領域の平均中性子スペクトルを求め、それを重みとしてJOINT[10]により縮約し作成した。制御棒領域の縮約は、中心位置に挿入した状態の平均中性子スペクトルを重みとした。縮約後のエネルギー分割を、表3.1.3に示す。70群から18群へのkeffの縮約効果は、0.01%Δk/kk'未満であった。

CITATION計算での縮約体系を図3.1.1に示す。この体系は、文献(2)より引用した。制御棒の縮約体系を図3.1.2に示す。炉心中心の中性子スペクトルを、図3.1.3に示す。大型炉と比較して硬いことがわかる。

SLAROMおよびJOINTの入力を、付録4に示す。

3.1.3 3次元拡散·燃焼計算

計算条件

集合体配置および燃料交換は、実際のものを忠実に模擬した。50MW出力上昇サイクルの集合体配置を図3.1.7に示す。体系寸法は、運転時の温度における値とした。この場合、集合体ピッチは8.206cmとなる。(文献(2)参照)

計算は、50MW出力上昇試験から75MW第6サイクルまで(全11サイクル)をMOSES[12]を使用して3次元修正粗メッシュ拡散·燃焼計算を行った。

各集合体の軸方向の領域および寸法を図3.1.4に示す。安全棒は全引抜(800mm引抜き)状態とした。調整棒については、全サイクルを通して平均の引抜き位置(450mm引抜き)とした。

Mk-1炉心の運転履歴データを表3.1.4に示す。各サイクルの照射日数は、積算出力を炉出力で除して求めた。冷却期間は、サイクル終了日および開始日より求めた。各サイクルの積算出力は、文献(3)を引用した。

3次元計算に用いた各領域の原子数密度は、断面積の作成時と同様のものを使用した。ま

た、計算で考慮した燃焼チェーンを、図3.1.5に示す。

MOSESの入力を、付録4に示す。

計算結果

各サイクルの実効増倍率および燃焼反応度を表3.1.5、図3.1.6に示す。

解析結果より、50MW運転時の燃焼係数は、以下の値となった。

燃焼係数cal.＝-7.87×10^{-3}%Δk/k / 50MW·day　±1%

文献(16)より実測値は、

燃焼係数exp.＝-7.7×10^{-3}%Δk/k / 50MW·day　+6～−12%

であるため、燃焼係数のC/E値は以下の通りとなる。

C/E＝1.02　+7～−13%

また、各サイクルの増殖比を表3.1.6に示す。

50MW出力上昇試験サイクル時の炉心体系を図3.1.7に示す。各サイクルの初期および末期の出力分布を付録4に示す。

表3.1.1　各領域の原子数密度

（× 10^{24} atoms／cm^3 ）

Code Na	CITATION Na	領域／核種	炉　心	径ブランケット	軸ブランケット	可動反射体	ナトリウム	固定反射体	軸反射体
925		U235	1.5543－03 *1)	2.1944－05	1.6588－05				
928		U238	5.1404－03	1.0812－02	8.1728－03				
949		Pu239	1.0952－03						
940		Pu240	2.7610－04						
941		Pu241	3.6831－05						
942		Pu242	7.8313－06						
995		U^{235} FP							
999		Pu^{239} FP							
8		O	1.6267－02	2.1772－02	1.6349－02				
11		Na	8.8054－03	7.1097－03	8.8054－03	4.3542－03	2.2619－02	1.4856－02	9.0497－03
24		Cr	3.2336－03	2.8198－03	3.2590－03	1.3395－02		6.1492－03	3.3043－03
26		Fe	1.1774－02	1.0267－02	1.1866－02	4.7784－02		2.1937－02	1.2031－02
28		Ni	2.0720－03	1.8069－03	2.0883－03	6.1738－03		2.8343－03	2.1173－03
42		Mo	2.3298－04	2.0317－04	2.3481－04				2.3807－04
105		B10							
115		B11							
6		C							
4		Be							
51		Sb							

*1)　Read as 1.5543E－03

表3.1.1　各領域の原子数密度

Code No	CITATION No	領域 / 核種	中性子源	制御棒				Pile Oscillater	
				B_4Cペレット	プレナム	ダッシュラム	ナトリウム		
925		U235							
928		U238							
949		Pu239							
940		Pu240							
941		Pu241							
942		Pu242							
995		U^{235}FP							
999		Pu^{239}FP							
8		O							
11		Na	5.6441－03	1.2623－02	1.2623－02	1.8784－02	2.0820－02	1.5881－02	
24		Cr	3.2155－03	3.4751－03	3.4751－03	2.6662－03	1.2526－03	4.6731－03	
26		Fe	1.1708－02	1.2653－02	1.2653－02	9.7079－03	4.5609－03	1.6681－02	
28		Ni	2.0604－03	2.2268－03	2.2268－03	1.7085－03	8.0264－04	2.1787－03	
42		Mo	2.3167－04	2.5038－04	2.5038－04	1.9210－04	9.0248－05	9.9211－06	
105		B10		2.1806－02				1.8799－03	
115		B11		1.7951－03				2.5022－03	
6		C		5.6664－03				1.0516－03	
4		Be	5.6362－02						
51		Sb	1.7820－03						

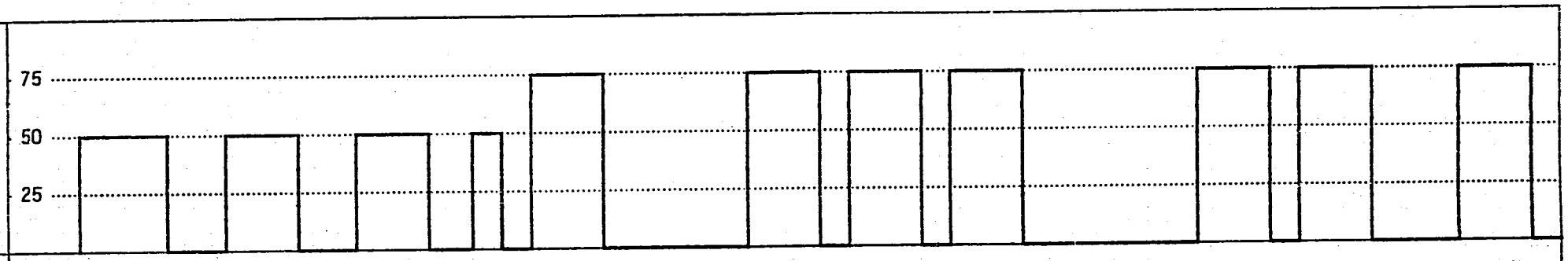
表3.1.2　各領域の平均温度

CITATION 断面積番号	PDSファイル メンバー名	領域名	領域温度 (℃)
1	CORE00	炉心燃料(0X~2X)	1250
2	CORE10	炉心燃料(3X~4X)	1250
3	CORE20	炉心燃料(5X)	1000
4	CORE0U	上部炉心燃料(0X~2X)	1000
5	CORE1U	上部炉心燃料(3X~4X)	1000
6	CORE2U	上部炉心燃料(5X)	800
7	CORE0L	下部炉心燃料(0X~2X)	930
8	CORE1L	下部炉心燃料(3X~4X)	930
9	CORE2L	下部炉心燃料(5X)	700
10	RDBLK5	径ブランケット(5X)	530
11	RDBLK6	径ブランケット(6X)	490
12	RDBLK7	径ブランケット(7X)	440
13	RDBLK8	径ブランケット(8X)	390
14	RDBLK9	径ブランケット(9X)	380
15	AXBL1U	上部軸ブランケット(1)	560
16	AXBL3U	上部軸ブランケット(2)	530
17	AXBL1L	下部軸ブランケット(1)	380
18	AXBL3L	下部軸ブランケット(2)	370
19	AXREFU	上部軸方向反射体	370
20	AXREFL	下部軸方向反射体	370
21	REF001	可動反射体	370
22	REF002	固定反射体	370
23	CRB4CP	B_4Cペレット	370
24	CRPREN	プレナム	370
25	CRDASH	ダッシュラム	370
26	CRADAP	Naフォロワー	370

表3.1.3　エネルギー群構造

18G	Upper energy	Lower energy
1	10.0 (MeV)	6.0653 (MeV)
2	6.0653	3.6788
3	3.6788	2.2313
4	2.2313	1.3534
5	1.3534	0.82085
6	0.82085	0.38774
7	0.38774	0.18316
8	0.18316	0.086517
9	86.517 (keV)	40.868 (keV)
10	40.868	19.305
11	19.305	9.1188
12	9.1188	4.3074
13	4.3074	2.0347
14	2.0347	0.96112
15	961.12 (eV)	454.00 (eV)
16	454.00	214.45
17	214.45	101.30
18	101.30	1.0×10^{-5} (eV)

表3.1.4　MK-I炉心の運転履歴データ



サイクル名称	50MW出力上昇試験	50MW第1サイクル	50MW第2サイクル	50MW保安監査	75MW出力上昇試験		75MW第1サイクル	75MW第2サイクル	75MW第3サイクル		75MW第4サイクル	75MW第5サイクル		75MW第6サイクル
炉心本数	70本	71	71	73	73		75	76	77		77	78		79
積算出力	2392MW	2150	2186	155	2021		2946	3072	3019		3662	3333		3124
燃料交換 B→C	5A5		5C5,5E5			5B2,5E2		5D2	5A2				5C2	5F2
燃料交換 C→C	1C1,5A3	2E2,5A4	1B1,4B2			1E1,3A2		1A1,1E1, 1F1,2D2	2F2, 5F3	1C1,1E1,2B1, 2C1,3E2,4B2			1A1,2F1	2A1,1C1, 1E1,1F1
燃料交換 B→B	5D1,5F2		5A2			5A1			6F1	6F4				
実効日数	47.84日	43.0	43.72	3.1	26.95		39.28	40.96	40.25		48.83	44.44		41.65
冷却期間	60日	60	45	30	150		30	30	180		30	90		30

表3.1.5　各サイクルの実効増倍率と燃焼反応度

サイクル名称	実効日数	実効増倍率 上段:初期 下段:末期	燃焼による 反応度低下 (%Δk/kk')	燃料交換による 反応度増加 (%Δk/kk')
50MW出力上昇試験	47.84	0.988665 0.984964	-0.3801	
燃料交換				+0.3310
50MW第1サイクル	43.00	0.988186 0.984900	-0.3376	
燃料交換				+0.0162
50MW第2サイクル	43.72	0.985057 0.981754	-0.3415	
燃料交換				+0.7133
50MW保安監査	3.10	0.988678 0.988472	-0.0211	
燃料交換				-0.0072
75MW出力上昇試験	26.95	0.988402 0.985403	-0.3079	
燃料交換				+0.7376
75MW第1サイクル	39.28	0.992618 0.988347	-0.4353	
燃料交換	30.0			+0.5308
75MW第2サイクル	40.96	0.993559 0.989171	-0.4465	
燃料交換	30.0			+0.4053
75MW第3サイクル	40.25	0.993153 0.988867	-0.4364	
燃料交換	180.0			+0.2877
75MW第4サイクル	48.83	0.991688 0.986518	-0.5285	
燃料交換	30.0			+0.4792
75MW第5サイクル	44.44	0.991204 0.986551	-0.4758	
燃料交換	90.0			+0.5632
75MW第6サイクル	41.65	0.992063 0.987716	-0.4436	

表3.1.6　各サイクルでの増殖比

	サイクル初期				サイクル末期			
	炉心	軸ブラ	径ブラ	合計	炉心	軸ブラ	径ブラ	合計
50MW 出力上昇試験	0.214003	0.164069	0.654984	1.03306	0.215030	0.164808	0.658656	1.03849
50MW 第1サイクル	0.215080	0.165137	0.649698	1.02991	0.215994	0.165800	0.652933	1.03473
50MW 第2サイクル	0.215951	0.165770	0.652771	1.03449	0.216878	0.166430	0.656050	1.03936
50MW 保安監査	0.216869	0.167126	0.637518	1.02151	0.216935	0.167175	0.637706	1.02182
75MW 出力上昇試験	0.217588	0.167676	0.639662	1.02492	0.218422	0.168289	0.642567	1.02928
75MW 第1サイクル	0.218337	0.168904	0.623942	1.01118	0.219536	0.169769	0.627973	1.01728
75MW 第2サイクル	0.219012	0.169728	0.616756	1.00550	0.220255	0.170623	0.620853	1.01173
75MW 第3サイクル	0.220012	0.170787	0.611443	1.00224	0.221221	0.171668	0.615419	1.00831
75MW 第4サイクル	0.220372	0.171048	0.612169	1.00359	0.221837	0.172124	0.616990	1.01095
75MW 第5サイクル	0.221486	0.172256	0.606501	1.00024	0.222809	0.173224	0.610809	1.00684
75MW 第6サイクル	0.222203	0.173155	0.599494	0.99485	0.223435	0.174066	0.603483	1.00098

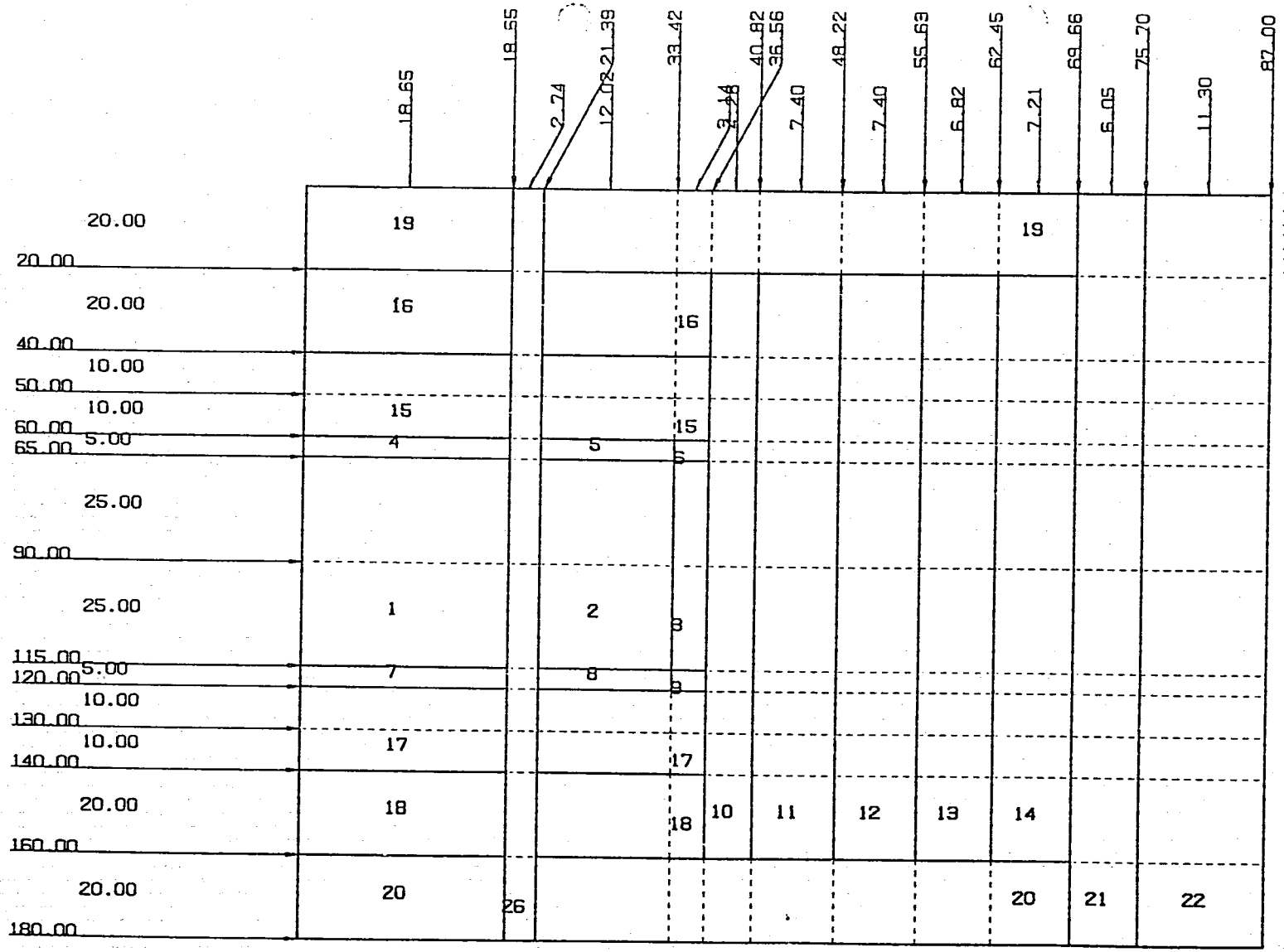


図3.1.1 「常陽」MK-I 炉心 R-Z炉心体系（縮約計算時）

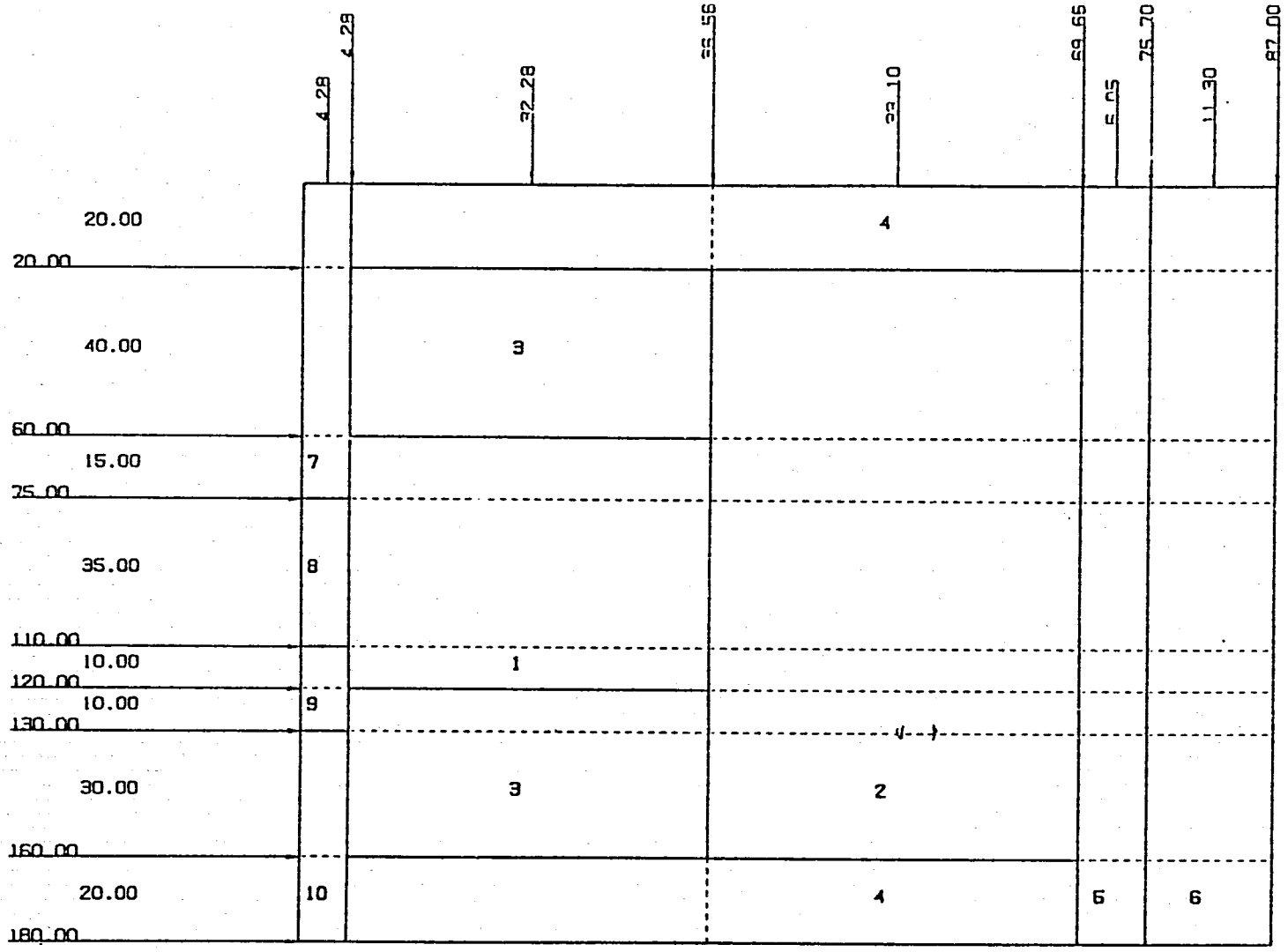


図3.1.2　「常陽」MK-I　炉心　R-Z炉心体系（制御棒縮約計算時）

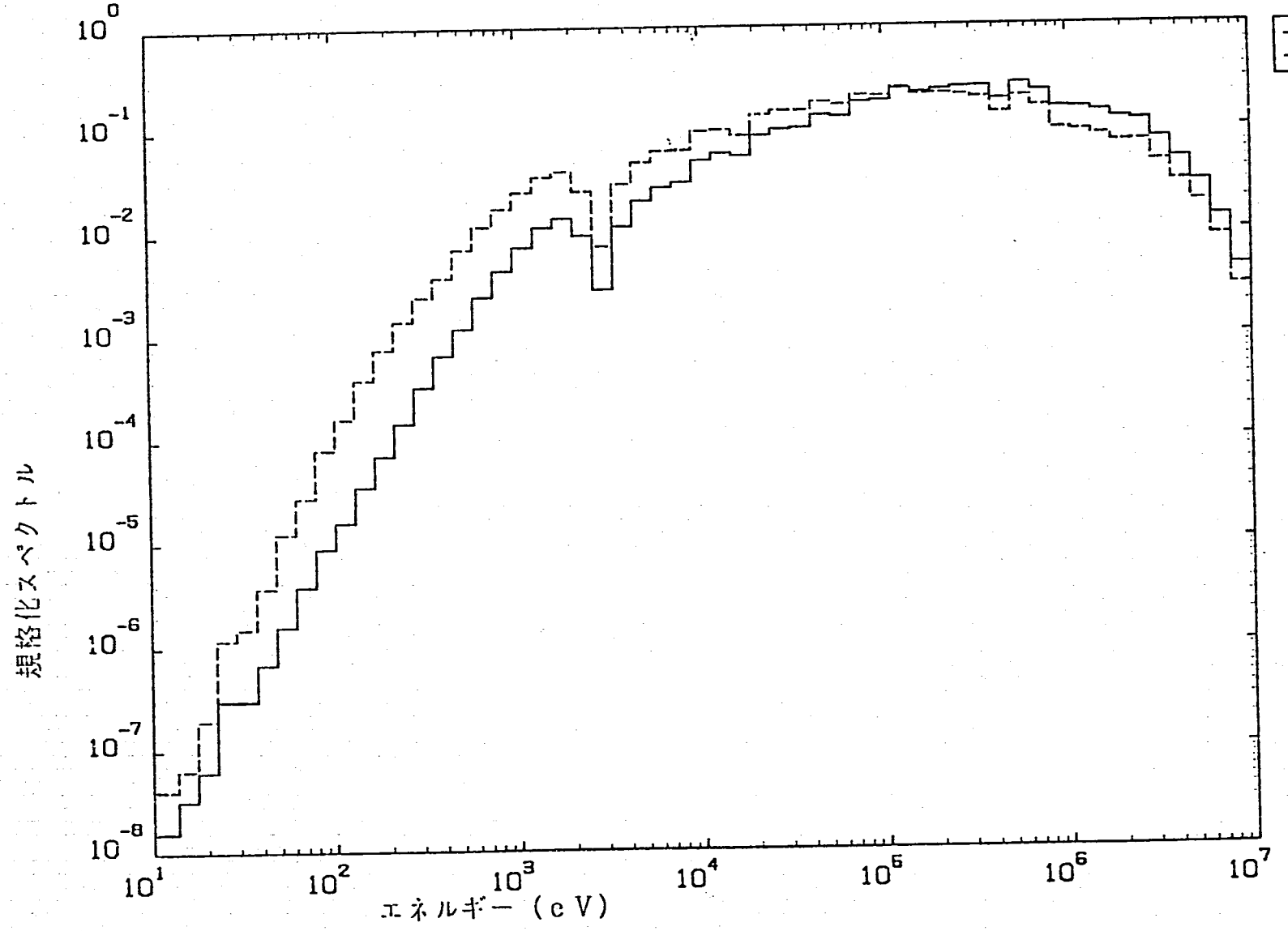


図3.1.3　　中性子スペクト（炉心中心）

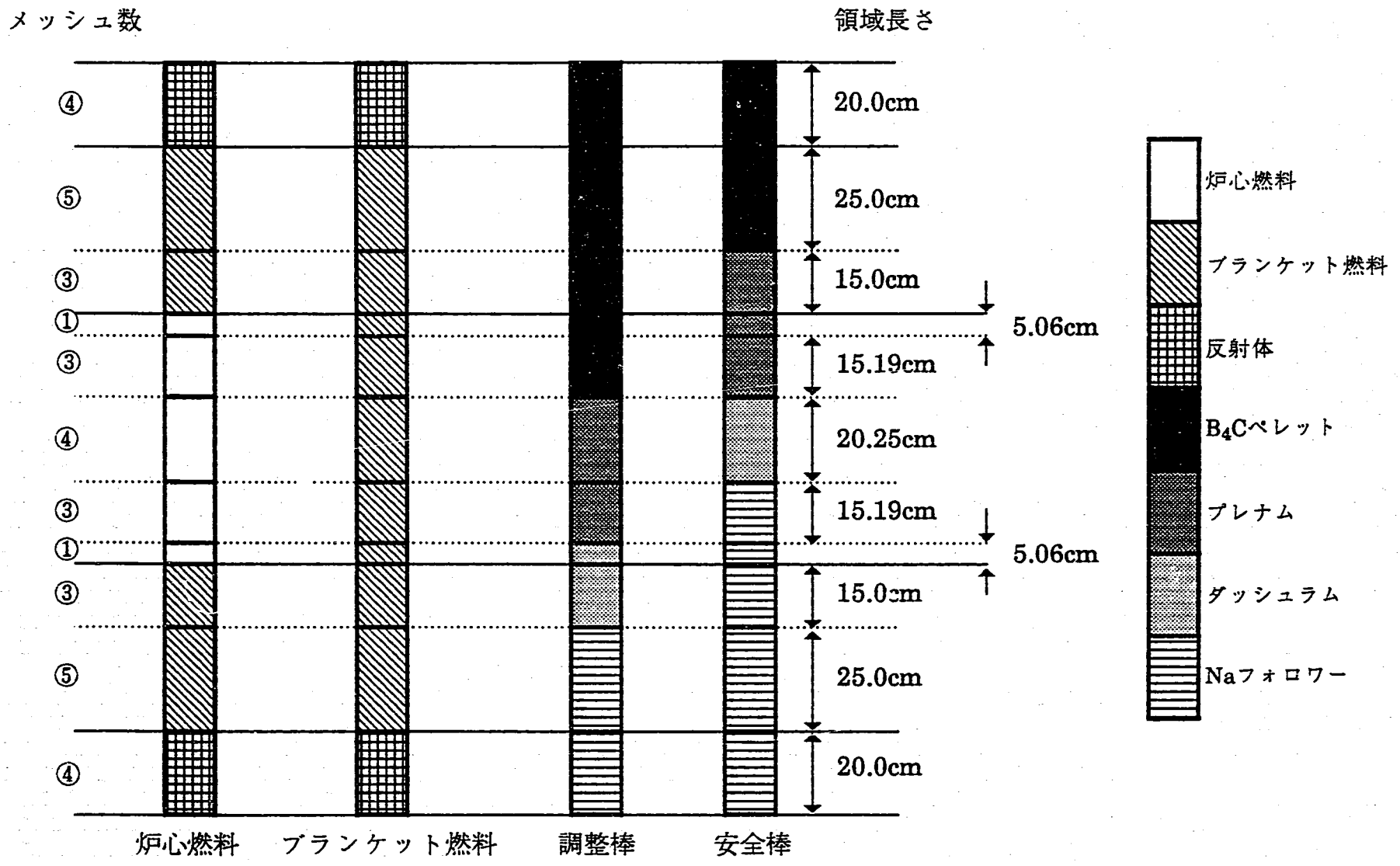


図3.1.4　軸方向ゾーン分割とメッシュ数

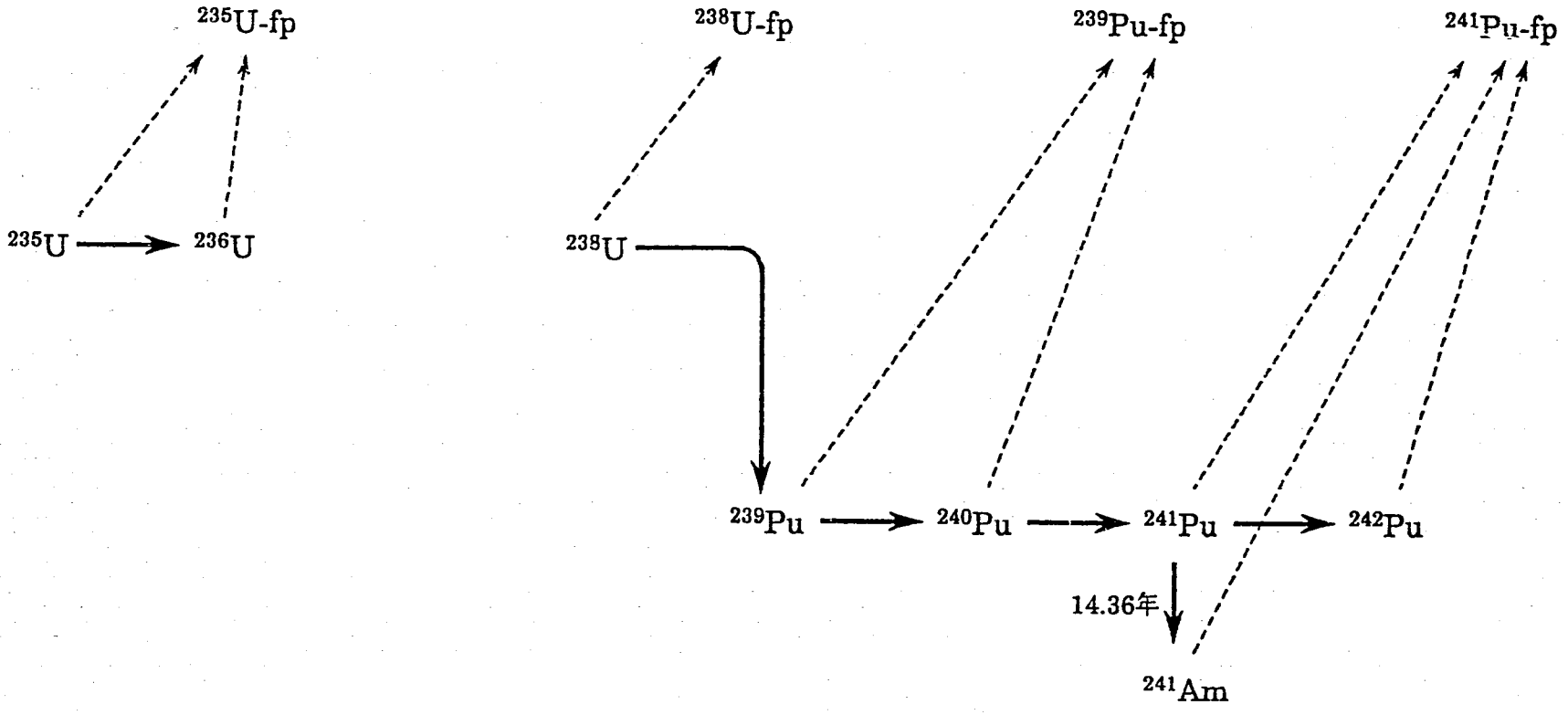

235U-fp
235U
236U
238U-fp
239Pu-fp
241Pu-fp
238U
239Pu
240Pu
241Pu
242Pu
14.36年
241Am

図3.1.5　燃焼チェーン

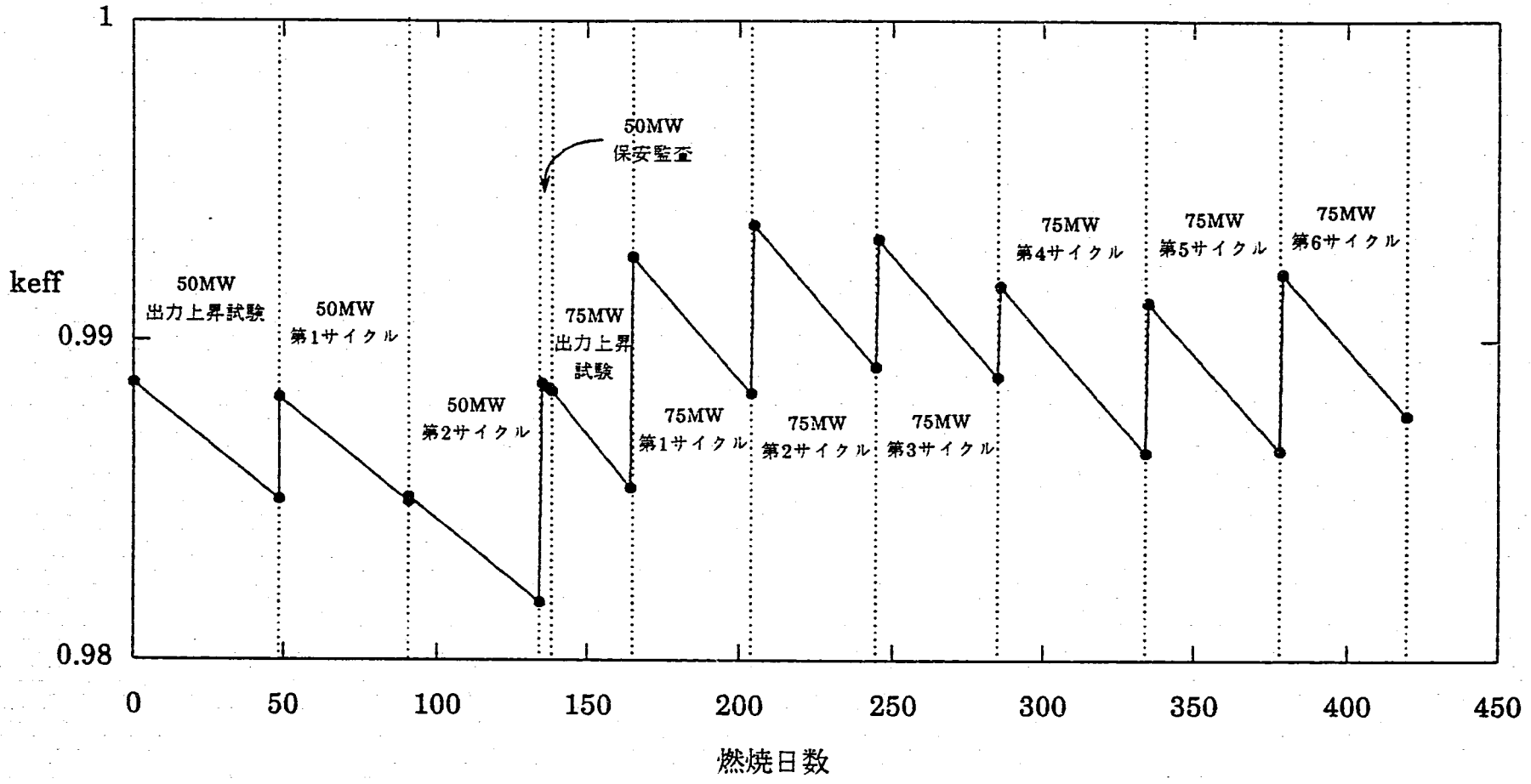


図3.1.6　各サイクルの実効増倍率の推移

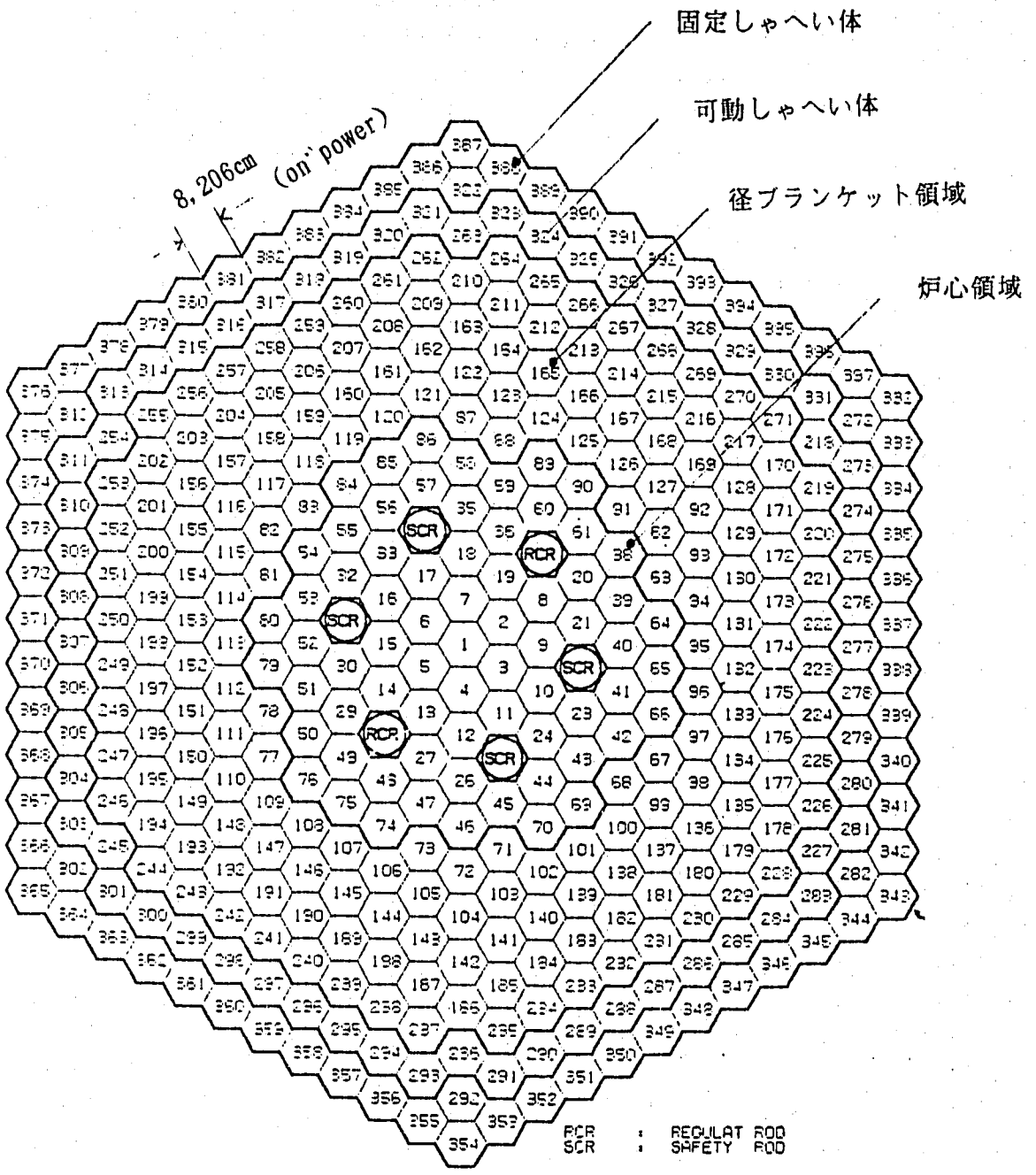


FIG. ASSEMBLY NO. AND LAYER NO. MAP

JOYO MK-1 BURNUP CALCULATION

図3.1.7 50MW出力上昇時の集合体配置図

3.2 燃焼組成の解析および考察

前章で求めた核各種の実効ミクロ断面積と各サイクル、各位置での中性子束により燃焼計算を実施した。計算条件は以下の通りである。

① 実効断面積は、全サイクルを通して同一とした[文献(2)]。

② 燃焼を考慮する核種およびチェーンは、図3.1.5に示す通りである。

③ PIE試料位置と中性子計算位置は、完全には一致しないため、最も近いメッシュ点の値を使用した。

④ 初期値は各ロットごとにPIEデータから求められた値を使用した。

⑤ 燃焼計算式および計算プログラムを付録5に示す。

同位体組成比の燃焼率に対する変化率

比較するPIEデータのグループは以下の通りである。

① プルトニウム

ロット： PU8230,PU8231
同位体： Pu239,Pu240,Pu242
径方向位置： 0~2層の集合体
軸方向位置： 炉心中心面より±5cmの領域

② ウラン

ロット： EU0004.EU0013
同位体： U235,U236,U238
径方向位置： 0~2層の集合体
軸方向位置： 炉心中心面より±5cmの領域

評価領域は制御棒およびブランケットからの影響の少ない部分に限定した。各ロットのPIE試料位置と照射期間を図3.2.1~4に示す。

評価を行った試料の存在する集合体、ピン番号、軸方向位置、燃焼率および同位体組成比について、PIEデータと計算値を表3.2.1~4に比較している。また、各ロットについて同位体組成比と燃焼率の関係を図3.2.5~16に示す。燃焼率に対する同位体組成比の変化率を最小二乗法により求め、C/E値とあわせて表3.2.5~8に示す。

さらに、評価した組成変化率は燃焼率に対する相対値であるため、中性子レベルの変動に影響されない。また、同位体比および燃焼率の測定誤差は、統計処理することにより除かれると考える。したがって、評価誤差はデータを最小二乗法により統計処理した時の統計誤差のみと考え、これを表3.2.5~8に示す。

計算値とPIEデータとの比C/E値は、Pu核種の同位体組成比の変化率については、一律に5%過大評価、U核種の同位体組成比の変化率については、一律に10%過大評価している。これは、以下の事が考えられる。

まず、Pu核種の数密度の変化ついては、最も量が大きいものは、Pu239の減少であり、他同位体の変化量をはるかに上回っている(表3.2.9)。このため、このPu239の減少量のC/Eが、そのまま同位体組成比の変化率のC/Eに反映される。従って、Pu核種の同位体組成比の変化率の過大評価は、おもにPu239の減少量を過大評価しているものと考えられる。また、Pu242のC/E値が他同位体と比べて非常に大きい理由は、①Pu241の初期量がPIEデータからは得られていないこと、②数密度が他核種と比べて非常に小さいため測定精度が落ちること、等が考えられる。

同様に、U核種の数密度の変化ついては、最も量が大きいものは、U235、U238の減少であり、この2つは他同位体の変化量をはるかに上回っている(表3.2.10)。このため、このU235、U238の減少量のC/Eが、そのまま同位体組成比の変化率のC/Eに反映される。2.2節で記述したようにU238の変化率はU235に大きく支配される。このため、U238のC/Eは、U235のC/Eを反映していると思われる。従って、U核種の同位体組成比の変化率の過大評価は、おもにU235の減少量を過大評価しているものと考えられる。

径ブランケット燃料のプルトニウム生成

径ブランケット各層の炉心中心面近傍のプルトニウム含有率について比較する。表3.2.11に集合体番号、ピン番号、軸方向位置、燃焼率および同位体組成比についてPIEデータと計算値を比較している。表より、各層ごとのC/E値は燃焼率およびPu生成量に依存していることがわかる。第5層では、Pu生成量が増加するにつれて過大評価は改善されていく方向にある。一方、第6層では逆に大きく過大評価となっている。

Pu生成量の計算値は、中性子レベルつまり炉出力レベルの変動±5.5%[4]に影響される。また、質量分析精度は±1.5% (N908 78−01 p.69より)である。したがって、誤差としては±7%を考慮する必要がある。

表3.2.1　プルトニウム粉末ロット（ＰＵ8230）

集合体番号	装荷位置	ピンNo.†	軸方向位置 (mm) 下端	軸方向位置 (mm) 上端	燃焼率 (a/o)	$^{239}Pu/Pu$ (a/o)	$^{240}Pu/Pu$ (a/o)	$^{242}Pu/Pu$ (a/o)	備考
PPJX13	0	46	140.3	146.1	4.650	76.8667	20.2439	0.5596	※
		◎	100.0	150.0	4.5025	76.8492	20.2790	0.5678	※
		46	272.6	278.0	5.220	76.6287	20.3969	0.5669	
		◎	250.0	300.0	5.1958	76.5947	20.4955	0.5785	
		46	420.7	425.6	4.700	76.8494	20.2176	0.5584	※
		◎	400.0	450.0	4.6174	76.8376	20.2899	0.5693	※
PPJX11	1A1	01	270.3	275.1	2.278	77.6738	19.4163	0.5302	
		◎	250.0	300.0	2.2561	77.7144	19.4037	0.5339	
PPJX12	1D1	06	270.0	274.6	4.950	76.7533	20.3256	0.5683	
		◎	250.0	300.0	5.0072	76.6617	20.4387	0.5756	
PPJX06	1E1	01	270.2	275.2	1.730	77.9165	19.1651	0.5220	
		91	270.1	275.1	1.760	77.9248	19.1668	0.5223	
		◎	250.0	300.0	1.7156	77.9232	19.2077	0.5260	
PPJX09	2B1	01	270.4	275.0	3.190	77.3835	19.7160	0.5446	
		21	269.8	275.2	3.150	77.3925	19.6728	0.5440	
		46	270.3	274.8	3.050	77.4466	19.6584	0.5424	
		◎	250.0	300.0	2.9683	77.4552	19.6986	0.5449	
PPJX08	2E2	01	300.2	304.9	0.806	78.1843	18.8736	0.5102	
		35	300.2	304.9	0.853	78.1867	18.8723	0.5123	
		80	305.2	312.5	0.885	78.1838	18.8802	0.5119	
		◎	300.0	350.0	0.8131	78.2154	18.8766	0.5126	
		35	150.2	154.9	0.775	78.2215	18.8490	0.5099	※
		◎	150.0	200.0	0.7672	78.2307	18.8632	0.5119	※
		35	450.2	454.9	0.730	78.2347	18.8310	0.5099	※
		◎	450.0	500.0	0.6509	78.2789	18.8217	0.5102	※

† No.46が中心ピン。◎は計算値を表す。

※は、軸方向に中心面より離れるため、変化率を評価する対象から除く。

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表3.2.2　プルトニウム粉末ロット（ＰＵ8231）

集合体番号	装荷位置	ピンNo.†	軸方向位置 (mm) 下端	軸方向位置 (mm) 上端	燃焼率 (a/o)	$^{239}Pu/Pu$ (a/o)	$^{240}Pu/Pu$ (a/o)	$^{242}Pu/Pu$ (a/o)	備考
PPJX13	0	06	273.1	278.7	5.260	76.6194	20.3819	0.5651	
		86	270.8	275.6	5.160	76.6638	20.4402	0.5763	
		©	250.0	300.0	5.1960	76.6158	20.4865	0.5769	
PPJX11	1A1	46	270.2	275.0	2.318	77.7038	19.3834	0.5338	
		©	250.0	300.0	2.2561	77.7372	19.3943	0.5325	
PPJX12	1D1	47	139.9	144.6	4.860	76.8755	20.2258	0.5659	※
		©	100.0	150.0	4.4325	76.9297	20.2207	0.5650	※
		47	269.9	274.9	5.150	76.7611	20.3855	0.5720	※※
		86	269.4	274.2	5.200	76.7337	20.4310	0.5741	※※
		©	250.0	300.0	5.0073	76.6828	20.4296	0.5740	※※
		47	419.8	424.8	4.630	76.8913	20.1992	0.5660	※
		©	400.0	450.0	4.3448	76.9263	20.2224	0.5639	※
PPJX06	1E1	46	139.9	145.4	1.600	77.9693	19.1120	0.5205	※
		©	100.0	150.0	1.5035	78.0347	19.1223	0.5216	※
		46	269.9	274.9	1.780	77.8985	19.1780	0.5237	
		©	250.0	300.0	1.7157	77.9465	19.1982	0.5247	
		46	419.9	424.9	1.600	77.9806	19.1183	0.5217	※
		©	400.0	450.0	1.4799	78.0295	19.1264	0.5214	※
PPJX09	2B1	71	270.3	275.3	2.900	77.4852	19.6366	0.5403	
		91	270.6	275.6	2.860	77.5041	19.6099	0.5398	
		©	250.0	300.0	2.9683	77.4774	19.6892	0.5435	
PPJD0M	2F1	01	270.0	275.0	3.890	77.1514	19.9539	0.5466	
		©	250.0	300.0	3.5673	77.2219	19.9241	0.5524	

† No46が中心ピン。©は計算値を表す。

※は、軸方向に中心面より離れるため、変化率を評価する対象から除く。

※※は、他のデータとの整合性がとれないため、変化率を評価する対象から除く。

表3.2.3　ウラン粉末ロット（ＥＵ0004）

集合体番号	装荷位置	ピンNo.†	軸方向位置 (mm) 下端	軸方向位置 (mm) 上端	燃焼率 (a/o)	$^{235}U/U$ (a/o)	$^{236}U/U$ (a/o)	$^{238}U/U$ (a/o)	備考
PPJX13	0	46	140.3	146.1	4.650	20.7951	0.8415	78.2343	※
		©	100.0	150.0	4.5975	20.6694	0.8702	78.4604	※
		46	272.6	278.0	5.220	20.5471	0.9067	78.4173	
		©	250.0	300.0	5.1733	20.3345	0.9537	78.5856	
		46	420.7	425.6	4.700	20.7864	0.8381	78.2471	※
		©	400.0	450.0	4.4830	20.7091	0.8664	78.4245	※
PPJX09	2B1	01	270.4	275.0	3.190	21.5666	0.6368	77.6694	
		21	269.8	275.2	3.150	21.5854	0.6278	77.6591	
		46	270.3	274.8	3.050	21.6135	0.6166	77.6424	
		©	250.0	300.0	2.9549	21.5072	0.6398	77.7267	
PPJX08	2E2	35	150.2	154.9	0.775	22.7144	0.3021	76.8579	※
		©	150.0	200.0	0.6480	22.7760	0.2955	76.9285	※
		01	300.2	304.9	0.806	22.6988	0.3142	76.8592	
		35	300.2	304.9	0.853	22.6847	0.3141	76.8741	
		80	305.2	312.5	0.885	22.6396	0.3186	76.9169	
		©	300.0	350.0	0.8094	22.6902	0.3206	76.8929	
		35	450.2	454.9	0.730	22.7281	0.2947	76.8524	※
		©	450.0	500.0	0.7638	22.7144	0.3126	76.9730	※

† No.46が中心ピン。©は計算値を表す。

※は、軸方向に中心面より離れるため、変化率を評価する対象から除く。

表3.2.4　ウラン粉末ロット（EU0013）

集合体番号	装荷位置	ピンNo.†	軸方向位置 (mm) 下端	軸方向位置 (mm) 上端	燃焼率 (a/o)	$^{235}U/U$ (a/o)	$^{236}U/U$ (a/o)	$^{238}U/U$ (a/o)	備考
PPJX13	0	06	273.1	278.7	5.260	20.6733	0.8722	78.3209	
		86	270.8	275.6	5.160	20.7102	0.9010	78.2558	
		©	250.0	300.0	5.1886	20.4697	0.9516	78.4490	
PPJX11	1A1	01	270.3	275.1	2.278	22.1271	0.4975	77.2444	
		46	270.2	275.0	2.318	22.0904	0.4982	77.2811	
		©	250.0	300.0	2.2528	20.0470	0.5224	77.3010	
PPJX12	1D1	47	139.9	144.6	4.860	20.9951	0.8237	78.0471	※
		©	100.0	150.0	4.4266	20.9043	0.8431	78.2526	※
		06	270.0	274.6	4.950	20.8041	0.8724	78.1902	
		47	269.9	274.9	5.150	20.7422	0.8874	78.2365	
		86	269.4	274.2	5.200	20.6877	0.9063	78.2728	
		©	250.0	300.0	5.0003	20.5628	0.9288	78.3787	
		47	419.8	424.8	4.630	21.0024	0.8200	78.0447	※
		©	400.0	450.0	4.3390	20.9274	0.8445	78.2281	※
PPJX06	1E1	46	139.9	145.4	1.600	22.4742	0.4010	76.9944	※
		©	100.0	150.0	1.5015	22.4816	0.4098	77.1086	※
		01	270.2	275.2	1.730	22.4221	0.4262	77.0198	
		46	269.9	274.9	1.780	22.4017	0.4261	77.0404	
		©	250.0	300.0	1.7131	22.3345	0.4434	77.0924	
		46	419.9	424.9	1.600	22.5071	0.3997	76.9618	※
		©	400.0	450.0	1.4779	22.4852	0.4118	77.1030	※
PPJX09	2B1	71	270.3	275.3	2.900	21.8081	0.6028	77.4572	
		91	270.6	275.6	2.860	21.7677	0.5935	77.5081	
		©	250.0	300.0	2.9639	21.6486	0.6356	77.5861	
PPJD0M	2F1	01	270.0	275.0	3.890	21.3107	0.7232	77.8339	
		©	250.0	300.0	3.5622	21.3180	0.7291	77.8233	

† No.46が中心ピン。©は計算値を表す。

※は、軸方向に中心面より離れるため、変化率を評価する対象から除く。

表3.2.5 燃焼率に対する同位体組成比の変化率（EU8230）

	計算より求めた値	PIEデータより求めた値	C/E
$^{239}Pu/Pu$	$-3.751\pm0.036 \times10^{-1}$	$-3.541\pm0.035 \times10^{-1}$	1.059 ±2%
$^{240}Pu/Pu$	$3.714\pm0.022 \times10^{-1}$	$3.522\pm0.028 \times10^{-1}$	1.055 ±2%
$^{242}Pu/Pu$	$1.506\pm0.003 \times10^{-2}$	$1.345\pm0.023 \times10^{-2}$	1.120 ±2%

表3.2.6 燃焼率に対する同位体組成比の変化率（EU8231）

	計算より求めた値	PIEデータより求めた値	C/E
$^{239}Pu/Pu$	$-3.832\pm0.027 \times10^{-1}$	$-3.656\pm0.022 \times10^{-1}$	1.048 ±1%
$^{240}Pu/Pu$	$3.724\pm0.057 \times10^{-1}$	$3.534\pm0.076 \times10^{-1}$	1.054 ±5%
$^{242}Pu/Pu$	$1.503\pm0.004 \times10^{-2}$	$1.300\pm0.099 \times10^{-2}$	1.156 ±8%

表3.2.7 燃焼率に対する同位体組成比の変化率（EU0004）

	計算より求めた値	PIEデータより求めた値	C/E
$^{235}U/U$	$-5.398\pm0.044 \times10^{-1}$	$-4.835\pm0.030 \times10^{-1}$	1.116 ±1%
$^{236}U/U$	$1.451\pm0.014 \times10^{-1}$	$1.355\pm0.005 \times10^{-1}$	1.071 ±1%
$^{238}U/U$	$3.879\pm0.003 \times10^{-1}$	$3.475\pm0.033 \times10^{-1}$	1.116 ±1%

表3.2.8 燃焼率に対する同位体組成比の変化率（EU0013）

	計算より求めた値	PIEデータより求めた値	C/E
$^{235}U/U$	$-5.376\pm0.024 \times10^{-1}$	$-4.907\pm0.041 \times10^{-1}$	1.096 ±1%
$^{236}U/U$	$1.467\pm0.015 \times10^{-1}$	$1.351\pm0.020 \times10^{-1}$	1.086 ±3%
$^{238}U/U$	$3.909\pm0.010 \times10^{-1}$	$3.548\pm0.037 \times10^{-1}$	1.102 ±1%

表3.2.9　Ｐｕ核種の数密度の変化（$\times 10^{-24}$）

PU8230ロット　PPJX13集合体　46番ピン

burn-up	Pu-239	Pu-240	Pu-241	Pu-242	Pu
0.0	1.1115 -3	2.6300 -4	3.4357 -5	7.0869 -6	1.4159 -3
5.1958	1.0098 -3	2.7021 -4	3.0858 -5	7.6262 -6	1.3185 -3
Δ	−0.1017 -3	+0.0721 -4	−0.3499 -5	+0.5393 -6	−0.0974 -3

表3.2.10　Ｕ核種の数密度の変化（$\times 10^{-24}$）

EU0004ロット　PPJX13集合体　46番ピン

burn-up	U-235	U-236	U-238	U
0.0	1.5458 -3	1.3483 -5	5.1270 -3	6.6947 -3
5.1733	1.2943 -3	6.0700 -5	5.0018 -3	6.3647 -3
Δ	−0.2515 -3	+4.7217 -4	−0.1252 -3	−0.3300 -3

表3.2.11　径ブランケット集合体でのＰｕ生成量

集合体番号	装荷位置	ピンNo.	軸方向位置(下端)	軸方向位置(上端)	燃焼率(a/o)	Pu/(Pu+U)(a/o)	C/E
NFJI0H	5A2	10	270.0	275.0	0.051	0.253	
		©	250.0	300.0	0.0592	0.2643	1.045
NFJI0Q	5A1	10	256.5	261.0	0.052	0.293	
		©	250.0	300.0	0.0587	0.3092	1.055
NFJI0R	5C2	10	256.6	261.4	0.184	0.765	
		©	250.0	300.0	0.1967	0.8024	1.049
NFJI11	5D1	10	256.5	261.5	0.174	0.808	
		©	250.0	300.0	0.1818	0.8264	1.023
NFJI0U	5E1	10	269.2	273.0	0.202	0.908	
		©	250.0	300.0	0.2132	0.9123	1.005
NFJO4A	6F1	10	256.0	260.5	0.036	0.369	
		©	250.0	300.0	0.0383	0.3771	1.022
NFJM1S	6F4	10	257.0	261.5	0.097	0.529	
		©	250.0	300.0	0.1111	0.5736	1.084
NFJM18	6E6	10	257.8	262.7	0.101	0.666	
		©	250.0	300.0	0.1104	0.7139	1.072
NFJO4K	6D1	10	270.0	275.0	0.077	0.611	
		©	250.0	300.0	0.0857	0.6982	1.143
NFJO64	7D1	10	257.0	262.0	0.033	0.431	
		©	250.0	300.0	0.0358	0.4620	1.072
NFJO5L	8D1	10	256.5	261.5	0.016	0.279	
		©	250.0	300.0	0.0160	0.2856	1.024

プルトニウム粉末ロット(PU8230)

集合体名	装荷位置	照射期間
PPJX13	0	50(0) ~ 75(6)
PPJX11	1A1	50(0) ~ 75(1)
PPJX12	1D1	50(0) ~ 75(6)
PPJX06	1E1	50(0) ~ 75(0)
PPJX09	2B1	50(0) ~ 75(3)
PPJX08	2E2	50(0) ~ 50(1)

試料位置と数

MOSSコード 軸方向メッシュ№	PPJX13	PPJX11	PPJX12	PPJX06	PPJX09	PPJX08
13	1				2	
14						
15						1
16	1					
17						
18						3
19	1	1	1	2	3	
20						
21						1
22	1					
23						
24	1				2	

600(mm)
500
400
300
200
100
0 (炉心燃料下端)
評価領域

図3.2.1 PU8230ロットのPIE試料位置と照射期間

プルトニウム粉末ロット(PU8231)

集合体名	装荷位置	照射期間
PPJX13	0	50(0) ~ 75(6)
PPJX11	1A1	50(0) ~ 75(1)
PPJX12	1D1	50(0) ~ 75(6)
PPJX06	1E1	50(0) ~ 75(0)
PPJX09	2B1	50(0) ~ 75(3)
PPJD0M	2F1	50(0) ~ 75(4)
※PPJD04	4B2	50(0) ~ 50(2)

※ 径ブランケット集合体と隣接するため評価対象から除外する

試料位置と数

軸方向メッシュNo MOSESコード	PPJX13	PPJX11	PPJX12	PPJX06	PPJX09	PPJD0M	
13	2	1	1	1	1		600(mm)
14							
15							500
16			1	1			
17							400
18							
19	2	1	2	1	2	1	300 評価領域
20							
21							200
22			1	1			
23							100
24	2	1	1	1	1		0 (炉心燃料下端)

図3.2.2 PU8231ロットのPIE試料位置と照射期間

ウラン粉末ロット(EU0004)

集合体名	装荷位置	照射期間
PPJX13	0	50(0) ~ 75(6)
PPJX09	2B1	50(0) ~ 75(3)
PPJX08	2E2	50(0) ~ 50(1)

試料位置と数

軸方向メッシュ№ MOSESコード	PPJX13	PPJX09	PPJX08	
13	1	2		600(mm)
14				
15			1	500
16	1			
17				400
18			3	
19	1	3		300 評価領域
20				
21			1	200
22	1			
23				100
24	1	2		0 (炉心燃料下端)

図3.2.3　ＥＵ0004ロットのＰＩＥ試料位置と照射期間

ウラン粉末ロット(EU0013)

集合体名	装荷位置	照射期間
PPJX13	0	50(0) ~ 75(6)
PPJX11	1A1	50(0) ~ 75(1)
PPJX12	1D1	50(0) ~ 75(6)
PPJX06	1E1	50(0) ~ 75(0)
PPJX09	2B1	50(0) ~ 75(3)
PPJD0M	2F1	50(0) ~ 75(4)

試料位置と数

軸方向メッシュ№ MOSESコード	PPJX13	PPJX11	PPJX12	PPJX06	PPJX09	PPJD0M
13	2	1	1	1	1	
14						
15						
16			1	1		
17						
18						
19	2	2	3	2	2	1
20						
21						
22			1	1		
23						
24	2	1	1	1	1	

600(mm)
500
400
300
200
100
0 (炉心燃料下端)
評価領域

図3.2.4 EU0013ロットのPIE試料位置と照射期間

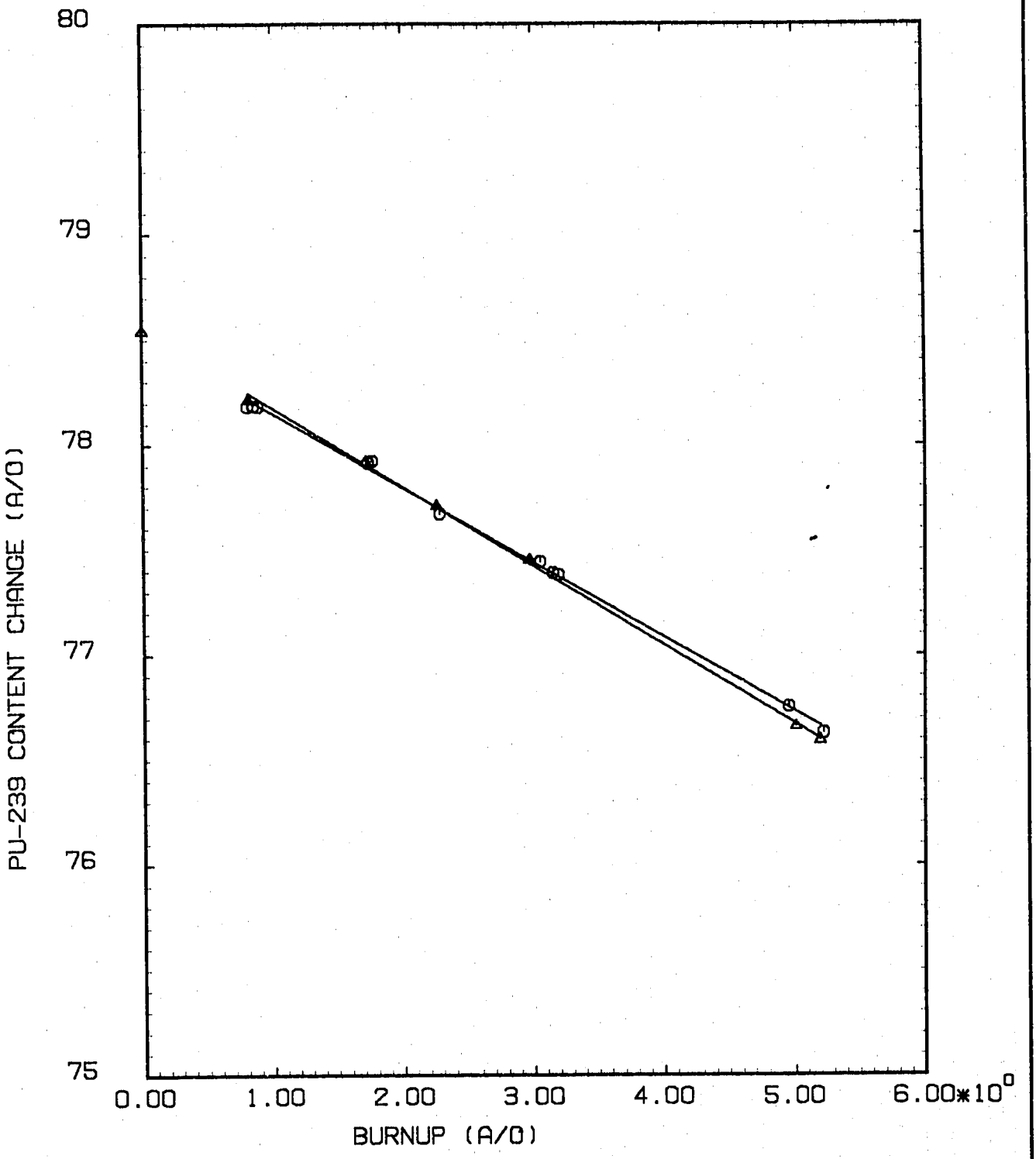

図3.2.5　^{239}Puの同位体組成の変化（PU8230）

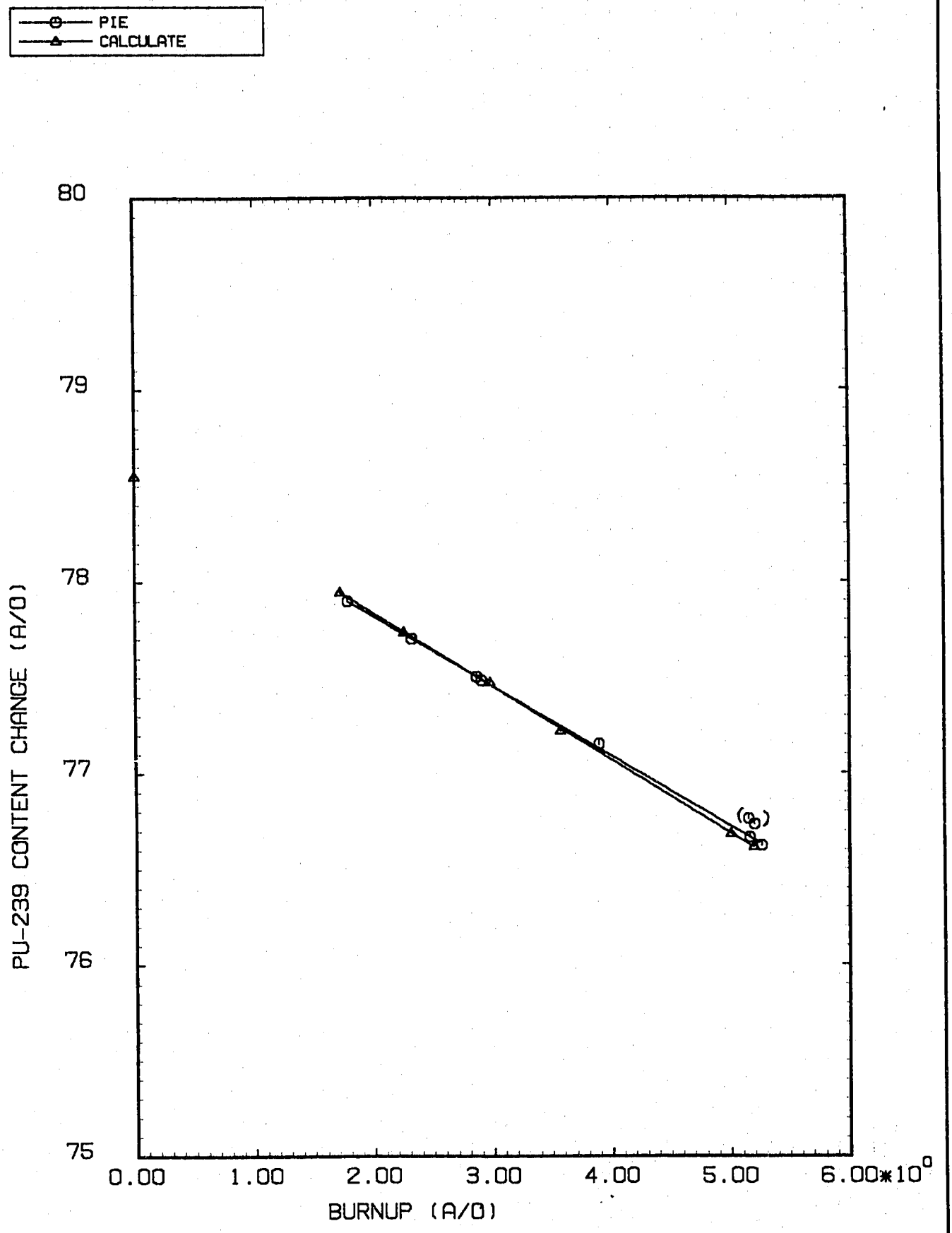

図3.2.6　^{239}Puの同位体組成の変化（PU8231）

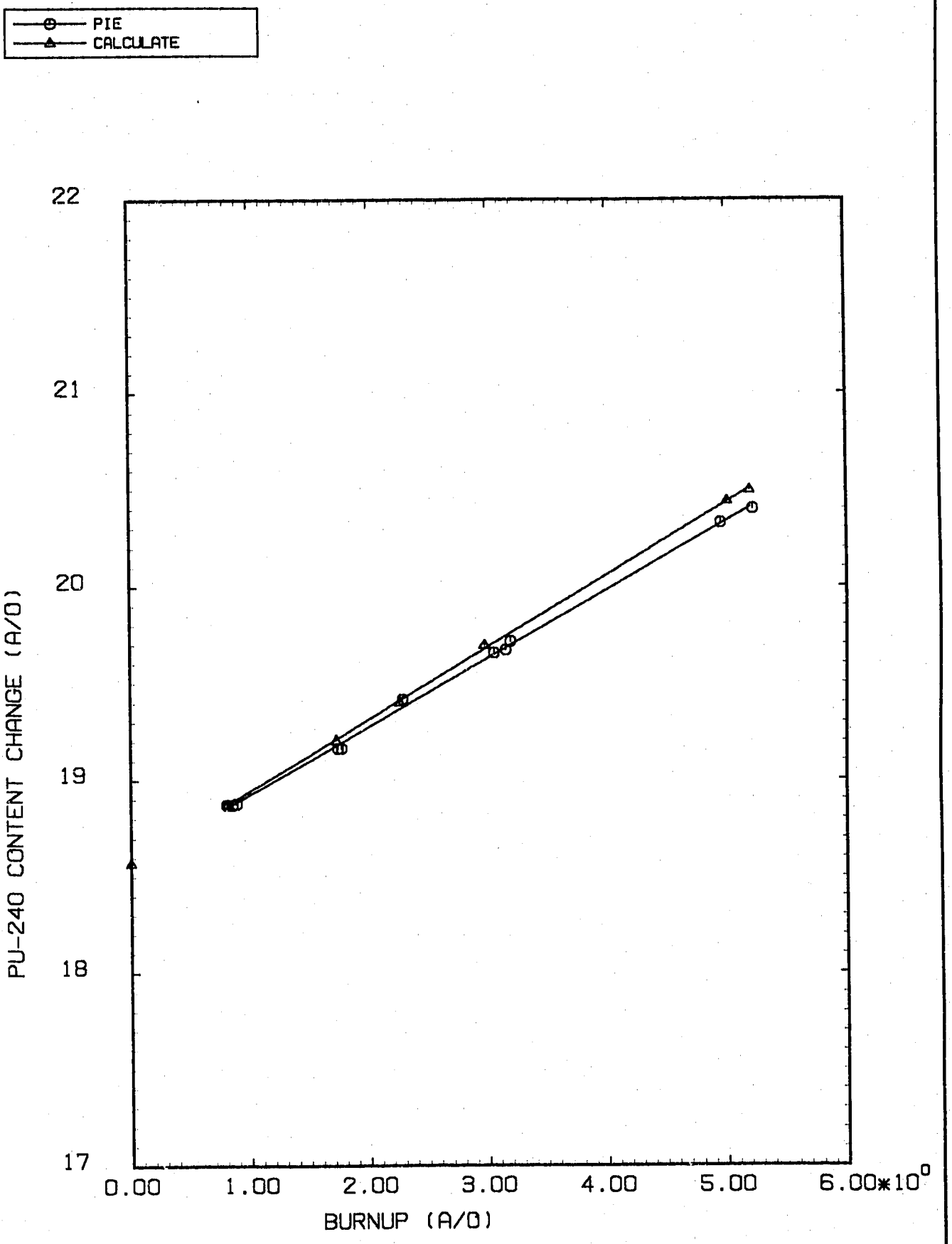

図3.2.7　^{240}Puの同位体組成の変化（PU8230）

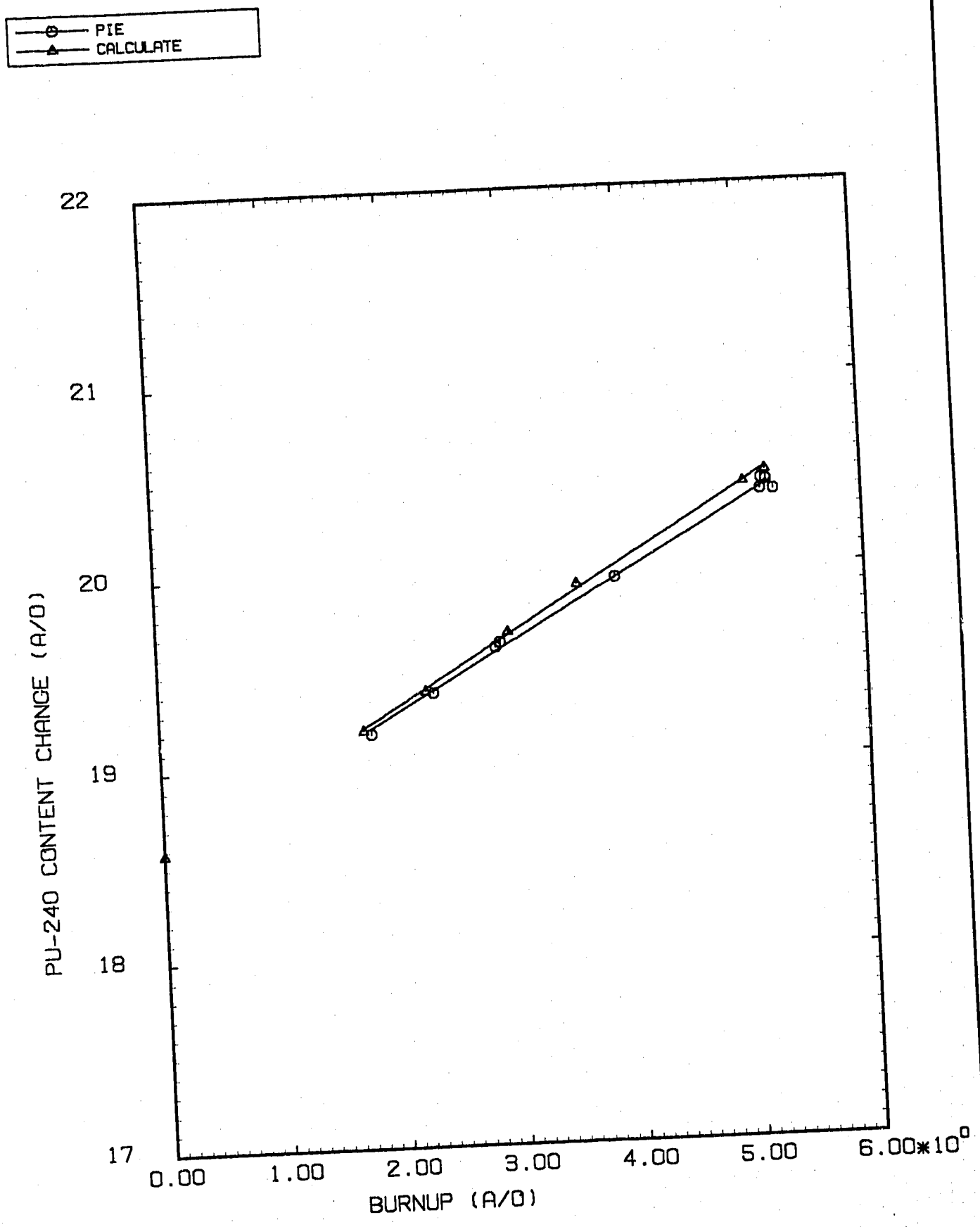

図3.2.8 ^{240}Puの同位体組成の変化（PU8231）

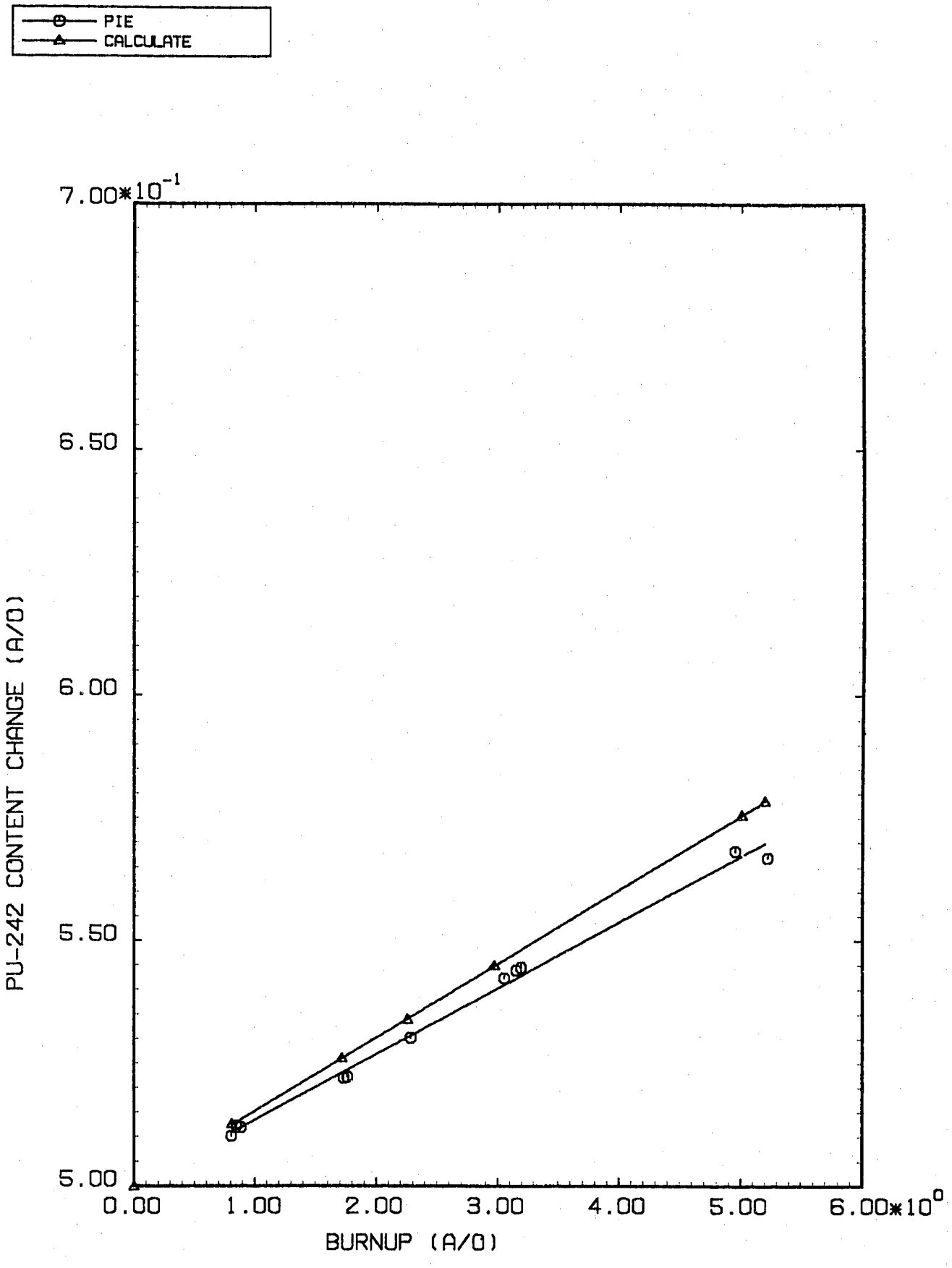

図3.2.9　^{242}Puの同位体組成の変化（PU8230）

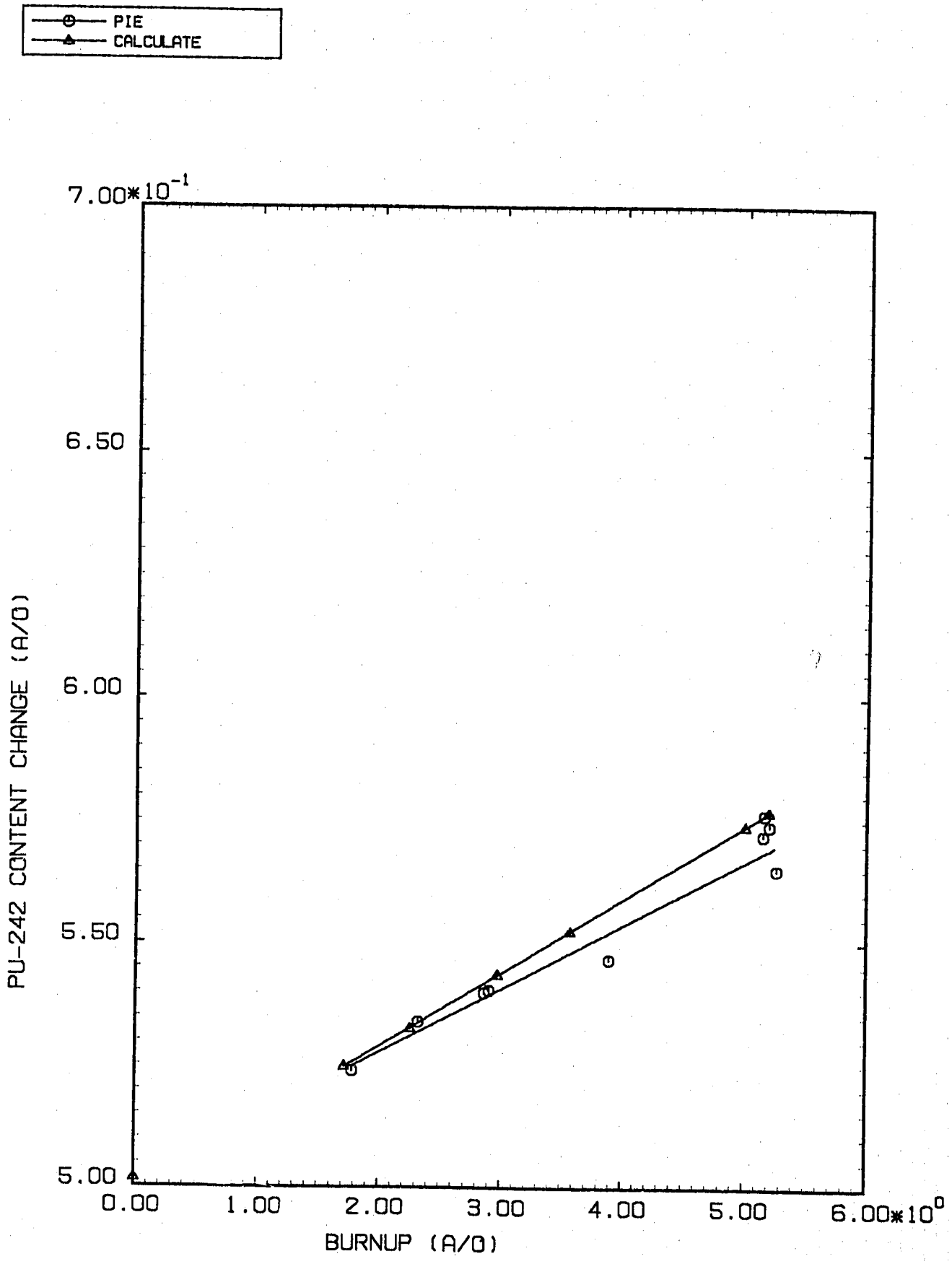

図3.2.10　^{242}Puの同位体組成の変化（PU8231）

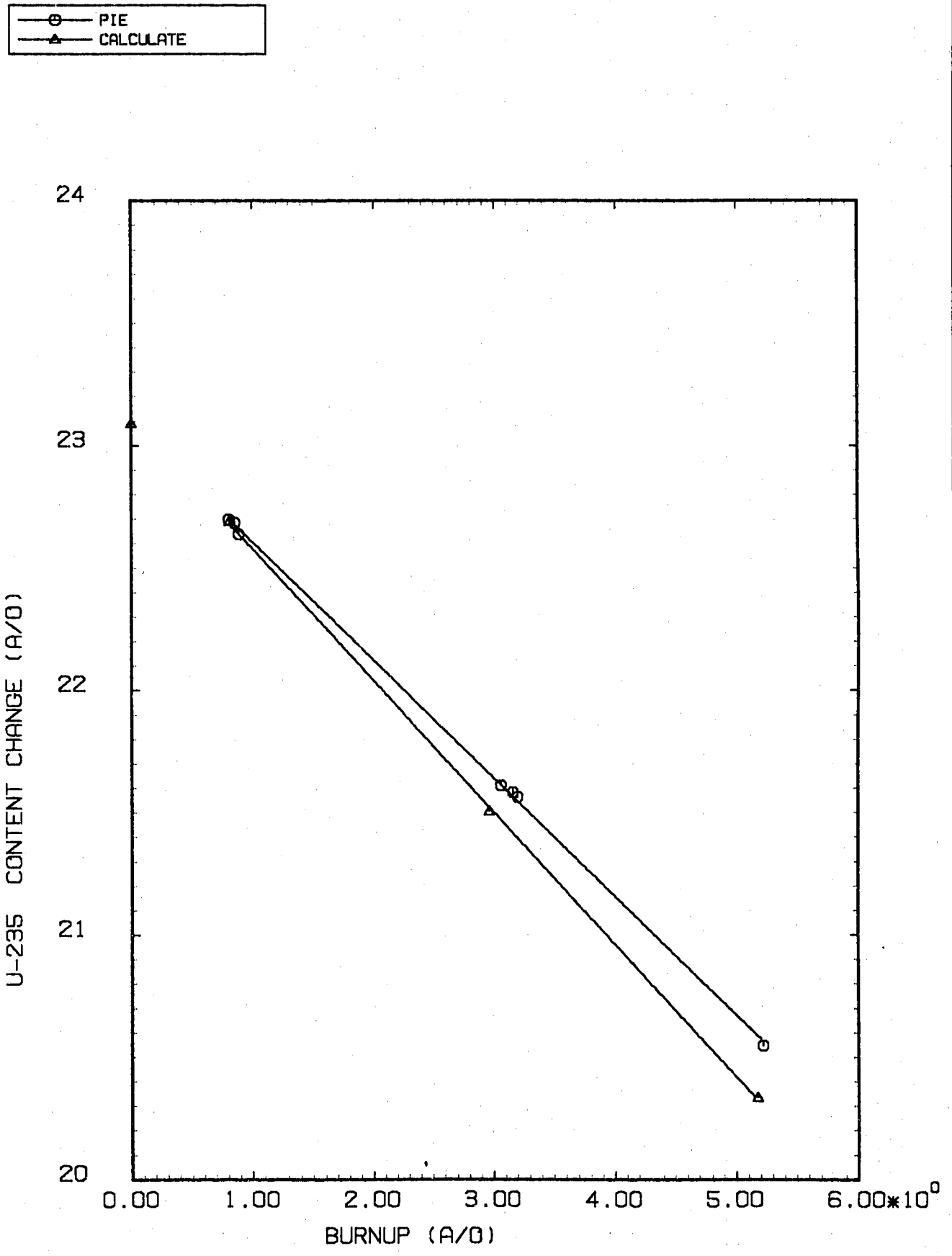

図3.2.11　^{235}Uの同位体組成の変化（ＰＵ0004）

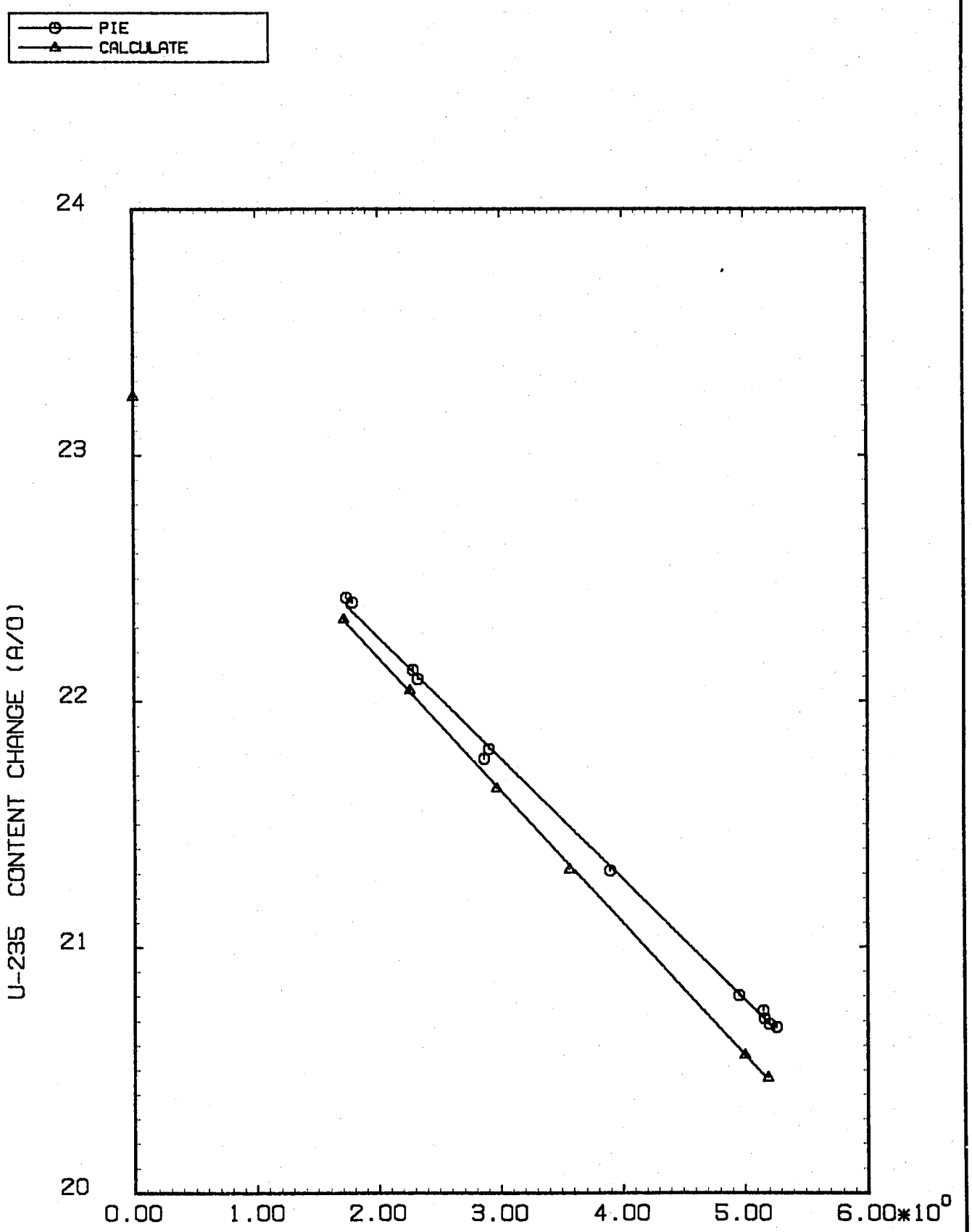

図3.2.12 ^{235}Uの同位体組成の変化（ＰＵ0013）

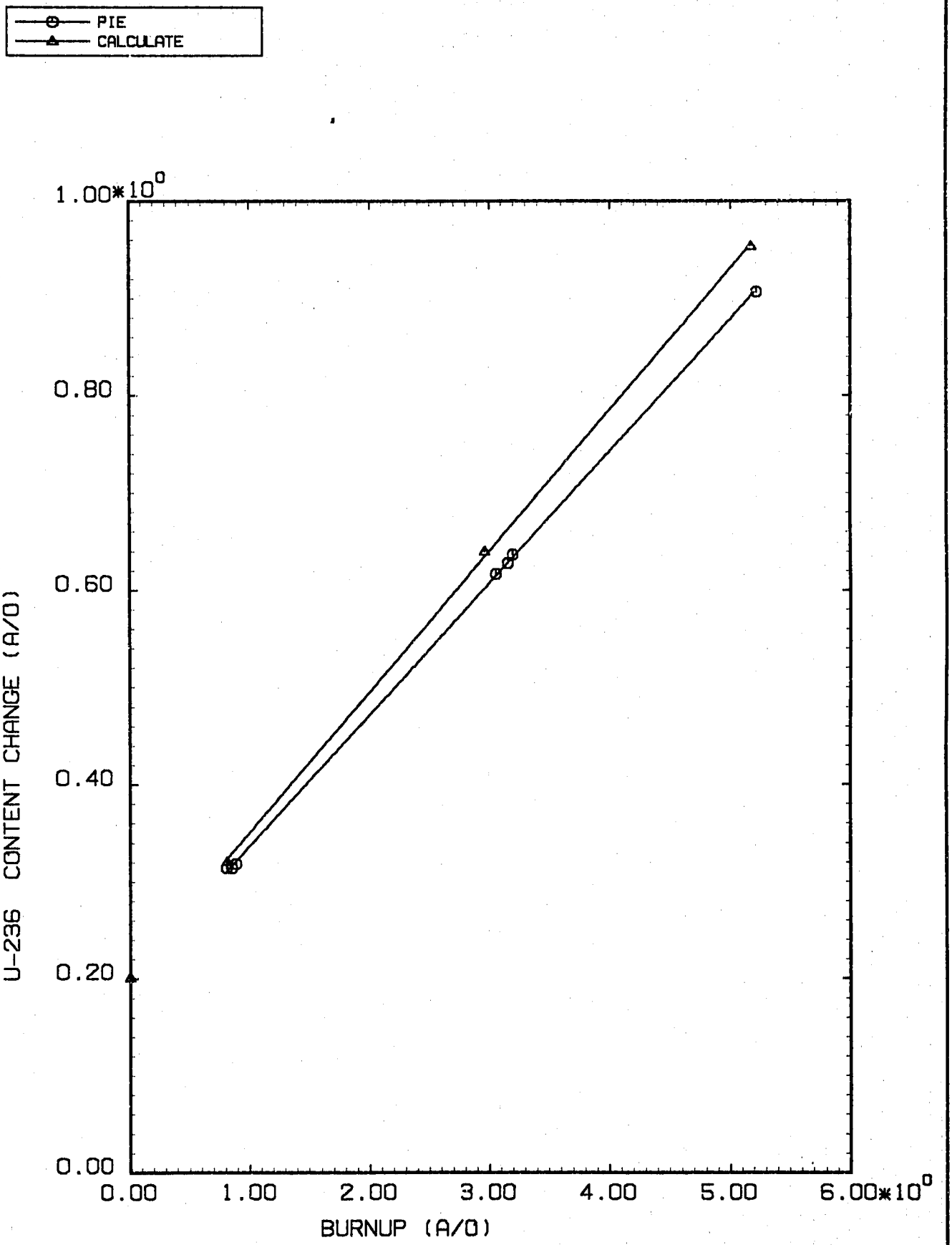

図3.2.13　^{236}Uの同位体組成の変化（ＰＵ0004）

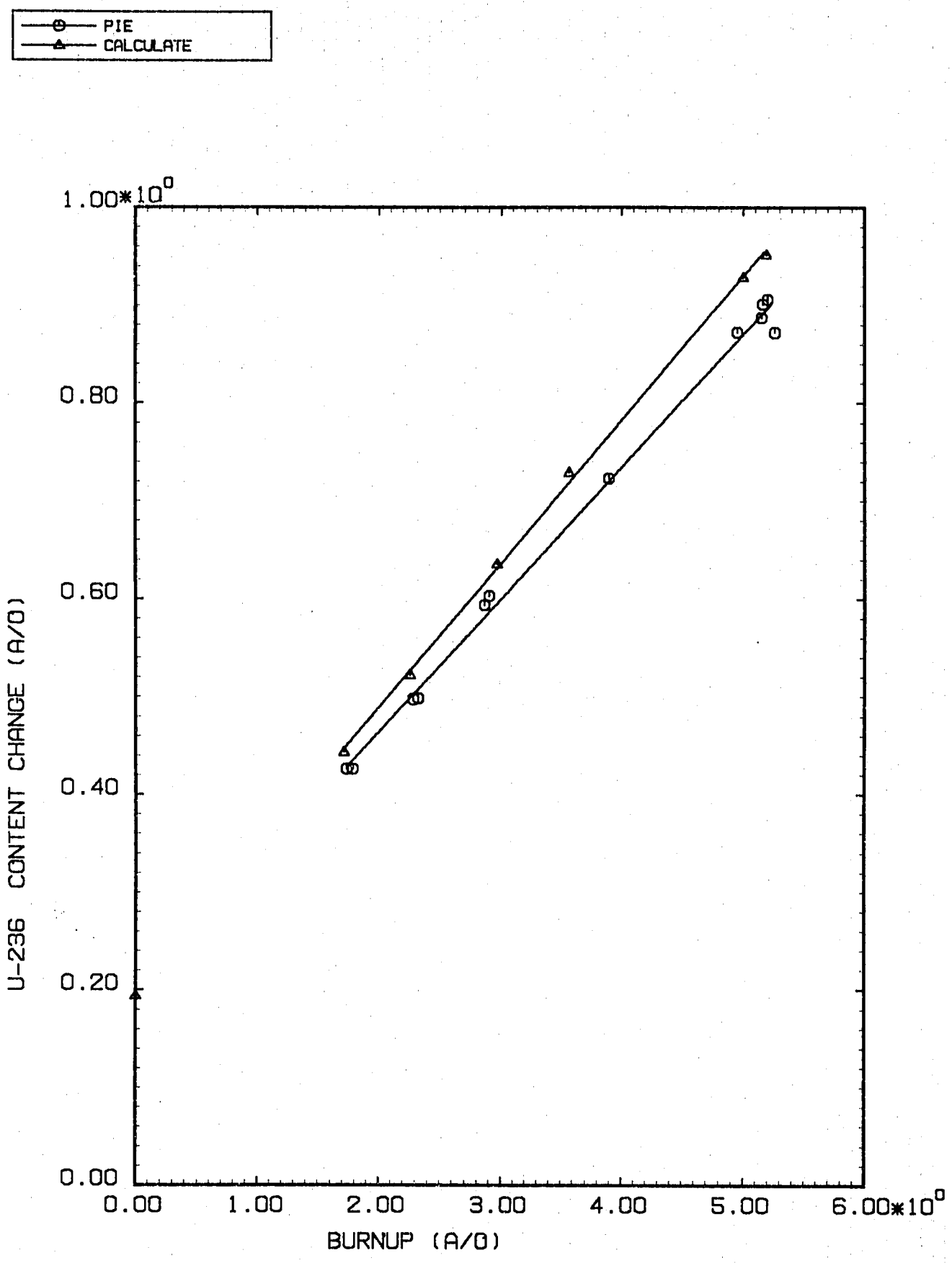

図3.2.14　^{236}Uの同位体組成の変化（ＰＵ0013）

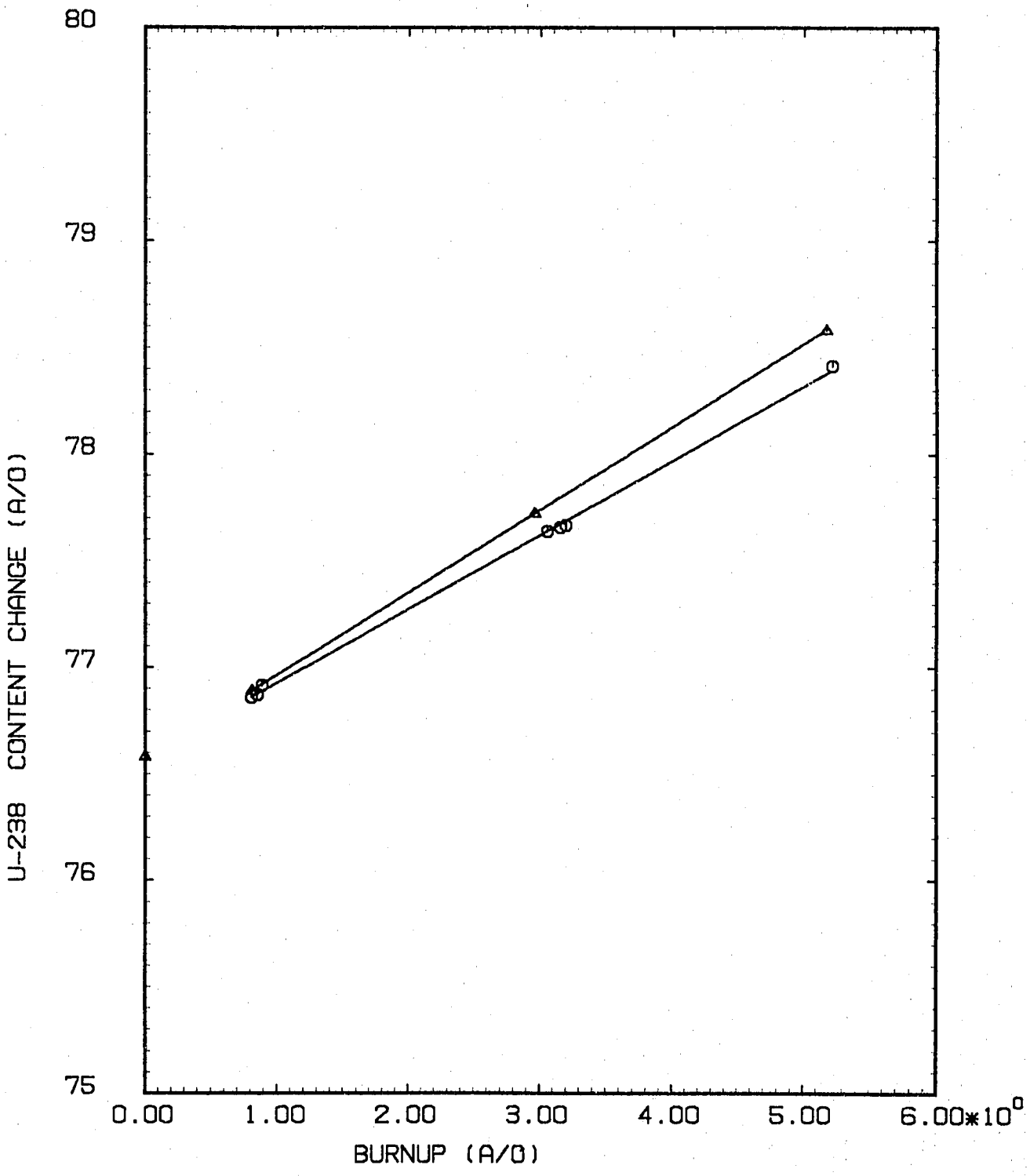

図3.2.15　^{238}Uの同位体組成の変化（ＰＵ0004）

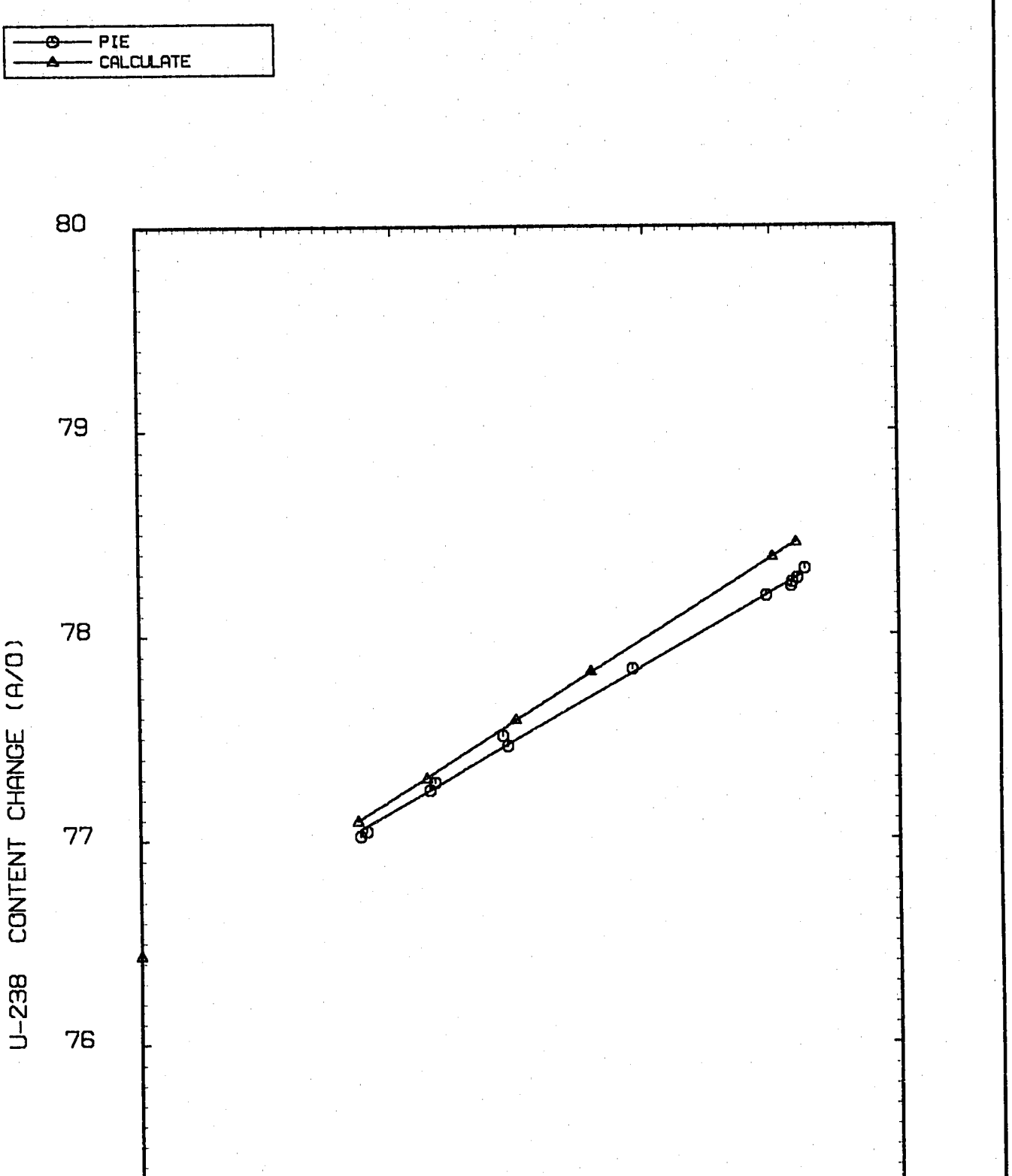

図3.2.16 ^{238}Uの同位体組成の変化（ＰＵ0013）

4 まとめと今後の予定

本報告書における成果

(1)「常陽」MK-I炉心の照射後試験のデータ全てをデータベース化した。その結果、PIEを実施した「常陽」MK-1の集合体は、炉心燃料集合体28体(ペレット燃焼度は最高5万MWd/t)、ブランケット燃料集合体11体であった。また、試料数としては、炉心燃料147個、軸ブランケット燃料28個、径ブランケット燃料43個であった。

(2) 作成したPIEデータファイルをもとに、炉心燃料については同位体組成比およびプルトニウム含有率を燃焼率について整理した。また、ブランケット燃料については、プルトニウム生成量を燃焼率および位置について整理した。

(3) 三次元モデルによる18群修正粗メッシュ拡散計算によって燃焼解析を行い、以下の燃焼特性について実測データと比較した。使用した群定数は、JFS3−JENDL-2である。各特性の計算値と実測値の比は以下の通りであった。

① 燃焼係数 (50MW·day当たりの反応度低下)

C/E＝1.02 +7～−13%

② 炉心部の燃焼率に対する組成変化率

Pu239 / Pu	C/E＝1.05	±2%
Pu240 / Pu	C/E＝1.06	±4%
Pu242 / Pu	C/E＝1.14	±5%
U235 / U	C/E＝1.11	±1%
U236 / U	C/E＝1.08	±2%
U238 / U	C/E＝1.11	±1%

③ 径ブランケット部のPu生成量

第5層	C/E＝1.01～1.06	±7%
第6層	C/E＝1.02～1.14	±7%
第7層	C/E＝1.07	±7%
第8層	C/E＝1.02	±7%

今後の予定

(1) 計算値の補正量の評価

解析は、修正粗メッシュ拡散計算手法で実施しているため、以下の補正が必要であると考えられる。

○ ピン非均質補正
○ 輸送補正
○ 実際のPIEデータ試料位置での温度で実効断面積を補正する。
○ 計算点から実際のPIEデータ試料位置への補正 (ブランケット部のPu生成量)

(2) 炉心部のPIEデータ評価

以下の項目について、今後評価する必要がある。

○ブランケット近傍領域での同様な評価

○燃焼率に対する数密度の変化率についての評価 (付録2.2参照)

○軸方向(PPJX13の中心ピン)、径方向(D1方向)の燃焼率分布(相対値)のC/E評価

○ 上記結果と性能試験時の反応率分布(相対値)のC/Eとの整合性評価

(3) ブランケット部のPIEデータ評価

以下の項目について、今後評価する必要がある。

○軸ブランケット部での同様な評価

○C/E値の燃焼率依存性の解明

(4) その他

○C/E値よりPIEデータから計算により求めた増殖比を補正する。

謝　　辞

本報告書の作成にあたっては、以下の方々に多大な御協力頂きました。ここに、厚く感謝の意を表します。

PIEデータ情報	AGS　吉川氏、滑川氏
集合体内のピン番号およびロット番号の情報	ADS　有松氏、野崎氏
3次元拡散燃焼解析に必要な情報	技術課　有井氏
解析手法へのアドバイス	技術開発部　池上氏、
	プラント工学室　三田氏

参 考 文 献

1) SN941 82-244 「常陽Mk-I炉心増殖比の実験的評価」
2) SJ901 83-11 「常陽Mk-I炉心の燃焼特性の評価」
3) SJ202 83-06 「大型炉の燃焼特性に関する検討(II)」
4) SJ901 84-13 「常陽Mk-I炉心の燃焼特性の評価(その2)」
5) SN841 76-18 「常陽燃料」炉心ペレットの製造 取替、計装燃料」
6) 私信、AGS吉川
7) 私信、ADS野崎
8) コロナ社刊、「応用数学講座 第五巻 次元解析·最小二乗法と実験式」
9) JAERI 1294 「SLAROM」
10) JAERI-M 83-066 「高速炉の核特性解析コードシステム」
11) ORNL-TM-2496,Rev.2 「CITATION」
12) N9520 89-018 「3次元拡散計算コードMOSESの開発(II)」
13) JAERI-memo 63-120 「高速炉用群定数セットJFS3-JENDL2の作成」
14) 私信、技術課有井
15) N941 79-236 「高速実験炉「常陽」性能試験解析報告書 炉心核特性の解析(その1)」
16) SN941 80-33 「高速実験炉「常陽」性能試験解析報告書 NT−35 燃焼係数」

付録1. PIEデータファイル

燃料組成を評価するために、PIEデータを一定の形式にまとめたデータファイルを作成し、PA30E.JOYO.DATABASE に収納している。
内容をTable Aに示す。ファイルの形式は、以下の通りである(文献(1)参照)。

1. ファイル中のデータ配列

各PIEデータは6レコードで構成され、次に示すFORMAT形式で書かれている。

```
      READ(5,10) FABNO,NOPIE,ZPOS1,ZPOS2,BSM,HDATE,DDATE,ALOT
10    FORMAT(4X,A6,2X,A4,4X,2F8.0,F7.0,F8.0,1X,F8.0,A7)
      READ(5,11) PURATS,PUE,RND8TU,BU,I,J,K,PULOT,EULOT,BP,OMIT
11    FORMAT(3X,4F8.0,2(1X,I1),2X,I2,2(1X,A8),A2,2X,A2)
      READ(5,12) AS234,AS235,AS236,AS238,AS239,AS240,AS241,AS242
      READ(5,12) AE234,AE235,AE236,AE238,AE239,AE240,AE241,AE242
      READ(5,12) AD143,AD144,AD145,AD146,AD148,AD150,CYCLS,CYCLE
12    FORMAT(3X,8F8.0)
      READ(5,13) AAA
13    FORMAT(A3)
```

ファイルの後端は、AAA='END'となることで知らされる。

ここに示した各記号の意味を次に示す。

FABNO データの属する集合体の製造番号(FAB No.)。

NOPIE FMFにて付けているPIEの番号(PIE No.)。
6桁の数字で、上2桁が集合体番号、下2桁がピンの集合体内ロケーション番号を表す。

ZPOS1,ZPOS2 採取した試料のピン内軸方向位置(mm)。炉心燃料ピンは炉心部下端を基準、ブランケット燃料ピンはブランケット燃料部下端を基準とし、上方向を正として示している。ZPOS1は試料下端、ZPOS2は試料上端の座標である。

BSM 未使用。

HDATE 試料中のプルトニウムを化学分離した日付。6桁の数字で、上2桁は西暦の下2桁、中2桁は月、下2桁は日を表す。

DDATE 試料中のネオジムを化学分離した日付。書式はHDATEに同じ。

ALOT ウラン/プルトニウム混合粉末ロット名。東海プル燃にて付けたもの。

PURATS 未使用。

PUE 試料中のPu/(U+Pu)の原子数比(a/o)。

RND8TU 未使用。

BU	ネオジムと重元素の原子数比から算出された燃焼率(a/o)。
I	該当集合体の「常陽」炉心内装荷列(5E3の5を言う)。
J	該当集合体の「常陽」炉心内周方向装荷位置番号 (1≦J≦I ; 5E3の3を言う)
K	未使用。
PULOT	プルトニウム粉末ロット名。東海プル燃にてつけられたもの。
EULOT	濃縮ウラン粉末ロット名。東海プル燃にてつけられたもの。
BP	径方向ブランケット燃料集合体の識別記号。'BP'(Blanket Pin)とする。
OMIT	未使用。
AS234,…	未使用。
AE234,…	PIEにて得られた重元素同位体の含有率データ(a/o)。AE234からAE238までが各ウラン同位体の含有率を、AE239からAE242までが各プルトニウム同位体の含有率を表す。各記号に含まれる数値は質量数である。プルトニウム同位体含有率の合計は100にならないが、残余は^{238}Puの含有率を表す。
AD143,…	PIEにて得られたネオジム同位体の含有率(a/o)。各記号に含まれる数値が質量数を表す。
CYCLS,CYCLE	該当集合体の「常陽」MK-I炉心への装荷日および炉心からの取出日。 書式は上記HDATEに同じ。

Table A Fuel Composition Data Set

```
                                                                  DATE 90-03-08
                                                                  TIME 17:24:49
                 DATA SET : PA30E.JOYO.DATABASE                   PAGE    1

----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
*************************************************************************
***                                                                   ***
***     「常陽」MK－I  データ                DATE : 89-08-31          ***
***                                          M.KATSUMATA              ***
*************************************************************************
*** PPJD1A  0206021  292.5   297.3           791030   791018 FR0139
RAT          17.420            0.217  5A3    PU8245   EU0U30
FAB
PIE  0.1281 23.0733  0.2289 76.5696 77.5675 19.4212  2.3657  0.5455
NEO 30.3357 17.7556 20.5750 16.3470 10.0304  4.9562  770422  781009
/// ---------------------------------------------------------------------
*** PPJD1A  0236025  -12.4    -7.6           791030   791018 05-L1
RAT           0.134            0.021  5A3
FAB
PIE  0.0022  0.2820  0.0046 99.7111 87.7531 10.6414  1.2807  0.2946
NEO 25.8119 17.7680 20.3093 18.3301 11.1406  6.6400  770422  781009
/// ---------------------------------------------------------------------
*** PPJD1A  0236026    7.5    12.3           791030   791018 FR0139
RAT          17.354            0.163  5A3    PU8245   EU0U30
FAB
PIE  0.1286 23.1031  0.2210 76.5472 77.5574 19.4042  2.3644  0.5441
NEO 30.3455 17.7892 20.5887 16.3311 10.0090  4.9366  770422  781009
/// ---------------------------------------------------------------------
*** PPJD1A  0236041  277.5   282.4           791030   791018 FR0139
RAT          17.429            0.252  5A3    PU8245   EU0U30
FAB
PIE  0.1275 23.0655  0.2303 76.5768 77.5448 19.4200  2.3668  0.5456
NEO 30.2288 17.7224 20.5784 16.3612 10.0732  5.0360  770422  781009
/// ---------------------------------------------------------------------
*** PPJD1A  0236061  567.5   574.3           791030   791018 FR0139
RAT          17.523            0.150  5A3    PU8245   EU0U30
FAB
PIE  0.1286 23.1027  0.2164 76.5523 77.5761 19.3800  2.3610  0.5438
NEO 30.2023 17.7692 20.5655 16.3886 10.0612  5.0133  770422  781009
/// ---------------------------------------------------------------------
*** PPJD1A  0236064  607.7   617.5           791030   791018 05-U1
RAT           0.056            0.018  5A3
FAB
PIE  0.0013  0.2096  0.0031 99.7861 97.9145  1.8220  0.2103  0.0480
NEO 25.7081 17.1477 20.6472 18.4075 11.3198  6.7698  770422  781009
/// ---------------------------------------------------------------------
*** PPJD1A  0286021  292.5   297.3           791030   791018 FR0155
RAT          17.383            0.298  5A3    PU8251/44EU0016
FAB
PIE  0.1280 23.1242  0.2138 76.5341 77.3675 19.5345  2.3936  0.5557
NEO 30.1450 17.6041 20.5909 16.4087 10.1452  5.1061  770422  781009
/// ---------------------------------------------------------------------
*** PPJX15  0506023  300.2   304.9           800207   800212 FR0136
RAT          17.332            0.502  1C1    PU8244   EU0U30
FAB
PIE  0.1293 22.9333  0.2598 76.6776 77.5520 19.4836  2.3293  0.5480
NEO 29.4447 18.6585 20.2520 16.2579 10.1581  5.2288  770321  781017
/// ---------------------------------------------------------------------
*** PPJX15  0546063  150.2   154.9           800207   800212 FR0138
RAT          17.293            0.466  1C1    PU8245   EU0U30
FAB
PIE  0.1276 22.9541  0.2537 76.6646 77.5435 19.4790  2.3286  0.5466
NEO 29.1012 18.7330 20.2891 16.3369 10.2351  5.3048  770321  781017
/// ---------------------------------------------------------------------
*** PPJX15  0546084  300.2   304.9           800207   800212 FR0138
RAT          17.408            0.521  1C1    PU8245   EU0U30
FAB
PIE  0.1299 22.9203  0.2599 76.6899 77.5310 19.4954  2.3303  0.5481
NEO 29.2754 18.5306 20.1294 16.2220 10.3496  5.4931  770321  781017
/// ---------------------------------------------------------------------
*** PPJX15  0546103  450.2   454.9           800207   800212 FR0138
RAT          17.366            0.435  1C1    PU8245   EU0U30
FAB
PIE  0.1298 22.9204  0.2516 76.6983 77.5279 19.4776  2.3498  0.5490
NEO 29.4140 18.6486 20.2050 16.3410 10.1605  5.2309  770321  781017
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

     *** CONTINUE ***
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NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 71  /// ------------------------------------------------------------------------  71
 72  *** PPJX15  0584053  300.2  304.9           800207   800212 FR0158              72
 73  RAT         17.531            0.531  1C1    PU8251   EU0016                     73
 74  FAB                                                                           74
 75  PIE  0.1285 23.0092  0.2444 76.6179 77.2240 19.7000  2.3993  0.5669            75
 76  NEO 29.4191 18.6606 20.2306 16.2723 10.1588  5.2585  770321  781017            76
 77  /// ------------------------------------------------------------------------  77
 78  *** PPJX08  0801023  300.2  304.9           800318   800327 FM0104              78
 79  RAT         17.290            0.806  2E2    PU8230   EU0004                     79
 80  FAB                                                                           80
 81  PIE  0.1277 22.6988  0.3142 76.8592 78.2901 18.8991  2.2068  0.5109            81
 82  NEO 29.2440 19.3422 20.1214 16.1609 10.0163  5.1160  770322  781223            82
 83  /// ------------------------------------------------------------------------  83
 84  *** PPJX08  0835063  150.2  154.9           800318   800327 FM0104              84
 85  RAT         17.362            0.775  2E2    PU8230   EU0004                     85
 86  FAB                                                                           86
 87  PIE  0.1256 22.7144  0.3021 76.8579 78.3271 18.8744  2.2008  0.5106            87
 88  NEO 29.2085 19.3291 20.0845 16.1976 10.0358  5.1445  770322  781223            88
 89  /// ------------------------------------------------------------------------  89
 90  *** PPJX08  0835084  300.2  304.9           800318   800327 FM0104              90
 91  RAT         17.296            0.853  2E2    PU8230   EU0004                     91
 92  FAB                                                                           92
 93  PIE  0.1271 22.6847  0.3141 76.8741 78.2923 18.8978  2.2016  0.5130            93
 94  NEO 29.1981 19.2732 20.1113 16.1979 10.0494  5.1700  770322  781223            94
 95  /// ------------------------------------------------------------------------  95
 96  *** PPJX08  0835103  450.2  454.9           800318   800327 FM0104              96
 97  RAT         17.342            0.730  2E2    PU8230   EU0004                     97
 98  FAB                                                                           98
 99  PIE  0.1247 22.7281  0.2947 76.8524 78.3403 18.8564  2.2011  0.5106            99
100  NEO 29.2060 19.3090 20.0888 16.1905 10.0558  5.1499  770322  781223           100
101  /// ------------------------------------------------------------------------ 101
102  *** PPJX08  088023   305.2  312.5           800318   800327 FM0104             102
103  RAT         17.307            0.885  2E2    PU8230   EU0004                    103
104  FAB                                                                          104
105  PIE  0.1249 22.6396  0.3186 76.9169 78.2895 18.9057  2.2052  0.5126           105
106  NEO 29.2644 19.3455 20.0501 16.1943 10.0184  5.1273  770322  781223           106
107  /// ------------------------------------------------------------------------ 107
108  *** PPJW1H  474623   269.4  273.8           821015   821022 FR0152             108
109  RAT         17.834            0.603  1F1    PU8243/4 EU0015                   109
110  FAB                                                                          110
111  PIE  0.1316 22.9951  0.2606 76.6127 77.6691 19.6274  2.0689  0.5541           111
112  NEO 30.4285 15.6464 21.0290 16.9646 10.4893  5.3802          820101           112
113  /// ------------------------------------------------------------------------ 113
114  *** PPJDOM  390122   270.0  275.0           821015   821022 FM0107             114
115  RAT         17.401            3.890  2F1    PU8231   EU0013                    115
116  FAB                                                                          116
117  PIE  0.1323 21.3107  0.7232 77.8339 77.2660 19.9836  2.0751  0.5474           117
118  NEO 27.5287 22.7442 19.2974 15.7795  9.6589  4.9429          810510           118
119  /// ------------------------------------------------------------------------ 119
120  *** PPJDOM  3946A3   269.6  274.7           821015   821022 FR0145             120
121  RAT         17.526            3.710  2F1    PU8245   EU0U30                    121
122  FAB                                                                          122
123  PIE  0.1307 21.3472  0.6996 77.8225 76.4638 20.6224  2.1797  0.5844           123
124  NEO 27.7661 23.1378 19.0646 15.5646  9.5396  4.8821          810510           124
125  /// ------------------------------------------------------------------------ 125
126  *** PPJDOM  399123   270.1  275.1           821015   821022 FM0122             126
127  RAT         17.616            3.430  2F1    PU8232   EU0010                    127
128  FAB                                                                          128
129  PIE  0.0652 21.5010  0.6879 77.7459 77.3696 19.8868  2.0694  0.5417           129
130  NEO 27.9377 23.0502 19.0891 15.5383  9.5021  4.8233          810510           130
131  /// ------------------------------------------------------------------------ 131
132  *** PPJD2U  4246A3   269.7  274.6           821015   821022 FR0210             132
133  RAT         17.603            4.230  2A1    PUJ001   EU0006                    133
134  FAB                                                                          134
135  PIE  0.1139 21.1541  0.7618 77.9702 75.7015 21.1313  2.3922  0.6354           135
136  NEO 28.1781 22.2568 19.2826 15.7113  9.6184  4.9091          810810           136
137  /// ------------------------------------------------------------------------ 137
138  *** PPJD0B  480173   269.9  274.7           821113   821117 FM0119             138
139  RAT         17.267            3.730  1B1    PU8232   EU0012/3                  139
140  FAB                                                                          140
     ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
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NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
141  PIE  0.1322 21.4204  0.7093 77.7381 77.3215 19.9513  2.0788  0.5477                141
142  NEO 28.4800 21.2046 19.5443 15.9170  9.7892  5.0057           820101                142
143  /// ------------------------------------------------------------------------------ 143
144  *** PPJDOB  484642    20.1   24.9           821113   821117 FM0121                 144
145  RAT          17.315           2.560  1B1    PU8232   EU0014                        145
146  FAB                                                                               146
147  PIE  0.1306 21.8756  0.5963 77.3975 77.6460 19.6799  2.0429  0.5386                147
148  NEO 28.7308 20.1952 19.6606 15.9275  9.7688  4.9415           820101                148
149  /// ------------------------------------------------------------------------------ 149
150  *** PPJDOB  4846A3    270.9  275.7           821113   821117 FM0121                 150
151  RAT          17.209           3.880  1B1    PU8232   EU0014                        151
152  FAB                                                                               152
153  PIE  0.1309 21.3272  0.7202 77.8217 77.2798 19.9964  2.0849  0.5461                153
154  NEO 28.5472 21.0743 19.5723 15.9396  9.7898  5.0098           820101                154
155  /// ------------------------------------------------------------------------------ 155
156  *** PPJDOB  4846F2    575.3  580.2           821113   821117 FM0121                 156
157  RAT          17.311           2.230  1B1    PU8232   EU0014                        157
158  FAB                                                                               158
159  PIE  0.1300 22.0534  0.5403 77.2763 77.8246 19.5298  2.0230  0.5336                159
160  NEO 28.7763 20.8500 19.7132 15.9334  9.7393  4.9275           820101                160
161  /// ------------------------------------------------------------------------------ 161
162  *** PPJDOB  489123    269.4  274.3           821113   821117 FM0119                 162
163  RAT          17.274           3.870  1B1    PU8232   EU0012/3                      163
164  FAB                                                                               164
165  PIE  0.1327 21.2887  0.7341 77.8445 77.2810 19.9975  2.0800  0.5560                165
166  NEO 28.7789 20.8578 19.5771 15.9460  9.7980  4.9873           820101                166
167  /// ------------------------------------------------------------------------------ 167
168  *** PPJX13  530622    20.8   25.8           831020   830815 FM0106                 168
169  RAT          17.388           3.450  000    PU8231   EU0013                        169
170  FAB                                                                               170
171  PIE  0.1312 21.3961  0.7358 77.7369 77.1825 20.0563  2.0717  0.5501                171
172  NEO 27.6054 23.2267 19.3770 15.4847  9.4673  4.7612           820101                172
173  /// ------------------------------------------------------------------------------ 173
174  *** PPJX13  530643    273.1  278.7           831020   830815 FM0106                 174
175  RAT          17.334           5.260  000    PU8231   EU0013                        175
176  FAB                                                                               176
177  PIE  0.1336 20.6733  0.8722 78.3209 76.7642 20.4204  2.0822  0.5662                177
178  NEO 26.9813 23.1724 19.3119 15.8228  9.6768  4.9585           820101                178
179  /// ------------------------------------------------------------------------------ 179
180  *** PPJX13  530662    575.7  580.8           831020   830815 FM0106                 180
181  RAT          17.372           3.220  000    PU8231   EU0013                        181
182  FAB                                                                               182
183  PIE  0.1331 21.6009  0.6750 77.5910 77.3868 19.8677  2.0617  0.5442                183
184  NEO 26.8629 25.4144 18.4564 15.2183  9.2466  4.7151           820101                184
185  /// ------------------------------------------------------------------------------ 185
186  *** PPJX13  534642    -98.7  -93.8           831020   830815 00-L1                  186
187  RAT           0.926           0.130  000                                           187
188  FAB                                                                               188
189  PIE  0.0011  0.1879  0.0078 99.8032 98.7096  1.2749  0.0122  0.0015                189
190  NEO 24.3161 22.8520 18.9992 17.0469 10.5331  6.1878           820101                190
191  /// ------------------------------------------------------------------------------ 191
192  *** PPJX13  534652    -22.9  -18.2           831020   830815 00-L1                  192
193  RAT           1.116           0.288  000                                           193
194  FAB                                                                               194
195  PIE  0.0018  0.1840  0.0082 99.8060 98.7474  1.2337  0.0110  0.0007                195
196  NEO 23.6869 23.5875 18.8666 17.0829 10.4688  6.2470           820101                196
197  /// ------------------------------------------------------------------------------ 197
198  *** PPJX13  534656     17.6   23.5           831020   830815 FM0103                 198
199  RAT          17.383           3.390  000    PU8230   EU0004                        199
200  FAB                                                                               200
201  PIE  0.1279 21.2699  0.7352 77.8671 77.2493 20.0331  2.0396  0.5537                201
202  NEO 28.1282 23.0124 19.1285 15.5324  9.4474  4.6609           820101                202
203  /// ------------------------------------------------------------------------------ 203
204  *** PPJX13  534682    140.3  146.1           831020   830815 FM0103                 204
205  RAT          17.429           4.650  000    PU8230   EU0004                        205
206  FAB                                                                               206
207  PIE  0.1291 20.7951  0.8415 78.2343 77.0100 20.2817  2.0539  0.5606                207
208  NEO 25.7253 29.0883 17.5674 14.3286  8.7500  4.4655           820101                208
209  /// ------------------------------------------------------------------------------ 209
210  *** PPJX13  5346B4    272.6  278.0           831020   830815 FM0103                 210
     ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
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NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
211  RAT         17.433           5.220  000     PU8230   EU0004                      211
212  FAB                                                                             212
213  PIE  0.1288 20.5471  0.9067 78.4173 76.7737 20.4355  2.0842  0.5680             213
214  NEO 27.9606 22.8418 19.0969 15.6063  9.5241  4.8697          820101             214
215  /// ------------------------------------------------------------------          215
216  *** PPJX13  5346E3   420.7  425.6           831020   830815 FM0103              216
217  RAT         17.404           4.700  000     PU8230   EU0004                      217
218  FAB                                                                             218
219  PIE  0.1283 20.7864  0.8381 78.2471 76.9932 20.2554  2.0613  0.5594             219
220  NEO 28.0447 22.6665 19.1765 15.6475  9.5552  4.8830          820101             220
221  /// ------------------------------------------------------------------          221
222  *** PPJX13  534662   575.3  580.5           831020   830815 FM0103              222
223  RAT         17.604           3.120  000     PU8230   EU0004                      223
224  FAB                                                                             224
225  PIE  0.1284 21.4879  0.6775 77.7061 77.3835 19.9135  2.0319  0.5469             225
226  NEO 28.1957 22.7153 19.2205 15.5553  9.4817  4.7859          820101             226
227  /// ------------------------------------------------------------------          227
228  *** PPJX13  538622    20.3   25.5           831020   830815 FM0107              228
229  RAT         17.568           3.480  000     PU8231   EU0013                      229
230  FAB                                                                             230
231  PIE  0.1319 21.4288  0.7367 77.7026 77.3075 19.9873  2.0357  0.5520             231
232  NEO 27.5989 24.4076 18.7656 15.2099  9.2595  4.6565          820101             232
233  /// ------------------------------------------------------------------          233
234  *** PPJX13  538643   270.8  275.6           831020   830815 FM0107              234
235  RAT         17.279           5.160  000     PU8231   EU0013                      235
236  FAB                                                                             236
237  PIE  0.1329 20.7102  0.9010 78.2558 76.8032 20.4774  2.0036  0.5773             237
238  NEO 27.5954 23.6698 18.9179 15.4652  9.4596  4.8246          820101             238
239  /// ------------------------------------------------------------------          239
240  *** PPJX13  538662   575.6  580.7           831020   830815 FM0107              240
241  RAT         17.362           3.100  000     PU8231   EU0013                      241
242  FAB                                                                             242
243  PIE  0.1304 21.5988  0.6759 77.5949 77.3245 19.8597  2.1401  0.5472             243
244  NEO 27.4702 24.7256 18.7155 15.1434  9.2088  4.6398          820101             244
245  /// ------------------------------------------------------------------          245
246  *** PPJD18  684122    19.7   24.4           850725   850722 FR0154              246
247  RAT         17.392           2.720  4D3     PU8244   EU0015/6                    247
248  FAB                                                                             248
249  PIE  0.1297 21.7561  0.6433 77.4709 76.6601 20.6808  1.9267  0.5920             249
250  NEO 27.6773 24.7009 18.7426 15.1258  9.1599  4.5554          820101             250
251  /// ------------------------------------------------------------------          251
252  *** PPJD18  684143   270.0  274.8           850725   850722 FR0154              252
253  RAT         17.220           3.980  4D3     PU8244   EU0015/6                    253
254  FAB                                                                             254
255  PIE  0.1311 21.2011  0.7608 77.9069 76.3806 20.9139  1.9461  0.6065             255
256  NEO 27.5418 24.5318 18.7408 15.2079  9.2739  4.6883          820101             256
257  /// ------------------------------------------------------------------          257
258  *** PPJD18  684162   574.9  579.6           850725   850722 FR0154              258
259  RAT         17.212           1.980  4D3     PU8244   EU0015/6                    259
260  FAB                                                                             260
261  PIE  0.1314 22.2530  0.4779 77.1376 77.2037 20.2325  1.8685  0.5766             261
262  NEO 27.6020 24.5178 18.7990 15.1419  9.2559  4.6586          820101             262
263  /// ------------------------------------------------------------------          263
264  *** PPJD18  684182   617.0  622.4           850725   850722 04-U1               264
265  RAT          1.195           0.149  4D3                                         265
266  FAB                                                                             266
267  PIE  0.0011  0.1956  0.0063 99.7970 99.2925  0.6784  0.0104  0.0078             267
268  NEO 23.7405 23.0022 19.1232 17.2847 10.5547  6.2947          820101             268
269  /// ------------------------------------------------------------------          269
270  *** PPJD18  6841A2   694.7  699.5           850725   850722 04-U1               270
271  RAT          0.474           0.067  4D3                                         271
272  FAB                                                                             272
273  PIE  0.0016  0.1986  0.0063 99.7935 99.3706  0.6003  0.0210  0.0036             273
274  NEO 24.0144 23.2054 19.0862 17.1395 10.4205  6.1340          820101             274
275  /// ------------------------------------------------------------------          275
276  *** PPJD18  684622    19.6   24.4           850725   850722 FR0154              276
277  RAT         17.284           2.490  4D3     PU8244   EU0015/6                    277
278  FAB                                                                             278
279  PIE  0.1319 21.8910  0.5916 77.3855 76.8501 20.5208  1.9050  0.5891             279
280  NEO 27.6580 24.6378 18.7689 15.1397  9.1990  4.5967          820101             280
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281  /// ----------------------------------------------------------------------
282  *** PPJD18  684643   270.8  275.4           850725   850722 FR0154
283  RAT         17.251            3.660  4D3     PU8244   EU0015/6
284  FAB
285  PIE  0.1323 21.4030  0.7020 77.7628 76.5597 20.7794  1.9341  0.6031
286  NEO 27.5047 24.5047 18.7610 15.2237  9.2763  4.7014          820101
287  /// ----------------------------------------------------------------------
288  *** PPJD18  684662   574.7  579.6           850725   850722 FR0154
289  RAT         17.270            1.950  4D3     PU8244   EU0015/6
290  FAB
291  PIE  0.1327 22.1998  0.4807 77.1868 77.1981 20.2450  1.8719  0.5781
292  NEO 27.6316 24.5491 18.7984 15.1333  9.2353  4.6406          820101
293  /// ----------------------------------------------------------------------
294  *** PPJD25  600623   271.1  276.6           850618   850617 FR0187
295  RAT         17.433            2.780  4D1     PU8253   EU000C
296  FAB
297  PIE  0.1299 21.7555  0.6450 77.4696 76.3176 20.9934  1.9373  0.6197
298  NEO 27.6235 24.7805 18.7244 15.1180  9.1758  4.5778          820101
299  /// ----------------------------------------------------------------------
300  *** PPJD25  604622  -349.7  -344.7           850618   850617 04-L4
301  RAT          0.226            0.011  4D1
302  FAB
303  PIE  0.0030  0.1984  0.0045 99.7941 99.3927  0.5846  0.0113  0.0126
304  NEO 25.9394 24.1213 18.9413 16.0758  9.5988  5.1143          820101
305  /// ----------------------------------------------------------------------
306  *** PPJD25  604642  -100.2  -95.0           850618   850617 04-L1
307  RAT          0.623            0.068  4D1
308  FAB
309  PIE  0.0022  0.1937  0.0057 99.7984 99.0076  0.9696  0.0126  0.0039
310  NEO 24.4584 23.1799 18.9868 16.9137 10.2922  5.9800          820101
311  /// ----------------------------------------------------------------------
312  *** PPJD25  604662   -20.6  -15.1           850618   850617 04-L1
313  RAT          0.738            0.156  4D1
314  FAB
315  PIE  0.0019  0.1890  0.0046 99.8045 99.1025  0.8816  0.0054  0.0007
316  NEO 23.9848 22.9198 19.0983 17.2009 10.5140  6.2335          820101
317  /// ----------------------------------------------------------------------
318  *** PPJD25  604664    19.1   24.3           850618   850617 FR0190
319  RAT         17.345            2.110  4D1     PU8253   EU0018/C
320  FAB
321  PIE  0.1323 22.0767  0.5412 77.2498 76.5162 20.7676  1.9662  0.6128
322  NEO 27.6260 24.7057 18.8025 15.1825  9.1586  4.5138          820101
323  /// ----------------------------------------------------------------------
324  *** PPJD25  604682   140.3  145.3           850618   850617 FR0190
325  RAT         17.438            2.880  4D1     PU8253   EU0018/C
326  FAB
327  PIE  0.1314 21.8306  0.6093 77.4287 76.3449 20.9122  1.9920  0.6172
328  NEO 27.5698 24.5178 18.7853 15.1917  9.2575  4.6632          820101
329  /// ----------------------------------------------------------------------
330  *** PPJD25  6046A3   269.3  274.8           850618   850617 FR0190
331  RAT         17.249            3.210  4D1     PU8253   EU0018/C
332  FAB
333  PIE  0.1314 21.6373  0.6533 77.5780 76.1693 20.9956  2.0831  0.6230
334  NEO 27.6642 24.2094 18.8380 15.2615  9.3034  4.6959          820101
335  /// ----------------------------------------------------------------------
336  *** PPJD25  6046C2   420.8  425.8           850618   850617 FR0190
337  RAT         17.284            2.890  4D1     PU8253   EU0018/C
338  FAB
339  PIE  0.1322 21.8069  0.6085 77.4524 76.3115 20.8913  2.0632  0.6235
340  NEO 27.6915 24.2226 18.8513 15.2452  9.2986  4.6904          820101
341  /// ----------------------------------------------------------------------
342  *** PPJD25  6046E2   575.3  580.3           850618   850617 FR0190
343  RAT         17.395            1.980  4D1     PU8253   EU0018/C
344  FAB
345  PIE  0.1326 22.1809  0.4995 77.1870 76.6414 20.6582  1.9681  0.6090
346  NEO 27.6612 24.5942 18.7906 15.1239  9.2060  4.5959          820101
347  /// ----------------------------------------------------------------------
348  *** PPJD25  6046G2   930.0  935.0           850618   850617 04-U4
349  RAT          0.193            0.007  4D1
350  FAB
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351  PIE  0.0020  0.2038  0.0038 99.7904 98.7969  1.0505  0.0783  0.0671                 351
352  NEO 25.1160 24.0960 18.5071 16.2887  9.5113  5.2536          820101                 352
353  /// ------------------------------------------------------------------------------ 353
354  *** PPJD25  608623   271.3  276.3           850618   850617 FR0188                 354
355  RAT         17.293           3.230  4D1     PU8253   EU000C                        355
356  FAB                                                                               356
357  PIE  0.1320 21.6277  0.6581 77.5823 76.2283 21.0116  2.0012  0.6226                 357
358  NEO 27.5656 24.5167 18.7634 15.1992  9.2523  4.6650          820101                 358
359  /// ------------------------------------------------------------------------------ 359
360  *** PPJD2Y  760122   269.9  275.4           860408   860331 FR0201                 360
361  RAT         17.242           4.450  3D1     PU8255   EU000A                        361
362  FAB                                                                               362
363  PIE  0.1140 20.9737  0.8015 78.1107 75.9000 21.3076  2.0097  0.6489                 363
364  NEO 27.5765 24.6963 18.6367 15.1372  9.2139  4.6940          820101                 364
365  /// ------------------------------------------------------------------------------ 365
366  *** PPJD2Y  764622  -101.0  -95.4           860408   860331 03-L1                  366
367  RAT          0.739           0.095  3D1                                            367
368  FAB                                                                               368
369  PIE  0.0012  0.1929  0.0075 99.7984 98.9203  1.0630  0.0077  0.0023                 369
370  NEO 24.3087 23.3905 18.8684 16.9034 10.2270  5.9793          820101                 370
371  /// ------------------------------------------------------------------------------ 371
372  *** PPJD2Y  764642   -19.6  -14.2           860408   860331 03-L1                  372
373  RAT          0.883           0.216  3D1                                            373
374  FAB                                                                               374
375  PIE  0.0012  0.1932  0.0080 99.7976 98.9391  1.0403  0.0068  0.0004                 375
376  NEO 23.9056 23.0843 19.0154 17.1916 10.4990  6.2401          820101                 376
377  /// ------------------------------------------------------------------------------ 377
378  *** PPJD2Y  764662    21.3   26.7           860408   860331 FR0217                 378
379  RAT         17.229           2.710  3D1     PUJ001   EU0006                        379
380  FAB                                                                               380
381  PIE  0.1151 21.7269  0.6340 77.5239 76.6791 20.6231  1.9528  0.6079                 381
382  NEO 27.5760 24.7519 18.7287 15.1407  9.1807  4.6017          820101                 382
383  /// ------------------------------------------------------------------------------ 383
384  *** PPJD2Y  764683   268.7  274.2           860408   860331 FR0217                 384
385  RAT         17.005           4.010  3D1     PUJ001   EU0006                        385
386  FAB                                                                               386
387  PIE  0.1162 21.2051  0.7616 77.9171 76.3315 20.9206  1.9800  0.6260                 387
388  NEO 27.4707 24.6427 18.7038 15.2180  9.2630  4.7018          820101                 388
389  /// ------------------------------------------------------------------------------ 389
390  *** PPJD2Y  7646A2   575.9  581.0           860408   860331 FR0217                 390
391  RAT         17.193           2.360  3D1     PUJ001   EU0006                        391
392  FAB                                                                               392
393  PIE  0.1164 21.9547  0.5780 77.3509 76.8446 20.4826  1.9288  0.6032                 393
394  NEO 27.6334 24.7238 18.7244 15.1107  9.2034  4.6043          820101                 394
395  /// ------------------------------------------------------------------------------ 395
396  *** PPJD2Y  769122   269.8  275.2           860408   860331 FR0214                 396
397  RAT         17.194           3.630  3D1     PUJ001   EU0006                        397
398  FAB                                                                               398
399  PIE  0.1162 21.3606  0.7217 77.8015 76.1037 21.0629  2.0480  0.6381                 399
400  NEO 27.4950 24.5826 18.7329 15.2050  9.2694  4.6914          820101                 400
401  /// ------------------------------------------------------------------------------ 401
402  *** PPJD2S  750122   269.9  275.0           860718   860703 FR0207                 402
403  RAT         17.042           4.320  2D1     PUJ001   EU0006                        403
404  FAB                                                                               404
405  PIE  0.1160 21.0155  0.8141 78.0544 75.7560 21.4105  2.0353  0.6578                 405
406  NEO 27.4595 24.7063 18.6834 15.2135  9.2510  4.6820          820101                 406
407  /// ------------------------------------------------------------------------------ 407
408  *** PPJD2S  754622  -350.1  -347.6           860718   860703 02-L4                  408
409  RAT          0.315           0.018  2D1                                            409
410  FAB                                                                               410
411  PIE  0.0018  0.1960  0.0043 99.7971 98.3544  1.6020  0.0370  0.0000                 411
412  NEO 24.3798 24.5097 17.7970 16.4612  9.3073  5.3031          820101                 412
413  /// ------------------------------------------------------------------------------ 413
414  *** PPJD2S  754642  -100.7  -95.2           860718   860703 02-L1                  414
415  RAT          0.835           0.115  2D1                                            415
416  FAB                                                                               416
417  PIE  0.0017  0.1902  0.0063 99.8018 98.8230  1.1709  0.0010  0.0000                 417
418  NEO 24.4071 23.3605 18.8907 16.9171 10.3011  6.0034          820101                 418
419  /// ------------------------------------------------------------------------------ 419
420  *** PPJD2S  754662   -20.5  -15.1           860718   860703 02-L1                  420
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421  RAT          1.000           0.259  2D1                                        421
422  FAB                                                                            422
423  PIE  0.0021  0.1891  0.0084 99.8004 98.7823  1.2005  0.0033  0.0000            423
424  NEO 23.8463 23.0856 18.9815 17.1935 10.5136  6.2720          820101            424
425  /// ----------------------------------------------------------------           425
426  *** PPJD2S  754683   268.9  274.2           860718   860703 FR0207             426
427  RAT         17.088           4.620  2D1     PUJ001   EU0006                    427
428  FAB                                                                            428
429  PIE  0.1153 20.9126  0.8311 78.1411 75.6643 21.4967  2.0460  0.6637            429
430  NEO 27.3988 24.6561 18.6932 15.2343  9.2833  4.7218          820101            430
431  /// ----------------------------------------------------------------           431
432  *** PPJD2S  7546C2   944.7  950.1           860718   860703 02-U4              432
433  RAT          0.163           0.009  2D1                                        433
434  FAB                                                                            434
435  PIE  0.0020  0.2033  0.0047 99.7900 99.6831  0.3153  0.0006  0.0000            435
436  NEO 24.6053 23.9828 18.6201 16.5289  9.7426  5.4703          820101            436
437  /// ----------------------------------------------------------------           437
438  *** PPJD2S  759122   269.7  275.0           860718   860703 FR0202             438
439  RAT         17.117           5.010  2D1     PU8255   EU0012/C                  439
440  FAB                                                                            440
441  PIE  0.1329 20.8359  0.8515 78.1797 76.1544 21.1823  1.8929  0.6200            441
442  NEO 27.5124 24.6245 18.6671 15.1840  9.2898  4.7221          820101            442
443  /// ----------------------------------------------------------------           443
444  *** PPJX12  670622   270.0  274.6           850912   851001 FM0105             444
445  RAT         17.084           4.950  1D1     PU8230   EU0013                    445
446  FAB                                                                            446
447  PIE  0.1333 20.8041  0.8724 78.1902 77.0300 20.3989  1.8462  0.5703            447
448  NEO 27.2944 24.6423 18.6284 15.3686  9.3038  4.7626          820101            448
449  /// ----------------------------------------------------------------           449
450  *** PPJX12  674722  -100.2  -95.4           850912   851001 01-L1              450
451  RAT          0.908           0.125  1D1                                        451
452  FAB                                                                            452
453  PIE  0.0011  0.1893  0.0071 99.8025 98.7113  1.2529  0.0099  0.0183            453
454  NEO 24.4624 23.2597 18.9341 16.9344 10.3165  6.0182          820101            454
455  /// ----------------------------------------------------------------           455
456  *** PPJX12  674742   -20.4  -17.8           850912   851001 01-L1              456
457  RAT          1.079           0.293  1D1                                        457
458  FAB                                                                            458
459  PIE  0.0007  0.1858  0.0083 99.8052 98.7708  1.2009  0.0086  0.0020            459
460  NEO 23.9857 23.0127 19.0299 17.2148 10.5056  6.2445          820101            460
461  /// ----------------------------------------------------------------           461
462  *** PPJX12  674762    19.8   24.8           850912   851001 FM0110             462
463  RAT         17.259           3.390  1D1     PU8231   EU0013                    463
464  FAB                                                                            464
465  PIE  0.1310 21.4719  0.7201 77.6770 77.4804 20.0751  1.7608  0.5546            465
466  NEO 27.5924 24.6257 18.7218 15.1796  9.2057  4.6223          820101            466
467  /// ----------------------------------------------------------------           467
468  *** PPJX12  674792   139.9  144.6           850912   851001 FM0110             468
469  RAT         17.182           4.860  1D1     PU8231   EU0013                    469
470  FAB                                                                            470
471  PIE  0.1342 20.9951  0.8237 78.0471 77.1517 20.2985  1.8392  0.5679            471
472  NEO 27.2299 24.4268 18.7404 15.3205  9.3940  4.8310          820101            472
473  /// ----------------------------------------------------------------           473
474  *** PPJX12  6747B2   269.9  274.9           850912   851001 FM0110             474
475  RAT         17.051           5.150  1D1     PU8231   EU0013   .                475
476  FAB                                                                            476
477  PIE  0.1339 20.7422  0.8874 78.2365 77.0303 20.4570  1.7956  0.5740            477
478  NEO 27.4215 24.5124 18.7255 15.2824  9.3059  4.7440          820101            478
479  /// ----------------------------------------------------------------           479
480  *** PPJX12  6747E3  -419.8  424.8           850912   851001 FM0110             480
481  RAT         17.061           4.630  1D1     PU8231   EU0013                    481
482  FAB                                                                            482
483  PIE  0.1329 21.0024  0.8200 78.0447 77.1675 20.2718  1.8394  0.5680            483
484  NEO 27.3942 24.5115 18.7191 15.2629  9.3133  4.7516          820101            484
485  /// ----------------------------------------------------------------           485
486  *** PPJX12  6747G2   575.1  579.5           850912   851001 FM0110             486
487  RAT         17.269           3.070  1D1     PU8231   EU0013                    487
488  FAB                                                                            488
489  PIE  0.1330 21.6562  0.6580 77.5527 77.6268 19.8926  1.8028  0.5495            489
490  NEO 27.5925 24.5914 18.7479 15.1654  9.2273  4.6431          820101            490
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491  /// ------------------------------------------------------------------------ 491
492  *** PPJX12  678622   269.4  274.2           850912   851001 FM0107            492
493  RAT         17.080           5.200  1D1     PU8231   EU0013                   493
494  FAB                                                                          494
495  PIE  0.1332 20.6877  0.9063 78.2728 77.0034 20.5928  1.7995  0.5761           495
496  NEO 27.3917 24.5564 18.7011 15.2856  9.3135  4.7518          820101           496
497  /// ------------------------------------------------------------------------ 497
498  *** PPJD2P  770622    19.9   25.2           860506   860428 FR0207            498
499  RAT         17.224           3.050  2A2     PUJ001   EU0006                   499
500  FAB                                                                          500
501  PIE  0.1122 21.4713  0.7007 77.7158 76.0041 21.1803  2.0389  0.6414           501
502  NEO 27.5903 24.8193 18.7024 15.1394  9.1715  4.5770          820101           502
503  /// ------------------------------------------------------------------------ 503
504  *** PPJD2P  770642   270.1  275.8           860506   860428 FR0207            504
505  RAT         17.078           4.480  2A2     PUJ001   EU0006                   505
506  FAB                                                                          506
507  PIE  0.1140 20.9398  0.8420 78.1043 75.6754 21.4675  2.0600  0.6608           507
508  NEO 27.4418 24.6772 18.6877 15.2357  9.2645  4.6931          820101           508
509  /// ------------------------------------------------------------------------ 509
510  *** PPJD2P  770662   575.1  580.6           860506   860428 FR0207            510
511  RAT         17.184           2.310  2A2     PUJ001   EU0006                   511
512  FAB                                                                          512
513  PIE  0.1120 21.9588  0.5450 77.3842 76.4997 20.7617  1.9906  0.6262           513
514  NEO 27.5780 24.6937 18.7546 15.1222  9.2189  4.6326          820101           514
515  /// ------------------------------------------------------------------------ 515
516  *** PPJD2P  770682   620.0  625.1           860506   860428 02-U1             516
517  RAT          0.706           0.182  2A2                                      517
518  FAB                                                                          518
519  PIE  0.0012  0.1936  0.0065 99.7987 99.2662  0.7186  0.0043  0.0009           519
520  NEO 20.9207 23.2601 16.5402 17.2786  9.4241  6.2307          820101           520
521  /// ------------------------------------------------------------------------ 521
522  *** PPJD2P  7706A2   695.1  700.1           860506   860428 02-U1             522
523  RAT          0.561           0.082  2A2                                      523
524  FAB                                                                          524
525  PIE  0.0010  0.1976  0.0066 99.7948 99.3132  0.6736  0.0022  0.0068           525
526  NEO 22.7402 23.5682 18.3578 17.3704  9.9984  6.2119          820101           526
527  /// ------------------------------------------------------------------------ 527
528  *** PPJD2P  774622   270.1  275.7           860506   860428 FR0203            528
529  RAT         17.040           4.870  2A2     PU8245   EU000C                   529
530  FAB                                                                          530
531  PIE  0.1320 20.8816  0.8366 78.1498 76.1757 21.1529  1.9052  0.6187           531
532  NEO 27.3744 24.6723 18.6864 15.2646  9.2728  4.7295          820101           532
533  /// ------------------------------------------------------------------------ 533
534  *** PPJD1J  720122   269.6  274.7           860530   860527 FR0164            534
535  RAT         17.258           2.500  5E3     PU8251   EU0015/6                 535
536  FAB                                                                          536
537  PIE  0.1289 21.8929  0.6183 77.3599 76.4551 20.9021  1.9041  0.6138           537
538  NEO 27.6651 24.8726 18.7151 15.0851  9.1343  4.5262          820101           538
539  /// ------------------------------------------------------------------------ 539
540  *** PPJD1J  724623   270.0  275.1           860530   860527 FR0167            540
541  RAT         17.279           2.940  5E3     PU8251   EU0017                   541
542  FAB                                                                          542
543  PIE  0.1314 21.7699  0.6234 77.4753 76.4555 20.9029  1.8969  0.6172           543
544  NEO 27.5288 24.7118 18.7292 15.1489  9.2331  4.6481          820101           544
545  /// ------------------------------------------------------------------------ 545
546  *** PPJD1J  729122   269.7  274.9           860530   860527 FR0164            546
547  RAT         17.230           3.330  5E3     PU8251   EU0015/6                 547
548  FAB                                                                          548
549  PIE  0.1312 21.5459  0.6710 77.6519 76.3207 21.0268  1.9102  0.6253           549
550  NEO 27.4900 24.6813 18.7248 15.1740  9.2522  4.6734          820101           550
551  /// ------------------------------------------------------------------------ 551
552  *** PPJX09  3001022  270.4  275.0           810810   810803 FM0104            552
553  RAT         17.250           3.190  2B1     PU8230   EU0004                   553
554  FAB                                                                          554
555  PIE  0.1272 21.5666  0.6368 77.6694 77.4557 19.7344  2.1715  0.5451           555
556  NEO 28.9449 19.9697 19.8444 16.1600  9.9358  5.0805  770322  800926           556
557  /// ------------------------------------------------------------------------ 557
558  *** PPJX09  302122    19.8   24.8           810810   810803 FM0104            558
559  RAT         17.313           2.080  2B1     PU8230   EU0004                   559
560  FAB                                                                          560
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561  PIE  0.1278 22.0447  0.5309 77.2966 77.7462 19.5085  2.1297  0.5345                561
562  NEO 28.7901 20.9822 19.6546 15.8906  9.7267  4.8974  770322  800926                562
563  /// ------------------------------------------------------------------------------ 563
564  *** PPJX09  302142   269.8  273.2           810810   810803 FM0104                 564
565  RAT         17.207            3.150  2B1    PU8230   EU0004                        565
566  FAB                                                                               566
567  PIE  0.1277 21.5854  0.6278 77.6591 77.4651 19.6913  2.1838  0.5445                567
568  NEO 28.9763 20.1540 19.8286 16.0876  9.8807  5.0429  770322  800926                568
569  /// ------------------------------------------------------------------------------ 569
570  *** PPJX09  302162   575.7  580.3           810810   810803 FM0104                 570
571  RAT         17.412            1.810  2B1    PU8230   EU0004                        571
572  FAB                                                                               572
573  PIE  0.1269 22.1500  0.4742 77.2489 77.9127 19.3405  2.1364  0.5314                573
574  NEO 29.0579 20.3207 19.8778 15.9829  9.7971  4.9348  770322  800926                574
575  /// ------------------------------------------------------------------------------ 575
576  *** PPJX09  3046052  -49.8  -44.8           810810   810803 02-L1                  576
577  RAT          0.627            0.111  2B1                                           577
578  FAB                                                                               578
579  PIE  0.0008  0.1922  0.0058 99.8012 99.1957  0.7912  0.0053  0.0004                579
580  NEO 24.3279 21.5236 19.3632 17.5106 10.7491  6.3872  770322  800926                580
581  /// ------------------------------------------------------------------------------ 581
582  *** PPJX09  3046054  -19.2  -14.7           810810   810803 02-L1                  582
583  RAT          0.660            0.158  2B1                                           583
584  FAB                                                                               584
585  PIE  0.0018  0.1934  0.0067 99.7981 99.2097  0.7708  0.0069  0.0011                585
586  NEO 24.4112 20.6544 19.6592 17.7838 10.9263  6.5256  770322  800926                586
587  /// ------------------------------------------------------------------------------ 587
588  *** PPJX09  3046057   19.7   24.7           810810   810803 FM0103                 588
589  RAT         17.533            2.030  2B1    PU8230   EU0004                        589
590  FAB                                                                               590
591  PIE  0.1282 22.0668  0.5206 77.2844 77.7892 19.4540  2.1380  0.5322                591
592  NEO 29.2128 20.0074 19.9340 16.0089  9.8077  4.9355  770322  800926                592
593  /// ------------------------------------------------------------------------------ 593
594  *** PPJX09  3046113  270.3  274.8           810810   810803 FM0103                 594
595  RAT         17.347            3.050  2B1    PU8230   EU0004                        595
596  FAB                                                                               596
597  PIE  0.1275 21.6135  0.6166 77.6424 77.5185 19.6767  2.1607  0.5429                597
598  NEO 29.0084 20.0216 19.8752 16.1291  9.8844  5.0434  770322  800926                598
599  /// ------------------------------------------------------------------------------ 599
600  *** PPJX09  3046183  574.6  580.1           810810   810803 FM0103                 600
601  RAT         17.281            1.690  2B1    PU8230   EU0004                        601
602  FAB                                                                               602
603  PIE  0.1264 22.2342  0.4499 77.1894 77.9951 19.2631  2.1122  0.5251                603
604  NEO 28.9056 19.9787 19.8516 16.1144  9.9137  5.0634  770322  800926                604
605  /// ------------------------------------------------------------------------------ 605
606  *** PPJX09  307122    20.2   24.7           810810   810803 FM0110                 606
607  RAT         17.326            1.960  2B1    PU8231   EU0013                        607
608  FAB                                                                               608
609  PIE  0.1326 22.1949  0.5167 77.1559 77.7920 19.4688  2.1351  0.5292                609
610  NEO 29.1815 20.2603 19.8561 16.0049  9.7685  4.8892  770322  800926                610
611  /// ------------------------------------------------------------------------------ 611
612  *** PPJX09  307142   270.3  275.3           810810   810803 FM0110                 612
613  RAT         17.338            2.900  2B1    PU8231   EU0013                        613
614  FAB                                                                               614
615  PIE  0.1319 21.8081  0.6028 77.4572 77.5568 19.6547  2.1503  0.5408                615
616  NEO 29.0041 20.1757 19.8386 16.0831  9.8619  5.0113  770322  800926                616
617  /// ------------------------------------------------------------------------------ 617
618  *** PPJX09  307162   575.3  580.2           810810   810803 FM0110                 618
619  RAT         17.428            1.470  2B1    PU8231   EU0013                        619
620  FAB                                                                               620
621  PIE  0.1322 22.4667  0.4082 76.9927 78.1162 19.1795  2.1002  0.5210                621
622  NEO 27.7446 20.5413 20.1461 16.2807 10.0420  5.0770  770322  800926                622
623  /// ------------------------------------------------------------------------------ 623
624  *** PPJX09  3091023  270.6  275.6           810810   810803 FM0110                 624
625  RAT         17.278            2.860  2B1    PU8231   EU0013                        625
626  FAB                                                                               626
627  PIE  0.1308 21.7677  0.5935 77.5081 77.5758 19.6281  2.1547  0.5403                627
628  NEO 29.0538 19.9827 19.8863 16.1239  9.9022  5.0445  770322  800926                628
629  /// ------------------------------------------------------------------------------ 629
630  *** PPJD2B  2646106  269.5  275.0           811012   810917 FR0176                 630
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631  RAT          17.360           2.670  2F2     PU8252   EU0018                    631
632  FAB                                                                            632
633  PIE  0.1318 22.0051  0.5412 77.3219 76.2833 20.6777  2.3388  0.6121            633
634  NEO 28.2305 21.8264 19.3709 15.7227  9.6755  4.9466  770322  800705            634
635  /// ------------------------------------------------------------------------- 635
636  *** PPJD39  2941022  269.9  274.7           811128   811129 FR0221             636
637  RAT          17.260           2.970  1C1     PUJ001/2 EU0006                   637
638  FAB                                                                            638
639  PIE  0.1100 21.7575  0.5978 77.5347 75.9645 20.8042  2.4504  0.6352            639
640  NEO 28.4419 21.6851 19.4388 15.7490  9.6517  4.9132  781017  800926            640
641  /// ------------------------------------------------------------------------- 641
642  *** PPJD39  2946083  269.4  274.9           811128   811129 FR0221             642
643  RAT          17.316           2.940  1C1     PUJ001/2 EU0006                   643
644  FAB                                                                            644
645  PIE  0.1082 21.7794  0.5876 77.5248 75.7935 20.7296  2.4426  0.6321            645
646  NEO 28.4015 21.6878 19.4545 15.7818  9.7011  4.9549  781017  800926            646
647  /// ------------------------------------------------------------------------- 647
648  *** PPJD39  2951023  270.3  274.9           811128   811129 FR0221             648
649  RAT          17.312           2.800  1C1     PUJ001/2 EU0006                   649
650  FAB                                                                            650
651  PIE  0.1097 21.8137  0.5787 77.4979 75.8388 20.7427  2.6093  0.6323            651
652  NEO 28.6698 20.8691 19.6045 16.0305  9.7636  5.0131  781017  800926            652
653  /// ------------------------------------------------------------------------- 653
654  *** PPJD1X  344663   269.0  274.2           811128   811129 FR0180             654
655  RAT          17.323           1.180  1E1     PU8253   EU000B                    655
656  FAB                                                                            656
657  PIE  0.1288 22.6183  0.3482 76.9047 76.9635 20.0675  2.2707  0.5825            657
658  NEO 29.3786 18.8989 20.0811 16.2553 10.0408  5.1797  800320  810217            658
659  /// ------------------------------------------------------------------------- 659
660  *** PPJX17  360622   270.3  275.7           820311   820318 FR0128             660
661  RAT          17.295           1.830  5F3     PU8243   EU0002                    661
662  FAB                                                                            662
663  PIE  0.1313 22.2257  0.4723 77.1708 76.8666 20.2290  2.2036  0.5764            663
664  NEO 26.2070 27.2874 17.9469 14.8295  9.0091  4.5687  770427  800705            664
665  /// ------------------------------------------------------------------------- 665
666  *** PPJX17  360822   269.8  274.3           820311   820318 FR0132             666
667  RAT          17.428           1.790  5F3     PU8243/93EU0U30                   667
668  FAB                                                                            668
669  PIE  0.1310 22.2239  0.4644 77.1807 76.8925 20.2089  2.1926  0.5845            669
670  NEO 27.7870 23.4743 19.0019 15.3649  9.4280  4.7754  770427  800705            670
671  /// ------------------------------------------------------------------------- 671
672  *** PPJX17  362522   269.8  274.8           820311   820318 FR0132             672
673  RAT          17.407           1.690  5F3     PU8243/93EU0U30                   673
674  FAB                                                                            674
675  PIE  0.1302 22.3340  0.4523 77.0835 76.8667 20.1861  2.2278  0.5853            675
676  NEO 23.6229 34.2757 16.1954 13.4648  8.1682  4.2351  770427  800705            676
677  /// ------------------------------------------------------------------------- 677
678  *** PPJX17  364642  -100.7  -95.7           820311   820318 05-L1              678
679  RAT           0.312           0.028  5F3                                       679
680  FAB                                                                            680
681  PIE  0.0034  0.1995  0.0069 99.7902 99.4315  0.5555  0.0087  0.0016            681
682  NEO 24.9495 21.5222 19.5156 17.3084 10.5188  6.0745  770427  800705            682
683  /// ------------------------------------------------------------------------- 683
684  *** PPJX17  364662   -19.6  -14.6           820311   820318 05-L1              684
685  RAT           0.375           0.064  5F3                                       685
686  FAB                                                                            686
687  PIE  0.0008  0.2019  0.0053 99.7920 99.4530  0.5343  0.0057  0.0013            687
688  NEO 24.3761 21.1536 19.5906 17.6361 10.8045  6.4085  770427  800705            688
689  /// ------------------------------------------------------------------------- 689
690  *** PPJX17  364665    19.1   24.1           820311   820318 FR0132             690
691  RAT          17.515           1.100  5F3     PU8243/93EU0U30                   691
692  FAB                                                                            692
693  PIE  0.1304 22.6158  0.3828 76.8710 77.1222 20.0199  2.1711  0.5759            693
694  NEO 25.6835 29.5760 17.4675 14.1998  8.6293  4.3542  770427  800705            694
695  /// ------------------------------------------------------------------------- 695
696  *** PPJX17  3646A3   270.7  275.7           820311   820318 FR0132             696
697  RAT          17.419           1.620  5F3     PU8243/93EU0U30                   697
698  FAB                                                                            698
699  PIE  0.1310 22.3388  0.4427 77.0875 77.0087 20.1335  2.1653  0.5731            699
700  NEO 26.6793 26.0222 18.2256 15.0910  9.1686  4.7250  770427  800705            700
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701  /// ------------------------------------------------------------------------
702  *** PPJX17  364662   574.8  579.8           820311   820318 FR0132
703  RAT          17.441           1.020  5F3     PU8243/93EU0U30
704  FAB
705  PIE  0.1291 22.6288  0.3709 76.8713 77.1768 19.9956  2.1695  0.5755
706  NEO 26.9544 26.1577 18.3446 14.9191  9.0342  4.5564  770427  800705
707  /// ------------------------------------------------------------------------
708  *** PPJX17  366722   270.3  275.2           820311   820318 FR0138
709  RAT          17.421           1.550  5F3     PU8245   EU0U30
710  FAB
711  PIE  0.1295 22.3763  0.4370 77.0572 77.2763 19.9147  2.1392  0.5592
712  NEO 28.0161 23.2486 19.1144 15.4166  9.4202  4.7327  770427  800705
713  /// ------------------------------------------------------------------------
714  *** PPJX17  368422   269.8  275.2           820311   820318 FR0132
715  RAT          17.446           1.390  5F3     PU8243/93EU0U30
716  FAB
717  PIE  0.1303 22.4035  0.4348 77.0314 76.9515 20.1508  2.1927  0.5803
718  NEO 26.6745 26.6112 18.2471 14.7525  8.9945  4.5178  770427  800705
719  /// ------------------------------------------------------------------------
720  *** PPJX17  368623   270.1  276.2           820311   820318 FM0138
721  RAT          17.430           1.360  5F3     PU8245   EU0002
722  FAB
723  PIE  0.1300 22.3775  0.4398 77.0532 77.2063 20.0034  2.1351  0.5568
724  NEO 27.9721 23.4159 18.8203 15.4821  9.3864  4.8227  770427  800705
725  /// ------------------------------------------------------------------------
726  *** PPJD2L  2306042  270.9  276.0           811012   810917 FR0206
727  RAT           0.000           2.260  2D2     PUJ001   EU0006
728  FAB
729  PIE  0.1143 22.1191  0.5036 77.2631 76.2062 20.5906  2.4636  0.6242
730  NEO 28.1137 22.6711 19.2308 15.5671  9.5557  4.8618  770322  800320
731  /// ------------------------------------------------------------------------
732  *** PPJD2L  2346082  270.4  275.7           811012   810917 F00004
733  RAT           0.000           2.140  2D2     PUXXXX   EUXXXX
734  FAB
735  PIE  0.1325 22.2555  0.4689 77.1431 76.4267 20.5166  2.3315  0.6067
736  NEO 28.0700 22.6066 19.2488 15.5888  9.5995  4.8863  770322  800320
737  /// ------------------------------------------------------------------------
738  *** PPJD2L  2386042  270.8  276.1           811012   810917 F00004
739  RAT           0.000           2.030  2D2     PUXXXX   EUXXXX
740  FAB
741  PIE  0.1299 22.3120  0.4573 77.1007 76.5995 20.4351  2.2843  0.5995
742  NEO 27.3711 24.4845 18.6539 15.2805  9.4093  4.8007  770322  800320
743  /// ------------------------------------------------------------------------
744  *** PPJD29  0946073  274.1  279.4           800926   800921 FR0187
745  RAT          17.465           0.507  5A4     PU8253   EU000C
746  FAB
747  PIE  0.1314 23.1023  0.2518 76.5145 77.1080 19.9109  2.3229  0.5785
748  NEO 28.3971 22.0071 19.4586 15.6220  9.6434  4.8719  770418  781223
749  /// ------------------------------------------------------------------------
750  *** PPJD04  1246083  270.9  275.8           800926   800921 FM0113
751  RAT          17.483           0.929  4B2     PU8231   EU0012
752  FAB
753  PIE  0.1303 22.8401  0.3212 76.7084 77.2833 19.8031  2.2755  0.5664
754  NEO 28.5091 21.3674 19.5911 15.7852  9.7765  4.9707  770415  790315
755  /// ------------------------------------------------------------------------
756  *** PPJX14  1306022  270.3  274.3           801013   801023 FM0115
757  RAT          17.269           1.400  1B1     PU8231/2 EU0012
758  FAB
759  PIE  0.1316 22.6402  0.3797 76.8484 78.1870 19.0803  2.1362  0.5185
760  NEO 28.4277 21.5140 19.5529 15.7616  9.7551  4.9887  770321  790315
761  /// ------------------------------------------------------------------------
762  *** PPJX14  1341022  270.0  274.0           801013   801023 FR0130
763  RAT          17.166           1.380  1B1     PU8243   EU0U20
764  FAB
765  PIE  0.1293 22.5677  0.3822 76.9209 77.2706 19.7999  2.2752  0.5664
766  NEO 28.4789 21.5271 19.5425 15.7617  9.7208  4.9611  770321  790315
767  /// ------------------------------------------------------------------------
768  *** PPJX14  1346042  -49.7  -45.2           801013   801023 01-L1
769  RAT           0.266           0.045  1B1
770  FAB
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771  PIE  0.0013  0.2033  0.0052 99.7902 99.5475  0.4356  0.0102  0.0007                771
772  NEO 24.5835 20.1300 19.8739 17.8799 10.9941  6.5385  770321  790315                772
773  /// ------------------------------------------------------------------------------ 773
774  *** PPJX14  1346044  -20.1  -15.1           801013   801023 01-L1                  774
775  RAT           0.283           0.069  1B1                                           775
776  FAB                                                                                776
777  PIE  0.0110  0.1990  0.0042 99.7957 99.6051  0.3829  0.0058  0.0000                777
778  NEO 24.3794 20.0278 19.8847 17.9789 11.0874  6.6418  770321  790315                778
779  /// ------------------------------------------------------------------------------ 779
780  *** PPJX14  1346047   20.3   24.8           801013   801023 FR0145                  780
781  RAT          17.444           0.892  1B1     PU8245   EU0U30                        781
782  FAB                                                                                782
783  PIE  0.1315 22.8204  0.3305 76.7177 77.4442 19.6829  2.2474  0.5553                783
784  NEO 28.6283 21.5931 19.5761 15.6529  9.6788  4.8709  770321  790315                784
785  /// ------------------------------------------------------------------------------ 785
786  *** PPJX14  1346063  140.0  144.5           801013   801023 FR0145                  786
787  RAT          17.345           1.220  1B1     PU8245   EU0U30                        787
788  FAB                                                                                788
789  PIE  0.1307 22.6947  0.3561 76.8185 77.3816 19.7390  2.2557  0.5567                789
790  NEO 28.3764 21.5076 19.5367 15.7891  9.7829  5.0072  770321  790315                790
791  /// ------------------------------------------------------------------------------ 791
792  *** PPJX14  1346083  270.4  276.4           801013   801023 FR0145                  792
793  RAT          17.303           1.360  1B1     PU8245   EU0U30                        793
794  FAB                                                                                794
795  PIE  0.1302 22.6959  0.3555 76.8183 77.3237 19.7792  2.2589  0.5593                795
796  NEO 28.4901 21.5333 19.5314 15.7537  9.7261  4.9654  770321  790315                796
797  /// ------------------------------------------------------------------------------ 797
798  *** PPJX14  1346103  419.0  424.5           801013   801023 FR0145                  798
799  RAT          16.696           1.220  1B1     PU8245   EU0U30                        799
800  FAB                                                                                800
801  PIE  0.1287 22.6032  0.3718 76.8963 77.3696 19.7414  2.2572  0.5579                801
802  NEO 28.5383 21.5454 19.5384 15.7359  9.6998  4.9422  770321  790315                802
803  /// ------------------------------------------------------------------------------ 803
804  *** PPJX14  1346132  575.8  580.8           801013   801023 FR0145                  804
805  RAT          17.290           0.775  1B1     PU8245   EU0U30                        805
806  FAB                                                                                806
807  PIE  0.1304 22.8585  0.3116 76.6995 77.4807 19.6419  2.2504  0.5522                807
808  NEO 28.6566 21.6461 19.5449 15.6734  9.6320  4.8471  770321  790315                808
809  /// ------------------------------------------------------------------------------ 809
810  *** PPJX14  1386023  269.5  274.5           801013   801023 FM0120                  810
811  RAT          17.346           1.310  1B1     PU8232   EU0014                        811
812  FAB                                                                                812
813  PIE  0.1299 22.6253  0.3704 76.8743 78.2045 19.0569  2.1414  0.5171                813
814  NEO 28.4852 21.5316 19.5303 15.7485  9.7361  4.9684  770321  790315                814
815  /// ------------------------------------------------------------------------------ 815
816  *** PPJX06  1601022  270.2  275.2           810312   801204 FM0105                  816
817  RAT          17.208           1.730  1E1     PU8230   EU0013                        817
818  FAB                                                                                818
819  PIE  0.1319 22.4221  0.4262 77.0198 78.0403 19.1956  2.1335  0.5228                819
820  NEO 28.4452 21.8861 19.4486 15.6685  9.6467  4.9049  770321  790915                820
821  /// ------------------------------------------------------------------------------ 821
822  *** PPJX06  1646042  -50.3  -45.3           810312   801204 01-L1                   822
823  RAT           0.344           0.060  1E1                                           823
824  FAB                                                                                824
825  PIE  0.0025  0.1990  0.0065 99.7920 99.5338  0.4553  0.0042  0.0010                825
826  NEO 24.8134 19.4581 20.0296 18.0480 11.0726  6.5783  770321  790915                826
827  /// ------------------------------------------------------------------------------ 827
828  *** PPJX06  1646044  -20.2  -15.7           810312   801204 01-L1                   828
829  RAT           0.364           0.088  1E1                                           829
830  FAB                                                                                830
831  PIE  0.0006  0.1982  0.0060 99.7952 99.5619  0.4267  0.0047  0.0000                831
832  NEO 24.6100 19.3553 20.0357 18.1172 11.1715  6.7102  770321  790915                832
833  /// ------------------------------------------------------------------------------ 833
834  *** PPJX06  1646046   20.9   25.9           810312   801204 FM0110                  834
835  RAT          18.068           1.170  1E1     PU8231   EU0013                        835
836  FAB                                                                                836
837  PIE  0.1307 22.6454  0.3658 76.8581 78.1845 19.0664  2.1250  0.5161                837
838  NEO 28.5017 21.8700 19.4694 15.6773  9.6212  4.8605  770321  790915                838
839  /// ------------------------------------------------------------------------------ 839
840  *** PPJX06  1646064  139.9  145.4           810312   801204 FM0110                  840
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841  RAT          17.324           1.600  1E1     PU8231   EU0013                    841
842  FAB                                                                            842
843  PIE  0.1304 22.4742  0.4010 76.9944 78.0928 19.1423  2.1268  0.5213            843
844  NEO 28.2296 21.6194 19.4836 15.8147  9.8079  5.0449  770321  790915            844
845  /// ---------------------------------------------------------------------------845
846  *** PPJX06  1646083  269.9  274.9           810312   801204 FM0110             846
847  RAT          17.233           1.780  1E1     PU8231   EU0013                    847
848  FAB                                                                            848
849  PIE  0.1317 22.4017  0.4261 77.0404 78.0223 19.2085  2.1353  0.5245            849
850  NEO 28.4486 21.7489 19.4756 15.7154  9.6756  4.9357  770321  790915            850
851  /// ---------------------------------------------------------------------------851
852  *** PPJX06  1646104  419.9  424.9           810312   801204 FM0110             852
853  RAT          17.204           1.600  1E1     PU8231   EU0013                    853
854  FAB                                                                            854
855  PIE  0.1315 22.5071  0.3997 76.9618 78.1044 19.1487  2.1317  0.5225            855
856  NEO 28.3214 21.7180 19.4934 15.7400  9.7386  4.9887  770321  790915            856
857  /// ---------------------------------------------------------------------------857
858  *** PPJX06  1646122  574.8  579.8           810312   801204 FM0110             858
859  RAT          17.383           1.030  1E1     PU8231   EU0013                    859
860  FAB                                                                            860
861  PIE  0.1321 22.7462  0.3443 76.7775 78.2751 19.0106  2.1130  0.5145            861
862  NEO 28.5667 21.9326 19.4512 15.6342  9.5818  4.8335  770321  790915            862
863  /// ---------------------------------------------------------------------------863
864  *** PPJX06  1691023  270.1  275.1           810312   801204 FM0101             864
865  RAT          17.284           1.760  1E1     PU8230   EU0003/4                  865
866  FAB                                                                            866
867  PIE  0.1272 22.3067  0.4337 77.1324 78.0485 19.1972  2.1323  0.5231            867
868  NEO 28.3301 21.7236 19.4841 15.7546  9.7292  4.9784  770321  790915            868
869  /// ---------------------------------------------------------------------------869
870  *** PPJD22  1746082  270.2  275.2           810313   810310 FR0185             870
871  RAT          17.441           1.440  3A2     PU8253   EU000C                    871
872  FAB                                                                            872
873  PIE  0.1310 22.5912  0.3691 76.9088 76.7169 20.2416  2.3506  0.5933            873
874  NEO 28.4351 21.7662 19.5046 15.6938  9.6764  4.9239  770330  790915            874
875  /// ---------------------------------------------------------------------------875
876  *** PPJD1W  2246063  269.7  274.7           811127   811129 FR0175             876
877  RAT          17.451           0.563  1E1     PU8252   EU0017/8                  877
878  FAB                                                                            878
879  PIE  0.1307 23.0347  0.2467 76.5879 77.0674 19.9494  2.2905  0.5813            879
880  NEO 28.8262 20.2854 19.8468 15.9827  9.9479  5.1110  790915  800320            880
881  /// ---------------------------------------------------------------------------881
882  *** PPJX11  1901022  270.3  275.1           810609   810506 FM0105             882
883  RAT          17.352           2.278  1A1     PU8230   EU0013                    883
884  FAB                                                                            884
885  PIE  0.1310 22.1271  0.4975 77.2444 77.7703 19.4404  2.1433  0.5309            885
886  NEO 28.5609 21.4261 19.5247 15.8063  9.7175  4.9644  770321  800409            886
887  /// ---------------------------------------------------------------------------887
888  *** PPJX11  1946042  -49.8  -44.9           810609   810506 01-L1              888
889  RAT           0.457           0.082  1A1                                       889
890  FAB                                                                            890
891  PIE  0.0009  0.1960  0.0049 99.7982 99.3982  0.5897  0.0062  0.0000            891
892  NEO 24.7994 19.5487 19.9628 18.0174 11.0755  6.5962  770321  800409            892
893  /// ---------------------------------------------------------------------------893
894  *** PPJX11  1946044  -19.5  -14.5           810609   810506 01-L1              894
895  RAT           0.479           0.119  1A1                                       895
896  FAB                                                                            896
897  PIE  0.0014  0.1950  0.0055 99.7981 99.4374  0.5492  0.0062  0.0000            897
898  NEO 24.6479 19.4961 19.9643 18.0741 11.1377  5.6800  770321  800409            898
899  /// ---------------------------------------------------------------------------899
900  *** PPJX11  1946046   21.2   25.9           810609   810506 FM0110             900
901  RAT          17.435           1.479  1A1     PU8231   EU0013                    901
902  FAB                                                                            902
903  PIE  0.1320 22.5053  0.4212 76.9415 78.0358 19.2161  2.1201  0.5243            903
904  NEO 28.6862 21.4476 19.5622 15.7642  9.6633  4.8765  770321  800409            904
905  /// ---------------------------------------------------------------------------905
906  *** PPJX11  1946083  270.2  275.0           810609   810506 FM0110             906
907  RAT          17.318           2.318  1A1     PU8231   EU0013                    907
908  FAB                                                                            908
909  PIE  0.1303 22.0904  0.4982 77.2811 77.8003 19.4075  2.1426  0.5345            909
910  NEO 28.5736 21.3610 19.5549 15.8208  9.7230  4.9667  770321  800409            910
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911  /// ----------------------------------------------------------------------
912  *** PPJX11  1946123  576.3  580.9          810609   810506 FM0110
913  RAT         17.546            1.346  1A1   PU8231   EU0013
914  FAB
915  PIE  0.1301 22.5629  0.3953 76.9116 78.1332 19.1401  2.1051  0.5208
916  NEO 28.6574 21.4515 19.5793 15.7577  9.6684  4.8857  770321  800409
917  /// ----------------------------------------------------------------------
918  *** PPJX11  1991023  270.3  275.0          810609   810506 FM0120
919  RAT         17.354            2.280  1A1   PU8232   EU0014
920  FAB
921  PIE  0.1310 22.1498  0.5006 77.2186 77.7998 19.4174  2.1384  0.5325
922  NEO 28.5707 21.3743 19.5518 15.8162  9.7241  4.9630  770321  800409
923  /// ----------------------------------------------------------------------
924  *** NFJ1OH  1503022  270.0  274.7          810427   810420 U031
925  RAT          0.264            0.058  5A2                   BP
926  FAB
927  PIE  0.0022  0.2102  0.0051 99.7825 99.6828  0.3107  0.0002  0.0000
928  NEO 24.0916 20.9776 19.6585 17.8093 10.9211  5.5419          790226
929  /// ----------------------------------------------------------------------
930  *** NFJ1OH  1510042  270.0  275.0          810427   810420 U031
931  RAT          0.253            0.051  5A2                   BP
932  FAB
933  PIE  0.0026  0.2032  0.0042 99.7900 99.6773  0.3055  0.0108  0.0000
934  NEO 24.2512 21.0181 19.6652 17.7318 10.8645  6.4693          790226
935  /// ----------------------------------------------------------------------
936  *** NFJ1OH  1517022  270.0  274.8          810427   810420 U031
937  RAT          0.251            0.051  5A2                   BP
938  FAB
939  PIE  0.0013  0.1984  0.0042 99.7960 99.6963  0.2976  0.0015  0.0000
940  NEO 24.1606 20.9983 19.6439 17.7706 10.9067  6.5200          790226
941  /// ----------------------------------------------------------------------
942  *** NFJ04A  2508022  257.5  262.0          820312   820318 U040
943  RAT          0.381            0.028  6F1                   BP
944  FAB
945  PIE  0.0012  0.1963  0.0069 99.7956 99.1594  0.8260  0.0125  0.0002
946  NEO 25.6140 21.6371 19.4775 17.0360 10.3480  5.8338          800624
947  /// ----------------------------------------------------------------------
948  *** NFJ04A  2510042  256.0  260.5          820312   820318 U040
949  RAT          0.369            0.036  6F1                   BP
950  FAB
951  PIE  0.0018  0.1951  0.0060 99.7971 99.3037  0.6834  0.0081  0.0011
952  NEO 25.1457 21.4701 19.5205 17.2606 10.5129  6.0408          800624
953  /// ----------------------------------------------------------------------
954  *** NFJ04A  2512022  256.5  261.5          820312   820318 U040
955  RAT          0.416            0.049  6F1                   BP
956  FAB
957  PIE  0.0014  0.1953  0.0067 99.7966 99.3569  0.6340  0.0054  0.0004
958  NEO 24.8444 21.2534 19.5555 17.4264 10.6710  6.2222          800624
959  /// ----------------------------------------------------------------------
960  *** NFJM1S  310822   257.5  262.0          820312   820319 U080
961  RAT          0.483            0.065  6F4                   BP
962  FAB
963  PIE  0.0012  0.1950  0.0056 99.7982 99.3676  0.6273  0.0028  0.0003
964  NEO 24.3633 22.1985 19.2764 17.2911 10.5683  6.2383          801001
965  /// ----------------------------------------------------------------------
966  *** NFJM1S  310922   256.8  262.8          820312   820319 U080
967  RAT          0.524            0.081  6F4                   BP
968  FAB
969  PIE  0.0015  0.1938  0.0062 99.7985 99.3629  0.6270  0.0039  0.0005
970  NEO 24.0085 22.8192 19.0930 17.2469 10.5437  6.2180          801001
971  /// ----------------------------------------------------------------------
972  *** NFJM1S  311042   257.0  261.5          820312   820319 U080
973  RAT          0.529            0.097  6F4                   BP
974  FAB
975  PIE  0.0081  0.1933  0.0126 99.7861 99.3622  0.6294  0.0027  0.0003
976  NEO 24.5573 20.8699 19.6336 17.6541 10.8121  6.4028          801001
977  /// ----------------------------------------------------------------------
978  *** NFJM1S  311122   257.5  262.0          820312   820319 U080
979  RAT          0.567            0.123  6F4                   BP
980  FAB
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 981 PIE  0.0006  0.1932  0.0054 99.8008 99.3567  0.6278  0.0025  0.0012              981
 982 NEO 23.7127 23.2028 19.0419 17.1653 10.5340  6.2757          801001              982
 983 /// ------------------------------------------------------------------------    983
 984 *** NFJM1S  311242   257.5  263.0           820312   820319 U080                 984
 985 RAT          0.600           0.157  6F4                    BP                   985
 986 FAB                                                                            986
 987 PIE  0.0010  0.1934  0.0059 99.7997 99.3652  0.6171  0.0021  0.0009              987
 988 NEO 23.8133 22.3931 19.2448 17.3885 10.6764  6.3845          801001              988
 989 /// ------------------------------------------------------------------------    989
 990 *** NFJI0Q  330822   257.0  261.5           820316   820326 U010                 990
 991 RAT          0.277           0.035  5A1                    BP                   991
 992 FAB                                                                            992
 993 PIE  0.0011  0.1976  0.0048 99.7965 99.5903  0.4052  0.0024  0.0006              993
 994 NEO 24.0508 22.7725 19.2199 17.2141 10.5156  6.1902          790901              994
 995 /// ------------------------------------------------------------------------    995
 996 *** NFJI0Q  330922   256.5  261.0           820316   820326 U010                 996
 997 RAT          0.282           0.042  5A1                    BP                   997
 998 FAB                                                                            998
 999 PIE  0.0016  0.1985  0.0050 99.7949 99.5931  0.4018  0.0022  0.0001              999
1000 NEO 23.8580 22.7969 19.1910 17.2972 10.5438  6.2459          790901             1000
1001 /// ------------------------------------------------------------------------   1001
1002 *** NFJI0Q  331042   256.5  261.0           820316   820326 U010                1002
1003 RAT          0.293           0.052  5A1                    BP                  1003
1004 FAB                                                                           1004
1005 PIE  0.0100  0.1946  0.0046 99.7908 99.5893  0.4046  0.0025  0.0001             1005
1006 NEO 24.0503 22.0466 19.3908 17.4505 10.6945  6.3463          790901             1006
1007 /// ------------------------------------------------------------------------   1007
1008 *** NFJI0Q  331222   256.5  261.5           820316   820326 U010                1008
1009 RAT          0.325           0.080  5A1                    BP                  1009
1010 FAB                                                                           1010
1011 PIE  0.0009  0.1968  0.0048 99.7975 99.5889  0.4019  0.0028  0.0011             1011
1012 NEO 23.6331 22.5575 19.2330 17.4073 10.6984  6.4133          790901             1012
1013 /// ------------------------------------------------------------------------   1013
1014 *** NFJI0R  410322   257.4  262.6           820730   820804 U010                1014
1015 RAT          0.852           0.278  5C2                    BP                  1015
1016 FAB                                                                           1016
1017 PIE  0.0018  0.1884  0.0084 99.8014 99.0932  0.8831  0.0094  0.0008             1017
1018 NEO 23.6548 21.7330 19.1716 17.7837 10.8826  6.6672          810529             1018
1019 /// ------------------------------------------------------------------------   1019
1020 *** NFJI0R  410622   257.5  262.1           820730   820804 U010                1020
1021 RAT          0.803           0.219  5C2                    BP                  1021
1022 FAB                                                                           1022
1023 PIE  0.0042  0.1888  0.0099 99.7971 99.0926  0.8860  0.0102  0.0008             1023
1024 NEO 23.4639 23.1250 18.8619 17.2866 10.6420  6.4626          810529             1024
1025 /// ------------------------------------------------------------------------   1025
1026 *** NFJI0R  411022     7.2   11.9           820730   820804 U010                1026
1027 RAT          0.560           0.107  5C2                    BP                  1027
1028 FAB                                                                           1028
1029 PIE  0.0015  0.1939  0.0069 99.7977 99.2377  0.7466  0.0071  0.0035             1029
1030 NEO 22.7669 23.1596 17.8782 18.7646 10.3037  6.8093          810529             1030
1031 /// ------------------------------------------------------------------------   1031
1032 *** NFJI0R  411062   256.6  261.4           820730   820804 U010                1032
1033 RAT          0.765           0.184  5C2                    BP                  1033
1034 FAB                                                                           1034
1035 PIE  0.0020  0.1876  0.0068 99.8036 99.0985  0.8812  0.0089  0.0005             1035
1036 NEO 24.1655 21.1497 19.3228 17.7006 10.9025  6.6102          810529             1036
1037 /// ------------------------------------------------------------------------   1037
1038 *** NFJI0R  411082   567.1  572.6           820730   820804 U010                1038
1039 RAT          0.537           0.104  5C2                    BP                  1039
1040 FAB                                                                           1040
1041 PIE  0.0009  0.1923  0.0057 99.8011 99.2938  0.6941  0.0068  0.0008             1041
1042 NEO 23.0216 24.8997 18.3918 16.6966 10.2668  6.6028          810529             1042
1043 /// ------------------------------------------------------------------------   1043
1044 *** NFJI0R  411422   257.3  262.6           820730   820804 U010                1044
1045 RAT          0.736           0.148  5C2                    BP                  1045
1046 FAB                                                                           1046
1047 PIE  0.0034  0.1890  0.0096 99.7980 99.0989  0.8825  0.0094  0.0006             1047
1048 NEO 23.9828 22.7341 19.0920 17.2149 10.5484  6.2572          810529             1048
1049 /// ------------------------------------------------------------------------   1049
1050 *** NFJI0R  411722   257.3  262.4           820730   820804 U010                1050
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1051  RAT          0.717           0.127  5C2                      BP                1051
1052  FAB                                                                            1052
1053  PIE  0.0020  0.1904  0.0079 99.7997 99.0990  0.8847  0.0092  0.0006            1053
1054  NEO 23.9265 23.3256 18.9744 17.0677 10.4439  6.1735          810529            1054
1055  /// ----------------------------------------------------------------           1055
1056  *** NFJM18  441042   257.8  262.7           820730   820811 U070               1056
1057  RAT          0.666           0.101  6E6                      BP                1057
1058  FAB                                                                            1058
1059  PIE  0.0011  0.2299  0.0075 99.7616 99.0655  0.9194  0.0091  0.0002            1059
1060  NEO 24.5583 22.7037 19.1617 17.0677 10.4051  6.0545          810815            1060
1061  /// ----------------------------------------------------------------           1061
1062  *** NFJI11  571022     7.0   12.0           840611   840613 U010               1062
1063  RAT          0.566           0.086  5D1                      BP                1063
1064  FAB                                                                            1064
1065  PIE  0.0008  0.1911  0.0061 99.8020 99.2650  0.7262  0.0034  0.0000            1065
1066  NEO 23.8983 23.3505 19.0236 17.1223 10.4424  6.1629          820101            1066
1067  /// ----------------------------------------------------------------           1067
1068  *** NFJI11  571043   256.5  261.5           840611   840613 U010               1068
1069  RAT          0.808           0.174  5D1                      BP                1069
1070  FAB                                                                            1070
1071  PIE  0.0007  0.1867  0.0062 99.8064 99.1039  0.8815  0.0037  0.0000            1071
1072  NEO 22.2040 28.3112 17.7671 15.9786  9.8636  5.8755          820101            1072
1073  /// ----------------------------------------------------------------           1073
1074  *** NFJI11  571062   568.0  573.0           840611   840613 U010               1074
1075  RAT          0.551           0.091  5D1                      BP                1075
1076  FAB                                                                            1076
1077  PIE  0.0019  0.1923  0.0055 99.8003 99.3225  0.6674  0.0024  0.0000            1077
1078  NEO 23.9291 23.0398 19.0831 17.1607 10.5442  6.2431          820101            1078
1079  /// ----------------------------------------------------------------           1079
1080  *** NFJO4K  581022  -350.0 -345.0           840525   840525 U050               1080
1081  RAT          0.114           0.005  6D1                      BP                1081
1082  FAB                                                                            1082
1083  PIE  0.0017  0.2017  0.0047 99.7919 99.2939  0.6999  0.0039  0.0016            1083
1084  NEO 26.7279 23.3828 19.3196 16.1071  9.5439  4.9186          820101            1084
1085  /// ----------------------------------------------------------------           1085
1086  *** NFJO4K  581042    20.5   25.0           840525   840525 U050               1086
1087  RAT          0.463           0.045  6D1                      BP                1087
1088  FAB                                                                            1088
1089  PIE  0.0012  0.1950  0.0060 99.7978 99.2944  0.6999  0.0033  0.0004            1089
1090  NEO 24.9074 22.1629 19.3334 17.1057 10.4273  6.0342          820101            1090
1091  /// ----------------------------------------------------------------           1091
1092  *** NFJO4K  581063   270.0  275.0           840525   840525 U050               1092
1093  RAT          0.611           0.077  6D1                      BP                1093
1094  FAB                                                                            1094
1095  PIE  0.0010  0.1899  0.0057 99.8034 99.1150  0.8773  0.0043  0.0000            1095
1096  NEO 23.5490 25.5519 18.4026 16.4403 10.0918  5.9644          820101            1096
1097  /// ----------------------------------------------------------------           1097
1098  *** NFJO4K  581082   580.5  585.0           840525   840525 U050               1098
1099  RAT          0.426           0.040  6D1                      BP                1099
1100  FAB                                                                            1100
1101  PIE  0.0018  0.1957  0.0054 99.7971 99.3606  0.6343  0.0019  0.0000            1101
1102  NEO 24.4099 23.2644 19.0241 16.9084 10.3586  6.0346          820101            1102
1103  /// ----------------------------------------------------------------           1103
1104  *** NFJO4K  5810A2   945.5  950.0           840525   840525 U050               1104
1105  RAT          0.090           0.004  6D1                      BP                1105
1106  FAB                                                                            1106
1107  PIE  0.0011  0.1990  0.0029 99.7970 99.7651  0.2280  0.0035  0.0000            1107
1108  NEO 26.4725 23.4567 19.1998 16.2636  9.5720  4.9759          820101            1108
1109  /// ----------------------------------------------------------------           1109
1110  *** NFJO4K  581923   270.0  275.0           840525   840525 U050               1110
1111  RAT          0.724           0.106  6D1                      BP                1111
1112  FAB                                                                            1112
1113  PIE  0.0023  0.1927  0.0071 99.7979 99.0456  0.9429  0.0062  0.0000            1113
1114  NEO 23.8668 22.8501 18.7735 17.3957 10.7537  6.3602          820101            1114
1115  /// ----------------------------------------------------------------           1115
1116  *** NFJO64  561022     7.5   12.5           840702   840619 U070               1116
1117  RAT          0.298           0.019  7D1                      BP                1117
1118  FAB                                                                            1118
1119  PIE  0.0001  0.1983  0.0037 99.7979 99.4498  0.5442  0.0023  0.0000            1119
1120  NEO 25.0745 23.8225 18.9933 16.5212 10.0010  5.5874          820101            1120
      ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
```

*** CONTINUE ***

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 NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
1121  ///  ------------------------------------------------------------------------  1121
1122  *** NFJ064  561043   257.0  262.0           840702   840619 U070               1122
1123  RAT          0.431           0.033  7D1                    BP                 1123
1124  FAB                                                                            1124
1125  PIE  0.0012  0.1948  0.0049 99.7991 99.2866  0.7050  0.0040  0.0000           1125
1126  NEO 24.5564 24.6175 18.7683 16.4057  9.9959  5.6562          820101           1126
1127  ///  ------------------------------------------------------------------------  1127
1128  *** NFJ064  561062   567.0  572.0           840702   840619 U070               1128
1129  RAT          0.306           0.021  7D1                    BP                 1129
1130  FAB                                                                            1130
1131  PIE  0.0012  0.2373  0.0044 99.7571 99.4756  0.5220  0.0015  0.0000           1131
1132  NEO 25.2143 23.8182 19.0030 16.5164  9.9378  5.5104          820101           1132
1133  ///  ------------------------------------------------------------------------  1133
1134  *** NFJ064  561923   257.0  262.0           840702   840619 U070               1134
1135  RAT          0.527           0.046  7D1                    BP                 1135
1136  FAB                                                                            1136
1137  PIE  0.0020  0.1960  0.0066 99.7954 99.2150  0.7785  0.0039  0.0000           1137
1138  NEO 24.8479 23.1782 19.0846 16.7865 10.2386  5.8641          820101           1138
1139  ///  ------------------------------------------------------------------------  1139
1140  *** NFJ05L  541022     7.0   12.0           840711   840706 U070               1140
1141  RAT          0.195           0.010  8D1                    BP                 1141
1142  FAB                                                                            1142
1143  PIE  0.0005  0.2008  0.0041 99.7946 99.5415  0.4559  0.0022  0.0000           1143
1144  NEO 24.7977 25.8751 18.3333 16.0646  9.5828  5.3466          820101           1144
1145  ///  ------------------------------------------------------------------------  1145
1146  *** NFJ05L  541043   256.5  261.5           840711   840706 U070               1146
1147  RAT          0.279           0.016  8D1                    BP                 1147
1148  FAB                                                                            1148
1149  PIE  0.0011  0.1981  0.0041 99.7967 99.4070  0.5878  0.0041  0.0000           1149
1150  NEO 25.0543 24.1847 18.6383 16.6647  9.8763  5.5817          820101           1150
1151  ///  ------------------------------------------------------------------------  1151
1152  *** NFJ05L  541062   568.0  573.0           840711   840706 U070               1152
1153  RAT          0.192           0.010  8D1                    BP                 1153
1154  FAB                                                                            1154
1155  PIE  0.0013  0.1999  0.0035 99.7953 99.5491  0.4465  0.0037  0.0000           1155
1156  NEO 24.3399 27.2023 18.0203 15.8687  9.4113  5.1571          820101           1156
1157  ///  ------------------------------------------------------------------------  1157
1158  *** NFJ05L  541923   257.0  262.0           840711   840706 U070               1158
1159  RAT          0.338           0.022  8D1                    BP                 1159
1160  FAB                                                                            1160
1161  PIE  0.0006  0.1979  0.0044 99.7971 99.3644  0.6283  0.0055  0.0009           1161
1162  NEO 25.4037 23.2345 19.1826 16.5601 10.0167  5.5726          820101           1162
1163  ///  ------------------------------------------------------------------------  1163
1164  *** NFJIOU  740822   269.3  274.0           850418   850416 U010               1164
1165  RAT          0.807           0.139  5E1                    BP                 1165
1166  FAB                                                                            1166
1167  PIE  0.0017  0.1876  0.0062 99.8045 99.0349  0.9516  0.0051  0.0022           1167
1168  NEO 24.1080 22.9051 19.0623 17.1260 10.5149  6.2236          820101           1168
1169  ///  ------------------------------------------------------------------------  1169
1170  *** NFJIOU  741022   269.2  273.0           850418   850416 U010               1170
1171  RAT          0.908           0.202  5E1                    BP                 1171
1172  FAB                                                                            1172
1173  PIE  0.0014  0.1851  0.0067 99.8068 99.0127  0.9600  0.0077  0.0062           1173
1174  NEO 23.9502 22.8287 19.0806 17.2107 10.5730  6.2959          820101           1174
1175  ///  ------------------------------------------------------------------------  1175
1176  *** NFJIOU  741222   268.6  272.9           850418   850416 U010               1176
1177  RAT          0.949           0.283  5E1                    BP                 1177
1178  FAB                                                                            1178
1179  PIE  0.0013  0.1859  0.0070 99.8058 99.0411  0.9289  0.0040  0.0039           1179
1180  NEO 23.9024 22.9175 19.0882 17.2345 10.5534  6.3039          820101           1180
1181  END  ------------------------------------------------------------------------  1181
      ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
```

*** DATA-LIST END ***

付録2．1 ＰＩＥデータ整理手法の検討（その１）

PIEデータを整理する上で次の事項を評価した。

① 燃焼率に対する同位体組成の変化率の初期組成依存性 (炉心燃料部)

② 燃焼率に対する同位体組成の変化率の試料位置依存性 (炉心燃料部)

検討の結果、次の結論を得た。

- 初期組成依存性は大きく、同位体組成の変化率は、初期同位体組成に強く依存するため、各ロットごとに分類し変化率を求めなければならない。
- 試料位置依存性により、炉心燃料領域を次の三つのグループに分類する必要がある。Ⓐ 0列から4列までの炉心中心面領域、Ⓑ 軸ブランケット近傍領域、Ⓒ 径ブランケット近傍領域

検討の詳細を以下に示す。

1. 初期組成依存性

評価方法

異なる2種類の初期同位体組成で、燃焼計算を行なった。特にプルトニウムの組成比にばらつきがあるため、プルトニウム同位体組成を変えて評価した。各ケースの初期同位体組成比を付表2.1に示す。プルトニウム含有率およびウラン同位体組成は一定とする。

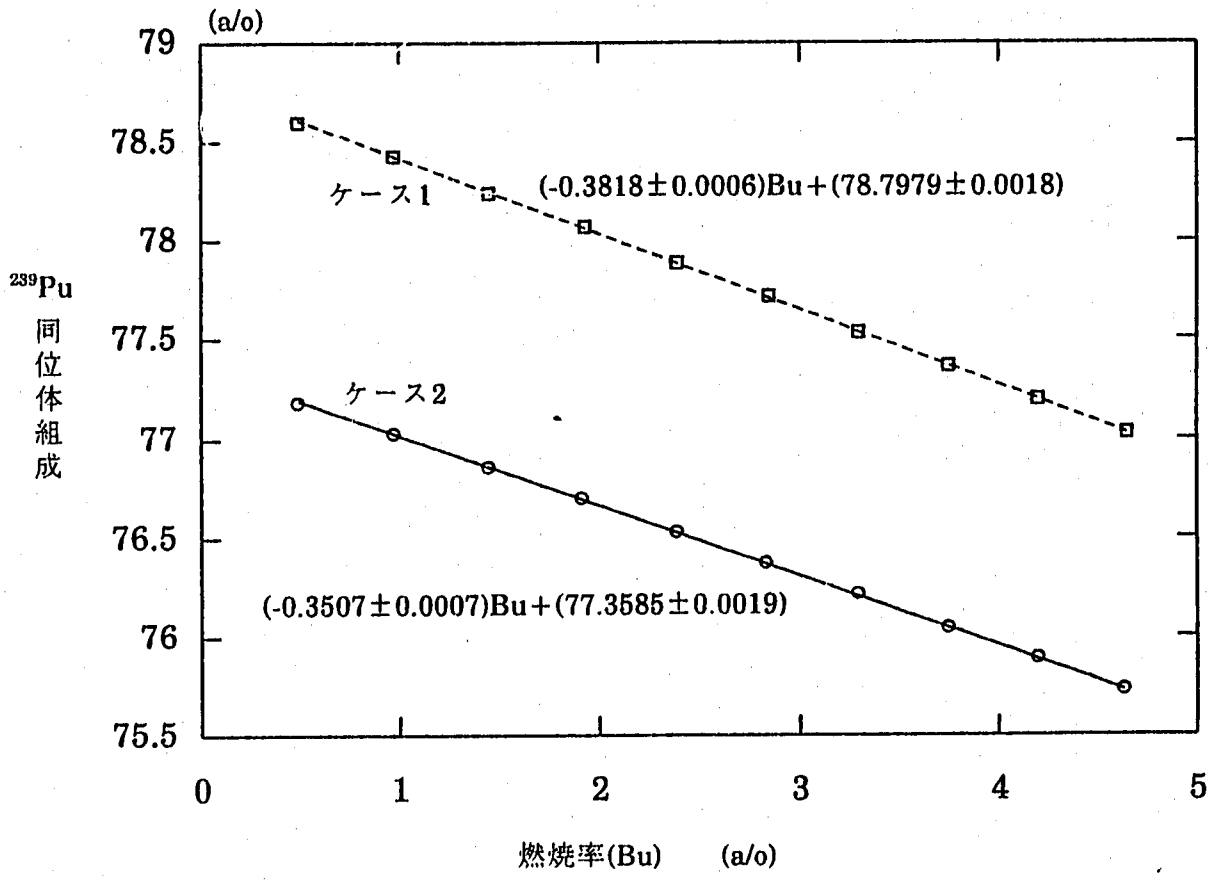
付表2.1 同位体組成　　単位：a/o

核種	^{239}Pu	^{240}Pu	^{241}Pu	^{242}Pu	^{235}U	^{238}U
ケース1	78.7871	18.6325	1.9820	0.5985	23.2169	76.7831
ケース2	77.3467	19.4991	2.6011	0.5531	23.2169	76.7831

計算は、ミクロ断面積と中性子束は、両方とも同じものを使用して燃焼計算を行った。

結果

計算結果を、付図2.1に示す。図より、　初期同位体組成2%の変化により、燃焼率に対する^{239}Pu同位体組成の変化率(傾き)は9%も異なることがわかった。したがって、同位体組成の変化率は、初期同位体組成に強く依存するため、各ロットごとに分類し変化率を求めなければならない。



付図2.1 燃焼率と同位体組成の関係

2. 試料位置依存性

評価方法

試料位置として、付図2.2に示すように炉心燃料領域を次の三つのグループに分類し、それぞれの領域での^{239}Pu同位体組成の変化を比較した。

Ⓐ 0層から4層までの炉心中心面領域

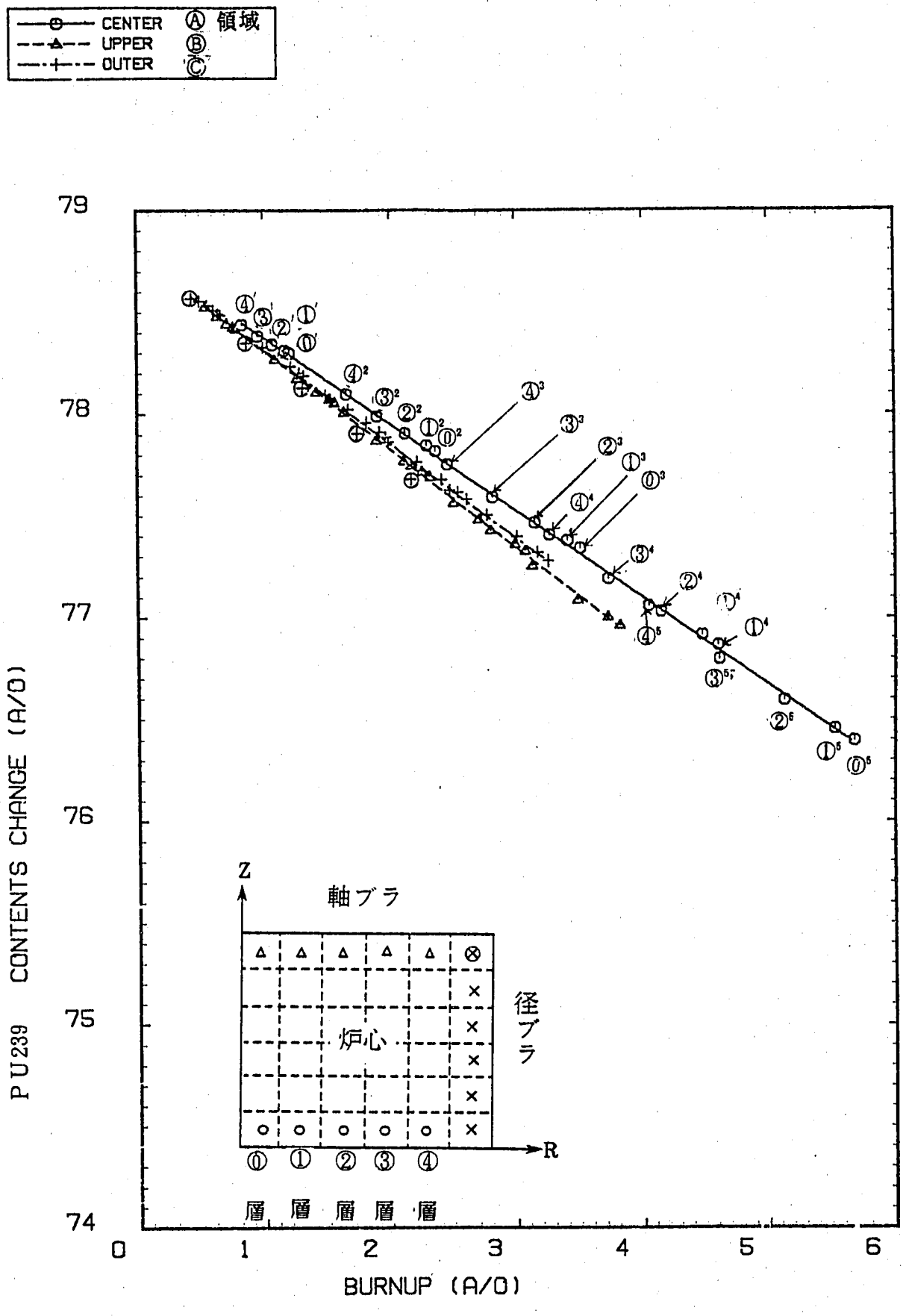
Ⓑ 軸ブランケット近傍領域

Ⓒ 径ブランケット近傍領域

結果

燃焼率と同位体組成の変化との関係を各領域ごとにまとめて付図2.2に示す。この図より、上記三つのグループに分類することにより、1次式によるフィッティングが可能となる。

また、Ⓐ領域の○数字は層数を表し、肩文字は燃焼サイクル数を表している。これより、詳細にみると、Ⓐ領域においても、0層と1層、2層と3層、4層、の三つのグループに別れることがわかる。さらに、同一燃焼サイクルのデータのみでグループし、1次式にフィッティングすると異なる結果が得られることが予測される。



付図2.2 PU-239 CONTENTS CHANGE IN CORE FUEL

付録2．2 ＰＩＥデータ整理手法の検討（その２）

PIEデータにより、Pu239の減少率の予測可能性について評価した。

以下の検討の結果、Pu239の減少率の予測誤差は同位体組成比の約3倍の3%と大きいことがわかった。

評価方法

PIEデータにより、Pu239の減少率は以下の様に表すことがわかる。

$$\frac{\Delta N(^{239}Pu)}{N_0(^{239}Pu)} = (A - A_0) \times \frac{1}{A_0}$$

$$\text{ここで、} A = \frac{Pu}{Pu+U} \times \left(1 - \frac{\text{燃焼率}}{100}\right) \times \frac{^{239}Pu}{Pu}$$

$$A_0 = \left(\frac{Pu}{Pu+U}\right)_0 \times \left(\frac{^{239}Pu}{Pu}\right)_0$$

PU8231ロットを含むFM0110のペレットのPIEデータについて、^{239}Puの同位体組成比とPu含有率より上記A(^{239}Puの含有率)を求めた。これを付表2.2に示す。燃焼率と^{239}Puの含有率(A)との関係を付図2.3に示す。これより、Aの初期値　A_0=0.1360が得られた。

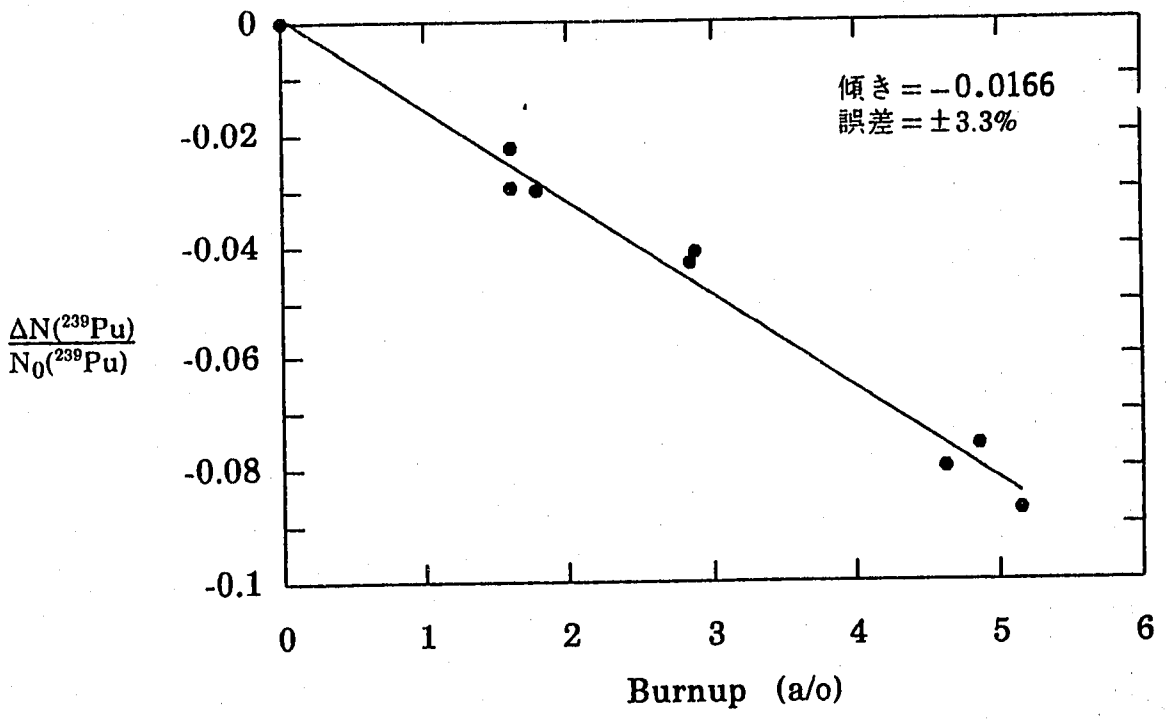
付表2.2　^{239}Puの同位体組成比とPu含有率および^{239}Puの含有率

燃焼率 (a/o)	^{239}Pu/Pu (a/o)	Pu/(Pu+U) (a/o)	^{239}Pu/(Pu+U) (a/o)
4.860	76.8755	17.182	0.1257
5.150	76.7611	17.051	0.1241
4.630	76.8913	17.061	0.1251
2.900	77.4852	17.338	0.1304
2.860	77.5041	17.278	0.1301
1.600	77.9693	17.324	0.1329
1.780	77.8985	17.233	0.1319
1.600	77.9806	17.204	0.1320

^{239}Puの初期含有率より、各データの^{239}Puの減少量を求め、付表2.3に示す。また、燃焼率に対する^{239}Puの減少量の関係を付図2.3に示す。この図より、燃焼率に対する^{239}Puの減少率のフィッティングの誤差は3%程度であった。燃焼率に対する^{239}Puの同位体組成比のフィッティング誤差は1%であることから、減少率についてはその約3倍の誤差が生じることがわかる。

付表2.3 燃焼率と^{239}Puの減少量

燃焼率 (a/o)	$\frac{N(^{239}Pu)}{N(Pu+U)}$	$\frac{\Delta N(^{239}Pu)}{N_0(Pu+U)}$	$\frac{\Delta N(^{239}Pu)}{N_0(^{239}Pu)}$
4.860	0.1257	-0.0103	-0.0757
5.150	0.1241	-0.0119	-0.0875
4.630	0.1251	-0.0109	-0.0801
2.900	0.1304	-0.0056	-0.0412
2.860	0.1301	-0.0059	-0.0434
1.600	0.1329	-0.0031	-0.0228
1.780	0.1319	-0.0041	-0.0301
1.600	0.1320	-0.0040	-0.0294



付図2.3 燃焼率に対する^{239}Puの減少率

付録3. ＰＩＥデータ整理プログラム

PIEデータを整理するために、つぎのプログラムを作成した。

① APPLE変換プログラム

② 粉末ロット検索プログラム

③ 誤差評価プログラム

各々のプログラムの簡易マニュアルを次に示す。

付録3.1　ＡＰＰＬＥ変換プログラム

PIEデータファイルから各ロットごとの燃焼率に対する同位体組成およびプルトニウム含有率との相関図を出力するプログラムを作成した。

$^{241}Pu/Pu$を、取出日に換算してからPuの総和を100%に規格化する。

データセットは、**PA30E.JOYO.FORT**に収納してある。メンバー名を付表3.1.1に示す。
プログラムソース例を付表3.1.2に示す。

プログラムの実行方法は、**PA30E.ISL.CLIST(JOYO)**を起動する。
出力は、**FT07F001**で、**FORMAT**は**APPLE**に合わせた。

付表3.1.1　プログラム名一覧

メンバー名	用途
PU238	^{238}Pu同位体組成の変化率評価(炉心部)
DB239	^{239}Pu同位体組成の変化率評価(　〃　)
DB240	^{240}Pu同位体組成の変化率評価(　〃　)
DB241	^{241}Pu同位体組成の変化率評価(　〃　)
DB242	^{242}Pu同位体組成の変化率評価(　〃　)
DB235	^{235}U同位体組成の変化率評価(　〃　)
DB236	^{236}U同位体組成の変化率評価(　〃　)
DB238	^{238}U同位体組成の変化率評価(　〃　)
DBPUE	プルトニウム含有率の変化率評価(炉心部)
DBPUEA	プルトニウム含有率の変化率評価(軸ブランケット部)
DBPUER	プルトニウム含有率の変化率評価(径ブランケット部)

付表3.1.2 プログラムリスト

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TIME 15:53:08
PAGE 1

DATA SET : PA30E.JOYO.FORT(DB239)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
1   C                                                                      00010006   1
2         CHARACTER*2 BP(500),OMIT(500)                                    00020006   2
3         CHARACTER*3 AAA                                                  00030006   3
4         CHARACTER*7 NOPIE(500)                                           00040008   4
5         CHARACTER*6 FABNO(500),NAMET(7)                                  00050006   5
6         CHARACTER*7 ALOT(500)                                            00060006   6
7         CHARACTER*9 PULOT(500)                                           00070006   7
8         CHARACTER*8 EULOT(500)                                           00080006   8
9         REAL        AE234(500),AE235(500),AE236(500),AE238(500),         00090006   9
10       >            AE239(500),AE240(500),AE241(500),AE242(500)          00100006   10
11        REAL        ZPOS1(500),ZPOS2(500),BSM(500),PUE(500),HDATE(500),  00110010   11
12       >            CYCLE(500)                                           00111010   12
13        INTEGER LAY(500)                                                 00120006   13
14  C                                                                      00130006   14
15  C     REAL         PU(3,500,14)/4200*0.0/                              00140006   15
16        DATA NAMET/'PU-239','PU-240','PU-241','PU-242',                  00150006   16
17       >           'U-235 ','U-236 ','U-238 '/                          00160006   17
18  C                                                                      00170006   18
19        CHARACTER*9 PULOTT(22)/                                          00180006   19
20       >  'PU8230   ','PU8231   ','PU8231/2 ','PU8232   ','PU8243   ',   00190009   20
21       >  'PU8243/4 ','PU8243/93','PU8244   ','PU8245   ','PU8251   ',   00200009   21
22       >  'PU8251/44','PU8252   ','PU8253   ','PU8255   ','PUJ001   ',   00210006   22
23       >  'PUJ001/2 ','PUXXX    ','         ','         ','         ',   00220009   23
24       >  '         ','         ' /                                      00230006   24
25  C                                                                      00400006   25
26        READ(1,1)                                                        00410006   26
27        READ(1,1)                                                        00420006   27
28        READ(1,1)                                                        00430006   28
29        READ(1,1)                                                        00440006   29
30        READ(1,1)                                                        00450006   30
31  C                                                                      00460006   31
32        IC=1                                                             00470006   32
33     10 READ(1,15) FABNO(IC),NOPIE(IC),ZPOS1(IC),ZPOS2(IC),              00480006   33
34       >           BU,HDATE(IC),DDATE,ALOT(IC)                          00490006   34
35        READ(1,17) PURATS,PUE(IC),RNDBTU,BSM(IC),LAY(IC),J,K,            00500006   35
36       >           PULOT(IC),EULOT(IC),BP(IC),OMIT(IC)                  00510006   36
37        READ(1,16) AS234,AS235,AS236,AS238,AS239,AS240,AS241,AS242       00520006   37
38        READ(1,16) AE234(IC),AE235(IC),AE236(IC),AE238(IC),              00530006   38
39       >           AE239(IC),AE240(IC),AE241(IC),AE242(IC)              00540006   39
40        READ(1,16) AD143,AD144,AD145,AD146,AD148,AD150,CYCLS,CYCLE(IC)   00550010   40
41  C                                                                      00560006   41
42  C     WRITE(6,1000) FABNO(IC),NOPIE(IC),ALOT(IC),                      00570014   42
43  C    >      ZPOS1(IC),ZPOS2(IC),BSM(IC),PUE(IC),BP(IC),OMIT(IC),       00580014   43
44  C    >      INT(HDATE(IC))                                             00590014   44
45  C     WRITE(6,1010) EULOT(IC),AE234(IC),AE235(IC),AE236(IC),AE238(IC), 00600014   45
46  C    >             PULOT(IC),AE239(IC),AE240(IC),AE241(IC),AE242(IC)   00610014   46
47        PU238=100-(AE239(IC)+AE240(IC)+AE241(IC)+AE242(IC))              00611010   47
48        CALL CALSEC(HDATE(IC),CYCLE(IC),SEC)                             00620010   48
49        AE241(IC)=AE241(IC)*EXP(-1.5306E-9*SEC)                          00630012   49
50  C     WRITE(6,1020) AE239(IC),AE240(IC),AE241(IC),AE242(IC)            00640011   50
51        AS=PU238+AE239(IC)+AE240(IC)+AE241(IC)+AE242(IC)                 00650010   51
52        AE239(IC)=AE239(IC)/AS*100.                                      00660006   52
53        AE240(IC)=AE240(IC)/AS*100.                                      00670006   53
54        AE241(IC)=AE241(IC)/AS*100.                                      00680006   54
55        AE242(IC)=AE242(IC)/AS*100.                                      00690006   55
56  C     WRITE(6,1020) AE239(IC),AE240(IC),AE241(IC),AE242(IC),CYCLE(IC)  00700014   56
57   1000 FORMAT(/1H ,A6,2X,A4,2X,A7,1X,2F10.1,F10.3,F10.3,2X,A2,2X,A2,I9) 00710006   57
58   1010 FORMAT(1H ,14X,A8,4F10.4)                                        00720006   58
59   1020 FORMAT(1H ,14X,8X,4F10.4,8X,4X,A8)                               00730011   59
60        READ(1,18) AAA                                                   00740006   60
61        IF(AAA.NE.'END') THEN                                            00750006   61
62          IC=IC+1                                                        00760006   62
63          GOTO 10                                                        00770006   63
64        ENDIF                                                            00780006   64
65  C                                                                      00790006   65
66     104 FORMAT(A6,' CONTENT CHANGE IN CORE FUEL')                       00840006   66
67     106 FORMAT(1H ,A6,' CONTENT CHANGE IN CORE FUEL')                   00841008   67
68     105 FORMAT('BURNUP(A/O)'/A6,' CONTENT(A/O)'/'1   7   -6   -5   1'/  00850015   68
69        >       '0.0 6.0 75.0 -80.0')                                    00860006   69
70        DO 30 J=1,17                                                     00870009   70
71          IF(MOD(J,12).EQ.1) THEN                                        00870107   71
72          WRITE(7,104) NAMET(1)                                          00871007   72
73           WRITE(6,106) NAMET(1)                                         00871108   73
74          WRITE(7,105) NAMET(1)                                          00872007   74
75          ENDIF                                                          00873007   75
76          WRITE(7,2010) PULOTT(J)                                        00880006   76
77          WRITE(6,2011) PULOTT(J)                                        00881008   77
78          DO 20 I=1,IC                                                   00890006   78
79            IF(BP(I).EQ.'BP' .OR. OMIT(I).EQ.'XX' ) GOTO 20              00900006   79
80            IF(ZPOS1(I).GT.600. .OR. ZPOS2(I).LT.0.0 ) GOTO 20           00910006   80
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8

   *** CONTINUE ***
```

DATE 90. 3.26
TIME 15:53:08
PAGE 2

DATA SET : PA30E.JOYO.FORT(DB239)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
          IF(PULOT(I).NE.PULOTT(J)) GOTO 20                                  00920006   81
          IF(ZPOS1(I).GT.550. .OR. ZPOS2(I).LT.50.0 .OR.                     00930006   82
     >       LAY(I).GE.5 )                                 THEN              00940006   83
            WRITE(7,2021) BSM(I),AE239(I)                                    00950006   84
            WRITE(6,2023) BSM(I),AE239(I),FABNO(I),NOPIE(I)                  00951008   85
          ELSE                                                               00960006   86
            IF(FABNO(I).EQ.'PPJD25' .OR. FABNO(I).EQ.'PPJD04') THEN          00970016   87
              WRITE(7,2021) BSM(I),AE239(I)                                  00981016   88
              WRITE(6,2023) BSM(I),AE239(I),FABNO(I),NOPIE(I)                00982016   89
            ELSE                                                             00983016   90
              WRITE(7,2020) BSM(I),AE239(I)                                  00984016   91
              WRITE(6,2022) BSM(I),AE239(I),FABNO(I),NOPIE(I)                00985016   92
            ENDIF                                                            00986016   93
          ENDIF                                                              00987016   94
   20   CONTINUE                                                            00990006   95
        WRITE(7,2030) 'DEND'                                                 01000006   96
        WRITE(6,2031) 'DEND'                                                 01000108   97
        IF(MOD(J,12).EQ.0) WRITE(7,2030) 'LEND'                              01001007   98
        IF(MOD(J,12).EQ.0) WRITE(6,2031) 'LEND'                              01002008   99
   30 CONTINUE                                                               01010006  100
      WRITE(7,2030) 'LEND'                                                   01020006  101
      WRITE(6,2031) 'LEND'                                                   01021008  102
 2010 FORMAT(A9,9X,' 1')                                                     01030006  103
 2020 FORMAT(10X,F10.3,F10.4)                                                01040006  104
 2021 FORMAT('*',9X,F10.3,F10.4)                                             01050006  105
 2030 FORMAT(A4)                                                             01060006  106
 2011 FORMAT(1H ,A9,9X,' 1')                                                 01061008  107
 2022 FORMAT(1H ,10X,F10.3,F10.4,2A12)                                       01062008  108
 2023 FORMAT(1H ,'*',9X,F10.3,F10.4,2A12)                                    01063008  109
 2031 FORMAT(1H ,A4)                                                         01064008  110
      STOP                                                                   01070006  111
    1 FORMAT(A2)                                                             01080006  112
   15 FORMAT(4X,A6,2X,A7,1X,2F8.0,F7.0,F8.1,1X,F8.1,A7)                      01090008  113
   16 FORMAT(3X,8F8.0)                                                       01100006  114
   17 FORMAT(3X,4F8.0,2(1X,I1),2X,I2,1X,A9,A8,A2,2X,A2)                      01110006  115
   18 FORMAT(A3)                                                             01120006  116
      END                                                                    01130006  117
C-----------------------------------------------------------------------    01140006  118
      SUBROUTINE CALSEC(DATE,ADATE,SEC)                                      01150010  119
                                                                             01160006  120
C                                                                            01170006  121
      INTEGER MONTH(12)/31,28,31,30,31,30,31,31,30,31,30,31/                 01180006  122
C                                                                            01190006  123
      IDY=INT(DATE/10000)                                                    01200006  124
      IDM=INT(DATE/100)-IDY*100                                              01210006  125
      IDD=INT(DATE)-IDY*10000-IDM*100                                        01220006  126
C                                                                            01221010  127
      JDY=INT(ADATE/10000)                                                   01222010  128
      JDM=INT(ADATE/100)-JDY*100                                             01223010  129
      JDD=INT(ADATE)-JDY*10000-JDM*100                                       01224010  130
C                                                                            01230010  131
      IA=JDY*365+JDD                                                         01250010  132
      DO 10 J=1,JDM-1                                                        01260010  133
   10 IA=IA+MONTH(J)                                                         01280006  134
C                                                                            01281010  135
      IB=IDY*365+IDD                                                         01282010  136
      DO 20 J=1,IDM-1                                                        01283010  137
   20 IB=IB+MONTH(J)                                                         01284010  138
C                                                                            01285010  139
      IDAY=IA-IB                                                             01300006  140
C                                                                            01310010  141
      SEC=IDAY*24*3600                                                       01320006  142
      RETURN                                                                 01330006  143
      END
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** DATA-LIST END ***

付録3.2 粉末ロット検索プログラム

入力したプルトニウムおよびウラン粉末ロット名により、PIEデータファイルの検索を行うプログラムを作成した。

データセットは、**PA30E.JOYO.FORT(SCHLOT)**に収納してある。プログラムソースを付表3.2.1に示す。

プログラムの実行方法は、**PA30E.ISL.CLIST(SCHLOT)**を起動する。

付録3.2.1 プログラムリスト

```
                                                                    DATE 90-03-26
                                                                    TIME 15:46:05
                DATA SET : PA3OE.JOYO.FORT(SCHLOT)                  PAGE    1

NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  1  C                                                              00010000    1
  2  C     FTO7F001 : PIE DATABASE                                  00020000    2
  3  C                                                              00030000    3
  4  C                                                              00040000    4
  5        CHARACTER   AAA*3,PULOT*8,EULOT*8,BP*2,OMIT*2            00050000    5
  6        CHARACTER   FABNO*6,NOPIE*4,ALOT*7                       00060000    6
  7        CHARACTER   PU*4,LOT*8                                   00070000    7
  8  C                                                              00080000    8
  9        CALL PROMPT(2,'"PU  " OR "U   " =',IR1,IR1)              00081001    9
 10        READ(5,5000) PU                                          00090001   10
 11        CALL PROMPT(2,'   LOT NAME      =',IR1,IR1)             00090101   11
 12        READ(5,5010) LOT                                         00091001   12
 13        WRITE(6,5000) ' ** ',LOT                                 00100000   13
 14   5000 FORMAT(A4,A8)                                            00110000   14
 15   5010 FORMAT(A8)                                               00111001   15
 16  C                                                              00120000   16
 17        READ(7,1)                                                00130000   17
 18        READ(7,1)                                                00140000   18
 19        READ(7,1)                                                00150000   19
 20        READ(7,1)                                                00160000   20
 21        READ(7,1)                                                00170000   21
 22  C                                                              00180000   22
 23        ICNT=1                                                   00190000   23
 24     10 READ(7,15) FABNO,NOPIE,ZPOS1,ZPOS2,BSM,HDATE,DDATE,ALOT  00200000   24
 25        READ(7,17) PURATS,PUE,RND8TU,BU,I,A,J,K,PULOT,EULOT,BP,OMIT 00210000 25
 26        READ(7,16) AS234,AS235,AS236,AS238,AS239,AS240,AS241,AS242 00220000 26
 27        READ(7,16) AE234,AE235,AE236,AE238,AE239,AE240,AE241,AE242 00230000 27
 28        READ(7,16) AD143,AD144,AD145,AD146,AD148,AD150,CYCLS,CYCLE 00240000 28
 29  C                                                              00241002   29
 30        IF(BP.EQ.'BP')      GOTO 20                              00242002   30
 31        IF(ZPOS1.GE.550.0) GOTO 20                               00243002   31
 32        IF(ZPOS2.LE. 50.0) GOTO 20                               00244002   32
 33  C                                                              00244102   33
 34        PU238=100-(AE239+AE240+AE241+AE242)                      00244202   34
 35        CALL CALSEC(HDATE,CYCLE,SEC)                             00244302   35
 36        AE241=AE241*EXP(-1.5306E-9*SEC)                          00244402   36
 37        AS=PU238+AE239+AE240+AE241+AE242                         00244602   37
 38        AE239=AE239/AS*100.                                      00244702   38
 39        AE240=AE240/AS*100.                                      00244802   39
 40        AE241=AE241/AS*100.                                      00244902   40
 41        AE242=AE242/AS*100.                                      00245002   41
 42  C                                                              00245102   42
 43        IF(PU.EQ.'U   ' .AND. EULOT.EQ.LOT) THEN                 00251002   43
 44                WRITE(6,6000) FABNO,NOPIE(3:4),I,A,J,ZPOS1,ZPOS2,BU, 00260002 44
 45       >                      AE235,AE236,AE238                 00261002   45
 46                LCNT=LCNT+1                                      00270000   46
 47        ENDIF                                                    00280000   47
 48        IF(PU.EQ.'PU  ' .AND. PULOT.EQ.LOT) THEN                 00290000   48
 49                WRITE(6,6000) FABNO,NOPIE(3:4),I,A,J,ZPOS1,ZPOS2,BU, 00300002 49
 50       >                      AE239,AE240,AE242                 00301003   50
 51                LCNT=LCNT+1                                      00310000   51
 52        ENDIF                                                    00320000   52
 53   6000 FORMAT(2X,A6,2X,A2,2X,I1,A1,I1,1X,2F6.1,F8.4,3F9.4)      00330002   53
 54     20 READ(7,18) AAA                                          00340002   54
 55        IF(AAA.NE.'END') THEN                                    00350000   55
 56          ICNT=ICNT+1                                            00360000   56
 57          GOTO 10                                                00370000   57
 58        ENDIF                                                    00380000   58
 59        WRITE(6,6010) LCNT                                       00390000   59
 60   6010 FORMAT(' DATA END      ',I3,' POINT')                    00400000   60
 61        STOP                                                     00410000   61
 62      1 FORMAT(A2)                                               00420000   62
 63     15 FORMAT(4X,A6,2X,A4,4X,2F8.0,F7.0,F8.1,1X,F8.1,A7)        00430000   63
 64     16 FORMAT(3X,8F8.0)                                        00440000   64
 65     17 FORMAT(3X,4F8.0,1X,I1,A1,I1,2X,I2,2(1X,A8),A2,2X,A2)    00450000   65
 66     18 FORMAT(A3)                                              00460000   66
 67        END                                                      00470000   67
 68  C-------------------------------------------------------------00480002   68
 69        SUBROUTINE CALSEC(DATE,ADATE,SEC)                        00490002   69
 70  C                                                              00500002   70
     ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

        *** CONTINUE ***
```

DATE 90-03-26
TIME 15:46:05
PAGE 2

DATA SET : PA30E.JOYO.FORT(SCHLOT)

```
NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 71          INTEGER MONTH(12)/31,28,31,30,31,30,31,31,30,31,30,31/          00510002   71
 72    C                                                                     00520002   72
 73          IDY=INT(DATE/10000)                                             00530002   73
 74          IDM=INT(DATE/100)-IDY*100                                       00540002   74
 75          IDD=INT(DATE)-IDY*10000-IDM*100                                 00550002   75
 76    C                                                                     00560002   76
 77          JDY=INT(ADATE/10000)                                            00570002   77
 78          JDM=INT(ADATE/100)-JDY*100                                      00580002   78
 79          JDD=INT(ADATE)-JDY*10000-JDM*100                                00590002   79
 80    C                                                                     00600002   80
 81          IA=JDY*365+JDD                                                  00610002   81
 82          DO 10 J=1,JDM-1                                                 00620002   82
 83       10 IA=IA+MONTH(J)                                                  00630002   83
 84    C                                                                     00640002   84
 85          IB=IDY*365+IDD                                                  00650002   85
 86          DO 20 J=1,IDM-1                                                 00660002   86
 87       20 IB=IB+MONTH(J)                                                  00670002   87
 88    C                                                                     00680002   88
 89          IDAY=IA-IB                                                      00690002   89
 90    C                                                                     00700002   90
 91          SEC=IDAY*24*3600                                                00710002   91
 92          RETURN                                                          00720002   92
 93          END                                                             00730002   93
     ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

        *** DATA-LIST END ***
```

付録3. 3 変化率の誤差評価プログラム

文献(8)をもとに1次の最小二乗法により燃焼率に対する変化率および初期組成を求め、誤差方程式によりそれぞれの誤差を評価するプログラムを作成した。

計算方法は、以下の順に行う。($y=(A\pm\Delta a)x+(B\pm\Delta b)$ を求める)
ここで、xは燃焼率(a/o)、yは同位体組成比(a/o)を示す。

・変化率

$$A=\frac{\sum X_i\cdot Y_i-\frac{\sum X_i\cdot\sum Y_i}{n}}{\sum X_i^2-\frac{(\sum X_i)^2}{n}}$$

n:データ数

・初期値

$$B=\frac{\sum Y_i-A\cdot\sum X_i}{n}$$

・変化率の誤差

$$\Delta a=\frac{r}{\sqrt{\frac{n-\left(\sum X_i\right)^2}{\sum X_i^2}}}$$

・初期値の誤差

$$\Delta b=\frac{r}{\sqrt{\frac{\sum X_i^2-\left(\sum X_i\right)^2}{n}}}$$

$$\sigma=\sum\left\{Y_i-(A\cdot X_i+B)\right\}^2$$

$$r=f\sqrt{\frac{\sigma}{n-2}}$$

$f=0.6745$

データセットは、**PA30E.ISL.FORT(MOLS)**に収納してある。プログラムソースを付表4.3.1に示す。

プログラムの実行方法は、**PA30E.ISL.CLIST(MOLS)**を起動する。
入力は、**FT05F001**から読み込み、**FORMAT**は**APPLE**に合わせた。

付表3.3.1 プログラムリスト

```
                                D A T A    L I S T                          DATE 90-03-08
                                                                            TIME 17:25:21
                    DATA SET : PA30E.ISL.FORT(HOLS)                         PAGE   1

NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  1  C                                                                     00010000   1
  2  C   METHOD OF LEAST SQUARES                                           00020000   2
  3  C                                                                     00030000   3
  4        REAL*16   A(100),B(100),C(100),F                                00040000   4
  5        REAL*16   AA,AB,BB,AC,BC,XO,YO,S,R,X1,RX,Y2,RY                  00050001   5
  6        CHARACTER*72 TITL                                               00060002   6
  7        CHARACTER*64 XTITL,YTITL                                        00070002   7
  8        CHARACTER*16 SUBT                                               00080002   8
  9        CHARACTER*4  DEND                                               00090002   9
 10        CHARACTER*1  CHR                                                00100002  10
 11        CHARACTER DSN*40                                                00110002  11
 12        LOGICAL*4 TR(2)                                                 00120002  12
 13        DATA F/ 0.6745 / , A/ 100*1.0 /                                 00130002  13
 14  C                                                                     00140000  14
 15        DSN   = 40H                                                     00150002  15
 16        TR(1) = .FALSE.                                                 00160002  16
 17        TR(2) = .FALSE.                                                 00170002  17
 18        INQUIRE(5,NAME=DSN,NAMED=TR(1),OPENED=TR(2) )                   00180002  18
 19        IF (TR(2).EQV..FALSE.) GO TO 99                                 00190002  19
 20        WRITE(6,6000) DSN                                               00200001  20
 21        GOTO 1                                                          00210002  21
 22     99 WRITE(6,6010)                                                   00220002  22
 23  C                                                                     00230002  23
 24      1 READ(5,'(A72)',END=9) TITL                                      00240002  24
 25        READ(5,'(A64)') XTITL                                           00250002  25
 26        READ(5,'(A64)') YTITL                                           00260002  26
 27        READ(5,'(A4)') DEND                                             00270002  27
 28        READ(5,'(A4)') DEND                                             00280002  28
 29      2 N=0                                                             00290002  29
 30        READ(5,'(A4)') DEND                                             00300002  30
 31        IF(DEND.EQ.'LEND') GOTO 1                                       00310002  31
 32        BACKSPACE 5                                                     00320002  32
 33        READ(5,'(A16)') SUBT                                            00330002  33
 34      3 READ(5,'(A4)') DEND                                             00340002  34
 35        IF(DEND.EQ.'DEND') GOTO 4                                       00350002  35
 36        BACKSPACE 5                                                     00360002  36
 37        READ(5,'(A1)') CHR                                              00370002  37
 38        IF(CHR.EQ.'*') GOTO 3                                           00380002  38
 39        N=N+1                                                           00390002  39
 40        BACKSPACE 5                                                     00400002  40
 41        READ(5,*) B(N),C(N)                                             00410002  41
 42        GOTO 3                                                          00420002  42
 43  C                                                                     00430002  43
 44      4 AA=0.                                                           00440002  44
 45        AB=0.                                                           00450002  45
 46        BB=0.                                                           00460002  46
 47        AC=0.                                                           00470002  47
 48        BC=0.                                                           00480002  48
 49        WRITE(6,2000) TITL,XTITL,YTITL,SUBT                             00490002  49
 50  C                                                                     00500002  50
 51        DO 20 I=1,N                                                     00510000  51
 52          AA=AA+A(I)**2                                                 00520000  52
 53          AB=AB+A(I)*B(I)                                               00530000  53
 54          BB=BB+B(I)**2                                                 00540000  54
 55          AC=AC+A(I)*C(I)                                               00550000  55
 56          BC=BC+B(I)*C(I)                                               00560000  56
 57     20 CONTINUE                                                        00570000  57
 58  C                                                                     00580000  58
 59        IF( AA.EQ.0.0 .AND. AB.NE.0.0 ) THEN                            00590000  59
 60          YO=AC/AB                                                      00600000  60
 61          XO=(BC-BB*YO)/AB                                              00610002  61
 62          GOTO 30                                                       00620000  62
 63        ENDIF                                                           00630000  63
 64        IF( AA.NE.0.0 ) THEN                                            00640000  64
 65          YO=(BC-AB*AC/AA)/(BB-AB**2/AA)                                00650000  65
 66          XO=(AC-AB*YO)/AA                                              00660000  66
 67        ENDIF                                                           00670000  67
 68     30 CONTINUE                                                        00680000  68
 69        DO 31 I=1,N                                                     00690000  69
 70          WRITE(6,2010) I,B(I),C(I),YO*B(I)+XO,C(I)-YO*B(I)-XO          00700002  70
     ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

        *** CONTINUE ***
```

D A T A L I S T

DATE 90-03-08
TIME 17:25:21
PAGE 2

DATA SET : PA3OE.ISL.FORT(MOLS)

```
NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 71      31 CONTINUE                                                    00710002   71
 72  C      WRITE(6,1000) YO,XO                                         00720002   72
 73         S=0.0                                                       00730000   73
 74         DO 40 I=1,N                                                 00740000   74
 75           S=S+(C(I)-A(I)*XO-B(I)*YO)**2                             00750000   75
 76      40 CONTINUE                                                    00760000   76
 77         WRITE(6,1010) S                                             00770000   77
 78         IF(N.GT.2) THEN                                             00780002   78
 79           R=F*SQRT(S/(N-2))                                         00790000   79
 80           WRITE(6,1020) R , F                                       00800000   80
 81  C                                                                  00810002   81
 82         IF( BB.EQ.0.0 ) THEN                                        00820002   82
 83           X1=0.0 ,                                                  00830002   83
 84           GOTO 50                                                   00840002   84
 85         ENDIF                                                       00850002   85
 86         X1=1/(AA-AB**2/BB)                                          00860002   86
 87      50 CONTINUE                                                    00870002   87
 88         RX=R/SQRT(1/X1)                                             00880002   88
 89  C                                                                  00890002   89
 90         IF( AA.EQ.0.0 ) THEN                                        00900000   90
 91           Y2=0.0                                                    00910001   91
 92           GOTO 60                                                   00920002   92
 93         ENDIF                                                       00930002   93
 94         Y2=1/(BB-AB**2/AA)                                          00940002   94
 95      60 CONTINUE                                                    00950002   95
 96         RY=R/SQRT(1/Y2)                                             00960002   96
 97         ELSE                                                        00970002   97
 98           RX=0.0                                                    00980002   98
 99           RY=0.0                                                    00990002   99
100         ENDIF                                                       01000002  100
101         WRITE(6,1040) YO,RY                                         01010002  101
102         WRITE(6,1030) XO,RX                                         01020002  102
103         GOTO 2                                                      01030002  103
104       9 WRITE(6,1050)                                               01040002  104
105         STOP                                                        01050002  105
106    1000 FORMAT(/' A     =',1PE15.7/' B     =',E15.7)               01060002  106
107    1010 FORMAT(/5X,' SIGMA=',1PE15.7,' (STANDARD DEVIATION)')       01070002  107
108    1020 FORMAT(5X,' R     =',1PE15.7' ( =',0PF7.4,'*SQRT( SIGMA/(N-2) )')  01080002  108
109    1030 FORMAT(5X,' B     =',F15.7,' +-',F10.7/)                    01090002  109
110    1040 FORMAT(5X,' A     =',F15.7,' +-',F10.7)                     01100002  110
111    1050 FORMAT(/' *** DATA END ***')                                01110002  111
112    2000 FORMAT(1HO,A72/5X,'X-TITLE   :',A64/5X,'Y-TITLE   :',A64/   01120002  112
113        >               5X,'LINE-NAME :',A16//                       01130002  113
114        > 5X,'    XO    ','    YO    ','   Y-CALC ','    DELTA ')   01140002  114
115    2010 FORMAT(I5,4F10.5)                                           01150002  115
116    6000 FORMAT(1H ,79('*')/                                         01160002  116
117        >  1H ,3('*'),25X,'METHOD OF LEAST SQUARES',25X,3('*')/      01170002  117
118        >  1H ,3('*'),25X,'     Y = A * X + B     ',25X,3('*')/      01180002  118
119        >  1H ,3('*'),12X,'DATASET :',A40,12X,3('*')/                01190002  119
120        >  1H ,79('*'))                                              01200002  120
121    6010 FORMAT(1H ,79('*')/                                         01210002  121
122        >  1H ,3('*'),25X,'METHOD OF LEAST SQUARES',25X,3('*')/      01220002  122
123        >  1H ,3('*'),25X,'     Y = A * X + B     ',25X,3('*')/      01230002  123
124        >  1H ,3('*'),12X,'DATASET :',40X,12X,3('*')/                01240002  124
125        >  1H ,79('*'))                                              01250002  125
126         END                                                         01260000  126
       ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
```

*** DATA-LIST END ***

付録4. 解析計算の入力および出力

(1) 均質セル計算を行ったときのSLAROM[9]の入力データを付表4.1に示す。

(2) 18群実効ミクロ断面積を作成したときのJOINT[10]の入力データを付表4.2に示す。

(3) 3次元拡散·燃焼計算を行ったときのMOSES[12]の入力データを付表4.3に示す。
各サイクルは、初期、末期および燃料交換の3ステップで計算を行った。
サイクル初期において拡散計算を行い、その中性子束を用いて燃焼計算を行った。サイクル末期では拡散計算のみを行った。燃料交換期間では核種の崩壊を考慮した。

(4) 各サイクル初期での集合体の炉内滞在サイクルを付図4.1~付図4.11に示す。
各図の集合体内の数字は、滞在サイクル数を示す。0は、そのサイクルに装荷されたことを表し、10は、炉内に10サイクル滞在したことを表す。(ただし、50MW保安監査サイクルはカウントしていない。)

(5) 各サイクルごとの集合体積算出力分布を付図4.12~付図4.33に示す。

付表4.1 SLAROMコード 入力データ

DATE 90. 2.15
TIME 9:06:43
PAGE 1

DATA SET : PA30E.SLAROM.DATA(SLA#2)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
 1
 2  PREP
 3   CORE 0X-4X   JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
 4    1  1  0  0  0  0  3 -20  0  0  0  0 70
 5   1523.15 0.0  0.0
 6   19
 7   1.0
 8   949  1.0952E-03  940  2.7610E-04  941  3.6831E-05  942  7.8313E-06
 9   951  0.0000E+00  925  1.5543E-03  926  0.0000E+00  928  5.1404E-03
10   939  0.0000E+00    8  1.6267E-02   11  8.8054E-03   26  1.1774E-02
11    24  3.2336E-03   28  2.0720E-03   42  2.3298E-04  854  0.0000E+00
12   884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
13  CORE00
14  PREP
15   CORE 5X-5X   JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
16    1  1  0  0  0  0  3 -20  0  0  0  0 70
17   1113.15 0.0  0.0
18   19
19   1.0
20   949  1.0952E-03  940  2.7610E-04  941  3.6831E-05  942  7.8313E-06
21   951  0.0000E+00  925  1.5543E-03  926  0.0000E+00  928  5.1404E-03
22   939  0.0000E+00    8  1.6267E-02   11  8.8054E-03   26  1.1774E-02
23    24  3.2336E-03   28  2.0720E-03   42  2.3298E-04  854  0.0000E+00
24   884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
25  CORE20
26  PREP
27   CORE 0X-4X U JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
28    1  1  0  0  0  0  3 -20  0  0  0  0 70
29   1273.15 0.0  0.0
30   19
31   1.0
32   949  1.0952E-03  940  2.7610E-04  941  3.6831E-05  942  7.8313E-06
33   951  0.0000E+00  925  1.5543E-03  926  0.0000E+00  928  5.1404E-03
34   939  0.0000E+00    8  1.6267E-02   11  8.8054E-03   26  1.1774E-02
35    24  3.2336E-03   28  2.0720E-03   42  2.3298E-04  854  0.0000E+00
36   884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
37  CORE0U
38  PREP
39   CORE 5X-5X U JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
40    1  1  0  0  0  0  3 -20  0  0  0  0 70
41   1073.15 0.0  0.0
42   19
43   1.0
44   949  1.0952E-03  940  2.7610E-04  941  3.6831E-05  942  7.8313E-06
45   951  0.0000E+00  925  1.5543E-03  926  0.0000E+00  928  5.1404E-03
46   939  0.0000E+00    8  1.6267E-02   11  8.8054E-03   26  1.1774E-02
47    24  3.2336E-03   28  2.0720E-03   42  2.3298E-04  854  0.0000E+00
48   884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
49  CORE2U
50  PREP
51   CORE 0X-4X L JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
52    1  1  0  0  0  0  3 -20  0  0  0  0 70
53   1203.15 0.0  0.0
54   19
55   1.0
56   949  1.0952E-03  940  2.7610E-04  941  3.6831E-05  942  7.8313E-06
57   951  0.0000E+00  925  1.5543E-03  926  0.0000E+00  928  5.1404E-03
58   939  0.0000E+00    8  1.6267E-02   11  8.8054E-03   26  1.1774E-02
59    24  3.2336E-03   28  2.0720E-03   42  2.3298E-04  854  0.0000E+00
60   884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
61  CORE0L
62  PREP
63   CORE 5X-5X L JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
64    1  1  0  0  0  0  3 -20  0  0  0  0 70
65    973.15 0.0  0.0
66   19
67   1.0
68   949  1.0952E-03  940  2.7610E-04  941  3.6831E-05  942  7.8313E-06
69   951  0.0000E+00  925  1.5543E-03  926  0.0000E+00  928  5.1404E-03
70   939  0.0000E+00    8  1.6267E-02   11  8.8054E-03   26  1.1774E-02
71    24  3.2336E-03   28  2.0720E-03   42  2.3298E-04  854  0.0000E+00
72   884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
73  CORE2L
74  PREP
75   RADIAL-BLK 5X JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
76    1  1  0  0  0  0  3 -20  0  0  0  0 70
77    803.15 0.0  0.0
78   19
79   1.0
80   949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
 951  0.0000E+00  925  2.1944E-05  926  0.0000E+00  928  1.0812E-02
 939  0.0000E+00    8  2.1772E-02   11  7.1097E-03   26  1.0267E-02
  24  2.8198E-03   28  1.8069E-03   42  2.0317E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
RDBLK5
PREP
 RADIAL-BLK 6X JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  763.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  2.1944E-05  926  0.0000E+00  928  1.0812E-02
 939  0.0000E+00    8  2.1772E-02   11  7.1097E-03   26  1.0267E-02
  24  2.8198E-03   28  1.8069E-03   42  2.0317E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
RDBLK6
PREP
 RADIAL-BLK 7X JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  713.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  2.1944E-05  926  0.0000E+00  928  1.0812E-02
 939  0.0000E+00    8  2.1772E-02   11  7.1097E-03   26  1.0267E-02
  24  2.8198E-03   28  1.8069E-03   42  2.0317E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
RDBLK7
PREP
 RADIAL-BLK 8X JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  663.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  2.1944E-05  926  0.0000E+00  928  1.0812E-02
 939  0.0000E+00    8  2.1772E-02   11  7.1097E-03   26  1.0267E-02
  24  2.8198E-03   28  1.8069E-03   42  2.0317E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
RDBLK8
PREP
 RADIAL-BLK 9X JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  653.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  2.1944E-05  926  0.0000E+00  928  1.0812E-02
 939  0.0000E+00    8  2.1772E-02   11  7.1097E-03   26  1.0267E-02
  24  2.8198E-03   28  1.8069E-03   42  2.0317E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
RDBLK9
PREP
 AXIAL-BLK 1U JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  833.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  1.6588E-05  926  0.0000E+00  928  8.1728E-03
 939  0.0000E+00    8  1.6349E-02   11  8.8054E-03   26  1.1866E-02
  24  3.2590E-03   28  2.0833E-03   42  2.3481E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
AXBL1U
PREP
 AXIAL-BLK 2U JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  823.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  1.6588E-05  926  0.0000E+00  928  8.1728E-03
 939  0.0000E+00    8  1.6349E-02   11  8.8054E-03   26  1.1866E-02
  24  3.2590E-03   28  2.0833E-03   42  2.3481E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
AXBL2U
PREP
 AXIAL-BLK 3U JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

DATA SET : PA30E.SLAROM.DATA(SLA#2)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
  803.15 0.0  0.0
19
1.0
949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
951  0.0000E+00  925  1.6588E-05  926  0.0000E+00  928  8.1728E-03
939  0.0000E+00    8  1.6349E-02   11  8.8054E-03   26  1.1866E-02
 24  3.2590E-03   28  2.0833E-03   42  2.3481E-04  854  0.0000E+00
884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
AXBL3U
PREP
 AXIAL-BLK 1L JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  653.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  1.6588E-05  926  0.0000E+00  928  8.1728E-03
 939  0.0000E+00    8  1.6349E-02   11  8.8054E-03   26  1.1866E-02
  24  3.2590E-03   28  2.0833E-03   42  2.3481E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
AXBL1L
PREP
 AXIAL-BLK 2L JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  653.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  1.6588E-05  926  0.0000E+00  928  8.1728E-03
 939  0.0000E+00    8  1.6349E-02   11  8.8054E-03   26  1.1866E-02
  24  3.2590E-03   28  2.0833E-03   42  2.3481E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
AXBL2L
PREP
 AXIAL-BLK 3L JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  643.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  1.6588E-05  926  0.0000E+00  928  8.1728E-03
 939  0.0000E+00    8  1.6349E-02   11  8.8054E-03   26  1.1866E-02
  24  3.2590E-03   28  2.0833E-03   42  2.3481E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
AXBL3L
PREP
 REF-1         JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 643.15  0.0  0.0
  4
 1.0
  11  4.3542E-03   26  4.7784E-02   24  1.3395E-02   28  6.1738E-03
REF001
PREP
 REF-2         JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 643.15  0.0  0.0
  4
 1.0
  11  1.4856E-02   26  2.1937E-02   24  6.1492E-03   28  2.8343E-03
REF002
PREP
 AXIAL-REF UP JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 643.15  0.0  0.0
  5
 1.0
  11  9.0497E-03   26  1.2031E-02   24  3.3043E-03   28  2.1173E-03
  42  2.3807E-04
AXREFU
PREP
 AXIAL-REF LO JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 643.15  0.0  0.0
  5
 1.0
  11  9.0497E-03   26  1.2031E-02   24  3.3043E-03   28  2.1173E-03
  42  2.3807E-04
AXREFL
PREP
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

DATA SET : PA3OE.SLARDM.DATA(SLA#2)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
 CR-B4C PLET  JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
693.15  0.0  0.0
  8
1.0
  11  1.2623E-02   26  1.2653E-02   24  3.4751E-03   28  2.2268E-03
  42  2.5038E-04  105  2.1806E-02  115  1.7951E-03    6  5.6664E-03
CRB4CP
PREP
 CR-PRENUM    JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
693.15  0.0  0.0
  5
1.0
  11  1.2623E-02   26  1.2653E-02   24  3.4751E-03   28  2.2268E-03
  42  2.5038E-04
CRPREN
PREP
 CR-DASHRUM   JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
693.15  0.0  0.0
  5
1.0
  11  1.8784E-02   26  9.7079E-03   24  2.6662E-03   28  1.7085E-03
  42  1.9210E-04
CRDASH
PREP
 CR-ADAP      JOYO MK-I REACTOR INITIAL CORE  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
693.15  0.0  0.0
  5
1.0
  11  2.0820E-02   26  4.5609E-03   24  1.2526E-03   28  8.0264E-04
  42  9.0248E-05
CRADAP
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** DATA-LIST END ***

付表4.2　JOINTコード　入力データ

DATE 90. 3.26
TIME 9:48:59
PAGE 1

DATA SET : PA351.@SLAROM.DATA(MICRO2)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
CITATIONMICR                                                          00000100   1
COREOO    SLAROM                                                      00000200   2
 21                                                                   00000300   3
   1 949  PU-239    239.05522   0.334000E-10                          00000400   4
   2 940  PU-240    240.0539    0.336   E-10                          00000410   5
   3 941  PU-241    241.0567    0.337   E-10                          00000420   6
   4 942  PU-242    242.0587    0.338   E-10                          00000420   7
   5 951  AM-241    241.0567    0.336   E-10                          00000420   8
   6 925   U-235    235.0439    0.323   E-10                          00000420   9
   7 926   U-236    236.0457    0.324   E-10                          00000420  10
   8 928   U-238    238.0508    0.331   E-10                          00000420  11
   9   8   O         15.9994    0.0                                   00000420  12
  10  11   NA        22.9898    0.0                                   00000420  13
  11  26   FE        55.8470    0.0                                   00000420  14
  12  24   CR        59.9960    0.0                                   00000400  15
  13  28   NI        58.7100    0.0                                   00000410  16
  14  42   MO        95.9110    0.0                                   00000420  17
  15 105   B-10      10.0123    0.0                                   00000420  18
  16 115   B-11      11.0093    0.0                                   00000420  19
  17   6   C         12.011     0.0                                   00000420  20
  18 854   U5-FP    235.0439    0.0                                   00000420  21
  19 884   U8-FP    238.0508    0.0                                   00000420  22
  20 894   PU9-FP   239.05522   0.0                                   00000420  23
  21 814   PU1-FP   241.0567    0.0                                   00000420  24
COREOO      18  CORE OX-2X                                                      25
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  26
CORE10      18  CORE 3X-4X                                                      27
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  28
CORE20      18  CORE 5X-5X                                                      29
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  30
COREOU      18  CORE OX-2X UP                                                  31
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  32
CORE1U      18  CORE 3X-4X UP                                                  33
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  34
CORE2U      18  CORE 5X-5X UP                                                  35
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  36
COREOL      18  CORE OX-2X LOW                                                 37
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  38
CORE1L      18  CORE 3X-4X LOW                                                 39
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  40
CORE2L      18  CORE 5X-5X LOW                                                 41
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  42
RDBLK5      18  RAD.BLANK 5X                                                  43
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  44
RDBLK6      18  RAD.BLANK 6X                                                  45
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  46
RDBLK7      18  RAD.BLANK 7X                                                  47
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  48
RDBLK8      18  RAD.BLANK 8X                                                  49
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  50
RDBLK9      18  RAD.BLANK 9X                                                  51
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  52
AXBL1U      18  AX. BLANK 1UP                                                  53
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  54
AXBL3U      18  AX. BLANK 2UP                                                  55
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  56
AXBL1L      18  AX. BLANK 1LOW                                                 57
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  58
AXBL3L      18  AX. BLANK 2LOW                                                 59
  1  2  3  4  5  6  7  8  9 10 11 12 13 14 18 19 20 21                00000280  60
AXREFU       5  AX.  REF UP                                           00000310  61
 10 11 12 13 14                                                       00000280  62
AXREFL       5  AX.  REF LOW                                          00000310  63
 10 11 12 13 14                                                       00000280  64
REF001       4  RAD. REF-1                                            00000320  65
 10 11 12 13                                                          00000280  66
REF002       4  RAD. REF-2                                            00000320  67
 10 11 12 13                                                          00000280  68
CRB4CP       8  C/R B4C                                               00000320  69
 10 11 12 13 14 15 16 17                                              00000280  70
CRPREN       5  C/R PRE-NUM                                           00000320  71
 10 11 12 13 14                                                       00000280  72
CRDASH       5  C/R DASHRUM                                           00000320  73
 10 11 12 13 14                                                       00000280  74
CRADAP       5  NA FOLLOWER                                           00000320  75
 10 11 12 13 14                                                       00000280  76
                                                                      00000900  77
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8

   *** DATA-LIST END ***
```

付表4.3　MOSESコード　入力データ

DATE 90. 3.26
TIME 9:21:26
PAGE 1

DATA SET : PA351.@MOSES.DATA(RUN11)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
JOYO MK-1  BURNUP CALCULATION (ENERGY GROUP 18)
  50MW POWER-UP CYCLE (BOC)
&&
&&   ------------------------------------------------------------------
&&
CONTROL
     3*1      &&  DIFFUSION CAL. ON
     3*1      &&  BURNUP CAL.    ON
EDIT
 0 4*1 20*0                      0 0 0 0 0  &&  EDIT PROGRAM SETUP
 0 1 23*0                        0 0 0 0 0  &&  EDIT FUEL MANAGEMENT DATA
 0 0 0 2 5*0 1 4*0 2 3*0 1 6*0 1 0 1 0 0  && EDIT DIFFUSION CAL. DATA
 0 1 23*0                        1 1 0 0 0  &&  EDIT BURNUP CAL. DATA

EDITD
&&  ¥IC1     ¥IC2      ¥OC1      ¥RBL  ¥RSH   ¥MCR  ¥OCR
&&   DETAILED EDIT FOR DIFF. CAL.
  1 4 12 26 46 72 104 142 186      41*0
&&   DETAILED EDIT FOR BURNUP CAL.
  1 4 12 26 46 72 104 142 186      41*0
&&   DETAILED EDIT FOR N.D. CAL.
  1 4 12 26 46 72 104 142 186      41*0
EOB
&&
&&   ------------------------------------------------------------------
&&
LOADING  1
&&
GEOM
&&       NSYM NLAY NPLN NAZN NGRP  PITCH
           6   12   36   11   18     8.206
&&       AXIAL MESH BY REGION
      4    5    3    1    3    4    3    1    3    5    4
&&       REGION WIDTH (CM)
     20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
&&       *** NMES  ( NMES=1:CM, NMES=2:MOD.CM)
&&       NMES NCAL NITR NIIT NITH NBATCH OUTCR RLOSS   DELAY  NSMALL
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0   47.84  1
CPARA2   5.E-5 1.E-4 0.5 1.5 1 0.0 4*0 0.0 0 0.0
EOB
&&
&&   ------------------------------------------------------------------
&&
&&         ASSEMBLY AXIAL INFORMATIONS
AXIAL
&&      NREGZ
 11   19   16 15    4  1  1  1  7    17 18   20 && CORE FUEL(0X-2X)
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   19   16 15    5  2  2  2  8    17 18   20 && CORE FUEL(3X-4X)
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   19   16 15    6  3  3  3  9    17 18   20 && CORE FUEL( 5X )
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   19   10 10   10 10 10 10 10    10 10   20 && RADIAL BLK (5X)
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   19   11 11   11 11 11 11 11    11 11   20 && RADIAL BLK (6X)
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   19   12 12   12 12 12 12 12    12 12   20 && RADIAL BLK (7X)
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   19   13 13   13 13 13 13 13    13 13   20 && RADIAL BLK (8X)
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   19   14 14   14 14 14 14 14    14 14   20 && RADIAL BLK (9X)
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   21   21 21   21 21 21 21 21    21 21   21 && RADIAL REF 1
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   22   22 22   22 22 22 22 22    22 22   22 && RADIAL REF 2
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   23   23 23   23 23 24 24 25    25 26   26 && REGULATING ROD
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
 11   23   23 24   24 24 25 26 26    26 26   26 && SAFETY ROD
    20.0 25.0 15.0  5.06 15.19 20.25 15.19  5.06 15.0 25.0 20.0
EOI
&&    ASSEMBLY GROUP ASSIGNMENT
ASYGROUP
       1  1  1  1  1 C00   CORE FUEL0X
       1  2  1  1  1 C01   CORE FUEL3X
       1  3  1  1  1 C02   CORE FUEL5X
       1  4  1  3  2 RB5   RADIAL BLK5X
       1  5  1  3  2 RB6   RADIAL BLK6X
       1  6  1  3  2 RB7   RADIAL BLK7X
       1  7  1  3  2 RB8   RADIAL BLK8X
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8

   *** CONTINUE ***
```

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
       1  8  1  3  2 RB9   RADIAL BLK9X                                          
       1  9  1  4  3 RF1   RADIAL REF1                                          
       1 10  1  4  4 RF2   RADIAL REF2                                          
       2 11  1  4 -1 RCR   REGULAT ROD                                          
       2 12  1  4 -2 SCR   SAFETY ROD                                           
EOI                                                                             
&&    MATERIAL ASSIGNMENT                                                       
REGION                                                                          
       1  1  1  1  1 ¥C00   CORE FUELOX                                         
       2  1  1  1  1 ¥C01   CORE FUEL3X                                         
       3  1  1  1  1 ¥C02   CORE FUEL5X                                         
       4  1  1  1  1 ¥C0U   CORE FUELOXU                                        
       5  1  1  1  1 ¥C1U   CORE FUEL3XU                                        
       6  1  1  1  1 ¥C2U   CORE FUEL5XU                                        
       7  1  1  1  1 ¥C0L   CORE FUELOXL                                        
       8  1  1  1  1 ¥C1L   CORE FUEL3XL                                        
       9  1  1  1  1 ¥C2L   CORE FUEL5XL                                        
      10  2  1  4  1 ¥RB5   RAD BLANK5                                          
      11  2  1  4  1 ¥RB6   RAD BLANK6                                          
      12  2  1  4  1 ¥RB7   RAD BLANK7                                          
      13  2  1  4  1 ¥RB8   RAD BLANK8                                          
      14  2  1  4  1 ¥RB9   RAD BLANK9                                          
      15  3  0  2  0 ¥A1U   AX BLANK1UP                                         
      16  3  0  2  0 ¥A2U   AX BLANK2UP                                         
      17  3  0  2  0 ¥A1L   AX BLANK1LO                                         
      18  3  0  2  0 ¥A2L   AX BLANK2LO                                         
      19  4  0  3  0 ¥ASU   AXIAL REFUP                                         
      20  4  0  3  0 ¥ASL   AXIAL REFLO                                         
      21  5  0  5 -1 ¥RS1   RADIAL REF1                                         
      22  6  0  5 -1 ¥RS2   RADIAL REF2                                         
      23  7  0  6  1 ¥B4C   CR B4CPLET                                          
      24  8  0  5  1 ¥PRE   CR PRENUM                                           
      25  9  0  5  1 ¥DSH   CR DUSHRUM                                          
      26 10  0  5 -1 ¥CRP   NA CHANNEL                                          
EOI                                                                             
&&                                                                              
&&    CROSS SECTION AND FISSION SPECTRUM                                        
&&                                                                              
MICROX$                                                                         
   1  26  21  6  1  2                                                          
  2.788E-2 1.129E-1 2.058E-1 2.248E-1 1.778E-1 1.531E-1                         
  6.304E-2 2.292E-2 7.850E-3 2.614E-3 8.589E-4 2.804E-4                         
  9.128E-5 2.880E-5 0.0      0.0      0.0      0.0                              
&&                                                                              
&&    NUCLIDE INFORMATION                                                       
&&                                                                              
XSNUC                                                                           
&&       1 : PU-239                                                             
&&       2 : PU-240                                                             
&&       3 : PU-241                                                             
&&       4 : PU-242                                                             
&&       5 : AM-241                                                             
&&       6 : U -235                                                             
&&       7 : U -236                                                             
&&       8 : U -238                                                             
&&       9 : O                                                                  
&&      10 : NA                                                                 
&&      11 : FE                                                                 
&&      12 : CR                                                                 
&&      13 : NI                                                                 
&&      14 : MO                                                                 
&&      15 : B -10                                                              
&&      16 : B -11                                                              
&&      17 : C                                                                  
&&      18 : U235-FP                                                            
&&      19 : U238-FP                                                            
&&      20 : PU239-FP                                                           
&&      21 : PU241-FP                                                           
&& CODE  NAME  4  5  6  7          ATW   EFIS ECAP DECAY                        
    1  PU239  2  1  0  1       239.05  3.34E-11 0   0                          
    2  PU240  2  2  0  1       240.05  3.36E-11 0   0                          
    3  PU241  2  1  0  1       241.06  3.37E-11 0 1.5306E-9                     
    4  PU242  2  2  0  1       242.06  3.38E-11 0   0                          
    5  AM241  2  3  0  1       241.06  3.36E-11 0   0                          
    6   U235  1  1  0  1       235.044 3.23E-11 0   0                          
    7   U236  1  3  0  1       236.05  3.24E-11 0   0                          
    8   U238  1  2  0 -1       238.051 3.31E-11 0   0                          
    9      O  0  5  0  1        15.999  0       0   0                          
   10     NA  0  6  0  1        22.990  0       0   0                          
   11     FE  0  6  0  1        55.847  0       0   0                          
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
    12     CR   0   6  0   1                51.996  0        0  0
    13     NI   0   6  0   1                58.70   0        0  0
    14     MO   0   6  0   1                95.94   0        0  0
    15    B10   0   7  0   1                10.013  0        0  0
    16    B11   0   7  0   1                11.009  0        0  0
    17      C   0   7  0   1                12.011  0        0  0
    18  U5-FP  -1   4  0   1               140.0    0        0  0
    19  U8-FP  -1   4  0   1               140.0    0        0  0
    20  P9-FP  -1   4  0   1               140.0    0        0  0
    21  P1-FP  -1   4  0   1               140.0    0        0  0
REACT1
     6     7     2   1.0
     8     1     2   1.0
     1     2     2   1.0
     2     3     2   1.0
     3     4     2   1.0
     3     5     1   1.0
     0
YIELD
    18      6 1.0
    18      7 1.0
    19      8 1.0
    20      1 1.0
    20      2 1.0
    21      3 1.0
    21      4 1.0
    21      5 1.0
&&
&&        ATOM NUMBER DENSITY
&&
ATDEN
&&  1=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&&  2=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&&  3=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&&  4=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&&  5=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&&  6=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&&  7=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&&  8=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&&  9=CORE FUEL
   1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0         1.5543E-03
   0.0         5.1404E-03              1.6267E-02  8.8054E-03  1.1774E-02
   3.2336E-03  2.0720E-03  2.3298E-04  0.0         0.0         0.0
   0.0         0.0         0.0         0.0
&& 10=RADIAL BLK
   0.0         0.0         0.0         0.0         0.0         2.1944E-05
   0.0         1.0812E-02              2.1772E-02  7.1097E-03  1.0267E-02
   2.8198E-03  1.8069E-03  2.0317E-04  0.0         0.0         0.0
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
  0.0          0.0          0.0          0.0
&& 11=RADIAL BLK
  0.0          0.0          0.0          0.0          0.0          2.1944E-05
  0.0          1.0812E-02                2.1772E-02   7.1097E-03   1.0267E-02
  2.8198E-03   1.8069E-03   2.0317E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 12=RADIAL BLK
  0.0          0.0          0.0          0.0          0.0          2.1944E-05
  0.0          1.0812E-02                2.1772E-02   7.1097E-03   1.0267E-02
  2.8198E-03   1.8069E-03   2.0317E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 13=RADIAL BLK
  0.0          0.0          0.0          0.0          0.0          2.1944E-05
  0.0          1.0812E-02                2.1772E-02   7.1097E-03   1.0267E-02
  2.8198E-03   1.8069E-03   2.0317E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 14=RADIAL BLK
  0.0          0.0          0.0          0.0          0.0          2.1944E-05
  0.0          1.0812E-02                2.1772E-02   7.1097E-03   1.0267E-02
  2.8198E-03   1.8069E-03   2.0317E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 15=AXIAL BLK
  0.0          0.0          0.0          0.0          0.0          1.6588E-05
  0.0          8.1728E-03                1.6349E-02   8.8054E-03   1.1866E-02
  3.2590E-03   2.0833E-03   2.3481E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 16=AXIAL BLK
  0.0          0.0          0.0          0.0          0.0          1.6588E-05
  0.0          8.1728E-03                1.6349E-02   8.8054E-03   1.1866E-02
  3.2590E-03   2.0833E-03   2.3481E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 17=AXIAL BLK
  0.0          0.0          0.0          0.0          0.0          1.6588E-05
  0.0          8.1728E-03                1.6349E-02   8.8054E-03   1.1866E-02
  3.2590E-03   2.0833E-03   2.3481E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 18=AXIAL BLK
  0.0          0.0          0.0          0.0          0.0          1.6588E-05
  0.0          8.1728E-03                1.6349E-02   8.8054E-03   1.1866E-02
  3.2590E-03   2.0833E-03   2.3481E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 19=AXIAL REF
  0.0          0.0          0.0          0.0          0.0          0.0
  0.0          0.0                       0.0          9.0497E-03   1.2031E-02
  3.3043E-03   2.1173E-03   2.3807E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 20=AXIAL REF
  0.0          0.0          0.0          0.0          0.0          0.0
  0.0          0.0                       0.0          9.0497E-03   1.2031E-02
  3.3043E-03   2.1173E-03   2.3807E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 21=RADIAL REF1
  0.0          0.0          0.0          0.0          0.0          0.0
  0.0          0.0                       0.0          4.3542E-03   4.7784E-02
  1.3395E-02   6.1738E-03   0.0          0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 22=RADIAL REF2
  0.0          0.0          0.0          0.0          0.0          0.0
  0.0          0.0                       0.0          1.4856E-02   2.1937E-02
  6.1492E-03   2.8343E-03   0.0          0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 23=B4C
  0.0          0.0          0.0          0.0          0.0          0.0
  0.0          0.0                       0.0          1.2623E-02   1.2653E-02
  3.4751E-03   2.2268E-03   2.5038E-04   2.1806E-02   1.7951E-03   5.6664E-03
  0.0          0.0          0.0          0.0
&& 24=PRENUM
  0.0          0.0          0.0          0.0          0.0          0.0
  0.0          0.0                       0.0          1.2623E-02   1.2653E-02
  3.4751E-03   2.2268E-03   2.5038E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 25=DUSHRUM
  0.0          0.0          0.0          0.0          0.0          0.0
  0.0          0.0                       0.0          1.8784E-02   9.7079E-03
  2.6662E-03   1.7085E-03   1.9210E-04   0.0          0.0          0.0
  0.0          0.0          0.0          0.0
&& 26=NA CHANNEL
  0.0          0.0          0.0          0.0          0.0          0.0
  0.0          0.0                       0.0          2.0820E-02   4.5609E-03
  1.2526E-03   8.0264E-04   9.0248E-05   0.0          0.0          0.0
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8

   *** CONTINUE ***
```

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
  0.0          0.0          0.0          0.0
EOI
&&       *** CAUTION ***  REFLECTIVE B.C. IS NOT PERMITTED
&&        0.0 MEANS VACUUM
BOUNDARY
  18*0.0
  18*0.0
  18*0.0
REFUEL
    1    0   107.84
    1    1   103.00
    1    1    88.72
    1    1   210.05
    1    1    69.28
    1    1    70.96
    1    1   220.25
    1    1    78.83
    1    1   134.44
    1    1    71.65
REFMAP
50MOCYCL
     1  19    1
    20  61    2
    62  91    4
    64  66    3
    69  70    3
    74  76    3
    79  80    3
    84  86    3
    89  90    3
    92 127    5
   128 169    6
   170 217    7
   219 271    8
   218 218    9
   227 227    9
   236 236    9
   245 245    9
   254 254    9
   263 263    9
   273 331    9
   332 397   10
   272 272   10
   282 282   10
   292 292   10
   302 302   10
   312 312   10
   322 322   10
    22  22   12
    25  25   12
    28  28   11
    31  31   12
    34  34   12
    37  37   11
     0   0    0
50M1CYCL
    91  91    3
     3   3    1
    89  89    3
    72  72    4
    83  83    4
     0   0    0
50M2CYCL
    15  15    1
    90  90    3
     0   0    0
75MOCYCL
    71  71    3
    81  81    3
     2   2    1
    39  39    2
    88  88    4
     0   0    0
75M1CYCL
    63  63    3
    78  78    3
     5   5    1
    36  36    2
    87  87    4
     0   0    0
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

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```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
75M2CYCL
    73  73    3
     7   7    1
     5   6    1
    13  13    1
     0   0    0
75M3CYCL
    88  88    3
    17  17    1
    84  84    3
   116 116    5
     0   0    0
75M4CYCL
     3   3    1
     5   5    1
     8   8    1
    10  10    1
    30  30    2
    39  39    2
   119 119    5
     0   0    0
75M5CYCL
    68  68    3
     7   7    1
    16  16    1
     0   0    0
75M6CYCL
    83  83    3
    18  18    1
     3   3    1
     5   6    1
     0   0    0
EOI
PLANT
 50.0 400
CRPOS
 && CORE --> REF      RCR   SCR
    10*0.0            0.0   0.0    28*0.0
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  50MW POWER-UP CYCLE (EOC)
CONTROL
    3*1     &&  DIFFUSION CAL. ON
    3*0     &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0    0.0  1
EOB
PLANT
 50.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  50MW POWER-UP CYCLE (COOLING TIME)
CONTROL
    3*0     &&  DIFFUSION CAL. ON
    3*1     &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0   60.0  1
EOB
PLANT
  0.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  50MW   1ST    CYCLE (BOC)
CONTROL
    3*1     &&  DIFFUSION CAL. ON
    3*1     &&  BURNUP CAL.    ON
EOB
LOADING 2
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0   43.0  1
EOB
PLANT
 50.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  50MW   1ST    CYCLE (EOC)
CONTROL
    3*1     &&  DIFFUSION CAL. ON
    3*0     &&  BURNUP CAL.    ON
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

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DATA SET : PA351.@MOSES.DATA(RUN11)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
481  EOB                                                                        481
482  LOADING 0                                                                  482
483  CPARA1   2    0   100   3   800    0 0 0 0 0 3*0    0.0  1                 483
484  EOB                                                                        484
485  PLANT                                                                      485
486   50.0 400                                                                  486
487  EOB                                                                        487
488  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                           488
489    50MW   1ST    CYCLE (COOLING TIME)                                       489
490  CONTROL                                                                    490
491      3*0     &&  DIFFUSION CAL. ON                                         491
492      3*1     &&  BURNUP CAL.    ON                                         492
493  EOB                                                                        493
494  LOADING 0                                                                  494
495  CPARA1   2    0   100   3   800    0 0 0 0 0 3*0   60.0  1                 495
496  EOB                                                                        496
497  PLANT                                                                      497
498    0.0 400                                                                  498
499  EOB                                                                        499
500  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                           500
501    50MW   2ND    CYCLE (BOC)                                                501
502  CONTROL                                                                    502
503      3*1     &&  DIFFUSION CAL. ON                                         503
504      3*1     &&  BURNUP CAL.    ON                                         504
505  EOB                                                                        505
506  LOADING 3                                                                  506
507  CPARA1   2    0   100   3   800    0 0 0 0 0 3*0  43.72  1                 507
508  EOB                                                                        508
509  PLANT                                                                      509
510   50.0 400                                                                  510
511  EOB                                                                        511
512  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                           512
513    50MW   2ND    CYCLE (EOC)                                                513
514  CONTROL                                                                    514
515      3*1     &&  DIFFUSION CAL. ON                                         515
516      3*0     &&  BURNUP CAL.    ON                                         516
517  EOB                                                                        517
518  LOADING 0                                                                  518
519  CPARA1   2    0   100   3   800    0 0 0 0 0 3*0    0.0  1                 519
520  EOB                                                                        520
521  PLANT                                                                      521
522   50.0 400                                                                  522
523  EOB                                                                        523
524  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                           524
525    50MW   2ND    CYCLE (COOLING TIME)                                       525
526  CONTROL                                                                    526
527      3*0     &&  DIFFUSION CAL. ON                                         527
528      3*1     &&  BURNUP CAL.    ON                                         528
529  EOB                                                                        529
530  LOADING 0                                                                  530
531  CPARA1   2    0   100   3   800    0 0 0 0 0 3*0   45.0  1                 531
532  EOB                                                                        532
533  PLANT                                                                      533
534    0.0 400                                                                  534
535  EOB                                                                        535
536  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                           536
537    50MW   3RD    CYCLE (BOC)                                                537
538  CONTROL                                                                    538
539      3*1     &&  DIFFUSION CAL. ON                                         539
540      3*1     &&  BURNUP CAL.    ON                                         540
541  EOB                                                                        541
542  LOADING 4                                                                  542
543  CPARA1   2    0   100   3   800    0 0 0 0 0 3*0    3.1  1                 543
544  EOB                                                                        544
545  PLANT                                                                      545
546   50.0 400                                                                  546
547  EOB                                                                        547
548  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                           548
549    50MW   3RD    CYCLE (EOC)                                                549
550  CONTROL                                                                    550
551      3*1     &&  DIFFUSION CAL. ON                                         551
552      3*0     &&  BURNUP CAL.    ON                                         552
553  EOB                                                                        553
554  LOADING 0                                                                  554
555  CPARA1   2    0   100   3   800    0 0 0 0 0 3*0    0.0  1                 555
556  EOB                                                                        556
557  PLANT                                                                      557
558   50.0 400                                                                  558
559  EOB                                                                        559
560  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                           560
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

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DATA SET : PA351.&MOSES.DATA(RUN11)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
  50MW   3RD    CYCLE (COOLING TIME)
CONTROL
    3*0     &&  DIFFUSION CAL. ON
    3*1     &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0   30.0  1
EOB
PLANT
  0.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW POWER UP CYCLE (BOC)
CONTROL
    3*1     &&  DIFFUSION CAL. ON
    3*1     &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0  26.95  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW POWER UP CYCLE (EOC)
CONTROL
    3*1     &&  DIFFUSION CAL. ON
    3*0     &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0    0.0  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW POWER UP CYCLE (COOLING TIME)
CONTROL
    3*0     &&  DIFFUSION CAL. ON
    3*1     &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0 150.00  1
EOB
PLANT
  0.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  1ST     CYCLE (BOC)
CONTROL
    3*1     &&  DIFFUSION CAL. ON
    3*1     &&  BURNUP CAL.    ON
EOB
LOADING 5
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0  39.28  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  1ST     CYCLE (EOC)
CONTROL
    3*1     &&  DIFFUSION CAL. ON
    3*0     &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0    0.0  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  1ST     CYCLE (COOLING TIME)
CONTROL
    3*0     &&  DIFFUSION CAL. ON
    3*1     &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0  30.00  1
EOB
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

DATA SET : PA351.@MOSES.DATA(RUN11)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
641  PLANT                                                                    641
642    0.0 400                                                                642
643  EOB                                                                      643
644  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                         644
645    75MW  2ND     CYCLE (BOC)                                               645
646  CONTROL                                                                  646
647      3*1     &&  DIFFUSION CAL. ON                                        647
648      3*1     &&  BURNUP CAL.    ON                                        648
649  EOB                                                                      649
650  LOADING 6                                                                650
651  CPARA1   2    0   100   3   800    0  0  0  0  0  3*0  40.96  1          651
652  EOB                                                                      652
653  PLANT                                                                    653
654   75.0 400                                                                654
655  EOB                                                                      655
656  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                         656
657    75MW  2ND     CYCLE (EOC)                                               657
658  CONTROL                                                                  658
659      3*1     &&  DIFFUSION CAL. ON                                        659
660      3*0     &&  BURNUP CAL.    ON                                        660
661  EOB                                                                      661
662  LOADING 0                                                                662
663  CPARA1   2    0   100   3   800    0  0  0  0  0  3*0    0.0  1          663
664  EOB                                                                      664
665  PLANT                                                                    665
666   75.0 400                                                                666
667  EOB                                                                      667
668  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                         668
669    75MW  2ND     CYCLE (COOLING TIME)                                      669
670  CONTROL                                                                  670
671      3*0     &&  DIFFUSION CAL. ON                                        671
672      3*1     &&  BURNUP CAL.    ON                                        672
673  EOB                                                                      673
674  LOADING 0                                                                674
675  CPARA1   2    0   100   3   800    0  0  0  0  0  3*0  30.00  1          675
676  EOB                                                                      676
677  PLANT                                                                    677
678    0.0 400                                                                678
679  EOB                                                                      679
680  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                         680
681    75MW  3RD     CYCLE (BOC)                                               681
682  CONTROL                                                                  682
683      3*1     &&  DIFFUSION CAL. ON                                        683
684      3*1     &&  BURNUP CAL.    ON                                        684
685  EOB                                                                      685
686  LOADING 7                                                                686
687  CPARA1   2    0   100   3   800    0  0  0  0  0  3*0  40.25  1          687
688  EOB                                                                      688
689  PLANT                                                                    689
690   75.0 400                                                                690
691  EOB                                                                      691
692  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                         692
693    75MW  3RD     CYCLE (EOC)                                               693
694  CONTROL                                                                  694
695      3*1     &&  DIFFUSION CAL. ON                                        695
696      3*0     &&  BURNUP CAL.    ON                                        696
697  EOB                                                                      697
698  LOADING 0                                                                698
699  CPARA1   2    0   100   3   800    0  0  0  0  0  3*0    0.0  1          699
700  EOB                                                                      700
701  PLANT                                                                    701
702   75.0 400                                                                702
703  EOB                                                                      703
704  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                         704
705    75MW  3RD     CYCLE (COOLING TIME)                                      705
706  CONTROL                                                                  706
707      3*0     &&  DIFFUSION CAL. ON                                        707
708      3*1     &&  BURNUP CAL.    ON                                        708
709  EOB                                                                      709
710  LOADING 0                                                                710
711  CPARA1   2    0   100   3   800    0  0  0  0  0  3*0 180.00  1          711
712  EOB                                                                      712
713  PLANT                                                                    713
714    0.0 400                                                                714
715  EOB                                                                      715
716  JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)                         716
717    75MW  4TH     CYCLE (BOC)                                               717
718  CONTROL                                                                  718
719      3*1     &&  DIFFUSION CAL. ON                                        719
720      3*1     &&  BURNUP CAL.    ON                                        720
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8

   *** CONTINUE ***
```

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DATA SET : PA351.@MOSES.DATA(RUN11)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
EOB
LOADING 8
CPARA1   2    0   100   3   800    0 0 0 0 0 3*0  48.83  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  4TH      CYCLE (EOC)
CONTROL
    3*1      &&  DIFFUSION CAL. ON
    3*0      &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0 0 0 0 0 3*0    0.0  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  4TH      CYCLE (COOLING TIME)
CONTROL
    3*0      &&  DIFFUSION CAL. ON
    3*1      &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0 0 0 0 0 3*0  30.00  1
EOB
PLANT
  0.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  5TH      CYCLE (BOC)
CONTROL
    3*1      &&  DIFFUSION CAL. ON
    3*1      &&  BURNUP CAL.    ON
EOB
LOADING 9
CPARA1   2    0   100   3   800    0 0 0 0 0 3*0  44.44  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  5TH      CYCLE (EOC)
CONTROL
    3*1      &&  DIFFUSION CAL. ON
    3*0      &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0 0 0 0 0 3*0    0.0  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  5TH      CYCLE (COOLING TIME)
CONTROL
    3*0      &&  DIFFUSION CAL. ON
    3*1      &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0 0 0 0 0 3*0  90.00  1
EOB
PLANT
  0.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  6TH      CYCLE (BOC)
CONTROL
    3*1      &&  DIFFUSION CAL. ON
    3*1      &&  BURNUP CAL.    ON
EOB
LOADING 10
CPARA1   2    0   100   3   800    0 0 0 0 0 3*0  41.65  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

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DATA SET : PA351.@MOSES.DATA(RUN11)

```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
  75MW  6TH      CYCLE (EOC)
CONTROL
    3*1      &&  DIFFUSION CAL. ON
    3*0      &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0    0.0  1
EOB
PLANT
 75.0 400
EOB
JOYO MK-1  BURNUP CALCULATION  (ENERGY GROUP 18)
  75MW  6TH      CYCLE (COOLING TIME)
CONTROL
    3*0      &&  DIFFUSION CAL. ON
    3*1      &&  BURNUP CAL.    ON
EOB
LOADING 0
CPARA1   2    0   100   3   800    0  0  0  0  0  3*0  30.00  1
EOB
PLANT
  0.0 400
EOB
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
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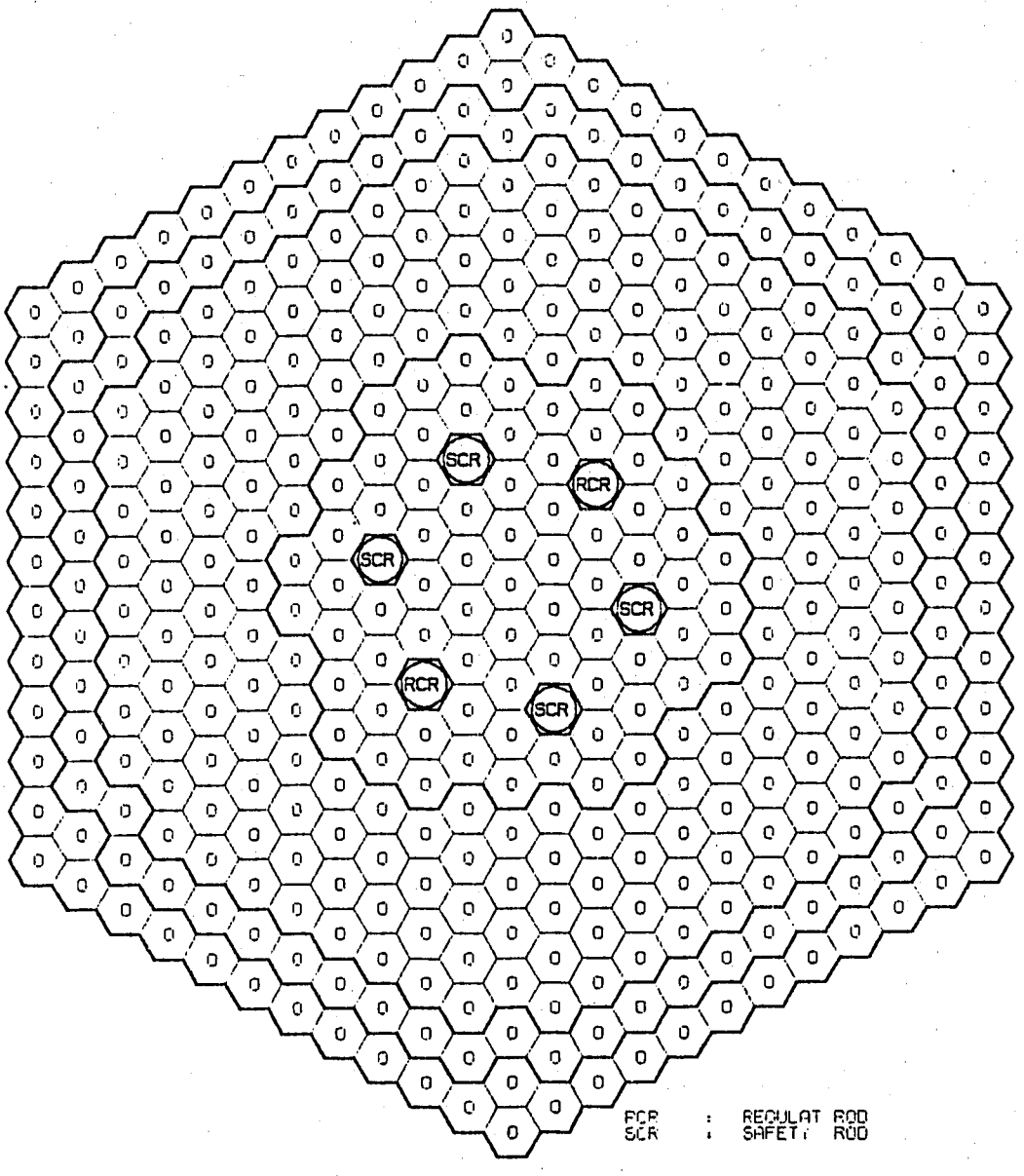
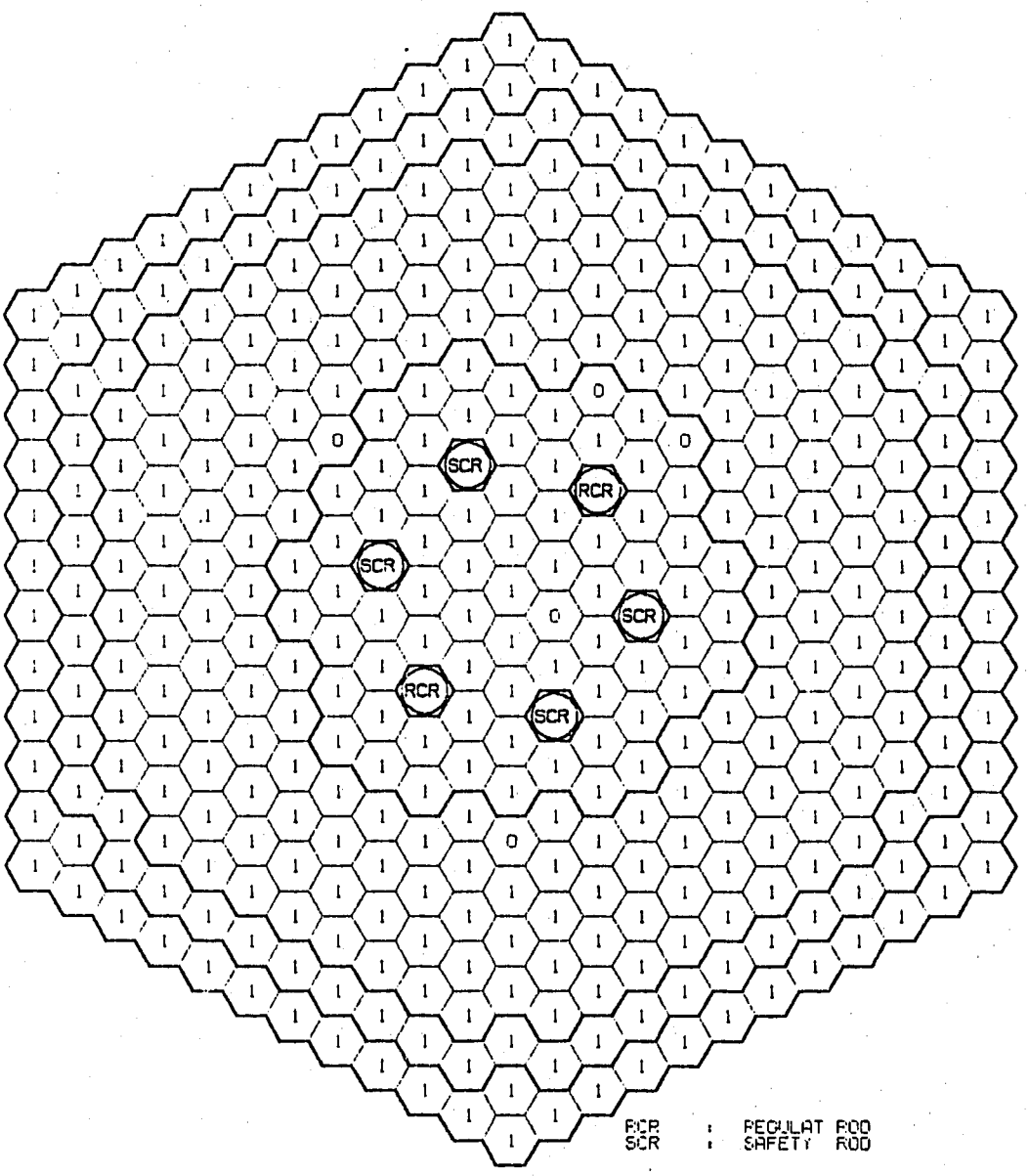


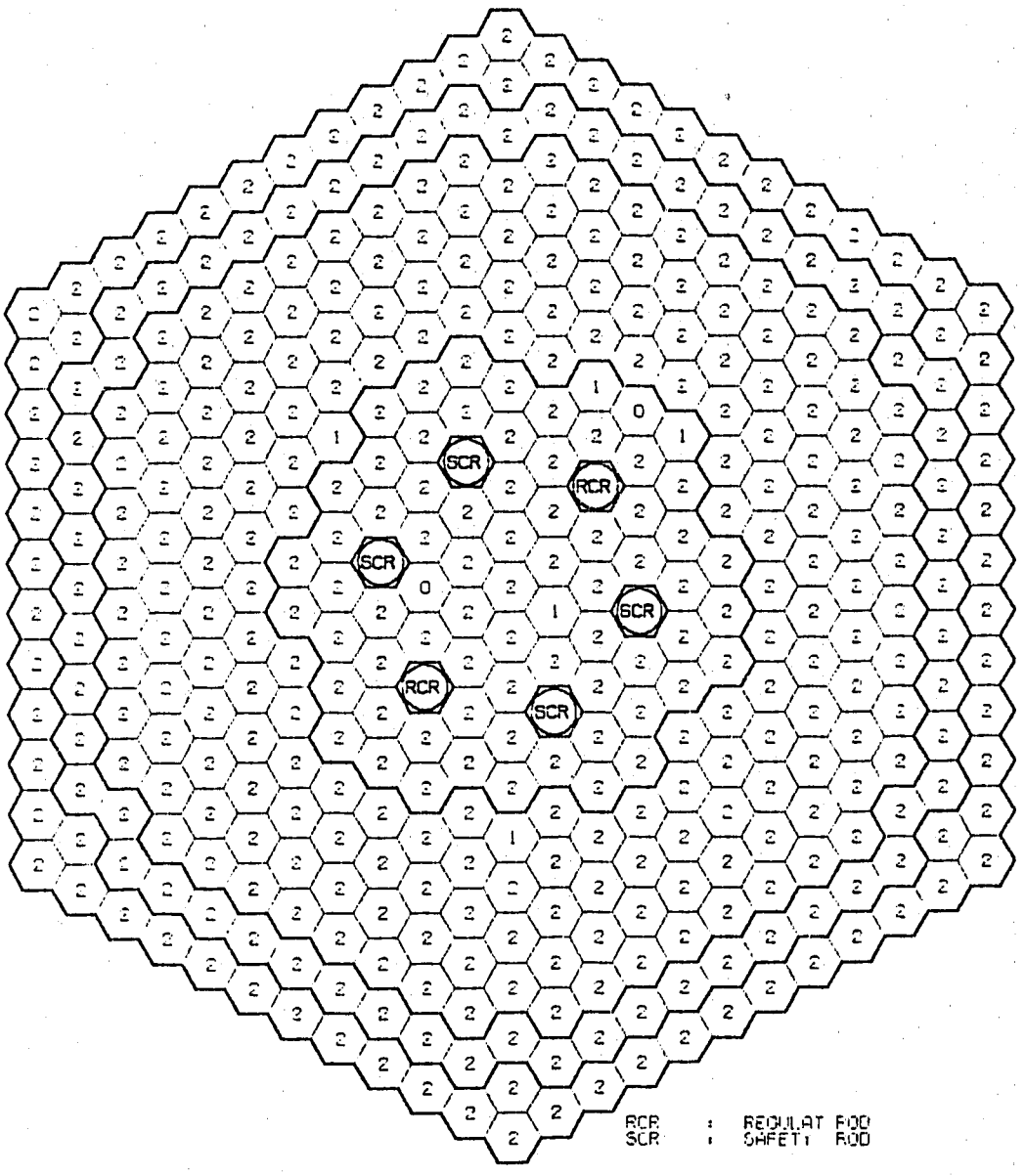
付図4.1 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW POWER-UP CYCLE (BOC)



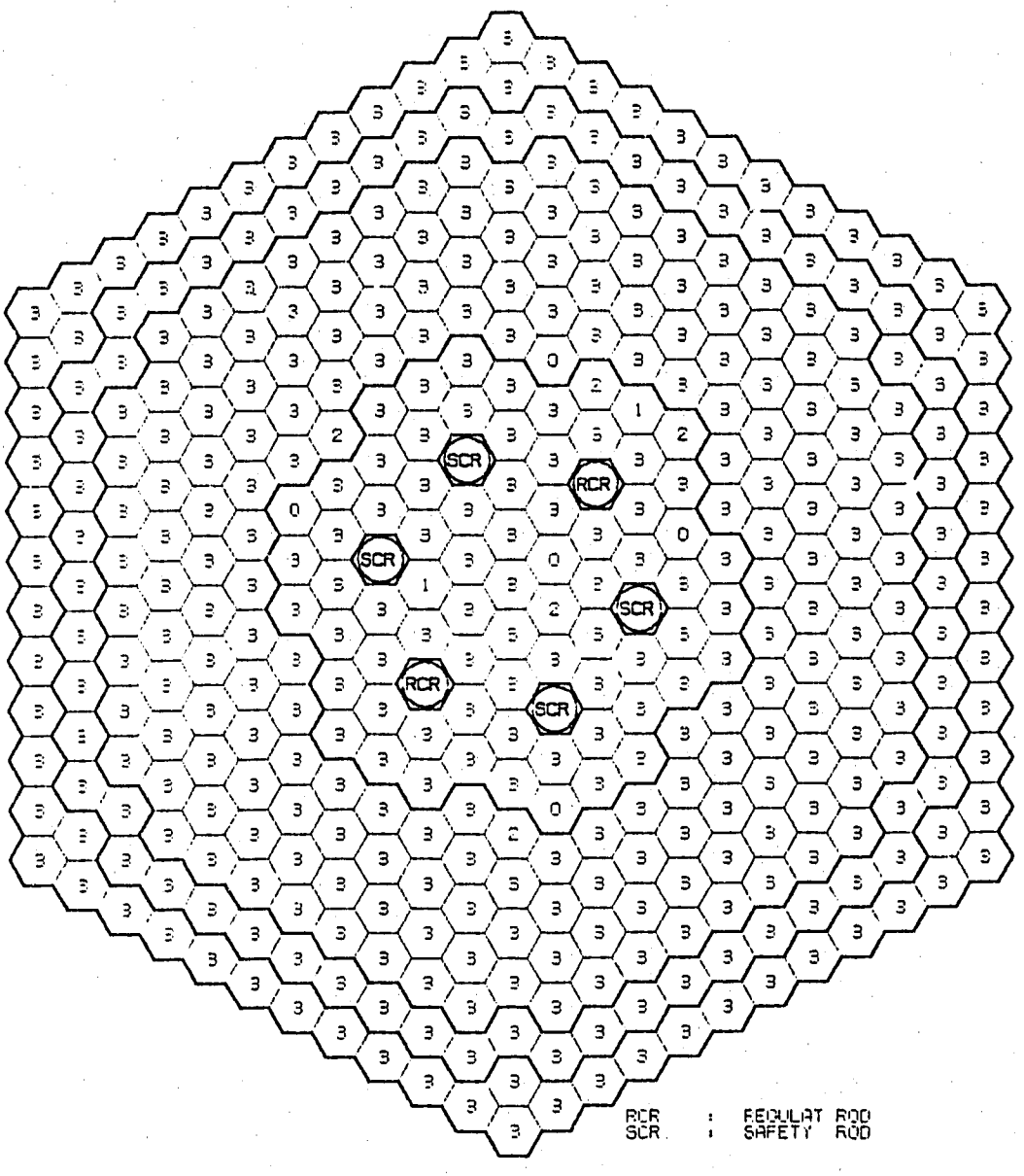
付図4.2 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 1ST CYCLE (BOC)



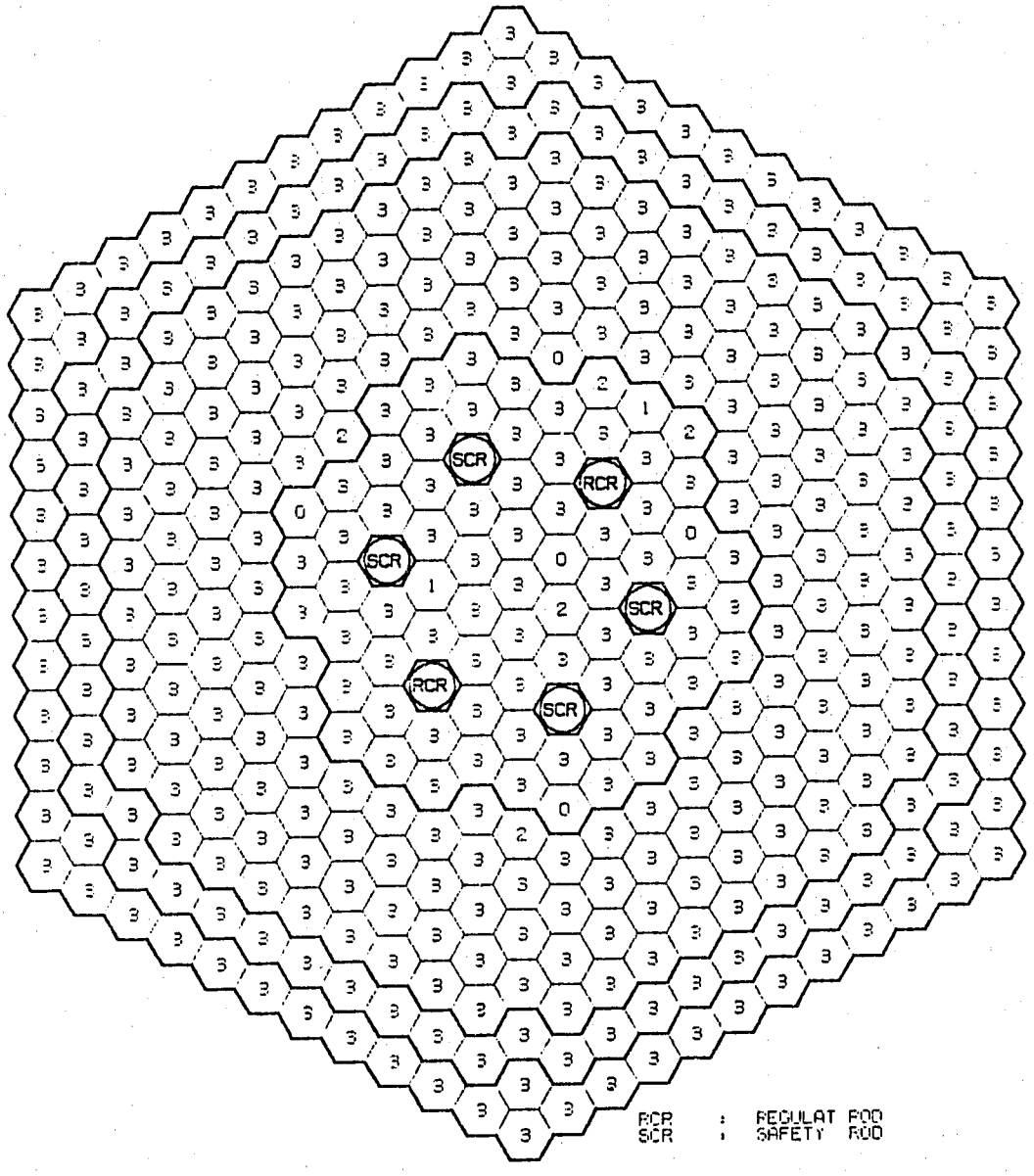
付図4.3 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 2ND CYCLE (BOC)



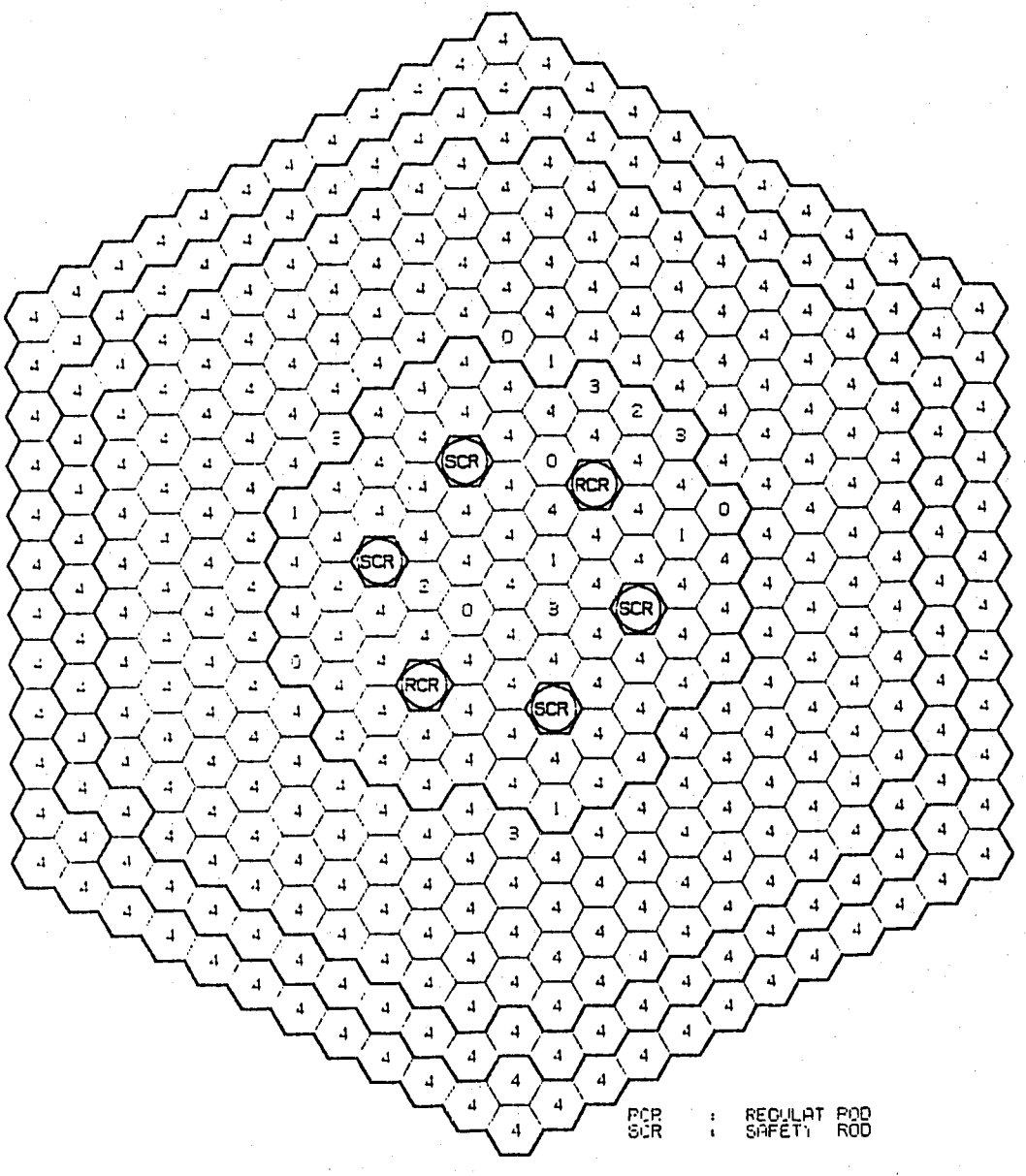
付図4.4 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 3RD CYCLE (BOC)



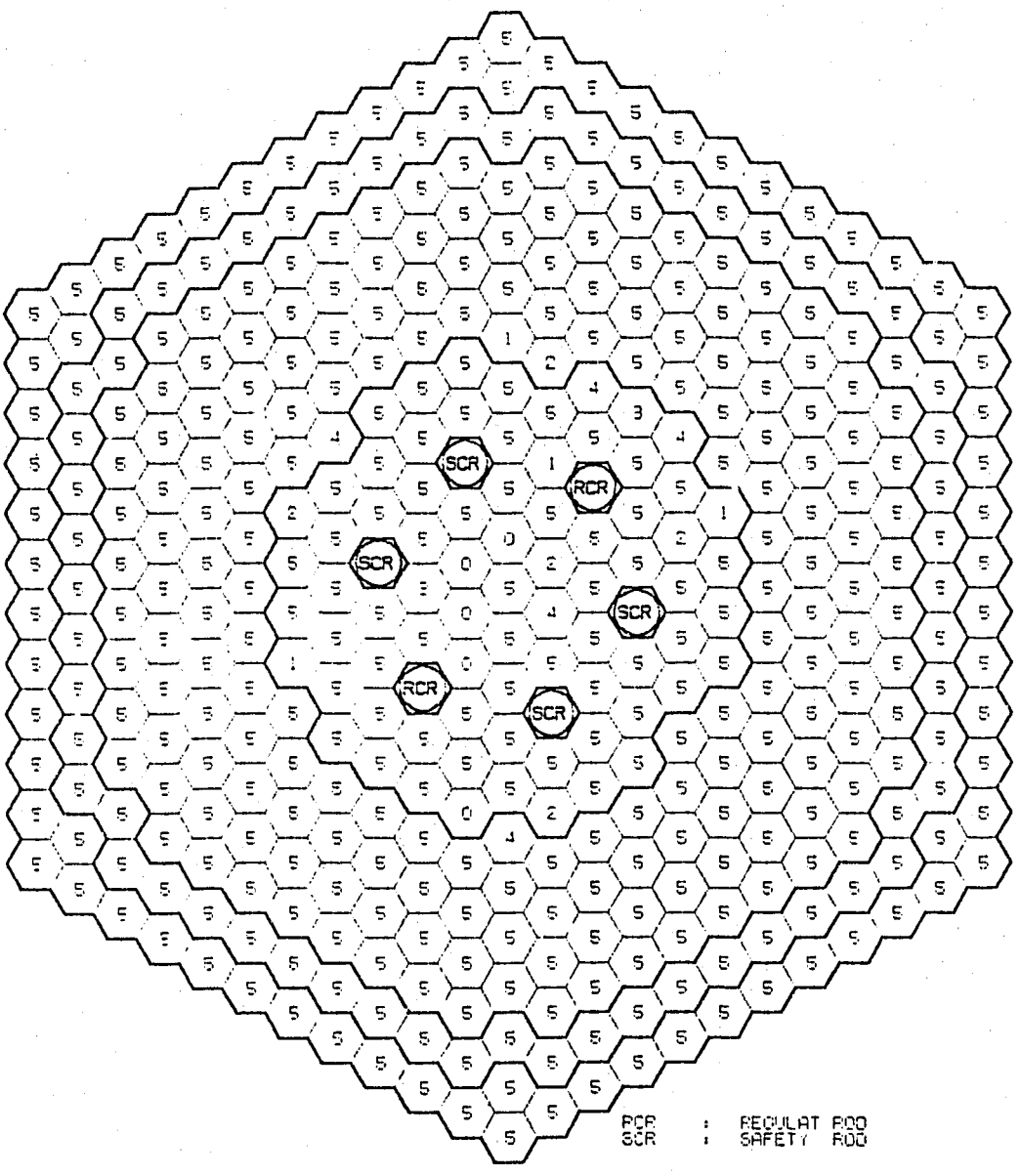
付図4.5 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW POWER UP CYCLE (BOC)



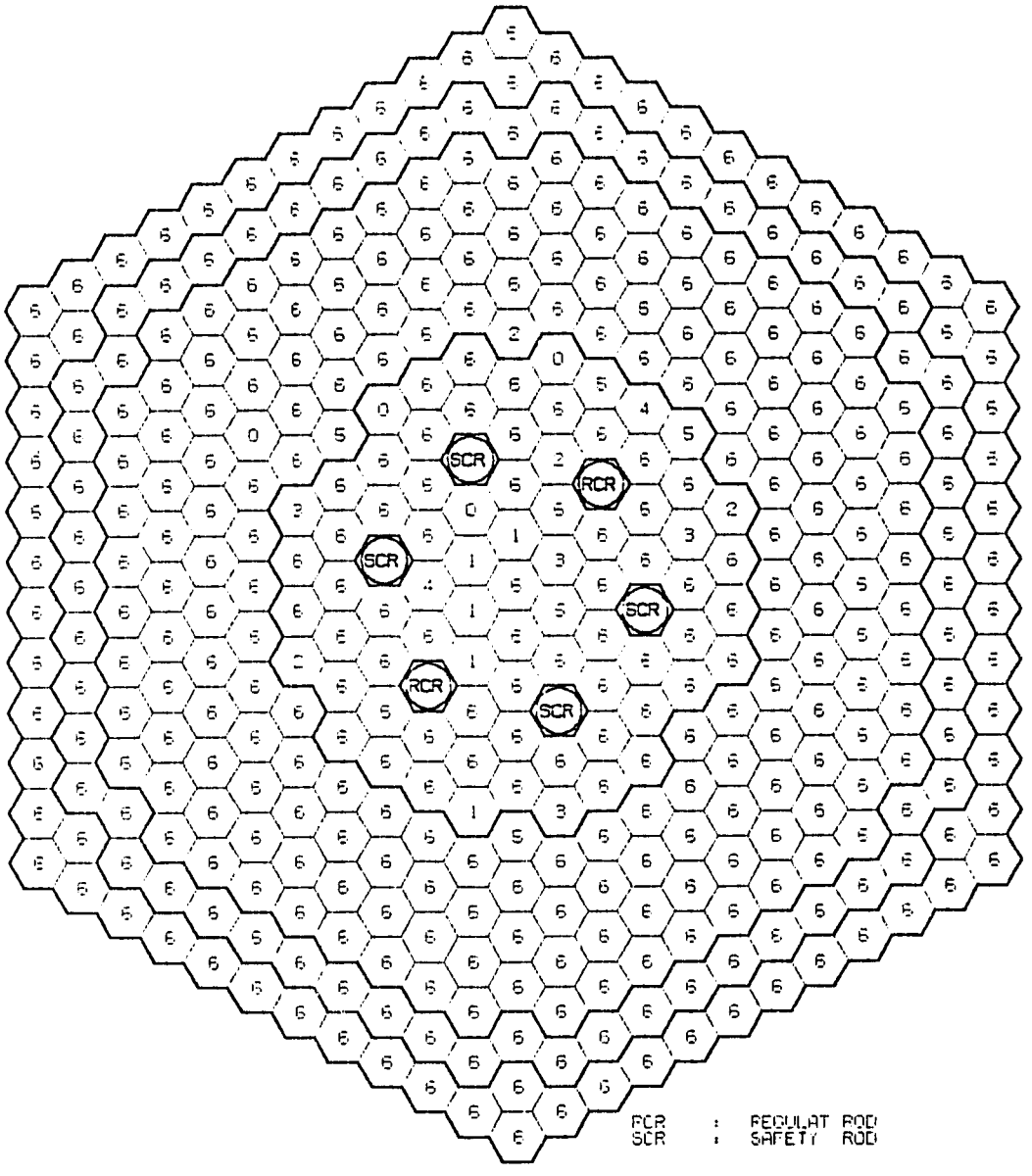
付図4.6 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 1ST CYCLE (BOC)



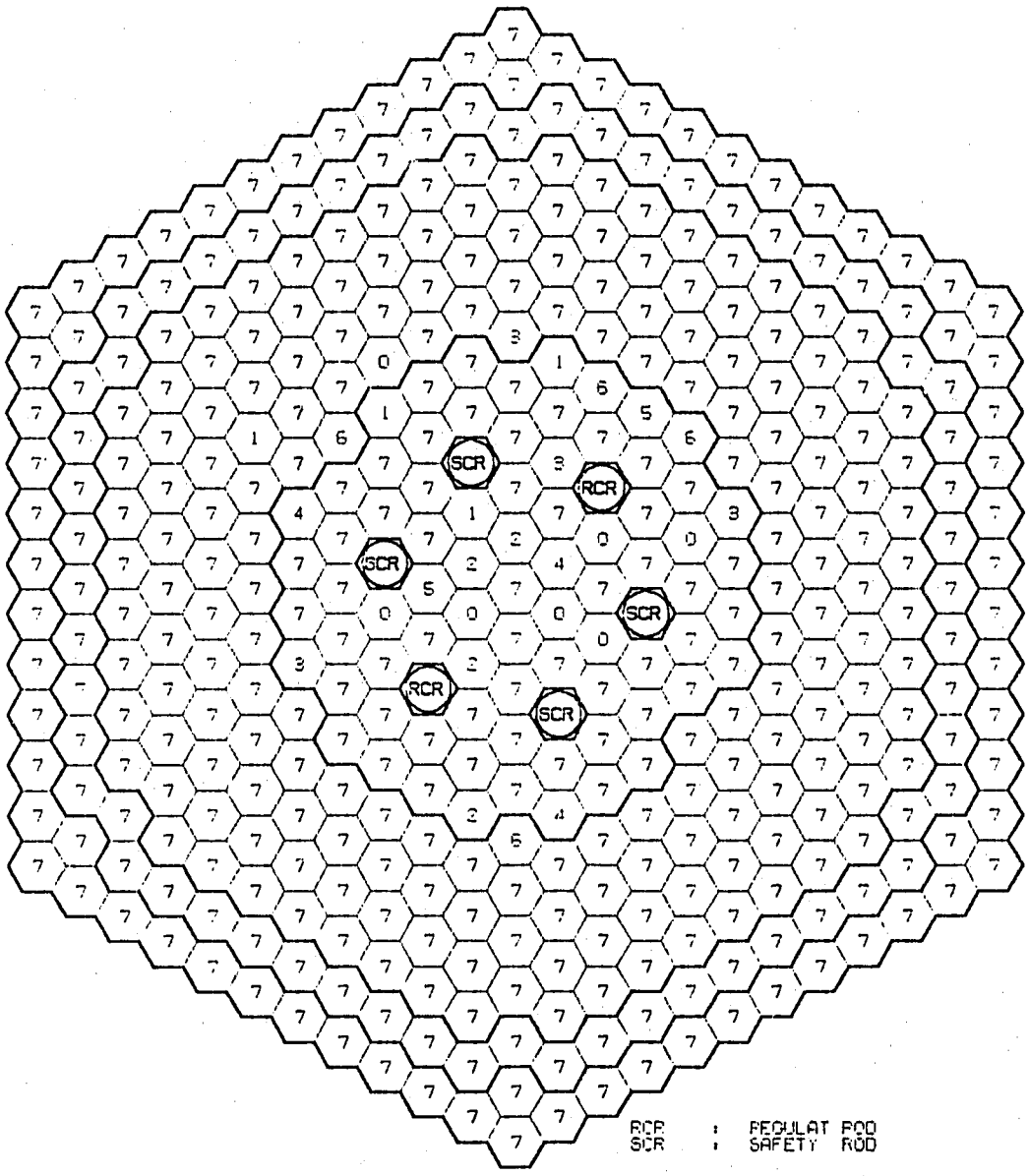
付図4.7 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 2ND CYCLE (BOC)



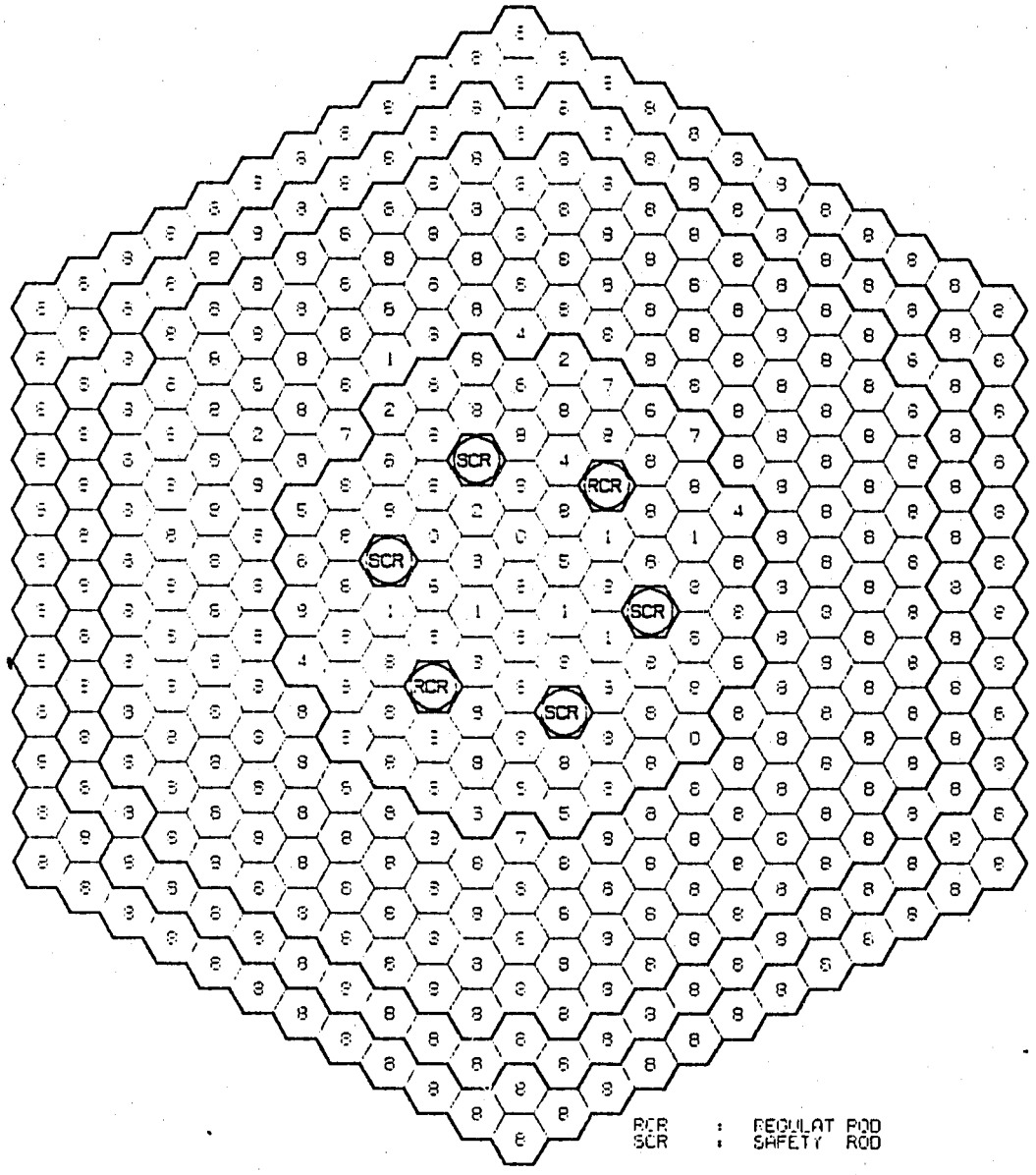
付図4.8 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 3RD CYCLE (BOC)



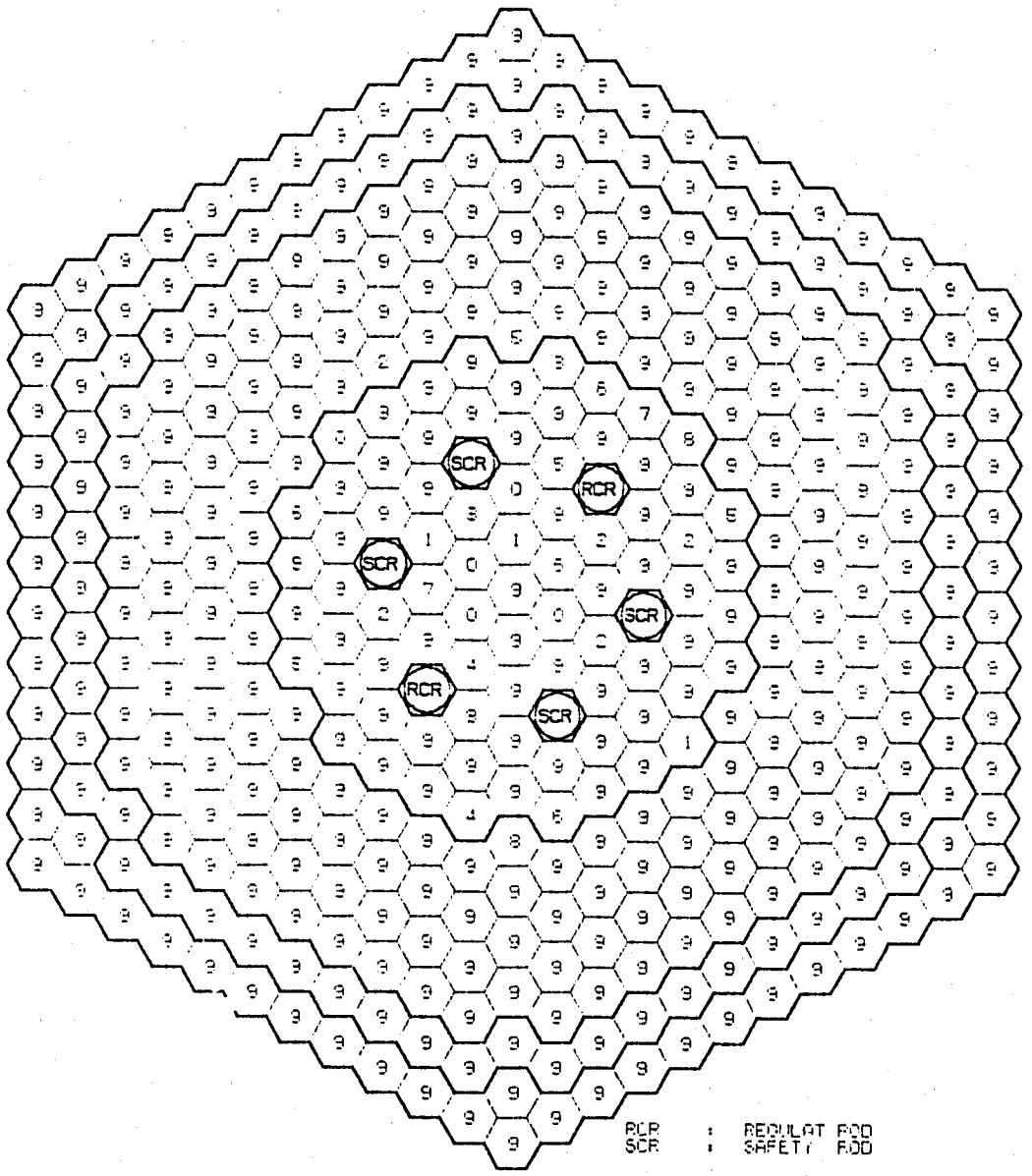
付図4.9 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 4TH CYCLE (BOC)



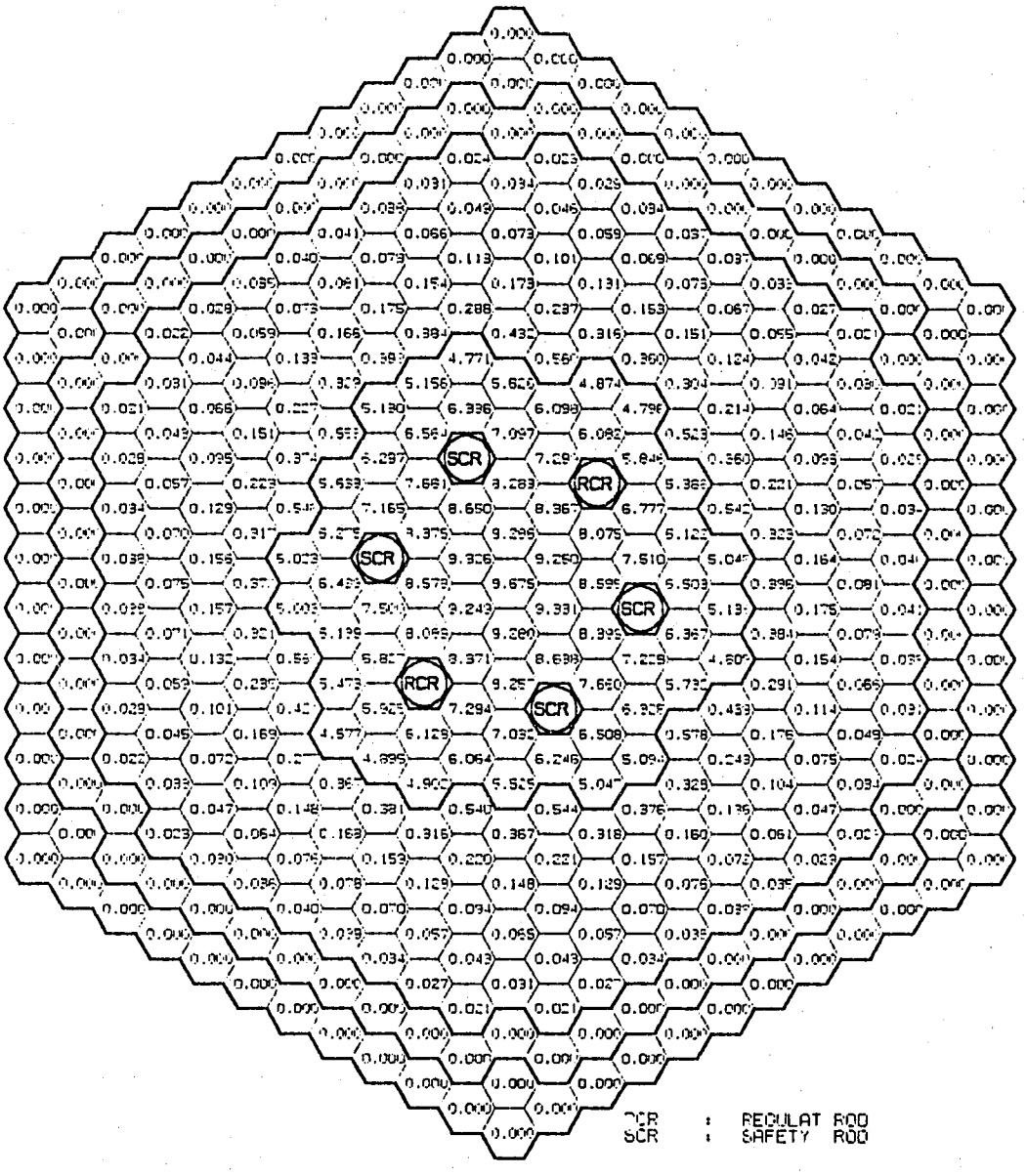
付図4.10 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 5TH CYCLE (BOC)



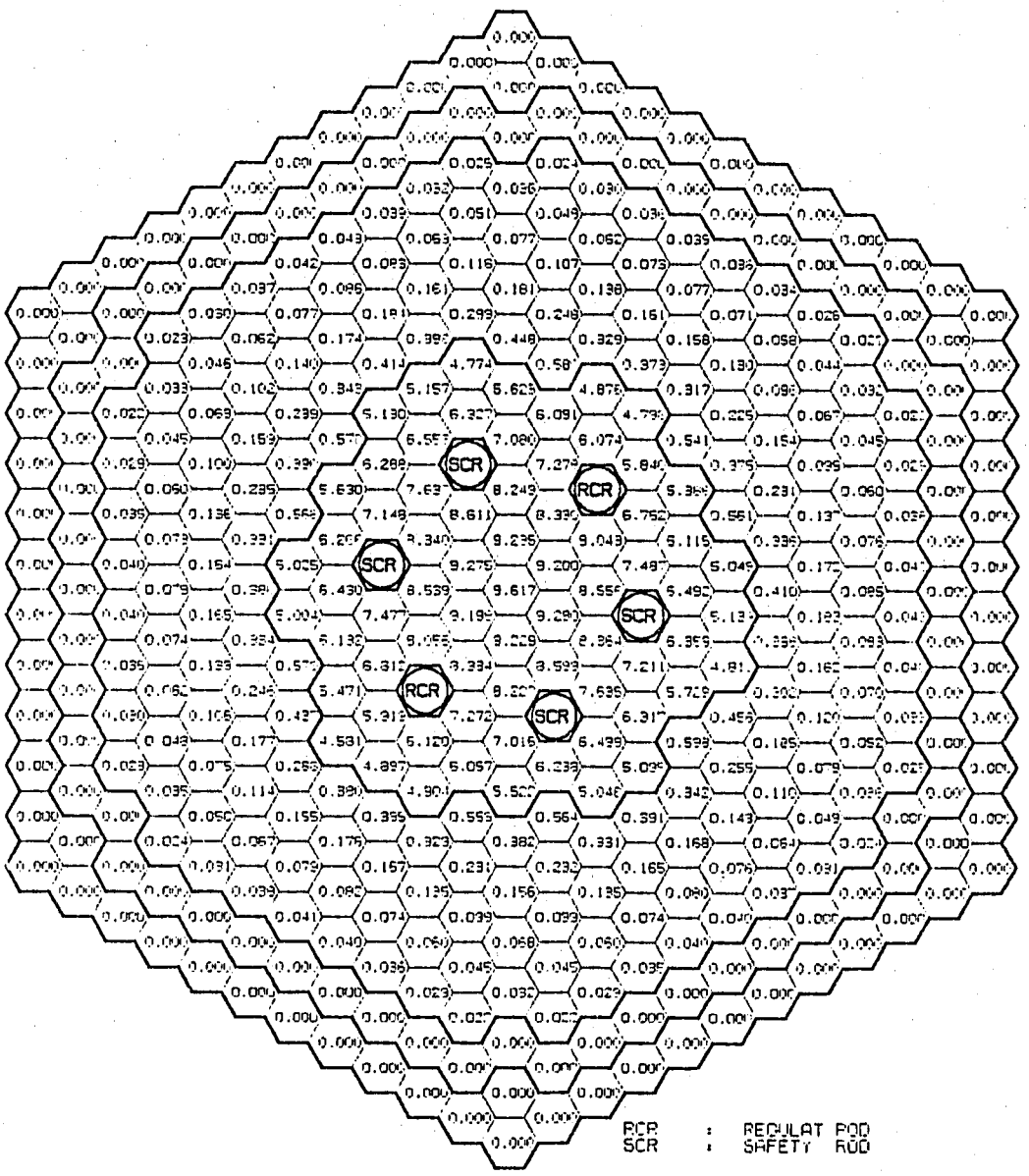
付図4.11 STAY CYCLE MAP

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 6TH CYCLE (BOC)



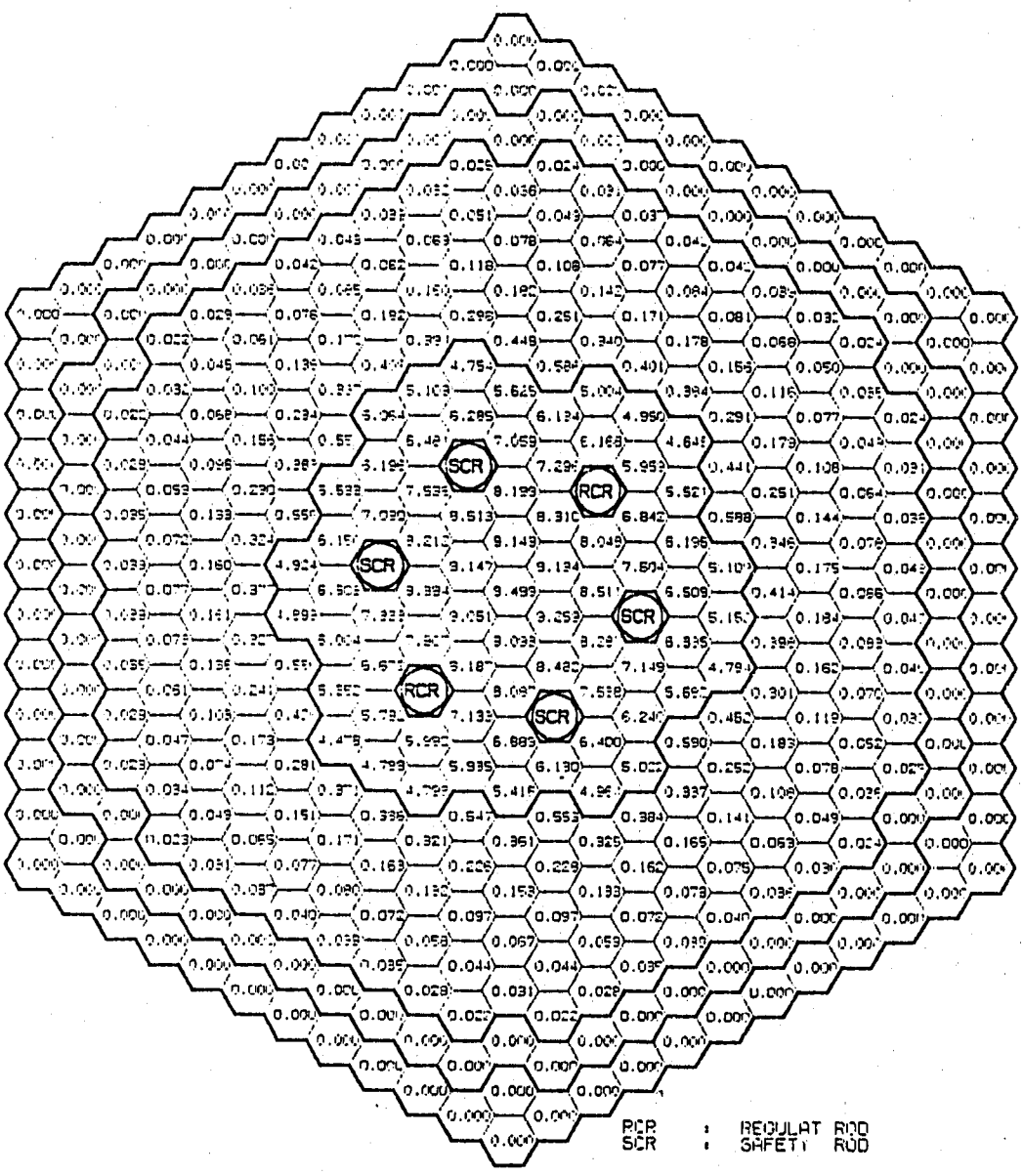
付図4.12 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^{-1} MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW POWER-UP CYCLE (BOC)



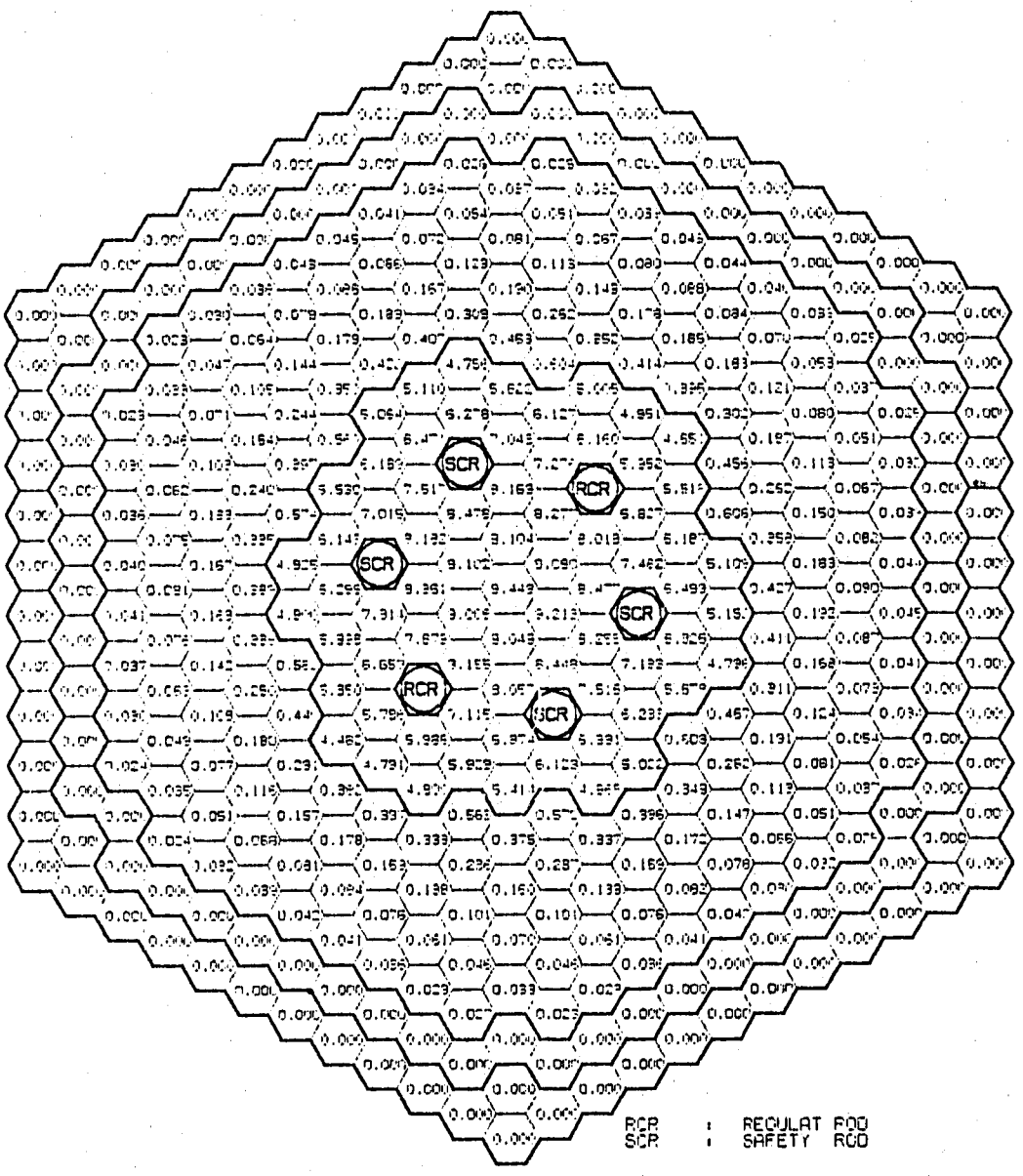
付図4.13 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^{-1} MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW POWER-UP CYCLE (EOC)



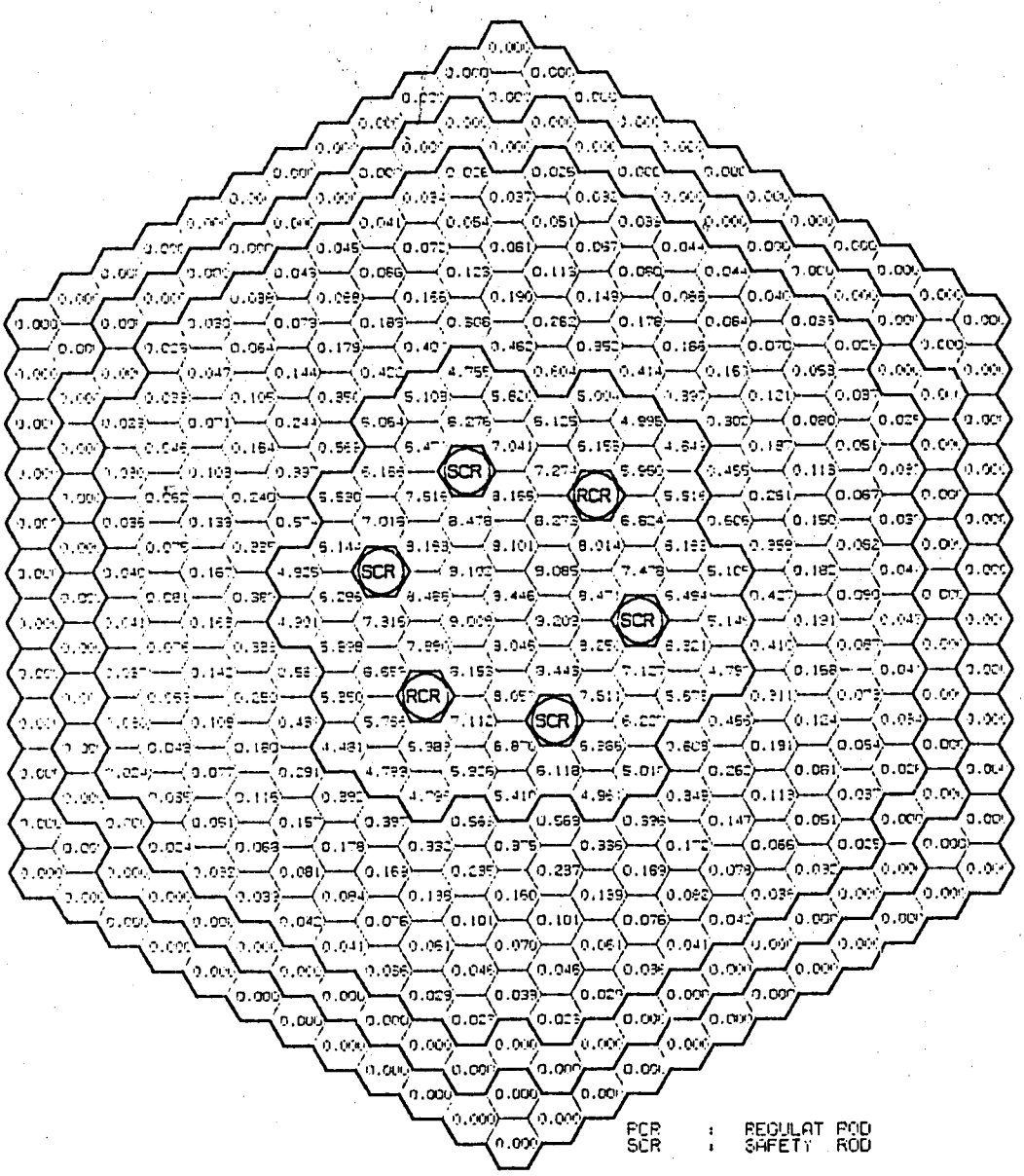
付図4.14 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^{-1} MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 1ST CYCLE (BOC)



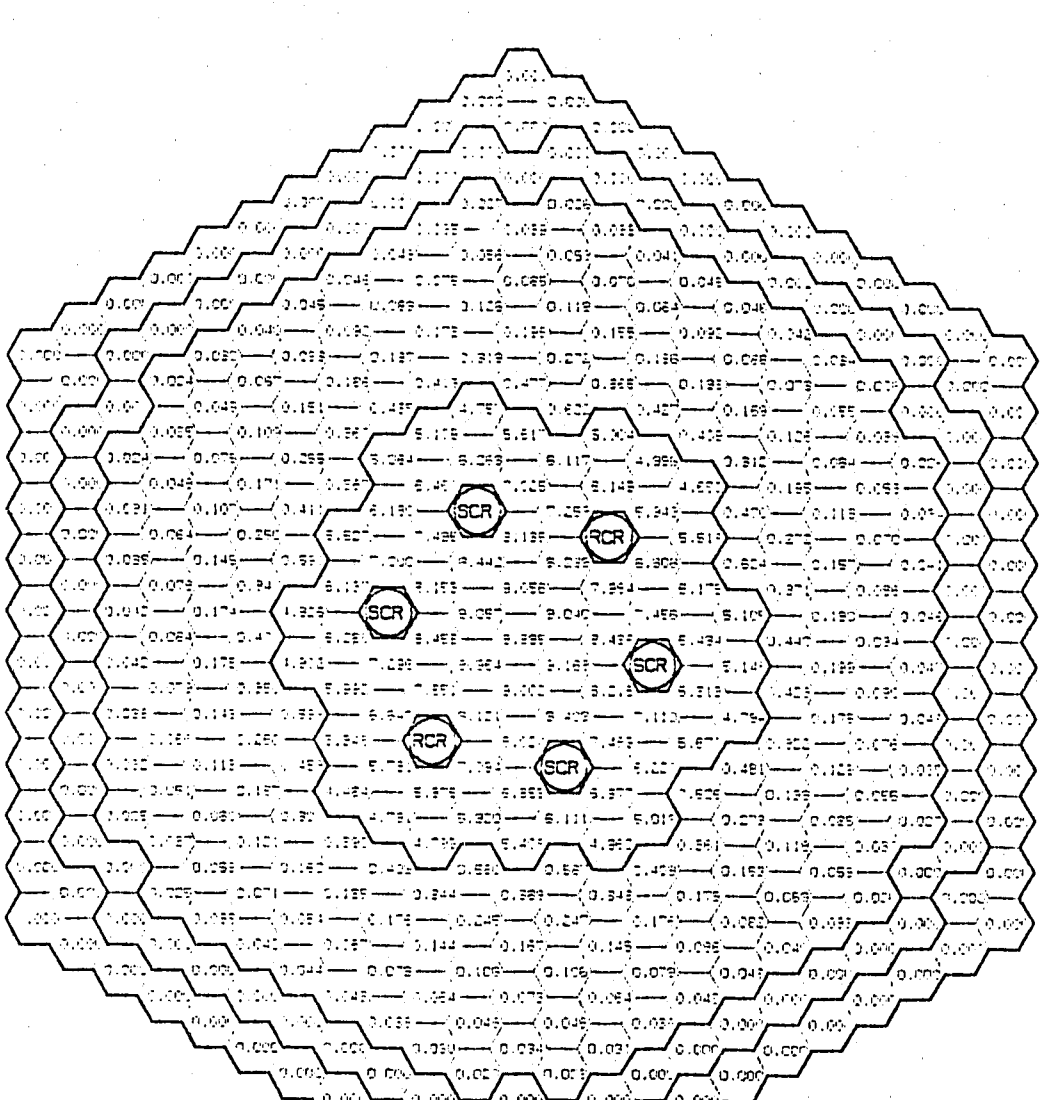
付図4.15 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^{-1} MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 1ST CYCLE (EOC)



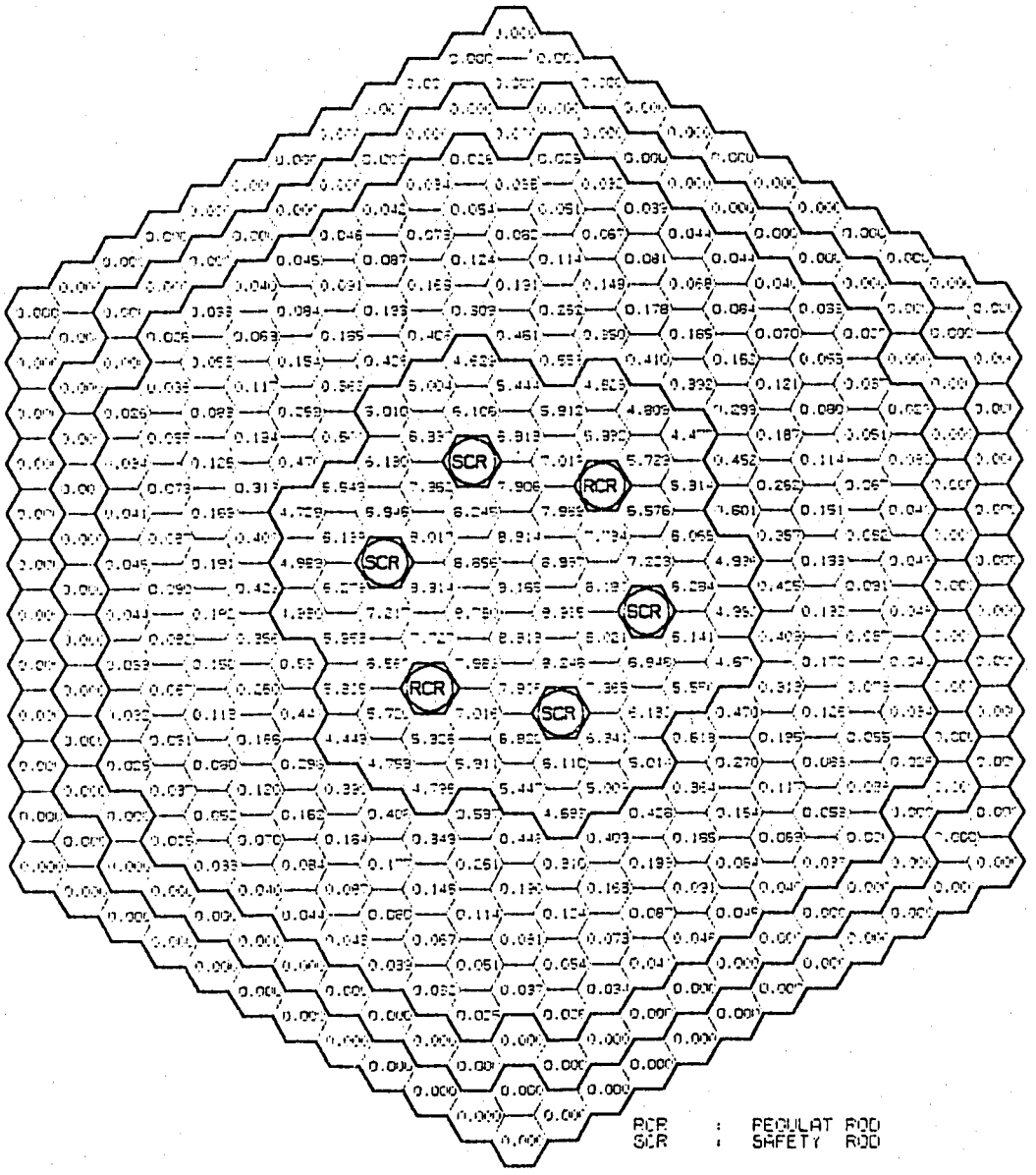
付図4.16 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^{-1} MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 2ND CYCLE (BOC)



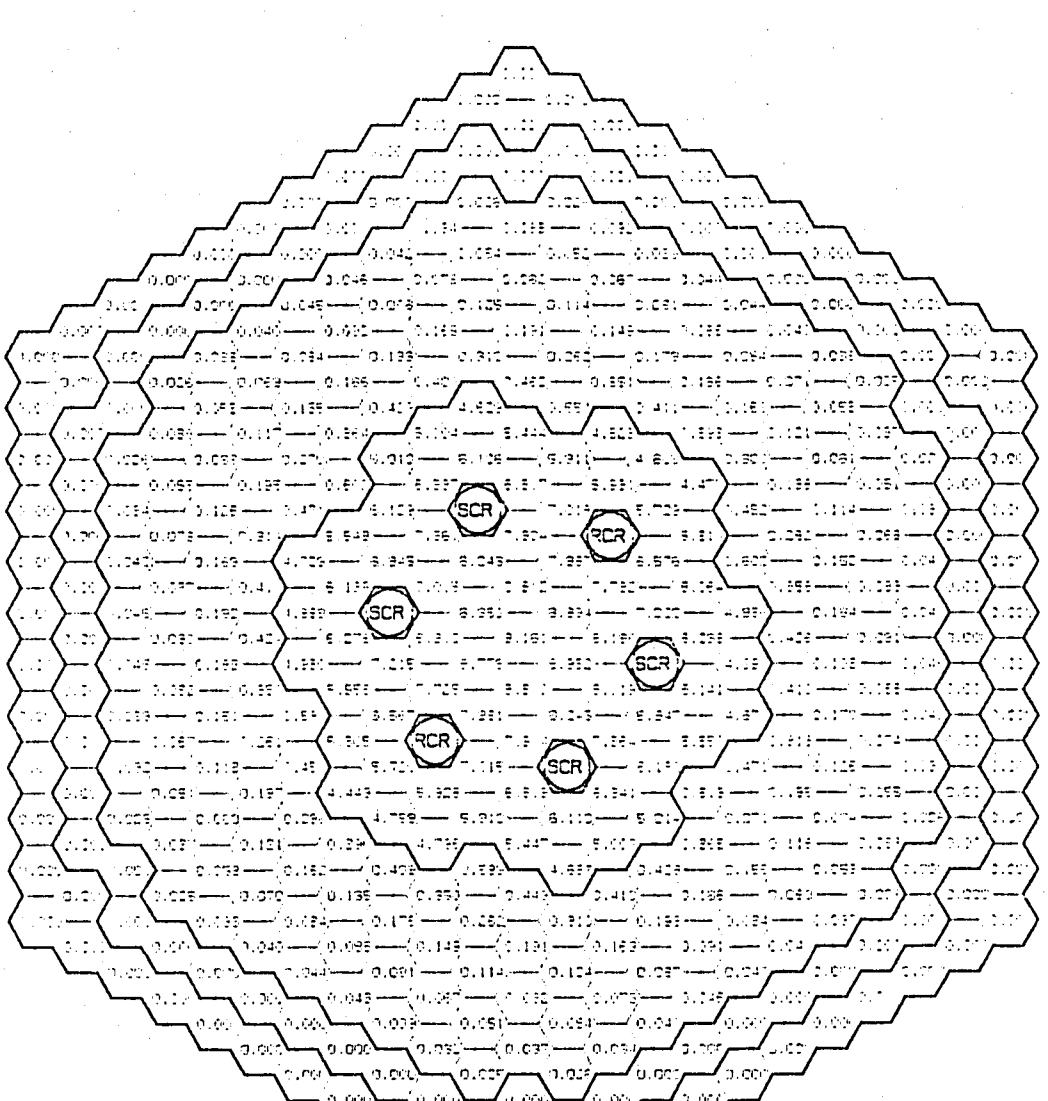
付図4.17 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^{-1} MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 2ND CYCLE (EOC)



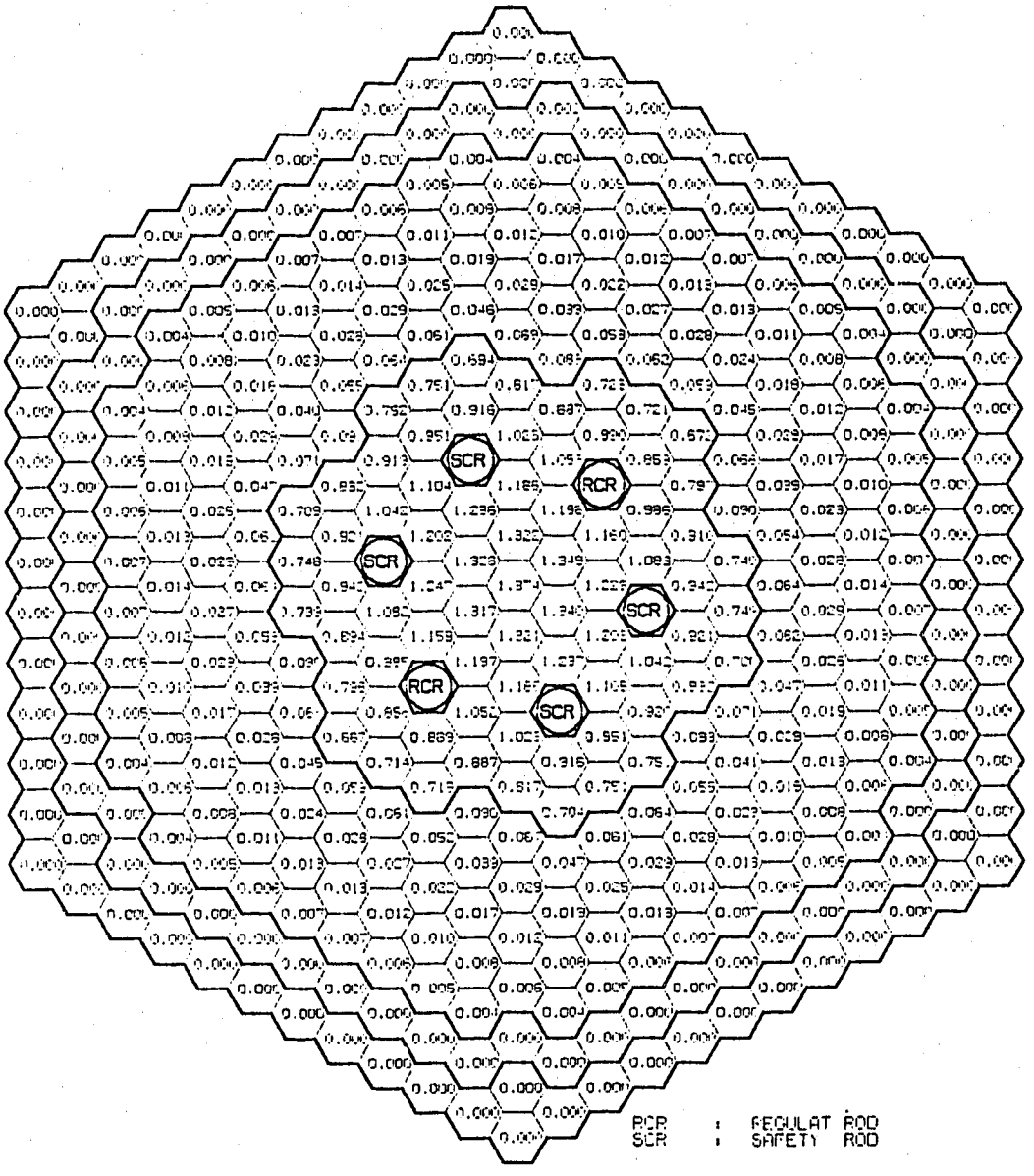
付図4.18 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^{-1} MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 3RD CYCLE (BOC)



付図4.19 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^{-1} MW)

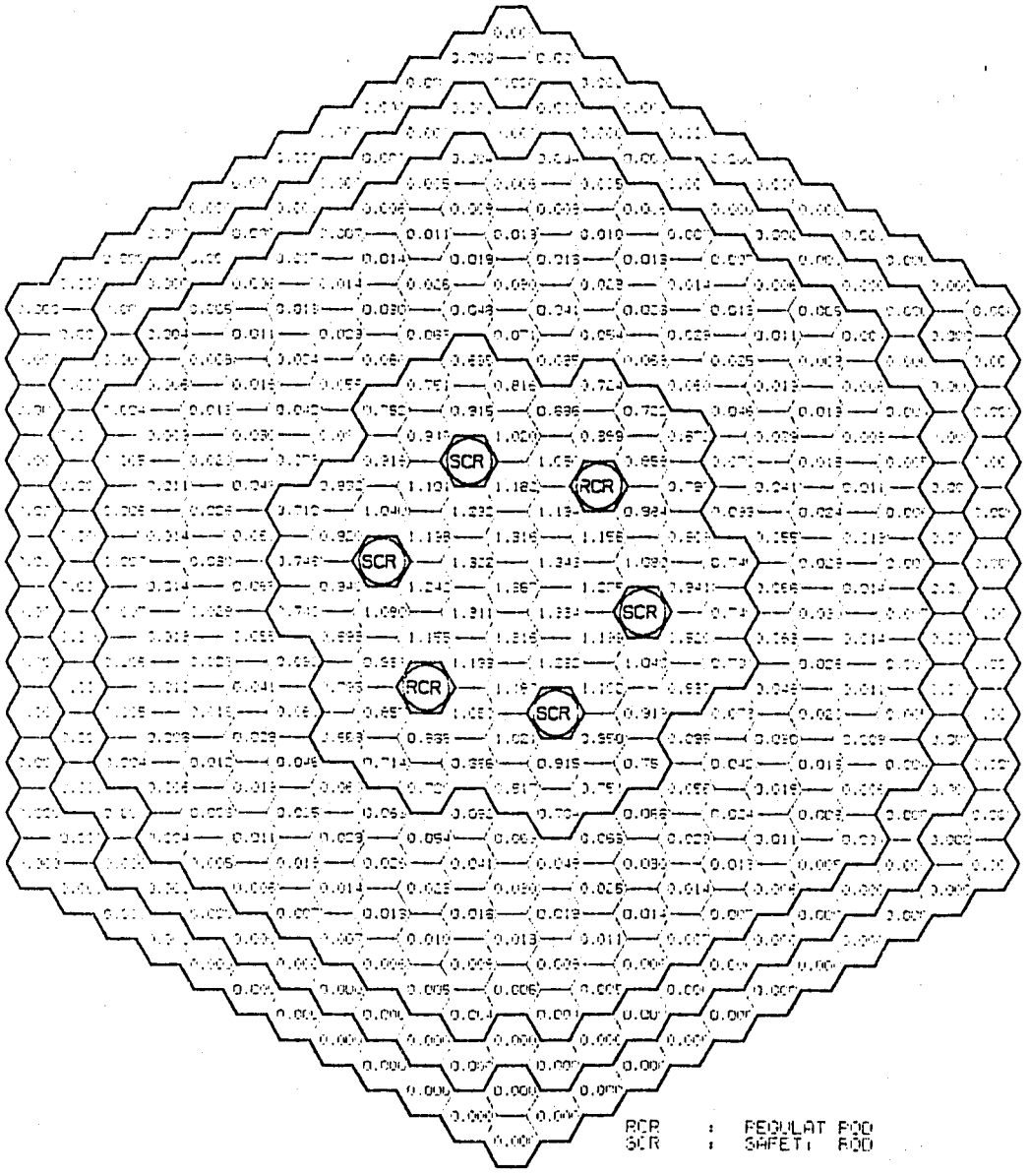
JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
50MW 3RD CYCLE (EOC)



付図4.20

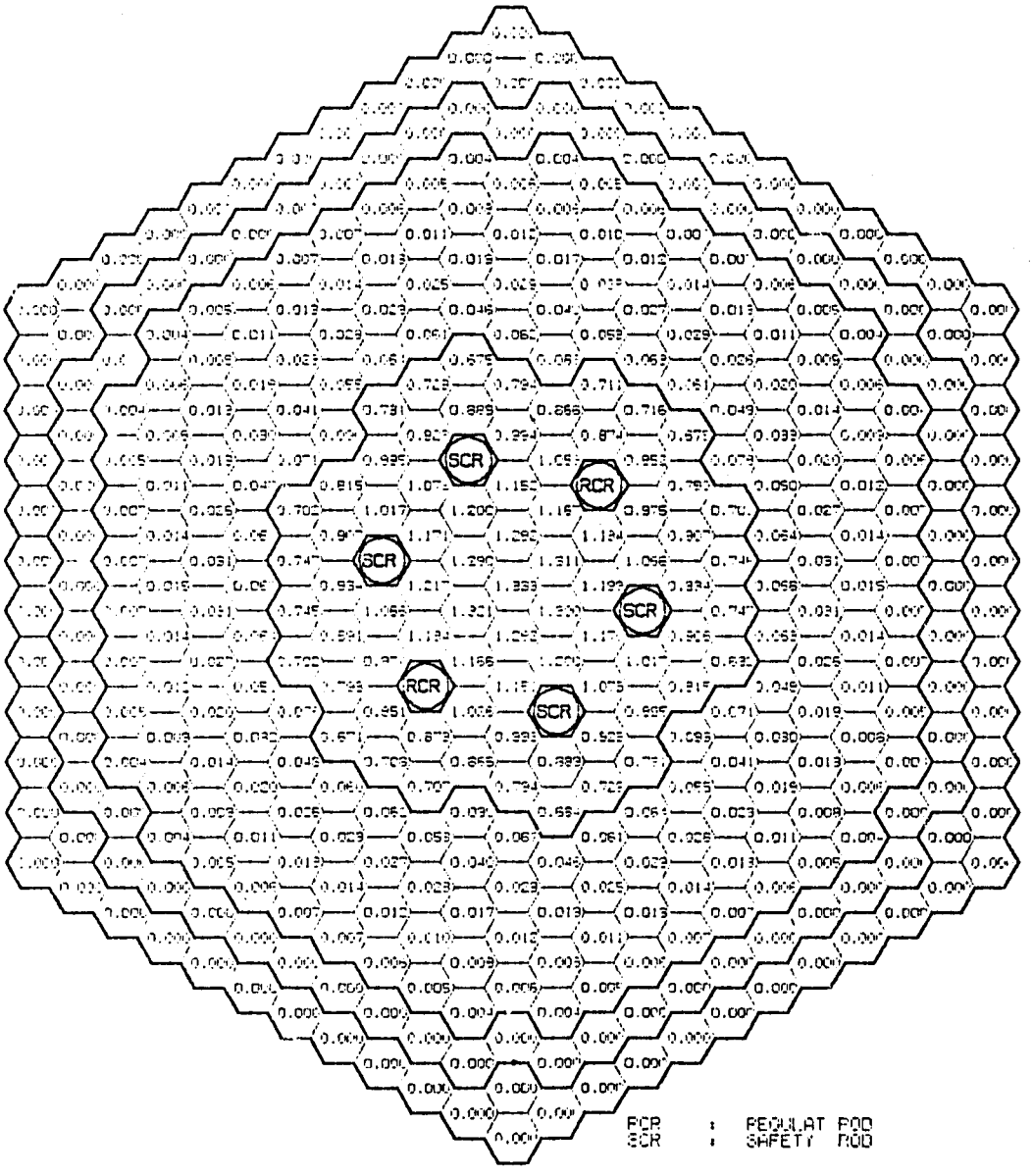
FIG.26 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW POWER UP CYCLE (BOC)



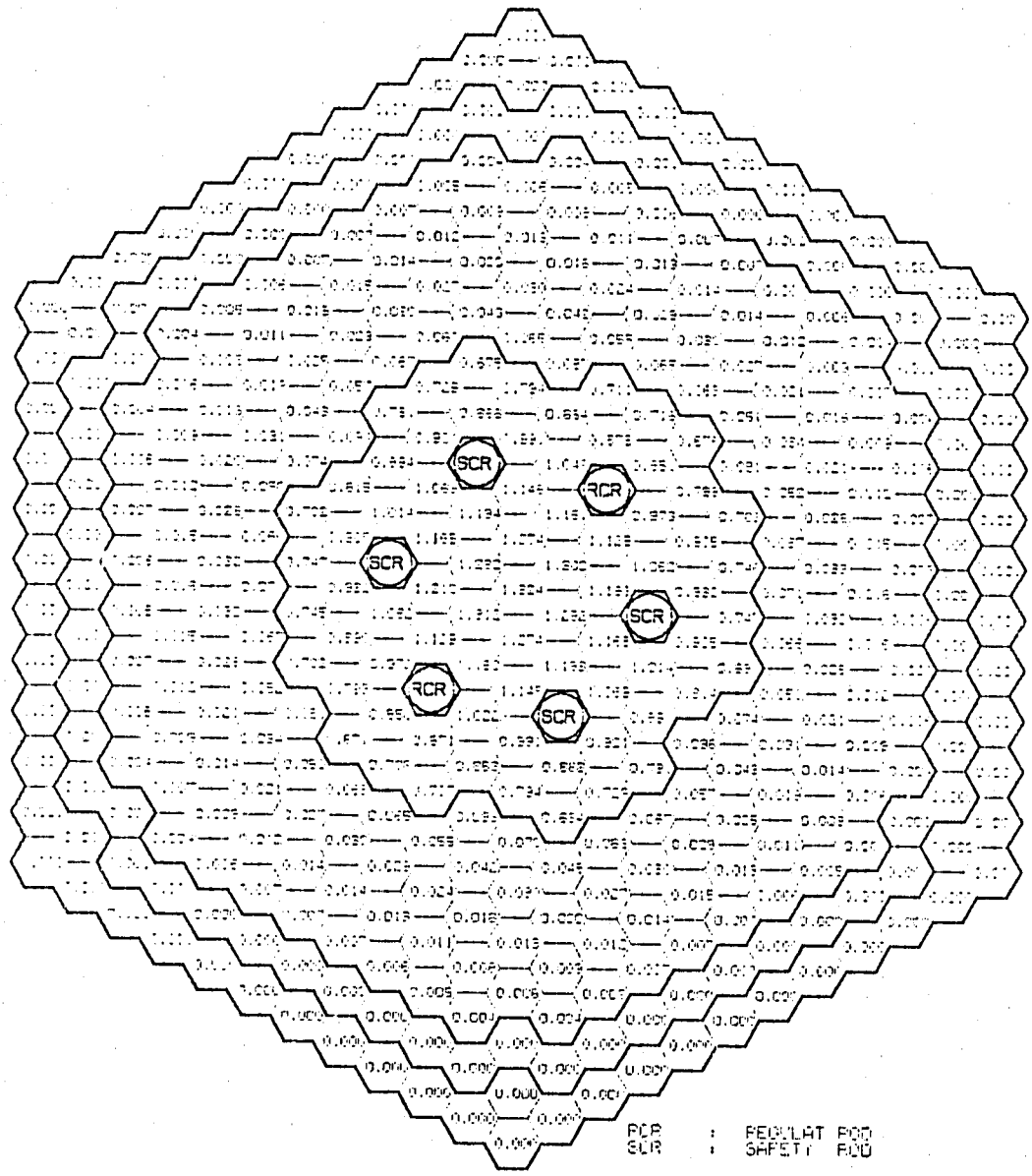
付図4.21 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW POWER UP CYCLE (EOC)



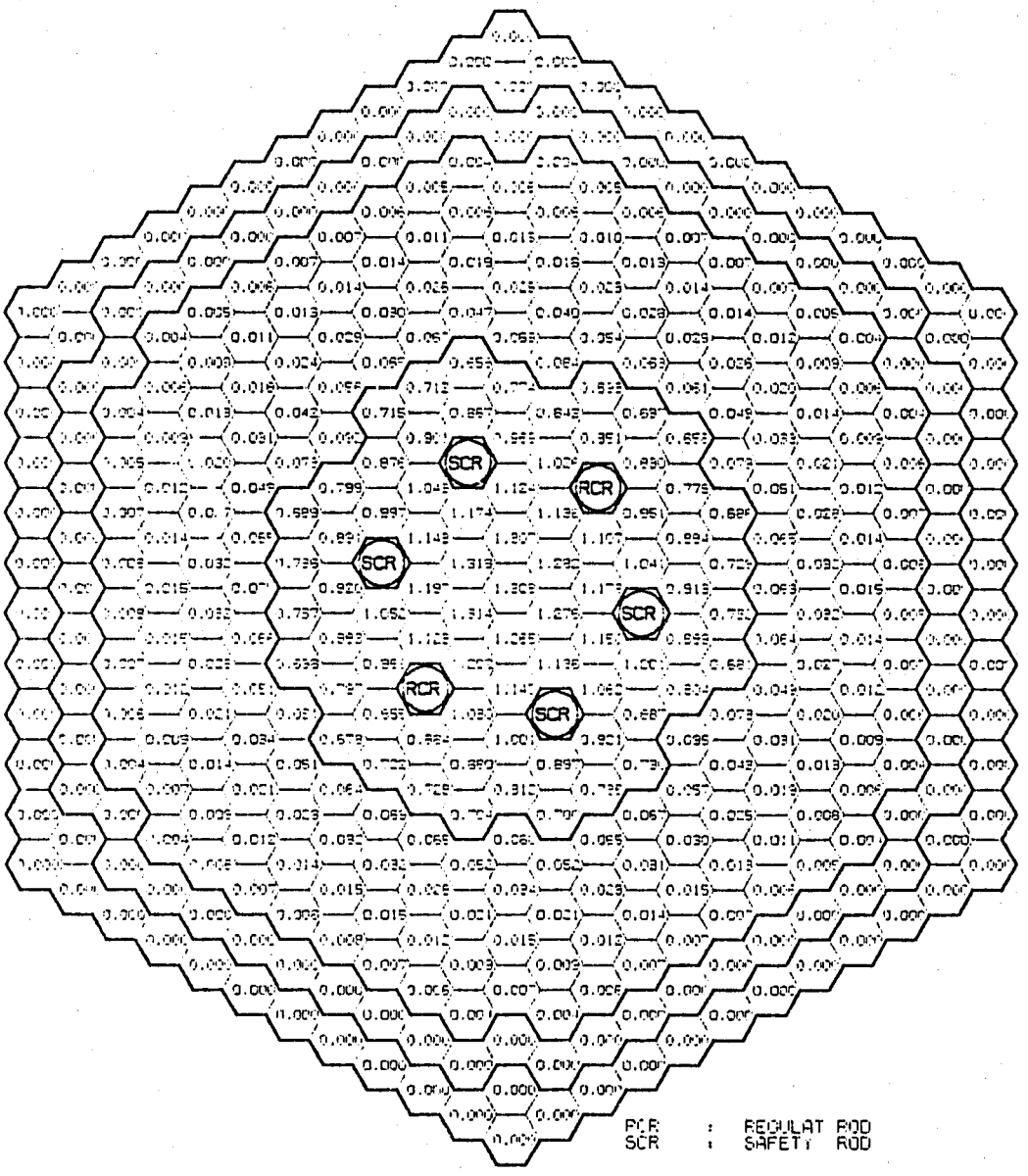
付図4.22 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 1ST CYCLE (BOC)



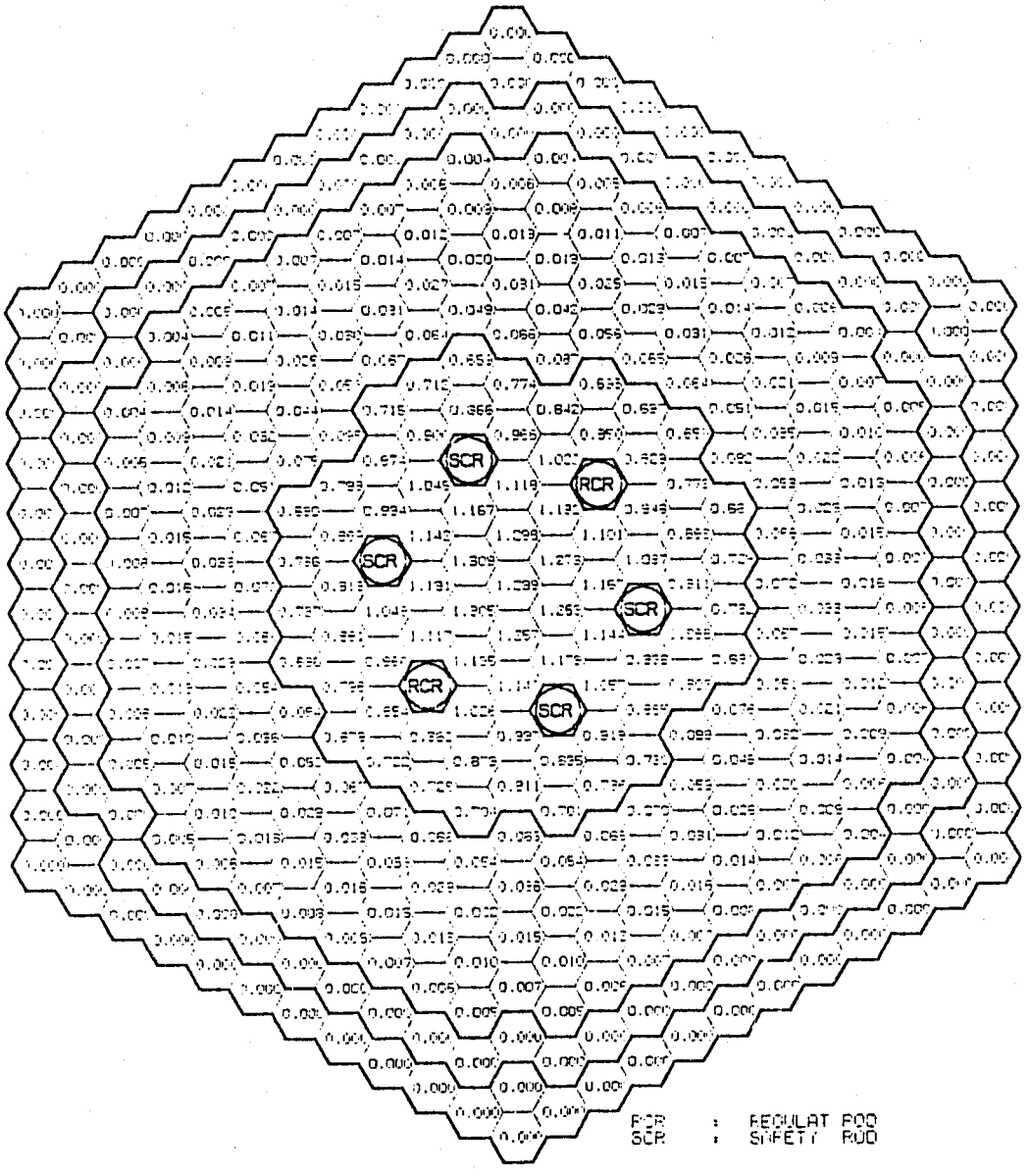
付図4.23 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 1ST CYCLE (EOC)



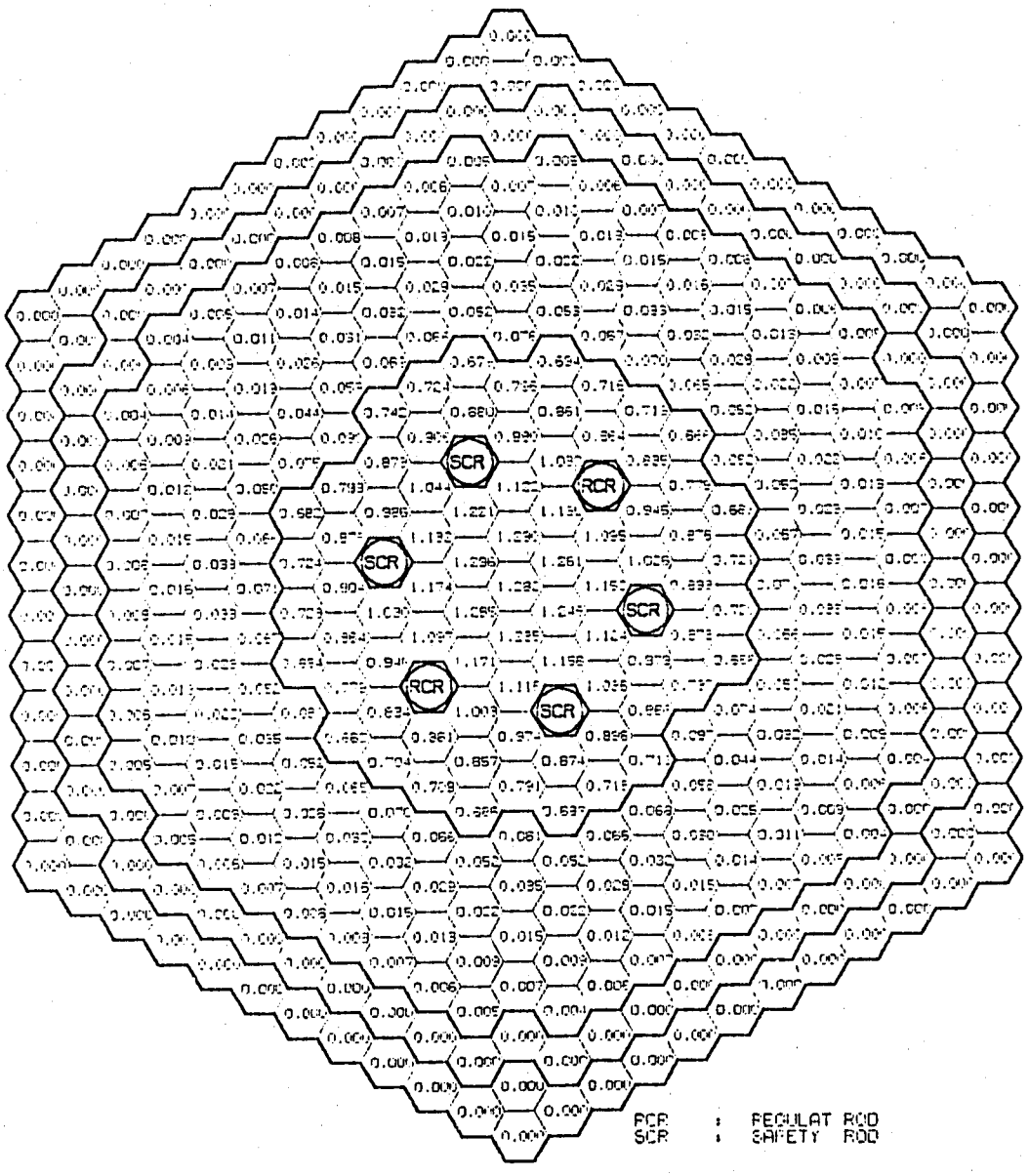
付図4.24 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 2NU CYCLE (90C)



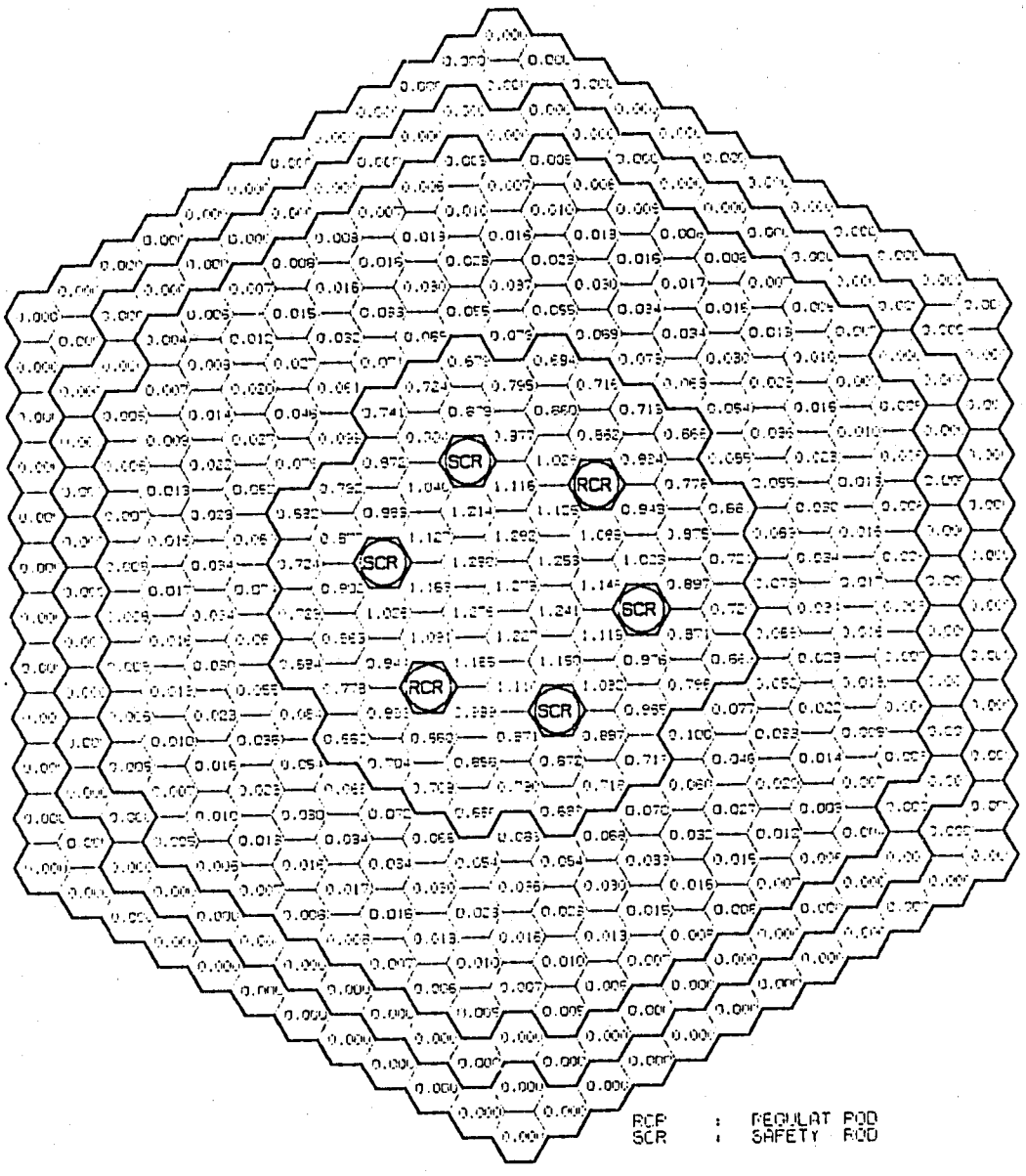
付図4.25 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 2ND CYCLE (EOC)



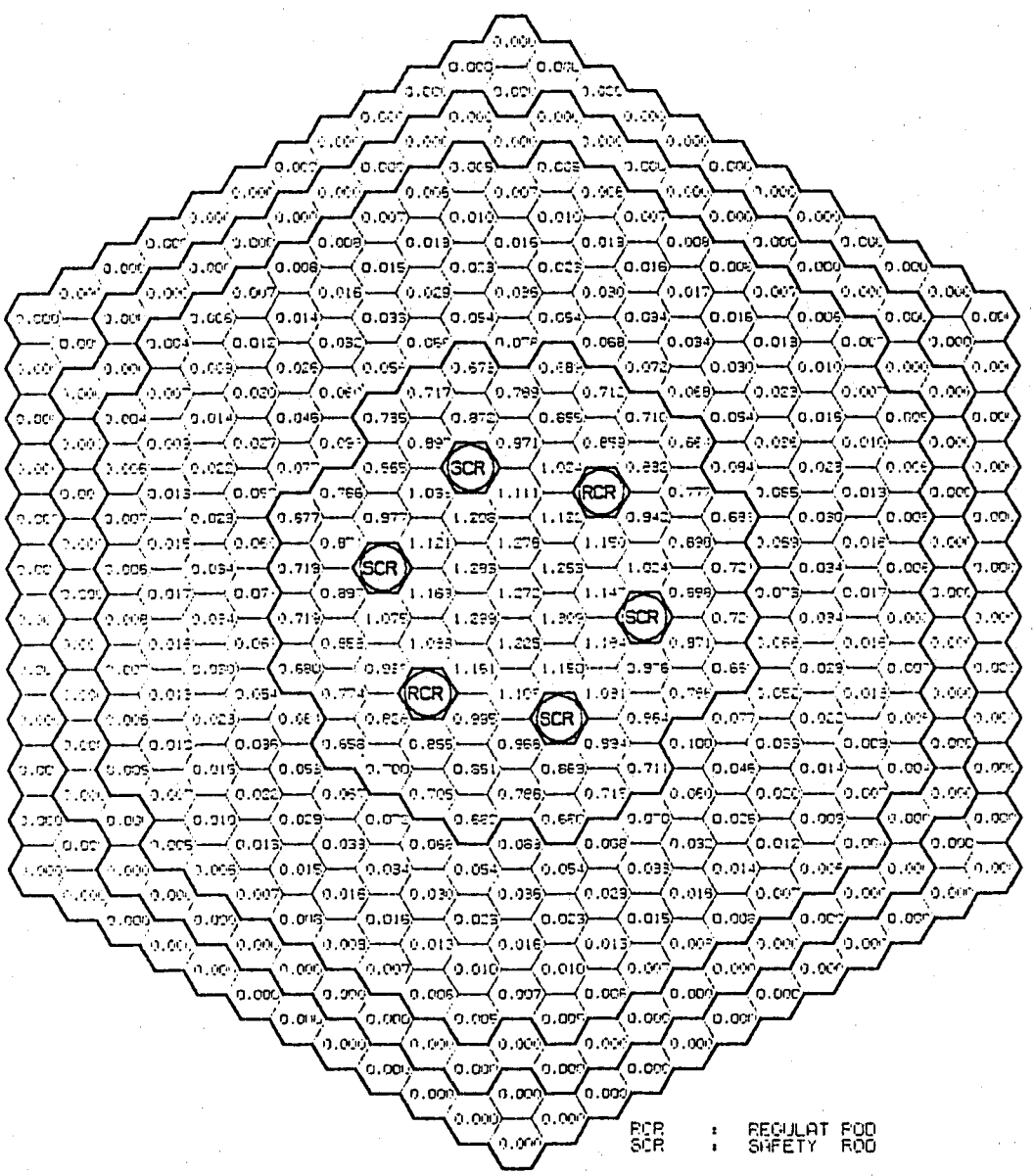
付図4.26 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 3RD CYCLE (BOC)



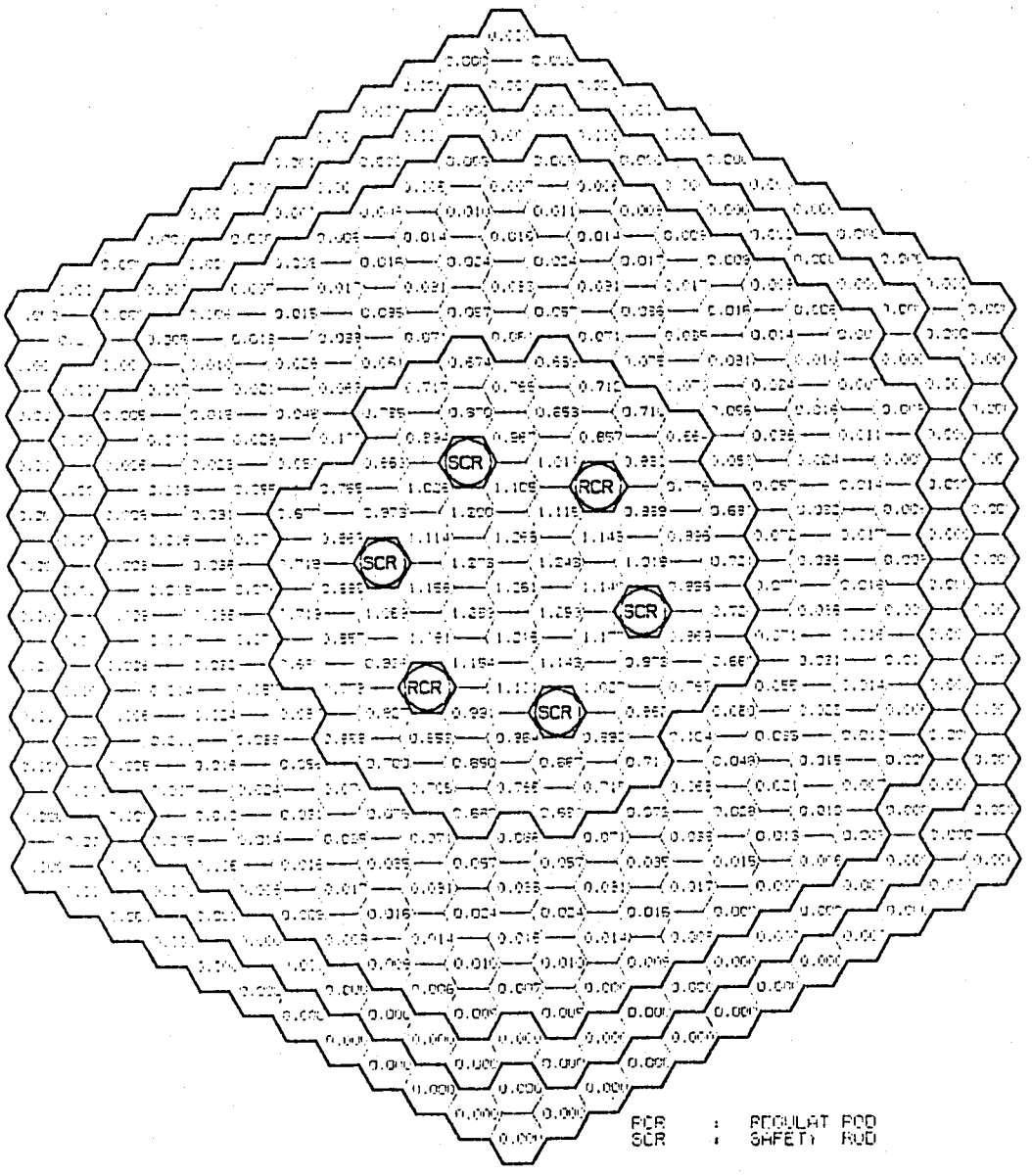
付図4.27 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 3RD CYCLE (EOC)



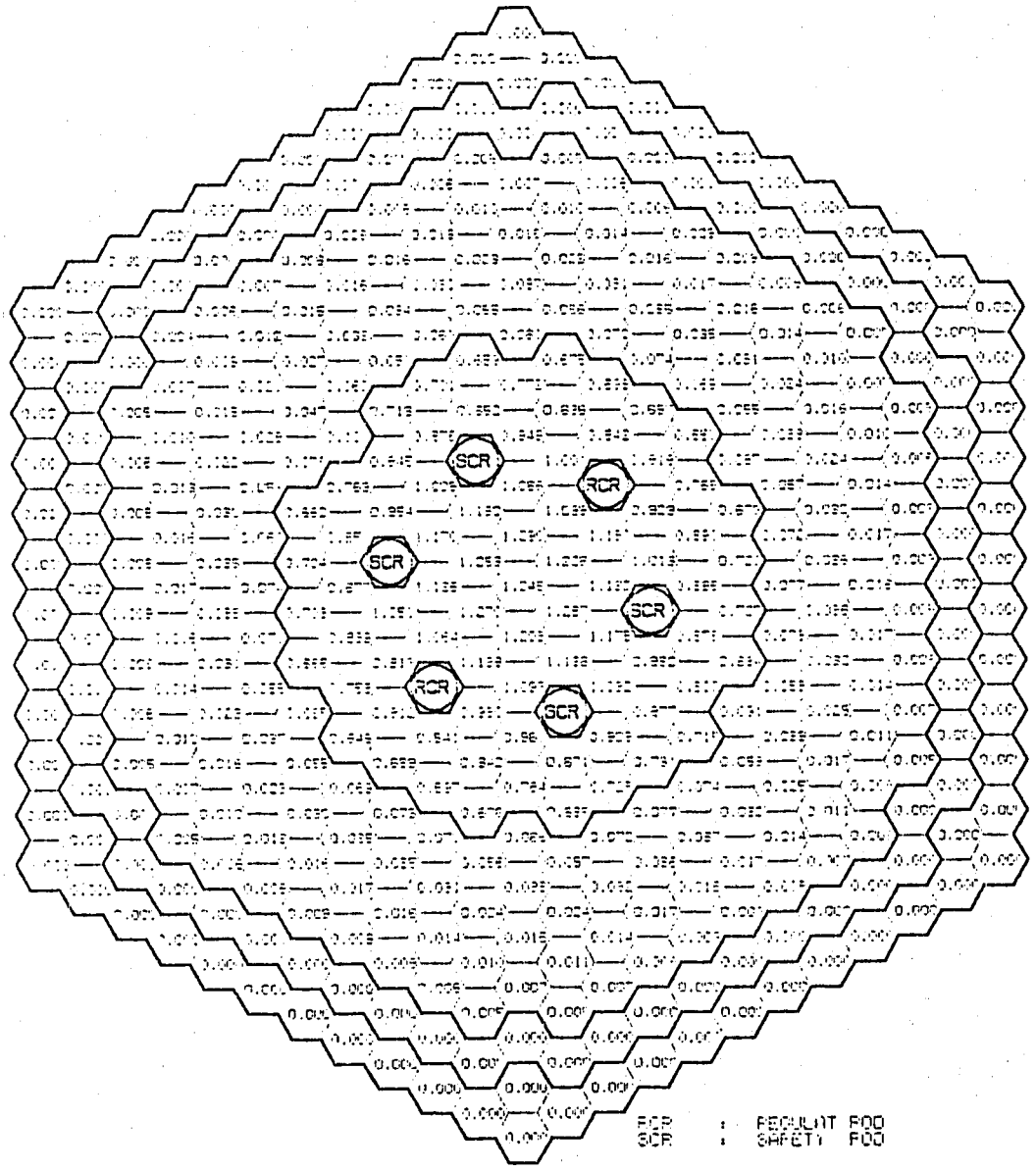
付図4.28 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 4TH CYCLE (BOC)



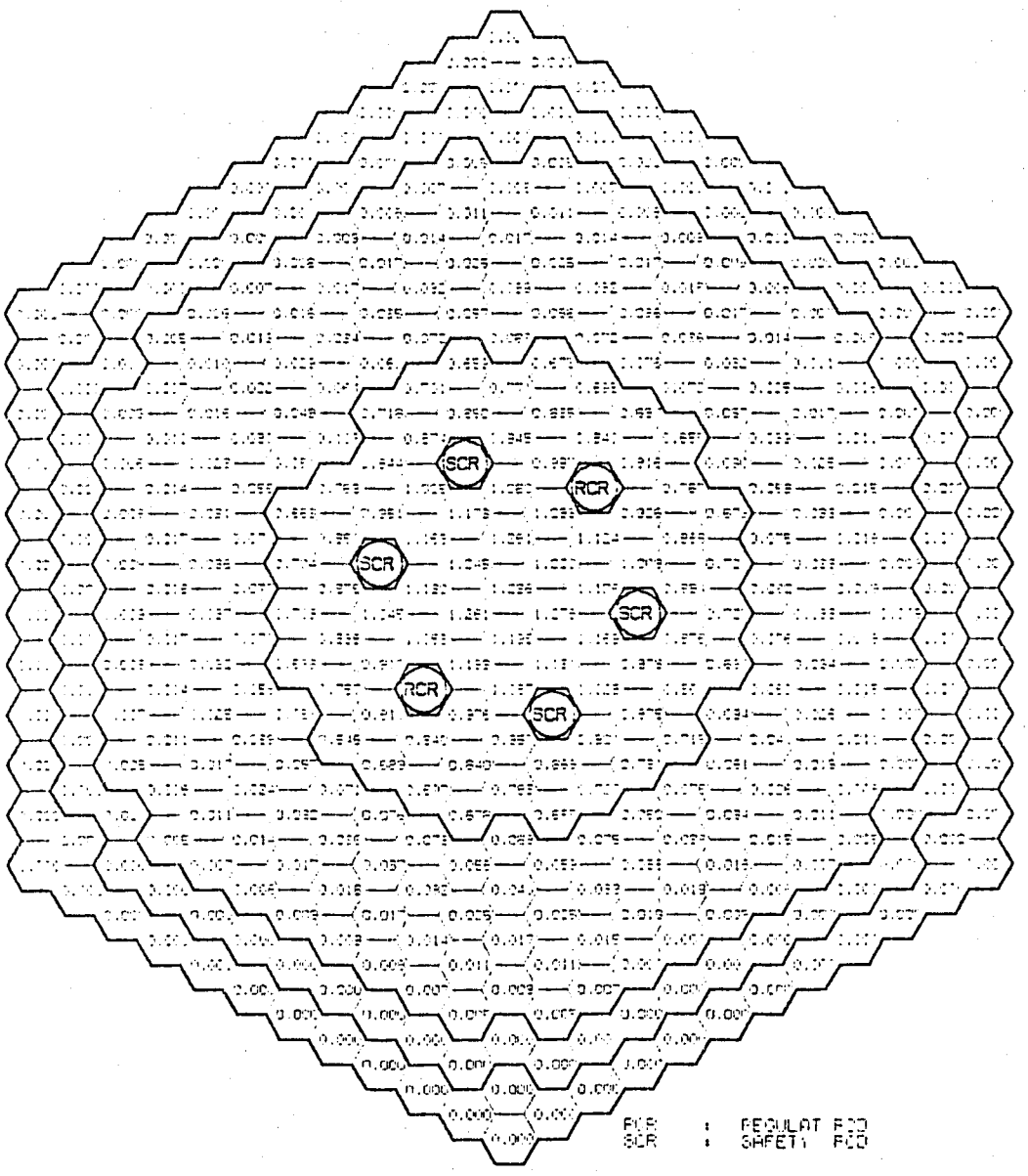
付図4.29 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 4TH CYCLE (EOC)



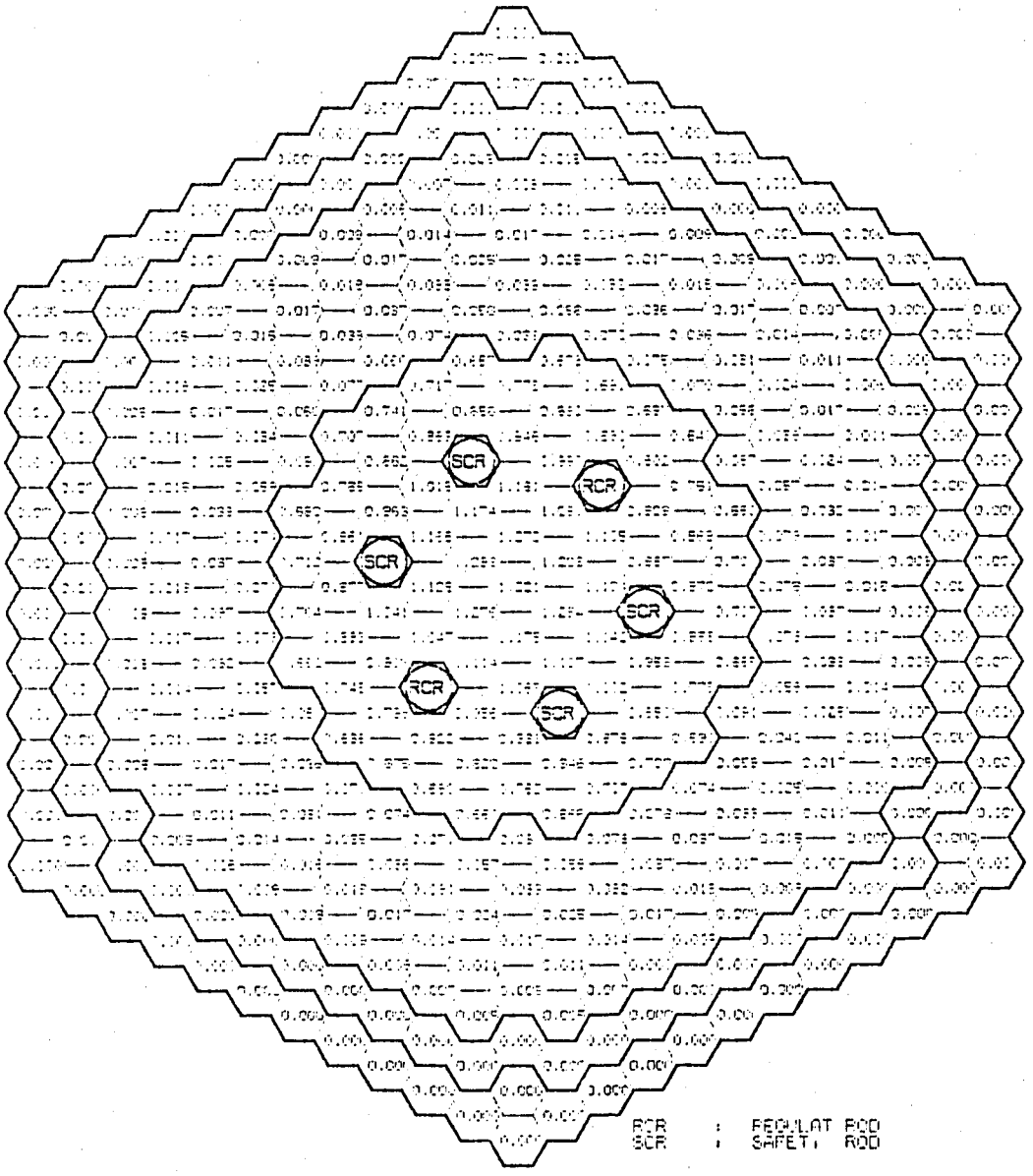
付図4.30 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 5TH CYCLE (BOC)



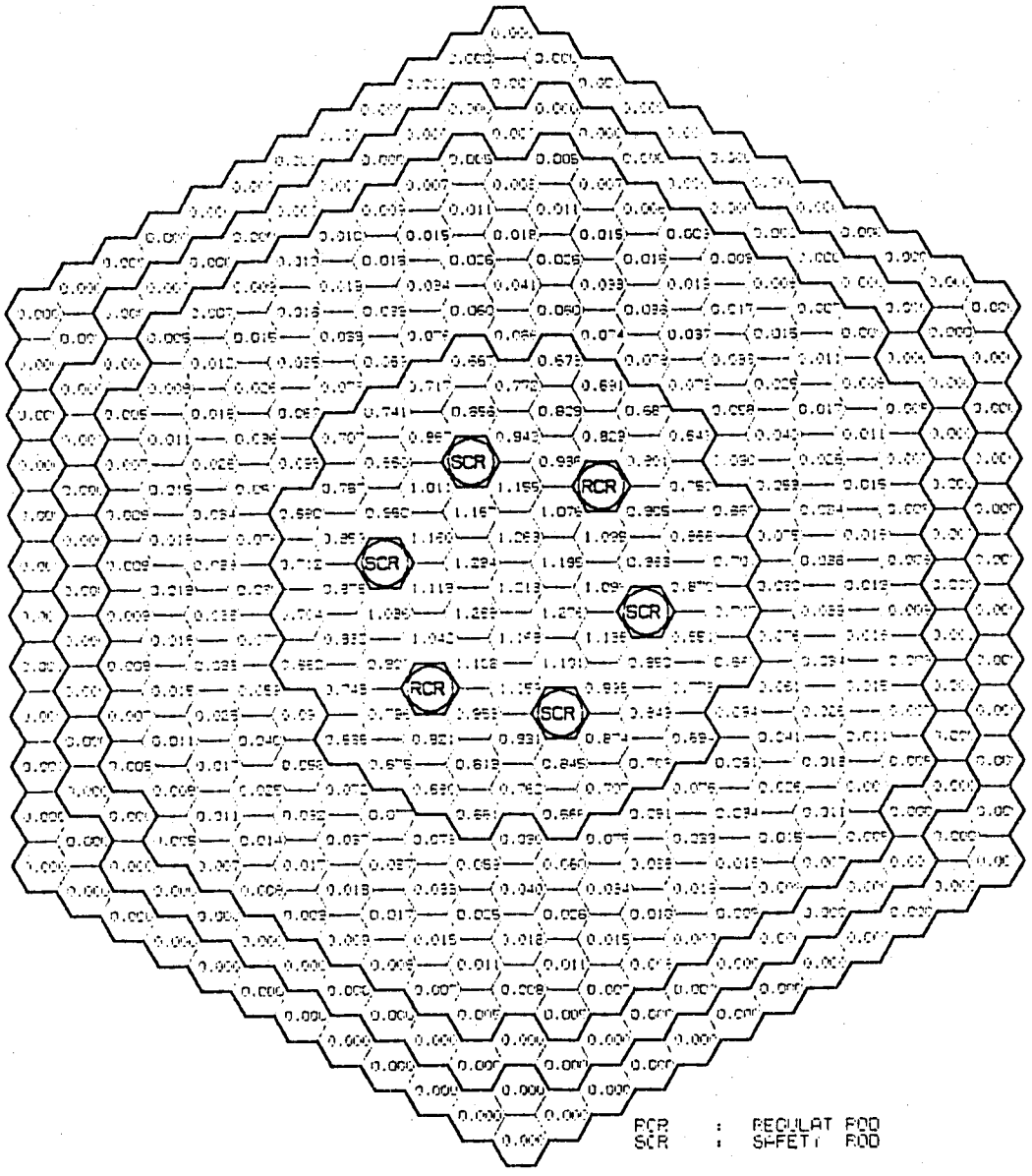
付図4.31 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 5TH CYCLE (EOC)



付図4.32 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 6TH CYCLE (BOC)



付図4.33

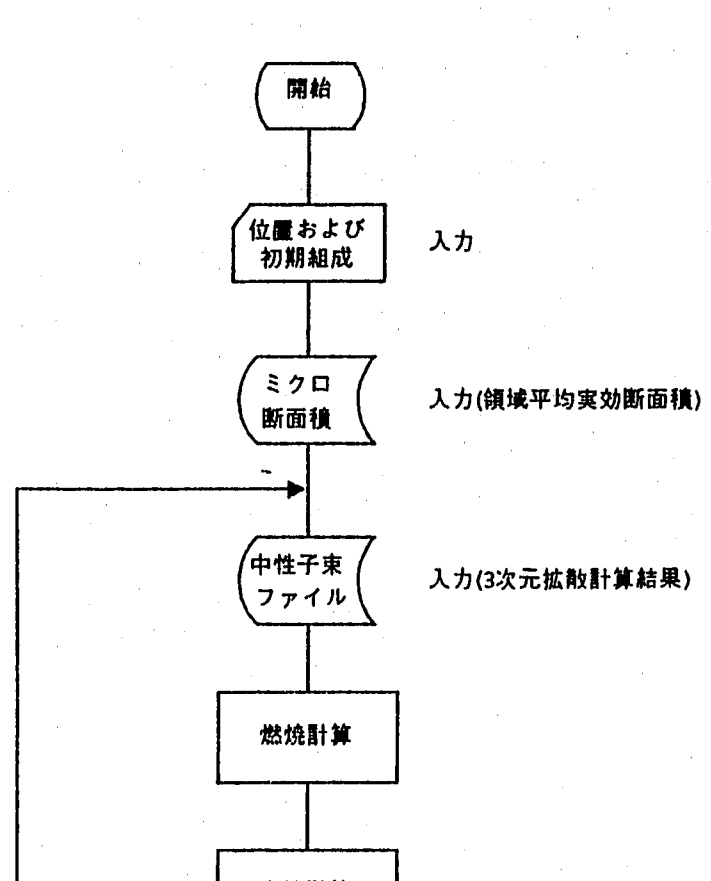
FIG.58 AXIAL INTEGRATED ASSEMBLY POWER DISTRIBUTION (10^0 MW)

JOYO MK-1 BURNUP CALCULATION (ENERGY GROUP 18)
75MW 6TH CYCLE (EOC)

付録5. 燃焼組成変化率計算プログラム

PIEデータとの比較を行うために、任意のメッシュ点での燃焼計算を行うプログラムを作成した。本プログラムは、燃焼計算と崩壊計算を行う。燃焼および崩壊の日数を24分割しサイクル計算を行う。1分割は、照射期間が各サイクルとも50日以内なので、約2日に相当する。

プログラム構成を 付図5.1に示す。



付図5.1 プログラム構成

計算式

t秒後の原子数密度を次の計算式で計算を行う。

$$U^{235}=U_0^{235}\times e^{-A^{235}\cdot t}$$

$$U^{236}=U_0^{236}\times e^{-A^{235}\cdot t}+U_0^{235}\times\left(1-e^{-C^{235}\cdot t}\right)$$

$$U^{238}=U_0^{238}\times e^{-A^{238}\cdot t}$$

$$Pu^{239}=Pu_0^{239}\times e^{-A^{239}\cdot t}+U_0^{238}\times\left(1-e^{-C^{238}\cdot t}\right)$$

$$Pu^{240}=Pu_0^{240}\times e^{-A^{240}\cdot t}+Pu_0^{239}\times\left(1-e^{-C^{239}\cdot t}\right)$$

$$Pu^{241}=Pu_0^{241}\times e^{-A^{241}\cdot t}+Pu_0^{240}\times\left(1-e^{-C^{240}\cdot t}\right)-Pu_0^{241}\times\left(1-e^{-\lambda\cdot t}\right)$$

λは^{241}Puの崩壊定数(=1.5306×10^{-3})

$$Pu^{242}=Pu_0^{242}\times e^{-A^{242}\cdot t}+Pu_0^{241}\times\left(1-e^{-C^{241}\cdot t}\right)$$

$$Am^{241}=Am_0^{241}\times e^{-A^{\overline{241}}\cdot t}+Pu_0^{241}\times\left(1-e^{-\lambda\cdot t}\right)$$

$$FP=\sum_i U^i\cdot\left(1-e^{-F^i\cdot t}\right)+\sum_i Pu^i\cdot\left(1-e^{-F^i\cdot t}\right)+Am^{241}\cdot\left(1-e^{-F^{\overline{241}}\cdot t}\right)$$

ここで、A^i、F^i、C^iは次式で求める。

$$A^i=\sum_g \sigma_a^g\phi^g$$

$$F^i=\sum_g \sigma_f^g\phi^g$$

$$C^i=\sum_g (\sigma_a^g-\sigma_f^g)\phi^g$$

U^{235}等は、それぞれの核種の原子数密度を表す。

σ_a、σ_f、σ_cは、それぞれの核種のミクロ断面積を表す。ϕは中性子束を表す。

プログラムは、**PA30E.ISL.FORT(BURNUP)**に収納してある。プログラムソースを付表5.1に示す。

プログラムの実行JCLは、**PA30E.ISL.CNTL(BURNUP)**に収納してある。

入力には、位置および初期組成データ、ミクロ断面積ファイル、中性子束ファイルを必要とする。

FT05F001　位置および初期組成データ

FT08F001　実効ミクロ断面積ファイル　(CITATION[11]ミクロファイル)

FT16F001　中性子束ファイル　(MOSES[12]の中性子束ファイル)

位置および初期組成データファイルの**FORMAT**を以下に示す。サンプルを付表5.2に示す。

Card1　**(4I4)**

- **NGRP**　エネルギー群数
- **NASM**　全集合体本数
- **NMSH**　軸方向メッシュ数
- **NAZN**　軸方向ゾーン数

Card2　**(2I4)**

- **IASM**　計算したい集合体番号
- **IMSH**　計算したい軸方向メッシュ番号

Card3　**(2A4)**

- **FLG**　フラグ　**=U**　炉心燃料のウラン同位体組成の入力
  - **=PU**　炉心燃料のプルトニウム同位体組成の入力
  - **=UPU**　炉心燃料の燃料組成すべての入力
  - **=AB**　軸ブランケットのウラン同位体組成の入力
  - **=RB**　径ブランケットのウラン同位体組成の入力
- **CALC**　拡散計算を行った計算コード名

Card4　**(FREE)**

- **CONT(I)** プルトニウム含有率、ウラン同位体組成、プルトニウム同位体組成

Card5　**(FREE)**

- **FF(I)**　核分裂断面積補正ファクター

Card6　**(FREE)**

- **FC(I)**　捕獲断面積補正ファクター

Card7　**(2F10.0)**

- **DAY1**　燃焼期間の日数
- **DAY2**　冷却期間の日数

付表5.1 プログラムリスト

DATE 90-03-26
TIME 15:44:16
PAGE 1

DATA SET : PA30E.ISL.FORT(BURNUP)

```
NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  1          CHARACTER*40 DSN05,DSN08,DSN16                                        1
  2          LOGICAL*4 TR(2)                                                       2
  3    C                                                                           3
  4          DSN05=40H                                                             4
  5          DSN08=40H                                                             5
  6          DSN16=40H                                                             6
  7          TR(1)=.FALSE.                                                         7
  8          TR(2)=.FALSE.                                                         8
  9          INQUIRE(5,NAME=DSN05,NAMED=TR(1),OPENED=TR(2))                        9
 10          TR(1)=.FALSE.                                                        10
 11          TR(2)=.FALSE.                                                        11
 12          INQUIRE(8,NAME=DSN08,NAMED=TR(1),OPENED=TR(2))                       12
 13          TR(1)=.FALSE.                                                        13
 14          TR(2)=.FALSE.                                                        14
 15          INQUIRE(16,NAME=DSN16,NAMED=TR(1),OPENED=TR(2))                      15
 16          WRITE(6,6000) DSN05,DSN08,DSN16                                      16
 17     6000 FORMAT(1H1,79('*')/                                                  17
 18         >  1H ,3('*'),25X,'  BURNUP CALCULATION   ',25X,3('*')/               18
 19         >  1H ,3('*'),12X,'          ',40X,12X,3('*')/                        19
 20         >  1H ,3('*'),12X,'FT05F001:',A40,12X,3('*')/                         20
 21         >  1H ,3('*'),12X,'FT08F001:',A40,12X,3('*')/                         21
 22         >  1H ,3('*'),12X,'FT16F001:',A40,12X,3('*')/                         22
 23         >  1H ,79('*'))                                                       23
 24    C                                                                          24
 25          CALL IN05(CODE)                                                      25
 26          CALL IN08                                                            26
 27          DO 10 I=1,11                                                         27
 28            READ(5,5000,END=999) DAY1,DAY2                                     28
 29            IF(DAY1.EQ.0.0) GOTO 10                                            29
 30            WRITE(6,6010) I                                                    30
 31            CALL IN16(&999)                                                    31
 32            CALL BURNUP(DAY1)                                                  32
 33            CALL IN16(&999)                                                    33
 34            READ(16)                                                           34
 35            CALL DECAY(DAY2)                                                   35
 36       10 CONTINUE                                                           36
 37      999 STOP                                                               37
 38     5000 FORMAT(2F10.0)                                                     38
 39     6010 FORMAT(/I7,' CYCLE')                                               39
 40          END                                                                40
 41    C-------------------------------------------------------------------------41
 42          SUBROUTINE IN05(CODE)                                              42
 43          COMMON /FT05/ NGRP,NBLC,NPLN,NAZN,NASM,NOX,MPLN                    43
 44          COMMON /INIT/ FLG,PU(4),U(3),U234                                  44
 45          COMMON /FACT/ FF(8),FC(8)                                          45
 46          COMMON /ND/ DENS(12)                                               46
 47    C                                                                        47
 48          READ(5,5000) NGRP,NBLC,NPLN,NAZN                                   48
 49          IF(NGRP.LE.0) NGRP=18                                              49
 50          IF(NBLC.LE.0) NBLC=397                                             50
 51          IF(NPLN.LE.0) NPLN=32                                              51
 52          IF(NAZN.LE.0) NAZN=11                                              52
 53    C                                                                        53
 54          READ(5,5000) NASM , MPLN                                           54
 55          IF(MPLN.LE.0) MPLN=16                                              55
 56          READ(5,5010) FLG,CODE                                              56
 57          IF(FLG.EQ.'PU  ') THEN                                             57
 58             READ(5,*) (PU(I),I=1,4)                                         58
 59             PUT=DENS(1)+DENS(2)+DENS(3)+DENS(4)                             59
 60             DO 10 I=1,4                                                     60
 61               DENS(I)=PUT*PU(I)/100                                         61
 62       10    CONTINUE                                                        62
 63          ENDIF                                                            63
 64          IF(FLG.EQ.'U   ') THEN                                           64
 65             READ(5,*) (U(I),I=1,3)                                          65
 66             UT=DENS(6)+DENS(7)+DENS(8)                                      66
 67             U234=100.-U(1)-U(2)-U(3)                                        67
 68             DO 20 I=6,8                                                     68
 69               DENS(I)=UT*U(I-5)/100                                         69
 70       20    CONTINUE                                                        70
      ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
```

*** CONTINUE ***

DATA SET : PA30E.ISL.FORT(BURNUP)

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
      ENDIF
      IF(FLG.EQ.'RB  ' .OR. FLG.EQ.'AB  ') THEN
         READ(5,*) (U(I),I=1,3)
         UT=0.0
         DO 30 I=1,8
           UT=UT+DENS(I)
   30    CONTINUE
         DO 31 I=1,5
           DENS(I)=0.0
   31    CONTINUE
         DO 32 I=6,8
           DENS(I)=UT*U(I-5)/100
   32    CONTINUE
      ENDIF
      IF(FLG.EQ.'UPU ') THEN
         READ(5,*) PURICH,(U(I),I=1,3),(PU(I),I=1,4)
         TO=0.0
         DO 40 I=1,8
           TO=TO+DENS(I)
   40    CONTINUE
         DO 41 I=6,8
           DENS(I)=TO*(1.0-PURICH/100.)*U(I-5)/100
   41    CONTINUE
         DO 42 I=1,4
           DENS(I)=TO*(PURICH/100.)*PU(I)/100
   42    CONTINUE
      ENDIF
C
      READ(5,*,END=70) (FF(I),I=1,8)
      READ(5,*,END=70) (FC(I),I=1,8)
   70 CONTINUE
      WRITE(6,6000) NGRP,NPLN,NASM,MPLN
      WRITE(6,6010) (DENS(I),I=1,12)
      CALL CONT
      WRITE(6,6020)
      WRITE(6,6030) (FF(I),I=1,8)
      WRITE(6,6040) (FC(I),I=1,8)
      IF(FLG.EQ.'RB  ') GOTO 50
      IF(FLG.EQ.'AB  ') GOTO 60
      IF(                NASM.LE.19) NOX=1
      IF(NASM.GE.20.AND.NASM.LE.61) NOX=2
      IF(NASM.GE.62               ) NOX=3
      RETURN
   50 CONTINUE
      IF(NASM.GE. 62) NOX=10
      IF(NASM.GE. 92) NOX=11
      IF(NASM.GE.128) NOX=12
      IF(NASM.GE.170) NOX=13
      IF(NASM.GE.218) NOX=14
      RETURN
   60 CONTINUE
      IF(MPLN.GE. 5 .AND. MPLN.LE. 8) NOX=16
      IF(MPLN.GE. 9 .AND. MPLN.LE.12) NOX=15
      IF(MPLN.GE.25 .AND. MPLN.LE.28) NOX=17
      IF(MPLN.GE.29 .AND. MPLN.LE.32) NOX=18
      RETURN
 5000 FORMAT(18I4)
 5010 FORMAT(2A4)
 6000 FORMAT(/' NGRP =',I3,'    NPLN =',I3/' 集合体番号 =',I4
     1                                   /' PLANE =',I4)
 6010 FORMAT(/' INITIAL DENSITY'/(1P6E12.4))
 6020 FORMAT(/' CROSS SECTION FACTOR')
 6030 FORMAT('    SIGF ',8F8.2)
 6040 FORMAT('    SIGC ',8F8.2)
      END
C-----------------------------------------------------------------------
      SUBROUTINE CONT
      COMMON /ND/ DENS(12)
      COMMON /INIT/ FLG,APU(4),AU(3),U234
      PU = DENS( 1) + DENS( 2) + DENS( 3) + DENS(4)
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
```

*** CONTINUE ***

```
NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
141         U   = DENS( 6) + DENS( 7) + DENS( 8)                                    141
142         FP  = DENS( 9) + DENS(10) + DENS(11) + DENS(12)                         142
143         TO  = DENS( 5) + PU       + U        + FP                               143
144         BU  = FP       / TO       * 100.0                                       144
145         WRITE(6,6000)                                                           145
146         IF(PU.NE.0.0) THEN                                                      146
147         WRITE(6,6010) BU,(DENS(I)/PU*100.,I=1,4),                               147
148        1        (DENS(I)/U*(100.-U234),I=6,8),PU/(PU+U)*100.                    148
149         ELSE                                                                    149
150         WRITE(6,6010) BU, 0.0, 0.0, 0.0, 0.0,                                   150
151        1        (DENS(I)/U*(100.-U234),I=6,8),PU/(PU+U)*100.                    151
152         ENDIF                                                                   152
153         RETURN                                                                  153
154   6000 FORMAT(/'  BURNUP   PU-239   PU-240   PU-241   PU-242    U-235',        154
155        1        '    U-236    U-238  PU/PU+U')                                 155
156   6010 FORMAT(F8.4,8F9.4)                                                       156
157         END                                                                     157
158  C-------------------------------------------------------------------          158
159         SUBROUTINE IN08                                                         159
160         COMMON /FT05/ NGRP,NBLC,NPLN,NAZN,NASM,NOX,MPLN                         160
161         COMMON /XSEC/ SIGA(21,18),SIGF(21,18)                                   161
162         DIMENSION     DUM(324)                                                  162
163         REWIND 1                                                                163
164  C   ISET NO. IS CROSS SECTION SET ORDER NO.                                    164
165         ISET=0                                                                  165
166       10 ISET=ISET+1                                                            166
167  C    RECORD 1                                                                  167
168         READ(8,END=999)                                                         168
169  C    RECORD 2                                                                  169
170         READ(8) NT,NN,NG,ND,NU,NZ                                               170
171  C    RECORD 3                                                                  171
172         READ(8)                                                                 172
173  C * TWO RECORDS FOR EACH NUCLIDE                                              173
174  C    RECORD 1                                                                  174
175         DO 100 K=1,NN                                                           175
176         READ(8)N1,N2,N3,N4,N5,(DUM(J),J=1,6),(DUM(I),I=1,60)                    176
177  C    RECORD 2                                                                  177
178         IF(ISET.EQ.NOX) THEN                                                    178
179           READ(8) (SIGA(N1,I),SIGF(N1,I),DUM(I),                                179
180        1        DUM(I),DUM(I),I=1,NGRP),                                       180
181        2        (DUM(I),I=1,NGRP*NGRP)                                         181
182         ELSE                                                                    182
183           READ(8)                                                               183
184         ENDIF                                                                   184
185     100 CONTINUE                                                                185
186         READ(8)NEND                                                             186
187         GO TO 10                                                                187
188     999 RETURN                                                                  188
189         END                                                                     189
190  C-------------------------------------------------------------------          190
191         SUBROUTINE IN16(*)                                                      191
192         COMMON /OPTP/ IPOPT,ITOPT                                               192
193         COMMON /FT05/ NGRP,NBLC,NPLN,NAZN,NASM,NOX,MPLN                         193
194         COMMON /FLX/ FLUX(18,397,40)                                            194
195  C                                                                              195
196         READ(16,END=999) JCOUNT                                                 196
197  C      WRITE(6,6000) JCOUNT                                                    197
198  C    -----( POWER  INPUT )                                                     198
199         READ(16,END=999)                                                        199
200  C    -----( FLUX   INPUT )                                                     200
201         READ(16,END=999) (((FLUX(II,JJ,KK),II=1,NGRP),                          201
202        >              JJ=1,NBLC),KK=1,NPLN)                                    202
203         RETURN                                                                  203
204     999 RETURN 1                                                                204
205    6000 FORMAT(1H ,' JCOUNT =',I3)                                              205
206         END                                                                     206
207  C-------------------------------------------------------------------          207
208         SUBROUTINE BURNUP(DAY)                                                  208
209         COMMON /XSEC/ SIGA(21,18),SIGF(21,18)                                   209
210         COMMON /FLX/ FLUX(18,397,40)                                            210
      ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
```

*** CONTINUE ***

DATA SET : PA3OE.ISL.FORT(BURNUP)

```
NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
211         COMMON /ND/ DENS(12)                                                    211
212         COMMON /FIOS/ NGRP,NBLC,NPLN,NAZN,NASM,NOX,MPLN                         212
213         COMMON /FACT/ FF(8),FC(8)                                               213
214         REAL SA(9)/9*0.0/,SC(9)/9*0.0/,SF(9)/9*0.0/,FP(9),WK(8),FX(8)           214
215         TI=DAY*24.*3600.                                                        215
216   C                                                                             216
217         WRITE(6,6000) DAY                                                       217
218         M = MPLN                                                                218
219          DO  11 J=1,8                                                           219
220           SA(J)=0.0                                                             220
221           SF(J)=0.0                                                             221
222           SC(J)=0.0                                                             222
223           FX(J)=0.0                                                             223
224          DO  10 K=1,NGRP                                                        224
225           SA(J)=SIGA(J,K)*FLUX(K,NASM,M)*1.0E-24+SA(J)                          225
226           SF(J)=SIGF(J,K)*FF(J)*FLUX(K,NASM,M)*1.0E-24+SF(J)                    226
227           SC(J)=(SIGA(J,K)-SIGF(J,K))*FC(J)*FLUX(K,NASM,M)*1.0E-24+SC(J)        227
228           FX(J)=FLUX(K,NASM,M)*1.0E-24+FX(J)                                    228
229       10  CONTINUE                                                            229
230           SA(J)=SC(J)+SF(J)                                                     230
231       11  CONTINUE                                                            231
232           WRITE(6,6020)                                                         232
233           WRITE(6,6030) ' SIGA    ',(SA(J)/FX(J),J=1,8)                       233
234           WRITE(6,6030) ' SIGC    ',(SC(J)/FX(J),J=1,8)                       234
235           WRITE(6,6030) ' SIGF    ',(SF(J)/FX(J),J=1,8)                       235
236           WRITE(6,6040) ' FLUX    ', FX(1)*1.0E24                             236
237           T=TI/24.                                                              237
238           TIME=0.0                                                              238
239          DO 30 I=1,24                                                           239
240   C       ----( U-235 )----                                                     240
241              FP(6)= DENS(6)*(1.0-EXP(-SF(6)*T))                                 241
242              WK(6)= DENS(6)*EXP(-SA(6)*T)                                       242
243   C       ----( U-236 )----                                                     243
244              FP(7)= DENS(7)*(1.0-EXP(-SF(7)*T))                                 244
245              WK(7)= DENS(7)*EXP(-SA(7)*T)                                       245
246         1         + DENS(6)*(1.0-EXP(-SC(6)*T))                                246
247   C       ----( U-238 )----                                                     247
248              FP(8)= DENS(8)*(1.0-EXP(-SF(8)*T))                                 248
249              WK(8)= DENS(8)*EXP(-SA(8)*T)                                       249
250   C       ----( PU-239 )----                                                    250
251              FP(1)= DENS(1)*(1.0-EXP(-SF(1)*T))                                 251
252              WK(1)= DENS(1)*EXP(-SA(1)*T)                                       252
253         1         + DENS(8)*(1.0-EXP(-SC(8)*T))                                253
254   C       ----( PU-240 )----                                                    254
255              FP(2)= DENS(2)*(1.0-EXP(-SF(2)*T))                                 255
256              WK(2)= DENS(2)*EXP(-SA(2)*T)                                       256
257         1         + DENS(1)*(1.0-EXP(-SC(1)*T))                                257
258   C       ----( PU-241 )----                                                    258
259              FP(3)= DENS(3)*(1.0-EXP(-SF(3)*T))                                 259
260              WK(3)= DENS(3)*EXP(-SA(3)*T)                                       260
261         1         - DENS(3)*(1.-EXP(-1.5306E-9*T))                             261
262         1         + DENS(2)*(1.0-EXP(-SC(2)*T))                                262
263   C       ----( PU-242 )----                                                    263
264              FP(4)= DENS(4)*(1.0-EXP(-SF(4)*T))                                 264
265              WK(4)= DENS(4)*EXP(-SA(4)*T)                                       265
266         1         + DENS(3)*(1.0-EXP(-SC(3)*T))                                266
267   C       ----( AM-241 )----                                                    267
268              FP(5)= DENS(5)*(1.0-EXP(-SF(5)*T))                                 268
269              WK(5)= DENS(5)*EXP(-SA(5)*T)                                       269
270         1         + DENS(3)*(1.-EXP(-1.5306E-9*T))                             270
271   C                                                                           271
272          DO 20 J=1,8                                                          272
273           DENS(J)=WK(J)                                                       273
274       20 CONTINUE                                                           274
275           DENS( 9)=DENS( 9) +FP(6) +FP(7)                                     275
276           DENS(10)=DENS(10) +FP(8)                                            276
277           DENS(11)=DENS(11) +FP(1) +FP(2)                                     277
278           DENS(12)=DENS(12) +FP(3) +FP(4) +FP(5)                              278
279       30 CONTINUE                                                           279
280          WRITE(6,6010) (DENS(I),I=1,12)                                       280
     ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

        *** CONTINUE ***
```

DATE 90-03-26
TIME 15:44:16
PAGE 5

DATA SET : PA30E.ISL.FORT(BURNUP)

```
NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
281         CALL CONT                                                              281
282         RETURN                                                                 282
283      6000 FORMAT(/' ***** BURN-UP TIME ***** ',F7.2,' DAYS')                   283
284      6010 FORMAT(/' NUMBER  DENSITY'/(1P6E12.4))                               284
285      6020 FORMAT(/' MICRO CROSS SECTION     (SIG*FLUX/FLUX)'                   285
286          1        /'                PU-239   PU-240   PU-241   PU-242   AM-241',286
287          2         '    U-235    U-236    U-238')                             287
288      6030 FORMAT(A8,8F9.5)                                                     288
289      6040 FORMAT(A8,1PE13.5)                                                   289
290         END                                                                    290
291      C-------------------------------------------------------------------     291
292         SUBROUTINE DECAY(DAY)                                                  292
293         COMMON /ND/ DENS(12)                                                   293
294         TI=DAY*24.*3600.                                                       294
295         T=TI/24.                                                               295
296      C                                                                         296
297         DO 10 I=1,24                                                           297
298         WK = DENS(3)*(1.-EXP(-1.5306E-9*T))                                    298
299      C      ----( PU-241 )----                                                 299
300         DENS(3)=DENS(3) - WK                                                   300
301      C      ----( AM-241 )----                                                 301
302         DENS(5)=DENS(5) + WK                                                   302
303      C                                                                         303
304        10 CONTINUE                                                            304
305       100 CONTINUE                                                            305
306         WRITE(6,6000) DAY                                                      306
307         CALL CONT                                                              307
308         RETURN                                                                 308
309      6000 FORMAT(/' ***** COOLING TIME ***** ',F6.1,' DAYS')                   309
310         END                                                                    310
311      C-------------------------------------------------------------------     311
312         BLOCK DATA                                                             312
313         COMMON /FIO5/ NGRP,NBLC,NPLN,NAZN,NASM,NOX,MPLN                        313
314         COMMON /INIT/ FLG,PU(4),U(3),U234                                      314
315         COMMON /FACT/ FF(8),FC(8)                                              315
316         COMMON /ND/ DENS(12)                                                   316
317      C                                                                         317
318         DATA DENS/1.0952E-3 , 2.7610E-4 , 3.6831E-5 , 7.8313E-6 , 0.0 ,        318
319          1          1.5543E-3 , 0.0       , 5.1404E-3 , 0.0       , 0.0 ,
320          2          0.0       , 0.0                                    /      320
321         DATA FF  / 8*1.0 /                                                     321
322         DATA FC  / 8*1.0 /                                                     322
323         END                                                                    323
       ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
```

*** DATA-LIST END ***

付表5.2 サンプル入力データ

DATE 90-03-19
TIME 13:34:47
PAGE 1

```
NO.  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  1     18 397  36  11                                                              1
  2      1  19                                                                      2
  3    PU  MOSES                                                                   3
  4    78.5449 18.5719 2.3833 0.4999 .                                             4
  5    1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0                                             5
  6    1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0                                             6
  7         47.84       60.0                                                       7
  8         43.00       60.0                                                       8
  9         43.72       45.0                                                       9
 10          3.10       30.0                                                      10
 11         26.95      150.0                                                      11
 12         39.28       30.0                                                      12
 13         40.96       30.0                                                      13
 14         40.25      180.0                                                      14
 15         48.83       30.0                                                      15
 16         44.44       90.0                                                      16
 17         41.65       30.0                                                      17
      ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

    *** DATA-LIST END ***
```

位置　　：中心集合体の軸方向19メッシュ点(炉心燃料下端より27.5cmの位置)

初期組成　：PU8230ロット

照射履歴　：50MW(0)~75MW(6)

付録6. 性能試験時の臨界性解析

50MW、75MWの各出力サイクルの燃焼解析に先立ち、解析モデルの妥当性の確認を含めて、性能試験時の臨界性の計算を行った。

1. 群定数とエネルギー分割

使用した断面積ライブラリーは、JFS3-JENDL2(文献(13))である。
3次元拡散計算では、これを7群に縮約した。縮約後のエネルギー分割は、大型炉心設計の場合と同じものであり、以下に示す。

群	エネルギー範囲	
1	10.0MeV～	3.7MeV
2	3.7MeV～	0.8MeV
3	0.8MeV～	86.5keV
4	86.5keV～	9.1keV
5	9.1keV～	1.0keV
6	1.0keV～	101.3 eV
7	101.3 eV～	10^{-5} eV

2. 7群実効ミクロ断面積の作成

組成

領域毎の均質組成は、文献(15)の Table 2.2を使用した。各領域ごとの組成を付表6.1に示す。

縮約計算体系

SLAROM[9]コードを使用して、均質セル計算を行いCITATION[11]コードにより各領域の平均中性子スペクトルを求め、それを重みとして縮約した。SLAROMの入力データを付表6.2に示す。
制御棒の縮約は、中心位置に装荷した状態の平均中性子スペクトルを重みとした。CITATION計算での領域分割を付図6.1に示す。この体系は、文献(2)の fig 3.2.2から20°Cにおける体系を引用した。

3. 3次元拡散計算

臨界性は、3次元修正粗メッシュ拡散計算によって求めた。使用した計算コードはMOSES[12]である。

計算体系

性能試験時の集合体配置(炉心燃料集合体は、64体である。)を付図6.2に示す。軸方向の領域分割を付図6.3に示す。
この時の制御棒は、全引抜き(調整棒700mm引抜き、安全棒900mm引抜き)である。

計算結果

3次元修正粗メッシュ拡散計算を行った結果、次の実効増倍率を得た。

keff＝1.002373

この結果に以下の補正係数を施すことによって最終結果を求める。

補正係数

(1) 縮約効果
70群から7群に縮約したときのkeffの差は以下の通りであった。
f_{col}＝0.9943

以下の補正量については、文献(15)の値を使用した。

(2) 輸送補正
f_{trans}＝1.0145

(3) 中性子源効果
f_{NS}＝1.0012

(4) その他の補正
f_{het}＝1.00012
f_{Pu}＝0.99722

(5) 補正結果
補正後の実効増倍率は、以下の通りとなる。
keff＝1.0096

一方、測定値としては、臨界時の制御棒位置から、全引抜時の炉の余剰反応度を推定し、k(exp)＝1.0027を得ている。この結果からJFS3-JENDL2とMOSESによる計算は、0.68%Δk/kk'の過大評価となっている。C/E値は補正済計算結果に対してC/E値＝1.0068となる。

付表6.1　200℃における各領域組成平均（未燃焼炉心）　（× 10^{24} atoms／cm^3 ）

＊1）SMARTによるデータ

＊2）技－51－13によるデータ

＊3）Pu 241のみ1972年11月検査時から1977年5月までのdecayを考慮した。

EXPANDA No.	CiTATiON No.	領域／核種	炉　心 ＊1)	径ブランケット ＊1)	軸ブランケット ＊1)	可動反射体 ＊2)	固定反射体 ＊2)	軸反射体 ＊2)
4	5	Be						
105	6	B 10						
115	7	B 11						
6	8	C						
8	10	O	1.6572－2	2.2024－2	1.6449－2			
11	11	Na	9.4694－3	7.6459－3	9.4694－3	4.6196－3	1.5545－2	9.4694－3
24	19	Cr	3.2754－3	2.8492－3	3.2754－3	1.3462－2	6.0954－3	3.2754－3
26	20	Fe	1.1926－2	1.0374－2	1.1926－2	4.8024－2	2.1745－2	1.1926－2
28	21	Ni	2.0988－3	1.8258－3	2.0988－3	6.2048－3	2.8095－3	2.0988－3
42	25	Mo	2.3599－4	2.0529－4	2.3599－4			2.3599－4
925	34	U 235	1.5834－3	2.2198－5	1.6689－5			
928	36	U 238	5.2368－3	1.0937－2	8.2230－3			
949	37	Pu 239	1.1157－3					
940	38	Pu 240	2.8127－4					
941	39	Pu 241 ＊3)	3.7521－5					
942	40	Pu 242	7.9780－6					
995	42	U^{235} FP						
999	43	Pu^{239} FP						

（続き） 200 ℃

EXPANDA No.	CiTATiON No.	領域 / 核種	中性子源	制御棒領域				RZ用制御棒領域		
				B_4Cペレット	プレナム	ダッシュラム	ナトリウム	B_4C 2/6 ⊕プレナム 4/6	プレナム 2/6 ⊕ダッシュラム4/6	ダッシュラム2/6 ⊕ Na 4/6
4	5	Be	5.5931 −2							
105	6	B 10		2.1639 −2				7.2130 −3		
115	7	B 11		1.7814 −3				5.9380 −4		
6	8	C		5.6231 −3				1.8744 −3		
8	10	O								
11	11	Na	5.9058 −3	1.3209 −2	1.3209 −2	1.9655 −2	2.1785 −2	1.3209 −2	1.7506 −2	2.1075 −2
24	19	Cr	3.1874 −3	3.4447 −3	3.4447 −3	2.6429 −3	1.2416 −3	3.4447 −3	2.9102 −3	1.7087 −3
26	20	Fe	1.1606 −2	1.2542 −2	1.2542 −2	9.6229 −3	4.5210 −3	1.2542 −2	1.0596 −2	6.2216 −3
28	21	Ni	2.0424 −3	2.2073 −3	2.2073 −3	1.6935 −3	7.9561 −4	2.2073 −3	1.8648 −3	1.0949 −3
42	25	Mo	2.2964 −4	2.4819 −4	2.4819 −4	1.9042 −4	8.9458 −5	2.4819 −4	2.0968 −4	1.2311 −4
925	34	U 235								
928	36	U 238								
949	37	Pu 239								
940	38	Pu 240								
941	39	Pu 241								
942	40	Pu 242								
995	42	U^{235} FP								
999	43	Pu^{239} FP								

付表6.2 SLAROMコード入力データ

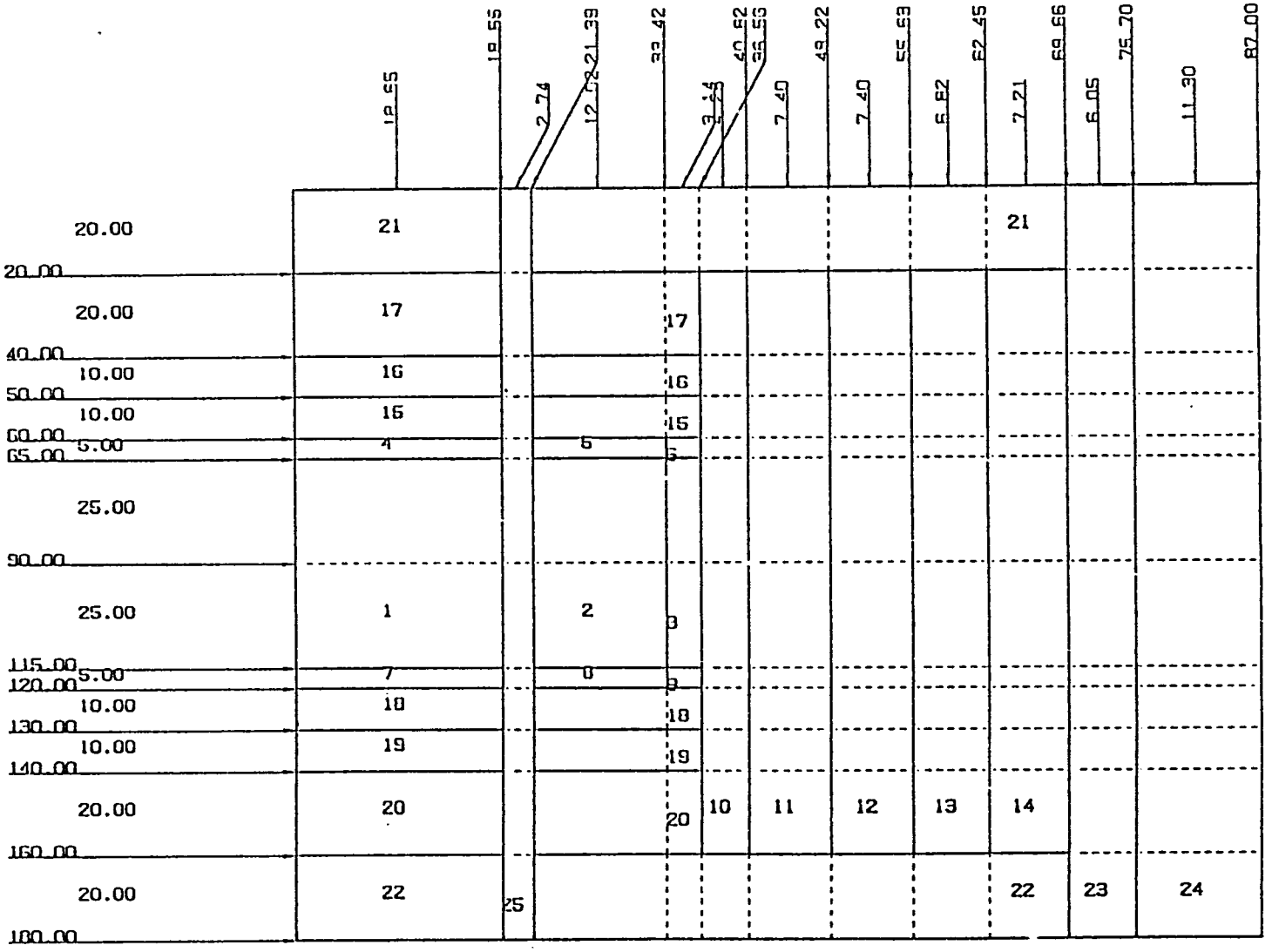
```
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
PREP
 CORE          JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  473.15 0.0  0.0
 19
 1.0
 949  1.1157E-03  940  2.8127E-04  941  3.7521E-05  942  7.9780E-06
 951  0.0000E+00  925  1.5834E-03  926  0.0000E+00  928  5.2368E-03
 939  0.0000E+00    8  1.6572E-02   11  9.7694E-03   26  1.1926E-02
  24  3.2754E-03   28  2.0988E-03   42  2.3599E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
CORE00
PREP
 RADIAL-BLK    JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  473.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  2.2198E-05  926  0.0000E+00  928  1.0937E-02
 939  0.0000E+00    8  2.2024E-02   11  7.6459E-03   26  1.0374E-02
  24  2.8492E-03   28  1.8258E-03   42  2.0529E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
RDBLK5
PREP
 AXIAL-BLK     JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
  473.15 0.0  0.0
 19
 1.0
 949  0.0000E+00  940  0.0000E+00  941  0.0000E+00  942  0.0000E+00
 951  0.0000E+00  925  1.6689E-05  926  0.0000E+00  928  8.2230E-03
 939  0.0000E+00    8  1.6449E-02   11  9.4694E-03   26  1.1926E-02
  24  3.2754E-03   28  2.0988E-03   42  2.3599E-04  854  0.0000E+00
 884  0.0000E+00  894  0.0000E+00  814  0.0000E+00
AXBL1U
PREP
 REF-1         JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 473.15  0.0  0.0
  4
 1.0
  11  4.6196E-03   26  4.8024E-02   24  1.3462E-02   28  6.2048E-03
REF001
PREP
 REF-2         JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 473.15  0.0  0.0
  4
 1.0
  11  1.5545E-02   26  2.1745E-02   24  6.0954E-03   28  2.8095E-03
REF002
PREP
 AXIAL-REF     JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 473.15  0.0  0.0
  5
 1.0
  11  9.4694E-03   26  1.1926E-02   24  3.2754E-03   28  2.0988E-03
  42  2.3599E-04
AXREFU
PREP
 CR-B4C PLET   JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 473.15  0.0  0.0
  8
 1.0
  11  1.3209E-02   26  1.2542E-02   24  3.4447E-03   28  2.2073E-03
  42  2.4819E-04  105  2.1639E-02  115  1.7814E-03    6  5.6231E-03
CRB4CP
PREP
 CR-PRENUM     JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N
  1  1  0  0  0  0  3 -20  0  0  0  0 70
 473.15  0.0  0.0
  5
 1.0
  11  1.3209E-02   26  1.2542E-02   24  3.4447E-03   28  2.2073E-03
  42  2.4819E-04
CRPREN
....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

*** CONTINUE ***

(続き)　SLAROMコード　入力データ

```
     ....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
81   PREP                                                                          81
82    CR-DASHRUM   JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N                 82
83     1  1  0  0  0  0  3 -20  0  0  0  0 70                                      83
84    473.15  0.0  0.0                                                            84
85     5                                                                          85
86    1.0                                                                         86
87     11  1.9655E-02   26  9.6229E-03   24  2.6429E-03   28  1.6935E-03         87
88     42  1.9042E-04                                                            88
89   CRDASH                                                                      89
90   PREP                                                                        90
91    CR-ADAP      JOYO MK-I  START-UP TEST (200C)  JFS-3R-J2 FP2N                91
92     1  1  0  0  0  0  3 -20  0  0  0  0 70                                      92
93    473.15  0.0  0.0                                                          93
94     5                                                                        94
95    1.0                                                                       95
96     11  2.1785E-02   26  4.5210E-03   24  1.2416E-03   28  7.9561E-04         96
97     42  8.9458E-05                                                          97
98   CRADAP                                                                    98
     ....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8

        *** DATA-LIST END ***
```



1～9	炉心燃料
10～14	径ブランケット
15～20	軸ブランケット
25	Naフォロワー
21～22	軸方向反射体
23	可動反射体
24	固定反射体

付図6.1　『常陽』MK-I　炉心　R-Z炉心体系(縮約計算)

1, 2, 3 ……炉心燃焼集合体
4, 5, 6, 7, 8 …ブランケット 〃
9, 10……反射体

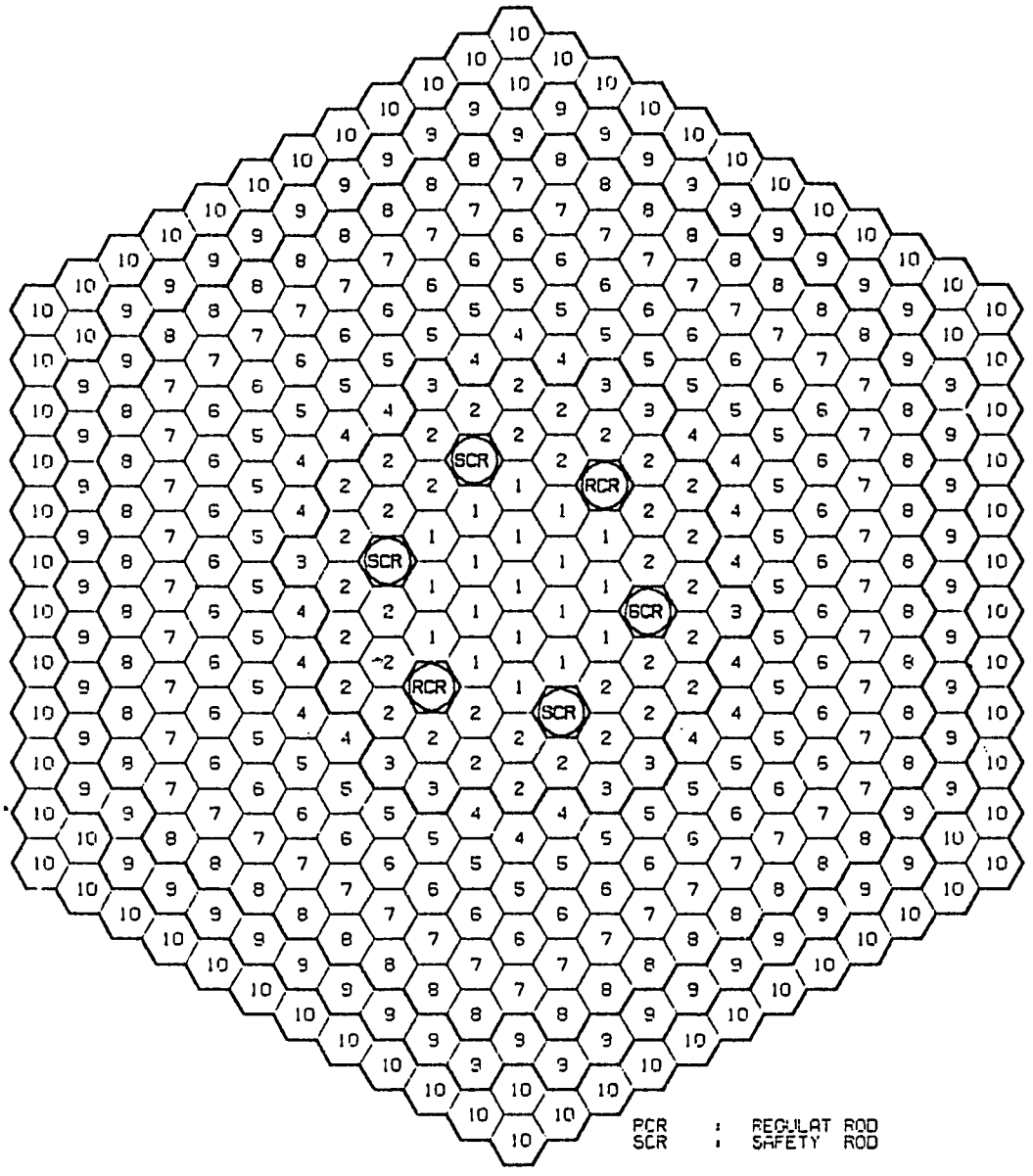
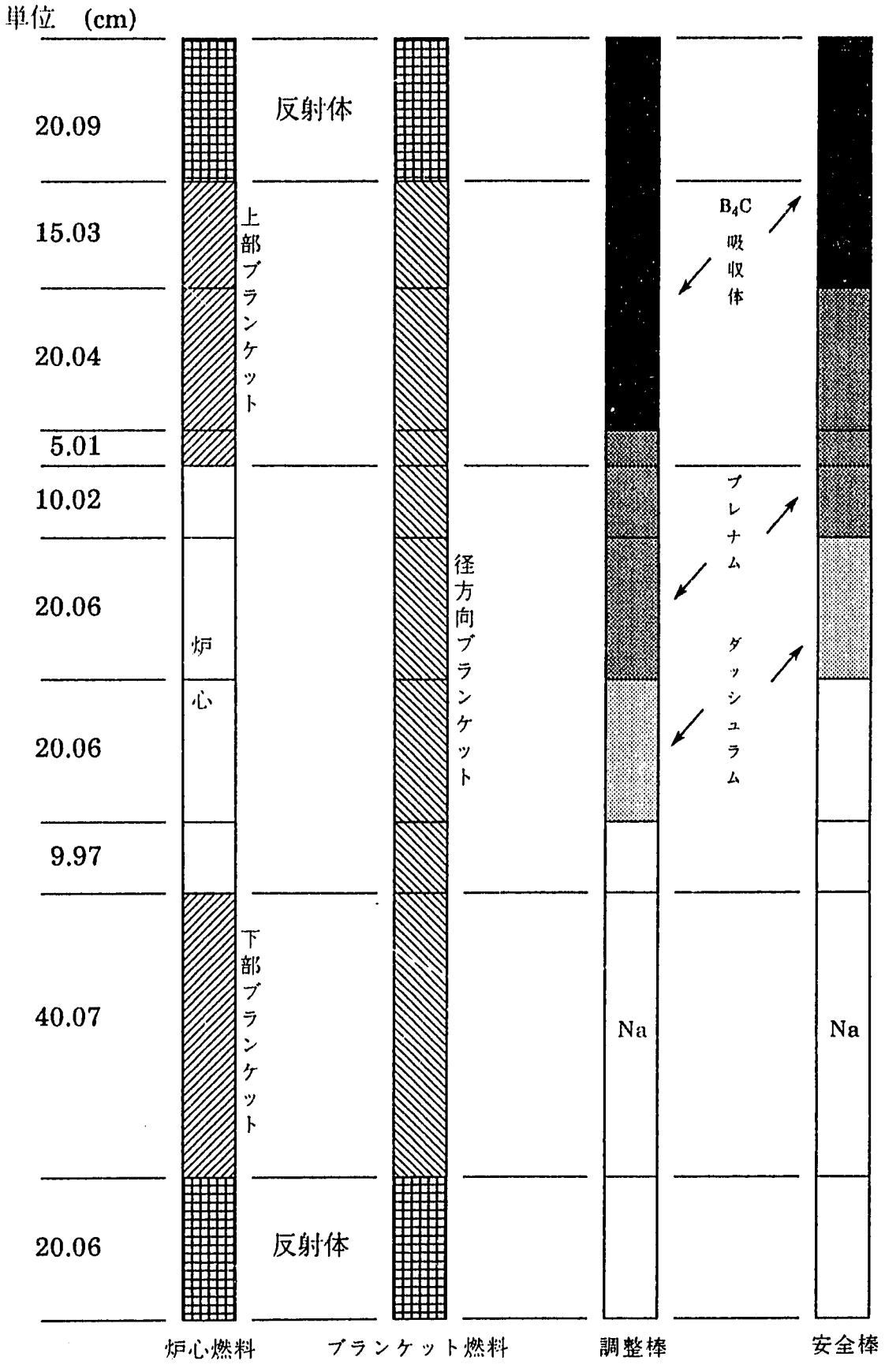


FIG. 3 LOADING ASSEMBLY GROUP MAP

JOYO MK-1 DIFFUSION CALCULATION (RR=700MM SR=900MM)
START UP TEST MIN.CRITICAL CORE

付図6.2 性能試験時の集合体配置図



付図6.3 3次元計算時 軸方向領域分割図

付録7. 燃焼組成解析結果

第3.2章で実施した燃焼組成計算結果(付録5.の燃焼計算コードのアウトプット)を次葉に示す。

記載されている内容は、以下の通りである。

FT05ファイルのメンバー名は、集合体名およびロット名を示す。

ロット名は集合体名の次の英文字で表される。(A=PU8230、B=PU8231、C=EU0004、D=EU0013)

MOSEコードでの集合体番号

MOSEコードでの軸方向メッシュ

各サイクルでの数密度

各サイクルでの同位体組成比

各サイクルでの1群実効断面積

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX06A1)                  ***
***          FT08F001:PA351.@JOYOR.MICRO18                        ***
***          FT16F001:PA351.JOYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  5
PLANE =  19

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580

CROSS SECTION FACTOR
  SIGF      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01427  0.88544  2.43010  0.70111  1.76927  1.96377  0.52948  0.27295
SIGC     0.29509  0.34737  0.34217  0.29650  1.29780  0.38107  0.36627  0.19667
SIGF     1.71918  0.53807  2.08794  0.40460  0.47147  1.58270  0.16320  0.07628
FLUX     1.87832E+15

NUMBER  DENSITY
 1.1020E-03  2.6372E-04  3.4703E-05  7.1392E-06  2.1539E-07  1.5308E-03
 4.5556E-06  5.1295E-03  1.8957E-05  3.6339E-06  1.5870E-05  5.7825E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4739  78.3199  18.7420   2.4307   0.5074  22.9680   0.0684  76.9636  17.4321

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4739  78.3349  18.7456   2.4120   0.5075  22.9680   0.0684  76.9636  17.4293

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01634  0.88497  2.43474  0.70069  1.77214  1.96805  0.52991  0.27330
SIGC     0.29675  0.34900  0.34334  0.29794  1.30300  0.38263  0.36761  0.19747
SIGF     1.71959  0.53597  2.09140  0.40275  0.46914  1.58542  0.16231  0.07583
FLUX     1.85187E+15

NUMBER  DENSITY
 1.0938E-03  2.6435E-04  3.3806E-05  7.1846E-06  6.7122E-07  1.5102E-03
 8.5352E-06  5.1198E-03  3.5548E-05  5.7024E-06  2.9830E-05  1.0871E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8898  78.1761  18.8941   2.4163   0.5135  22.7488   0.1286  77.1227  17.4069

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8898  78.1910  18.8978   2.3976   0.5136  22.7488   0.1286  77.1227  17.4041

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01761  0.88487  2.43741  0.70060  1.77388  1.97052  0.53023  0.27353
SIGC     0.29772  0.34993  0.34401  0.29876  1.30589  0.38351  0.36837  0.19792
SIGF     1.71990  0.53494  2.09340  0.40184  0.46799  1.58701  0.16186  0.07561
FLUX     1.85548E+15

NUMBER  DENSITY
 1.0854E-03  2.6498E-04  3.3422E-05  7.2300E-06  1.1191E-06  1.4895E-03
 1.2527E-05  5.1100E-03  5.2242E-05  8.4098E-06  4.3954E-05  1.6018E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3095  78.0293  19.0483   2.4026   0.5197  22.5268   0.1895  77.2837  17.3818

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3095  78.0405  19.0511   2.3887   0.5198  22.5268   0.1895  77.2837  17.3797

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01958  0.88398  2.44216  0.69980  1.77655  1.97490  0.53050  0.27382
SIGC     0.29940  0.35162  0.34522  0.30024  1.31144  0.38514  0.36975  0.19876
SIGF     1.72018  0.53236  2.09694  0.39956  0.46511  1.58976  0.16075  0.07505
FLUX     1.82054E+15

NUMBER  DENSITY
 1.0849E-03  2.6502E-04  3.3215E-05  7.2330E-06  1.3298E-06  1.4880E-03
 1.2802E-05  5.1093E-03  5.3394E-05  8.5925E-06  4.4932E-05  1.6374E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3385  78.0293  19.0614   2.3890   0.5202  22.5115   0.1937  77.2948  17.3781

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3385  78.0367  19.0632   2.3798   0.5203  22.5115   0.1937  77.2948  17.3767

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01968  0.88397  2.44240  0.69979  1.77670  1.97512  0.53053  0.27384
SIGC     0.29949  0.35170  0.34528  0.30031  1.31170  0.38522  0.36982  0.19880
SIGF     1.72020  0.53226  2.09711  0.39948  0.46500  1.58990  0.16071  0.07503
FLUX     2.73128E+15

NUMBER  DENSITY
 1.0774E-03  2.6558E-04  3.3045E-05  7.2733E-06  1.5621E-06  1.4695E-03
 1.6376E-05  5.1003E-03  6.8360E-05  1.1024E-05  5.7655E-05  2.1011E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7156  77.8867  19.1987   2.3888   0.5258  22.3113   0.2486  77.4400  17.3576

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7156  77.9232  19.2077   2.3430   0.5260  22.3113   0.2486  77.4400  17.3509
```

```
**********************************************************************
***                        BURNUP CALCULATION                        ***
***                                                                  ***
***          FT05F001:PA351.@BURN.DATA(PPJI13A1)                     ***
***          FT08F001:PA351.@JOYUR.MICR018                           ***
***          FT16F001:PA351.JOYO.FLUX18                              ***
**********************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  1
PLANE =  16

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0849E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01274  0.88447  2.47815  0.70033  1.76769  1.96197  0.52894  0.27273
SIGC     0.29430  0.34673  0.34166  0.29594  1.29637  0.38053  0.36575  0.19643
SIGF     1.71844  0.53774  2.08649  0.40439  0.47132  1.58144  0.16320  0.07630
FLUX     1.72821E+15

NUMBER  DENSITY
 1.1028E-03  2.6366E-04  3.4197E-05  7.1350E-06  2.1549E-07  1.5327E-03
 4.1887E-06  5.1304E-03  1.7439E-05  2.7917E-06  1.4599E-05  5.3161E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4360  78.3354  18.7286   2.4292   0.5068  22.9880   0.0628  76.9492  17.4338

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4360  78.3504  18.7322   2.4104   0.5069  22.9880   0.0628  76.9492  17.4311

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01450  0.88404  2.43213  0.69995  1.77013  1.96564  0.52931  0.27303
SIGC     0.29571  0.34813  0.34267  0.29718  1.30084  0.38186  0.36689  0.19712
SIGF     1.71678  0.53591  2.08946  0.40277  0.46929  1.58378  0.16241  0.07591
FLUX     1.71041E+15

NUMBER  DENSITY
 1.0951E-03  2.6423E-04  3.3794E-05  7.1769E-06  5.7176E-07  1.5136E-03
 7.8649E-06  5.1214E-03  3.2773E-05  5.2629E-06  2.7499E-05  1.0011E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8204  78.2050  18.8692   2.4133   0.5125  22.7856   0.1184  77.0960  17.4101

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8204  78.2199  18.8728   2.3947   0.5126  22.7856   0.1184  77.0960  17.4074

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01581  0.88389  2.43492  0.69982  1.77193  1.96822  0.52962  0.27326
SIGC     0.29672  0.34911  0.34337  0.29804  1.30389  0.38279  0.36769  0.19759
SIGF     1.71909  0.53479  2.09155  0.40178  0.46804  1.58543  0.16193  0.07567
FLUX     1.71321E+15

NUMBER  DENSITY
 1.0874E-03  2.6481E-04  3.3404E-05  7.2186E-06  1.1705E-06  1.4945E-03
 1.1557E-05  5.1123E-03  4.8213E-05  7.7663E-06  4.0553E-05  1.4758E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.2084  78.0716  19.0119   2.3982   0.5183  22.5808   0.1746  77.2446  17.3865

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.2084  78.0827  19.0147   2.3843   0.5183  22.5808   0.1746  77.2446  17.3845

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01758  0.88321  2.43915  0.69922  1.77442  1.97213  0.52992  0.27355
SIGC     0.29822  0.35061  0.34444  0.29936  1.30879  0.38424  0.36892  0.19834
SIGF     1.71936  0.53260  2.09471  0.39986  0.46562  1.58789  0.16100  0.07521
FLUX     1.67468E+15

NUMBER  DENSITY
 1.0869E-03  2.6485E-04  3.3197E-05  7.2215E-06  1.3312E-06  1.4932E-03
 1.1811E-05  5.1117E-03  4.9276E-05  7.9345E-06  4.1454E-05  1.5085E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.2351  78.0728  19.0239   2.3845   0.5187  22.5666   0.1785  77.2549  17.3829

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.2351  78.0802  19.0257   2.3753   0.5188  22.5666   0.1785  77.2549  17.3816

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01767  0.88320  2.43936  0.69921  1.77455  1.97232  0.52995  0.27357
SIGC     0.29829  0.35068  0.34450  0.29943  1.30902  0.38431  0.36898  0.19838
SIGF     1.71938  0.53252  2.09486  0.39978  0.46553  1.58801  0.16097  0.07519
FLUX     2.51247E+15

NUMBER  DENSITY
 1.0800E-03  2.6536E-04  3.3019E-05  7.2584E-06  1.5646E-06  1.4760E-03
 1.5106E-05  5.1035E-03  6.3080E-05  1.0178E-05  5.3177E-05  1.9343E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5828  77.9431  19.1502   2.3829   0.5238  22.3823   0.2291  77.3886  17.3638

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5828  77.9795  19.1592   2.3372   0.5241  22.3823   0.2291  77.3886  17.3571

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01920  0.88254  2.44308  0.69863  1.77671  1.97576  0.53019  0.27382
SIGC     0.29961  0.35201  0.34544  0.30059  1.31337  0.38558  0.37007  0.19904
SIGF     1.71960  0.53053  2.09764  0.39804  0.46334  1.59018  0.16013  0.07478
FLUX     2.45311E+15

NUMBER  DENSITY
 1.0704E-03  2.6608E-04  3.2323E-05  7.3090E-06  2.3474E-06  1.4519E-03
 1.9729E-05  5.0918E-03  8.2485E-05  1.3350E-05  6.9740E-05  2.5318E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0728  77.7843  19.3358   2.3488   0.5311  22.1214   0.3006  77.5780  17.3324

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0728  77.7915  19.3376   2.3397   0.5312  22.1214   0.3006  77.5780  17.3310
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.01977	0.88243	2.44436	0.69854	1.77754	1.97695	0.53033	0.27393
SIGC	0.30006	0.35246	0.34576	0.30099	1.31481	0.38602	0.37044	0.19926
SIGF	1.71971	0.52997	2.09860	0.39755	0.46273	1.59093	0.15990	0.07466
FLUX	2.43035E+15							

NUMBER DENSITY

1.0606E-03	2.6681E-04	3.2151E-05	7.3606E-06	2.6108E-06	1.4275E-03
2.4408E-05	5.0798E-03	1.0221E-04	1.6609E-05	8.6711E-05	3.1474E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.5732	77.5908	19.5186	2.3521	0.5385	21.8544	0.3737	77.7719	17.3060

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.5732	77.5981	19.5204	2.3430	0.5385	21.8544	0.3737	77.7719	17.3046

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02150	0.88196	2.44892	0.69811	1.78033	1.98115	0.53075	0.27426
SIGC	0.30169	0.35406	0.34692	0.30240	1.31993	0.38755	0.37175	0.20005
SIGF	1.72011	0.52788	2.10200	0.39571	0.46041	1.59361	0.15900	0.07422
FLUX	2.40506E+15							

NUMBER DENSITY

1.0512E-03	2.6749E-04	3.1988E-05	7.4103E-06	2.8667E-06	1.4040E-03
2.8878E-05	5.0681E-03	1.2117E-04	1.9752E-05	1.0308E-04	3.7451E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.0543	77.4034	19.6957	2.3553	0.5456	21.5967	0.4442	77.9591	17.2810

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.0543	77.4463	19.7066	2.3017	0.5459	21.5967	0.4442	77.9591	17.2731

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02208	0.88197	2.44945	0.69813	1.78069	1.98164	0.53082	0.27431
SIGC	0.30189	0.35424	0.34705	0.30256	1.32047	0.38772	0.37190	0.20013
SIGF	1.72020	0.52773	2.10240	0.39557	0.46072	1.59392	0.15893	0.07418
FLUX	2.40978E+15							

NUMBER DENSITY

1.0400E-03	2.6830E-04	3.1221E-05	7.4677E-06	3.7540E-06	1.3760E-03
3.4188E-05	5.0540E-03	1.4369E-04	2.3568E-05	1.2280E-04	4.4594E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.6318	77.2102	19.9176	2.3178	0.5544	21.2865	0.5289	78.1846	17.2449

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.6318	77.2173	19.9195	2.3088	0.5544	21.2865	0.5289	78.1846	17.2435

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02398	0.88157	2.45367	0.69777	1.78331	1.98554	0.53123	0.27464
SIGC	0.30340	0.35573	0.34812	0.30387	1.32518	0.38914	0.37311	0.20086
SIGF	1.72059	0.52584	2.10555	0.39390	0.45813	1.59641	0.15812	0.07378
FLUX	2.38636E+15							

NUMBER DENSITY

1.0301E-03	2.6900E-04	3.1091E-05	7.5189E-06	3.9960E-06	1.3512E-03
3.8873E-05	5.0412E-03	1.6369E-04	2.6976E-05	1.4041E-04	5.1025E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.1457	77.0054	20.1084	2.3241	0.5621	21.0096	0.6044	78.3859	17.2189

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.1457	77.0266	20.1140	2.2972	0.5622	21.0096	0.6044	78.3859	17.2150

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02467	0.88142	2.45523	0.69765	1.78430	1.98698	0.53139	0.27476
SIGC	0.30395	0.35628	0.34850	0.30435	1.32693	0.38966	0.37356	0.20113
SIGF	1.72072	0.52515	2.10672	0.39329	0.45737	1.59732	0.15783	0.07364
FLUX	2.36559E+15							

NUMBER DENSITY

1.0211E-03	2.6963E-04	3.0728E-05	7.5652E-06	4.4659E-06	1.3285E-03
4.3132E-05	5.0294E-03	1.8197E-04	3.0131E-05	1.5663E-04	5.6957E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6174	76.8306	20.2881	2.3121	0.5692	20.7547	0.6738	78.5715	17.1925

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6174	76.8376	20.2899	2.3032	0.5693	20.7547	0.6738	78.5715	17.1912

```
*****************************************************************
***                      BURNUP CALCULATION                   ***
***                                                           ***
***          FT05F001:PA351.@BURN.DATA(PPJX13A2)              ***
***          FT08F001:PA351.@JOYOR.MICRO18                    ***
***          FT16F001:PA351.JOYO.FLUX18                       ***
*****************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  1
PLANE =  19

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01044  0.88479  2.42291  0.70058  1.76405  1.95709  0.52827  0.27221
SIGC     0.29247  0.34487  0.34038  0.29430  1.29049  0.37875  0.36424  0.19552
SIGF     1.71797  0.53992  2.08253  0.40628  0.47356  1.57834  0.16403  0.07669
FLUX     1.96154E+15

NUMBER  DENSITY
 1.1016E-03  2.6373E-04  3.4203E-05  7.1411E-06  2.1533E-07  1.5298E-03
 4.7257E-06  5.1290E-03  1.9737E-05  3.1880E-06  1.6564E-05  6.0246E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4943  78.3127  18.7482   2.4314   0.5077  22.9580   0.0709  76.9711  17.4305

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4943  78.3277  18.7518   2.4127   0.5077  22.9580   0.0709  76.9711  17.4277

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01736  0.88428  2.42727  0.70013  1.76670  1.96112  0.52865  0.27253
SIGC     0.29403  0.34640  0.34148  0.29566  1.29541  0.38022  0.36550  0.19627
SIGF     1.71833  0.53787  2.08578  0.40448  0.47129  1.58089  0.16315  0.07625
FLUX     1.94105E+15

NUMBER  DENSITY
 1.0929E-03  2.6437E-04  3.3806E-05  7.1883E-06  6.7084E-07  1.5083E-03
 8.8648E-06  5.1189E-03  3.7062E-05  6.0078E-06  3.1183E-05  1.1346E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.9294  78.1620  18.9063   2.4176   0.5141  22.7292   0.1336  77.1372  17.4038

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.9294  78.1770  18.9099   2.3990   0.5142  22.7292   0.1336  77.1372  17.4011

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01384  0.88408  2.43044  0.69995  1.76871  1.96405  0.52899  0.27278
SIGC     0.29517  0.34751  0.34278  0.29663  1.29889  0.38178  0.36641  0.19681
SIGF     1.71867  0.53656  2.08815  0.40331  0.46982  1.58277  0.16258  0.07597
FLUX     1.94389E+15

NUMBER  DENSITY
 1.0842E-03  2.6500E-04  3.3422E-05  7.2353E-06  1.1182E-06  1.4867E-03
 1.3014E-05  5.1087E-03  5.4479E-05  8.8486E-06  4.5960E-05  1.6726E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3681  78.0083  19.0664   2.4047   0.5206  22.4978   0.1969  77.3053  17.3773

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3681  78.0195  19.0691   2.3907   0.5206  22.4978   0.1969  77.3053  17.3752

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01572  0.88334  2.43493  0.69930  1.77134  1.96820  0.52930  0.27308
SIGC     0.29676  0.34911  0.34343  0.29804  1.30409  0.38281  0.36771  0.19761
SIGF     1.71896  0.53423  2.09151  0.40127  0.46724  1.58538  0.16159  0.07548
FLUX     1.89887E+15

NUMBER  DENSITY
 1.0836E-03  2.6504E-04  3.3216E-05  7.2385E-06  1.3288E-06  1.4853E-03
 1.3300E-05  5.1079E-03  5.5677E-05  9.0386E-06  4.6979E-05  1.7097E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3983  78.0080  19.0798   2.3911   0.5211  22.4818   0.2013  77.3169  17.3735

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3983  78.0154  19.0816   2.3819   0.5211  22.4818   0.2013  77.3169  17.3722

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01583  0.88333  2.43518  0.69929  1.77149  1.95842  0.52933  0.27310
SIGC     0.29685  0.34919  0.34349  0.29811  1.30436  0.38289  0.36778  0.19765
SIGF     1.71898  0.53413  2.09169  0.40118  0.46714  1.58552  0.16155  0.07546
FLUX     2.84875E+15

NUMBER  DENSITY
 1.0759E-03  2.6561E-04  3.3046E-05  7.2801E-06  1.5604E-06  1.4660E-03
 1.6994E-05  5.0986E-03  7.1211E-05  1.1586E-05  6.0227E-05  2.1923E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7906  77.8599  19.2217   2.3915   0.5269  22.2739   0.2582  77.4678  17.3519

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7906  77.8965  19.2307   2.3457   0.5271  22.2739   0.2582  77.4678  17.3452

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01744  0.88264  2.43909  0.69868  1.77375  1.97203  0.52959  0.27336
SIGC     0.29823  0.35059  0.34448  0.29933  1.30893  0.38424  0.36892  0.19834
SIGF     1.71920  0.53205  2.09460  0.39935  0.46483  1.58779  0.16066  0.07502
FLUX     2.78158E+15

NUMBER  DENSITY
 1.0650E-03  2.6640E-04  3.2363E-05  7.3372E-06  2.3396E-06  1.4389E-03
 2.2166E-05  5.0855E-03  9.3011E-05  1.5192E-05  7.8932E-05  2.8697E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.3428  77.6752  19.4293   2.3604   0.5351  21.9801   0.3386  77.6814  17.3171

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.3428  77.6824  19.4312   2.3512   0.5352  21.9801   0.3386  77.6814  17.3157
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.01804	0.88252	2.44044	0.69859	1.77463	1.97328	0.52973	0.27348
SIGC	0.29871	0.35106	0.34482	0.29976	1.31044	0.38469	0.36931	0.19858
SIGF	1.71933	0.53146	2.09562	0.39885	0.46419	1.58859	0.16042	0.07490
FLUX	2.75558E+15							

NUMBER DENSITY

1.0540E-03 2.6718E-04 3.2207E-05 7.3953E-06 2.5984E-06 1.4115E-03
2.7386E-05 5.0719E-03 1.1513E-04 1.8898E-05 9.8075E-05 3.5680E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9060	77.4552	19.6346	2.3668	0.5435	21.6797	0.4206	77.8997	17.2873

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9060	77.4624	19.6364	2.3576	0.5435	21.6797	0.4206	77.8997	17.2859

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02028	0.88196	2.44548	0.69809	1.77769	1.97794	0.53018	0.27385
SIGC	0.30052	0.35284	0.34610	0.30132	1.31611	0.38639	0.37076	0.19945
SIGF	1.71977	0.52913	2.09938	0.39677	0.46159	1.59155	0.15942	0.07440
FLUX	2.72599E+15							

NUMBER DENSITY

1.0435E-03 2.6793E-04 3.2060E-05 7.4514E-06 2.8496E-06 1.3853E-03
3.2359E-05 5.0587E-03 1.3627E-04 2.2470E-05 1.1651E-04 4.2460E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4465	77.2422	19.8331	2.3732	0.5516	21.3901	0.4996	78.1103	17.2591

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4465	77.2853	19.8441	2.3186	0.5519	21.3901	0.4996	78.1103	17.2512

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02061	0.88198	2.44611	0.69810	1.77811	1.97852	0.53026	0.27390
SIGC	0.30075	0.35305	0.34626	0.30151	1.31676	0.38659	0.37094	0.19955
SIGF	1.71986	0.52892	2.09986	0.39659	0.46135	1.59192	0.15932	0.07435
FLUX	2.73078E+15							

NUMBER DENSITY

1.0309E-03 2.6879E-04 3.1313E-05 7.5161E-06 3.7308E-06 1.3541E-03
3.8245E-05 5.0427E-03 1.6146E-04 2.6791E-05 1.3869E-04 5.0566E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0940	77.0188	20.0804	2.3393	0.5615	21.0423	0.5943	78.3634	17.2194

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0940	77.0259	20.0823	2.3302	0.5616	21.0423	0.5943	78.3634	17.2181

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02270	0.88152	2.45076	0.69769	1.78098	1.98281	0.53070	0.27425
SIGC	0.30242	0.35469	0.34743	0.30295	1.32196	0.38815	0.37228	0.20035
SIGF	1.72079	0.52683	2.10333	0.39474	0.45907	1.59466	0.15842	0.07391
FLUX	2.70291E+15							

NUMBER DENSITY

1.0199E-03 2.6954E-04 3.1203E-05 7.5739E-06 3.9658E-06 1.3265E-03
4.3420E-05 5.0283E-03 1.8371E-04 3.0652E-05 1.5847E-04 5.7867E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6690	76.7870	20.2935	2.3492	0.5702	20.7323	0.6786	78.5891	17.1904

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6690	76.8084	20.2992	2.3221	0.5704	20.7323	0.6786	78.5891	17.1865

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02545	0.88137	2.45243	0.69756	1.78204	1.98435	0.53088	0.27439
SIGC	0.30301	0.35528	0.34785	0.30346	1.32382	0.38871	0.37276	0.20063
SIGF	1.72044	0.52609	2.10458	0.39410	0.45822	1.59564	0.15812	0.07376
FLUX	2.67835E+15							

NUMBER DENSITY

1.0098E-03 2.7021E-04 3.0858E-05 7.6262E-06 4.4295E-06 1.3014E-03
4.8109E-05 5.0150E-03 2.0398E-04 3.4215E-05 1.7666E-04 6.4603E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.1958	76.5877	20.4935	2.3404	0.5784	20.4474	0.7559	78.7967	17.1613

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.1958	76.5948	20.4954	2.3313	0.5785	20.4474	0.7559	78.7967	17.1600

```
*****************************************************************
***                      BURNUP CALCULATION                   ***
***                                                           ***
***        FT05F001:PA351.$BURN.DATA(PPJ313A3)                ***
***        FT08F001:PA351.$JOYOR.MICRO18                      ***
***        FT16F001:PA351.JUYO.FLUX18                         ***
*****************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  1
PLANE =  22

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02953  0.88908  2.45896  0.70434  1.79210  1.99059  0.53554  0.27662
SIGC     0.30551  0.35741  0.34907  0.30540  1.32684  0.39030  0.37434  0.20132
SIGF     1.72402  0.53167  2.10989  0.39894  0.46525  1.60050  0.16100  0.07530
FLUX     1.66992E+15

NUMBER  DENSITY
 1.1031E-03  2.6371E-04  3.4207E-05  7.1349E-06  2.1555E-07  1.5331E-03
 4.1519E-06  5.1306E-03  1.7052E-05  2.6668E-06  1.4141E-05  5.1903E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4239  78.3370  18.7271   2.4292   0.5067  22.9924   0.0623  76.9454  17.4368

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4239  78.3521  18.7307   2.4104   0.5068  22.9924   0.0623  76.9454  17.4340

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03143  0.88871  2.46315  0.70401  1.79472  1.99446  0.53576  0.27695
SIGC     0.30701  0.35889  0.35013  0.30670  1.33151  0.39170  0.37554  0.20204
SIGF     1.72442  0.52982  2.11302  0.39731  0.46321  1.60276  0.16022  0.07491
FLUX     1.65388E+15

NUMBER  DENSITY
 1.0958E-03  2.6434E-04  3.3813E-05  7.1768E-06  6.7210E-07  1.5144E-03
 7.7597E-06  5.1218E-03  3.2062E-05  5.0208E-06  2.6648E-05  9.7782E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7978  78.2077  18.8667   2.4133   0.5122  22.7936   0.1174  77.0890  17.4155

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7978  78.2227  18.8703   2.3947   0.5123  22.7936   0.1174  77.0890  17.4128

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03285  0.88862  2.46609  0.70392  1.79664  1.99718  0.53611  0.27720
SIGC     0.30807  0.35991  0.35087  0.30760  1.33468  0.39267  0.37638  0.20253
SIGF     1.72477  0.52870  2.11525  0.39632  0.46196  1.60451  0.15973  0.07467
FLUX     1.65730E+15

NUMBER  DENSITY
 1.0884E-03  2.6497E-04  3.3431E-05  7.2186E-06  1.1213E-06  1.4956E-03
 1.1467E-05  5.1129E-03  4.7159E-05  7.4073E-06  3.9313E-05  1.4419E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1717  78.0757  19.0082   2.3982   0.5178  22.5923   0.1732  77.2345  17.3944

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1757  78.0868  19.0109   2.3843   0.5179  22.5923   0.1732  77.2345  17.3924

    4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03477  0.88801  2.47057  0.70339  1.79934  2.00132  0.53648  0.27752
SIGC     0.30966  0.36150  0.35200  0.30899  1.33980  0.39419  0.37767  0.20331
SIGF     1.72511  0.52652  2.11857  0.39439  0.45955  1.60713  0.15881  0.07421
FLUX     1.61977E+15

NUMBER  DENSITY
 1.0878E-03  2.6500E-04  3.3224E-05  7.2214E-06  1.3322E-06  1.4943E-03
 1.1719E-05  5.1122E-03  4.8231E-05  7.5682E-06  4.0187E-05  1.4739E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.2017  78.0771  19.0200   2.3846   0.5183  22.5784   0.1771  77.2445  17.3909

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.2017  78.0845  19.0218   2.3754   0.5183  22.5784   0.1771  77.2445  17.3896

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03488  0.88801  2.47079  0.70338  1.79949  2.00152  0.53651  0.27754
SIGC     0.30974  0.36158  0.35205  0.30906  1.34004  0.39426  0.37774  0.20335
SIGF     1.72513  0.52643  2.11873  0.39452  0.45945  1.60726  0.15877  0.07420
FLUX     2.43012E+15

NUMBER  DENSITY
 1.0812E-03  2.6557E-04  3.3055E-05  7.2584E-06  1.5661E-06  1.4775E-03
 1.4993E-05  5.1042E-03  6.1756E-05  9.7094E-06  5.1562E-05  1.8904E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5402  77.9483  19.1454   2.3830   0.5233  22.3972   0.2273  77.3755  17.3740

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5402  77.9848  19.1544   2.3373   0.5235  22.3972   0.2273  77.3755  17.3673

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03656  0.88743  2.47475  0.70287  1.80186  2.00518  0.53682  0.27783
SIGC     0.31115  0.36298  0.35306  0.31030  1.34459  0.39561  0.37888  0.20404
SIGF     1.72541  0.52445  2.12169  0.39257  0.45726  1.60957  0.15793  0.07378
FLUX     2.37495E+15

NUMBER  DENSITY
 1.0719E-03  2.6636E-04  3.2369E-05  7.3093E-06  2.3504E-06  1.4538E-03
 1.9591E-05  5.0927E-03  8.0791E-05  1.2736E-05  6.7654E-05  2.4754E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0179  77.7907  19.3298   2.3490   0.5304  22.1406   0.2984  77.5610  17.3458

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0179  77.7979  19.3316   2.3399   0.5305  22.1406   0.2984  77.5610  17.3444
```

7 CYCLE

***** BURN-UP TIME ***** 40.95 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.03720	0.88736	2.47615	0.70281	1.80279	2.00648	0.53699	0.27795
SIGC	0.31165	0.36347	0.35341	0.31073	1.34614	0.39608	0.37929	0.20428
SIGF	1.72555	0.52388	2.12274	0.39208	0.45665	1.61040	0.15770	0.07367
FLUX	2.35373E+15							

NUMBER DENSITY

1.0625E-03	2.6715E-04	3.2209E-05	7.3612E-06	2.6149E-06	1.4297E-03
2.4250E-05	5.0809E-03	1.0016E-04	1.5851E-05	8.4154E-05	3.0786E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.5061	77.5984	19.5116	2.3524	0.5376	21.8777	0.3711	77.7512	17.3226

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.5061	77.6056	19.5134	2.3433	0.5377	21.8777	0.3711	77.7512	17.3212

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.03942	0.88695	2.48100	0.70244	1.80582	2.01096	0.53748	0.27833
SIGC	0.31339	0.36518	0.35463	0.31223	1.35152	0.39770	0.38068	0.20511
SIGF	1.72604	0.52177	2.12637	0.39021	0.45431	1.61326	0.15680	0.07322
FLUX	2.33029E+15							

NUMBER DENSITY

1.0534E-03	2.6791E-04	3.2057E-05	7.4113E-06	2.8720E-04	1.4066E-03
2.8705E-05	5.0695E-03	1.1873E-04	1.8856E-05	1.0008E-04	3.6646E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9758	77.4118	19.6878	2.3558	0.5446	21.6238	0.4413	77.9350	17.3007

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9758	77.4547	19.6987	2.3016	0.5449	21.6238	0.4413	77.9350	17.2927

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.03975	0.88699	2.48161	0.70247	1.80624	2.01152	0.53757	0.27839
SIGC	0.31361	0.36539	0.35478	0.31241	1.35213	0.39789	0.38085	0.20521
SIGF	1.72614	0.52160	2.12683	0.39006	0.45411	1.61362	0.15672	0.07318
FLUX	2.33439E+15							

NUMBER DENSITY

1.0426E-03	2.6880E-04	3.1301E-05	7.4691E-06	3.7624E-06	1.3790E-03
3.3999E-05	5.0555E-03	1.4091E-04	2.2499E-05	1.1927E-04	4.3650E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.5397	77.2198	19.9086	2.3183	0.5532	21.3184	0.5256	78.1561	17.2683

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.5397	77.2269	19.9105	2.3093	0.5533	21.3184	0.5256	78.1561	17.2670

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04182	0.88667	2.48610	0.70219	1.80909	2.01567	0.53805	0.27875
SIGC	0.31523	0.36696	0.35591	0.31380	1.35708	0.39939	0.38213	0.20597
SIGF	1.72660	0.51971	2.13019	0.38839	0.45201	1.61628	0.15591	0.07278
FLUX	2.31222E+15							

NUMBER DENSITY

1.0330E-03	2.6958E-04	3.1182E-05	7.5209E-06	4.0062E-06	1.3545E-03
3.8672E-05	5.0430E-03	1.6057E-04	2.5757E-05	1.3642E-04	4.9960E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0416	77.0160	20.0985	2.3248	0.5607	21.0453	0.6008	78.3538	17.2457

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0416	77.0372	20.1040	2.2979	0.5609	21.0453	0.6008	78.3538	17.2418

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04262	0.88657	2.48781	0.70210	1.81022	2.01726	0.53825	0.27890
SIGC	0.31584	0.36757	0.35634	0.31433	1.35897	0.39997	0.38263	0.20626
SIGF	1.72678	0.51900	2.13147	0.38777	0.45124	1.61730	0.15562	0.07264
FLUX	2.29175E+15							

NUMBER DENSITY

1.0242E-03	2.7028E-04	3.0829E-05	7.5678E-06	4.4787E-06	1.3322E-03
4.2922E-05	5.0314E-03	1.7854E-04	2.8769E-05	1.5222E-04	5.5781E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.5025	76.8422	20.2772	2.3129	0.5678	20.7941	0.6700	78.5359	17.2225

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.5025	76.8492	20.2790	2.3039	0.5678	20.7941	0.6700	78.5359	17.2211

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.aBURN.DATA(PPJX111)                   ***
***          FT08F001:PA351.aJUYUR.MICH018                        ***
***          FT16F001:PA351.JUYU.FLUX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  2
PLANE =  19

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580
     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

NUMBER  DENSITY
 1.1020E-03  2.6372E-04  3.4203E-05  7.1392E-06  2.1539E-07  1.5308E-03
 4.5556E-06  5.1295E-03  1.8959E-05  3.0339E-06  1.5871E-05  5.7830E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4740  78.3199  18.7420   2.4307   0.5074  22.9680   0.0684  76.9637  17.4321

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4740  78.3349  18.7456   2.4120   0.5075  22.9680   0.0684  76.9637  17.4293
     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

NUMBER  DENSITY
 1.0937E-03  2.6435E-04  3.3806E-05  7.1850E-06  6.7115E-07  1.5100E-03
 8.5695E-06  5.1197E-03  3.5702E-05  5.7317E-06  7.9963E-05  1.0919E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8938  78.1747  18.8953   2.4164   0.5136  22.7467   0.1291  77.1242  17.4067

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8938  78.1897  18.8989   2.3978   0.5137  22.7467   0.1291  77.1242  17.4039
     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

NUMBER  DENSITY
 1.0853E-03  2.6498E-04  3.3423E-05  7.2308E-06  1.1190E-06  1.4891E-03
 1.2596E-05  5.1098E-03  5.2540E-05  8.4619E-06  4.4211E-05  1.6111E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3171  78.0266  19.0507   2.4029   0.5198  22.5229   0.1905  77.2866  17.3814

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3171  78.0377  19.0534   2.3890   0.5199  22.5229   0.1905  77.2866  17.3793
     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

NUMBER  DENSITY
 1.0847E-03  2.6502E-04  3.3716E-05  7.2338E-06  1.3297E-06  1.4877E-03
 1.2872E-05  5.1091E-03  5.3695E-05  8.6437E-06  4.5191E-05  1.6468E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3461  78.0265  19.0638   2.3893   0.5203  22.5076   0.1947  77.2977  17.3777

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3461  78.0339  19.0656   2.3801   0.5204  22.5076   0.1947  77.2977  17.3763
     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

NUMBER  DENSITY
 1.0773E-03  2.6558E-04  3.3045E-05  7.2740E-06  1.5619E-06  1.4691E-03
 1.6442E-05  5.1002E-03  6.8663E-05  1.1090E-05  5.7929E-05  2.1108E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7237  77.8842  19.2008   2.3891   0.5259  22.3073   0.2497  77.4430  17.3571

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7237  77.9208  19.2098   2.3433   0.5261  22.3073   0.2497  77.4430  17.3503
     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

NUMBER  DENSITY
 1.0668E-03  2.6636E-04  3.2360E-05  7.3293E-06  2.3424E-06  1.4430E-03
 2.1451E-05  5.0875E-03  8.9716E-05  1.4544E-05  7.5945E-05  2.7631E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2561  77.7072  19.4019   2.3571   0.5339  22.0237   0.3274  77.6489  17.3237

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2561  77.7144  19.4037   2.3480   0.5339  22.0237   0.3274  77.6489  17.3223
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*********************************************************************
***                    BURNUP CALCULATION                         ***
***                                                               ***
***        FT05F001:PA351.WBURN.DAT.(PPJX121)                     ***
***        FT08F001:PA351.WJOYOU.MICRO18                          ***
***        FT16F001:PA351.JOYO.FLUX18                             ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  4
PLANE =  19

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580
     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

NUMBER  DENSITY
 1.1020E-03  2.6372E-04  3.4704E-05  7.1391E-06  2.1539E-07  1.5307E-03
 4.5644E-06  5.1295E-03  1.8987E-05  3.0412E-06  1.5891E-05  5.7916E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4747  78.3194  18.7424   2.4308   0.5074  22.9675   0.0685  76.9640  17.4321

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4747  78.3345  18.7460   2.4120   0.5075  22.9675   0.0685  76.9640  17.4293
     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

NUMBER  DENSITY
 1.0937E-03  2.6436E-04  3.3807E-05  7.1849E-06  6.7170E-07  1.5101E-03
 8.5567E-06  5.1198E-03  3.5626E-05  5.7171E-06  2.9888E-05  1.0895E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8917  78.1752  18.8949   2.4164   0.5135  22.7478   0.1289  77.1234  17.4070

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8917  78.1901  18.8985   2.3977   0.5136  22.7478   0.1289  77.1234  17.4042
     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

NUMBER  DENSITY
 1.0854E-03  2.6499E-04  3.3424E-05  7.2104E-06  1.1191E-06  1.4893E-03
 1.2563E-05  5.1099E-03  5.7363E-05  8.4244E-06  4.4042E-05  1.6056E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3123  78.0279  19.0495   2.4028   0.5198  22.5251   0.1900  77.2848  17.3818

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3123  78.0390  19.0522   2.3889   0.5199  22.5251   0.1900  77.2848  17.3798
     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

NUMBER  DENSITY
 1.0848E-03  2.6503E-04  3.3217E-05  7.2335E-06  1.3298E-06  1.4879E-03
 1.2838E-05  5.1092E-03  5.3518E-05  8.6071E-06  4.5022E-05  1.6413E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3414  78.0278  19.0626   2.3892   0.5203  22.5098   0.1942  77.2960  17.3781

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3414  78.0352  19.0644   2.3800   0.5203  22.5098   0.1942  77.2960  17.3768
     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

NUMBER  DENSITY
 1.0774E-03  2.6559E-04  3.3048E-05  7.2739E-06  1.5620E-06  1.4693E-03
 1.6419E-05  5.1003E-03  6.8511E-05  1.1039E-05  5.7765E-05  2.1059E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7191  77.8849  19.2001   2.3891   0.5258  22.3091   0.2493  77.4415  17.3577

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7191  77.9215  19.2092   2.3432   0.5261  22.3091   0.2493  77.4415  17.3509
     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

NUMBER  DENSITY
 1.0669E-03  2.6638E-04  3.2363E-05  7.3293E-06  2.3426E-06  1.4431E-03
 2.1436E-05  5.0876E-03  8.9564E-05  1.4478E-05  7.5761E-05  2.7581E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2511  77.7076  19.4014   2.3571   0.5338  22.0254   0.3272  77.6474  17.3246

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2511  77.7149  19.4032   2.3480   0.5339  22.0254   0.3272  77.6474  17.3233
     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

NUMBER  DENSITY
 1.0563E-03  2.6718E-04  3.2207E-05  7.3861E-06  2.6027E-06  1.4165E-03
 2.6532E-05  5.0744E-03  1.1105E-04  1.8033E-05  9.4278E-05  3.4337E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.7965  77.4939  19.6014   2.3628   0.5419  21.7336   0.4071  77.8593  17.2965

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.7965  77.5011  19.6033   2.3537   0.5419  21.7336   0.4071  77.8593  17.2951
     8 CYCLE

***** BURN-UP TIME *****   40.25 DAYS

NUMBER  DENSITY
 1.0462E-03  2.6793E-04  3.2059E-05  7.4406E-06  2.8555E-06  1.3911E-03
 3.1370E-05  5.0617E-03  1.3151E-04  2.1433E-05  1.1203E-04  4.0867E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 3.3177  77.2879  19.7940   2.3684   0.5497  21.4534   0.4838  78.0628  17.2701

***** COOLING TIME *****  180.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 3.3177  77.3310  19.8050   2.3140   0.5500  21.4534   0.4838  78.0628  17.2621
     9 CYCLE

***** BURN-UP TIME *****   48.83 DAYS

NUMBER  DENSITY
 1.0341E-03  2.6880E-04  3.1309E-05  7.5036E-06  3.7392E-06  1.3608E-03
 3.7103E-05  5.0463E-03  1.5590E-04  2.5554E-05  1.3341E-04  4.8677E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 3.9427  77.0726  20.0346   2.3336   0.5593  21.1167   0.5758  78.3075  17.2324

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 3.9427  77.0797  20.0365   2.3245   0.5593  21.1167   0.5758  78.3075  17.2311
    10 CYCLE

***** BURN-UP TIME *****   44.44 DAYS

NUMBER  DENSITY
 1.0234E-03  2.6958E-04  3.1198E-05  7.5602E-06  3.9764E-06  1.3340E-03
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 4.2166E-05  5.0324E-03  1.7752E-04  3.9238E-05  1.5252E-04  5.5729E-06

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 4.4993   76.8472   20.2424    2.3427    0.5677   20.8155    0.6580   78.5265  17.2052

***** COOLING TIME *****   90.0 DAYS

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 4.4993   76.8585   20.2480    2.3156    0.5679   20.8155    0.6580   78.5265  17.2013
    11 CYCLE

***** BURN-UP TIME *****   41.65 DAYS

NUMBER  DENSITY
 1.0137E-03  7.7026E-04  3.0853E-05  7.6112E-06  4.4476E-06  1.3096E-03
 4.6743E-05  5.0196E-03  1.9716E-04  3.2617E-05  1.7003E-04  6.2205E-06

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 5.0072   76.6546   20.4368    2.3331    0.5755   20.5399    0.7331   78.7270  17.1781

***** COOLING TIME *****   30.0 DAYS

 BURNUP    PU-239    PU-240    PU-241    PU 242     U-235     U-236     U-238  PU/PU+U
 5.0072   76.6617   20.4387    2.3240    0.5756   20.5399    0.7331   78.7270  17.1768
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*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          F105F001:PA351.@BURN.DATA(PPJ3091)                   ***
***          F108F001:PA351.@JUYON.MICRO18                        ***
***          F116F001:PA351.JUYO.LIBX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
ｾﾙﾌﾞﾚﾍﾞﾙ =  8
PLANE =  19

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580
     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

NUMBER  DENSITY
 1.1032E-03  2.6372E-04  3.4207E-05  7.1346E-06  2.1556E-07  1.5333E-03
 4.1170E-06  5.1307E-03  1.6886E-05  2.6081E-06  1.3990E-05  5.1374E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.4192  78.3383  18.7261   2.4290   0.5066  22.9945   0.0617  76.9437  17.4371

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.4192  78.3533  18.7297   2.4103   0.5067  22.9945   0.0617  76.9437  17.4343
     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

NUMBER  DENSITY
 1.0958E-03  2.6435E-04  3.3813E-05  7.1767E-06  6.7210E-07  1.5146E-03
 7.7740E-06  5.1219E-03  3.1937E-05  4.9474E-06  2.6532E-05  9.7360E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.7959  78.2084  18.8661   2.4132   0.5122  22.7952   0.1170  77.0878  17.4157

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.7959  78.2234  18.8698   2.3946   0.5123  22.7952   0.1170  77.0878  17.4130
     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

NUMBER  DENSITY
 1.0884E-03  2.6498E-04  3.3431E-05  7.2188E-06  1.1213E-06  1.4957E-03
 1.1451E-05  5.1130E-03  4.7099E-05  7.3194E-06  3.9229E-05  1.4387E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 1.1724  78.0757  19.0083   2.3982   0.5178  22.5934   0.1730  77.2337  17.3945

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 1.1724  78.0868  19.0110   2.3843   0.5179  22.5934   0.1730  77.2337  17.3924
     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

NUMBER  DENSITY
 1.0879E-03  2.6501E-04  3.3224E-05  7.2716E-06  1.3322E-06  1.4944E-03
 1.1700E-05  5.1123E-03  4.8137E-05  7.4803E-06  4.0098E-05  1.4705E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 1.1983  78.0771  19.0201   2.3845   0.5183  22.5795   0.1768  77.2437  17.3910

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 1.1983  78.0845  19.0219   2.3753   0.5183  22.5795   0.1768  77.2437  17.3896
     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

NUMBER  DENSITY
 1.0813E-03  2.6557E-04  3.3054E-05  7.2585E-06  1.5662E-06  1.4777E-03
 1.4958E-05  5.1043E-03  6.1597E-05  9.5922E-06  5.1422E-05  1.8849E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 1.5351  77.9489  19.1450   2.3828   0.5233  22.3992   0.2267  77.3740  17.3739

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 1.5351  77.9854  19.1540   2.3771   0.5235  22.3992   0.2267  77.3740  17.3672
     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

NUMBER  DENSITY
 1.0719E-03  2.6636E-04  3.2366E-05  7.3094E-06  2.3505E-06  1.4540E-03
 1.9557E-05  5.0929E-03  8.0655E-05  1.2605E-05  6.7552E-05  2.4705E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 2.0133  77.7910  19.3297   2.3488   0.5304  22.1424   0.2978  77.5598  17.3453

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 2.0133  77.7982  19.3315   2.3397   0.5305  22.1424   0.2978  77.5598  17.3439
     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

NUMBER  DENSITY
 1.0625E-03  2.6715E-04  3.2205E-05  7.3612E-06  2.6152E-06  1.4300E-03
 2.4191E-05  5.0812E-03  9.9912E-05  1.5668E-05  8.3955E-05  3.0699E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 2.4983  77.5993  19.5110   2.3520   0.5376  21.8809   0.3702  77.7489  17.3221

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 2.4983  77.6066  19.5128   2.3429   0.5377  21.8809   0.3702  77.7489  17.3208
     8 CYCLE

***** BURN-UP TIME *****   40.25 DAYS

NUMBER  DENSITY
 1.0534E-03  2.6792E-04  3.2053E-05  7.4115E-06  2.8723E-06  1.4068E-03
 2.8653E-05  5.0697E-03  1.1851E-04  1.8645E-05  9.9903E-05  3.6564E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 2.9683  77.4123  19.6877   2.3554   0.5446  21.6265   0.4405  77.9331  17.3000

***** COOLING TIME *****  180.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 2.9683  77.4552  19.6986   2.3012   0.5449  21.6265   0.4405  77.9331  17.2921
```

```
*********************************************************************
***                        BURNUP CALCULATION                     ***
***                                                               ***
***          FI05F001:PA351.@BURN.DATA(PPJX081)                   ***
***          FI08F001:PA351.#JOYUR.MICRO18                        ***
***          FI16F001:PA351.JOYO.FLUX1R                           ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  15
PLANE =  15

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580
     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

NUMBER  DENSITY
 1.1047E-03  2.6363E-04  3.4202E-05  7.1270E-06  2.1576E-07  1.5368E-03
 3.4448E-06  5.1324E-03  1.4013E-05  2.1162E-06  1.1537E-05  4.2536E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.3463  78.3665  18.7017   2.4262   0.5056  23.0319   0.0516  76.9165  17.4414

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.3463  78.3816  18.7052   2.4075   0.5057  23.0319   0.0516  76.9165  17.4386
     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

NUMBER  DENSITY
 1.0987E-03  2.6418E-04  3.3801E-05  7.1619E-06  6.7337E-07  1.5215E-03
 6.4664E-06  5.1252E-03  2.6317E-05  3.9798E-06  2.1696E-05  7.9947E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.6509  78.2640  18.8181   2.4077   0.5102  22.8688   0.0972  77.0341  17.4242

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.6509  78.2789  18.8217   2.3891   0.5102  22.8688   0.0972  77.0341  17.4215
```

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*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX082)                   ***
***          FT08F001:PA351.@JUYUR.MICRO18                        ***
***          FT16F001:PA351.JUYU.FLUX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  15
PLANE =  18

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580
     1 CYCLE

***** BURN UP TIME *****   47.84 DAYS

NUMBER  DENSITY
 1.1029E-03  2.6373E-04  3.4209E-05  7.1361E-06  2.1552E-07  1.5326E-03
 4.2459E-06  5.1304E-03  1.7434E-05  2.7035E-06  1.4458E-05  5.3063E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4331  78.3327  18.7309   2.4296   0.5068  22.9872   0.0637  76.9491  17.4362

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4331  78.3477  18.7345   2.4108   0.5069  22.9872   0.0637  76.9491  17.4334
     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

NUMBER  DENSITY
 1.0954E-03  2.6438E-04  3.3816E-05  7.1789E-06  6.7200E-07  1.5136E-03
 7.9569E-06  5.1215E-03  3.2698E-05  5.0794E-06  2.7175E-05  9.9727E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8131  78.2005  18.8730   2.4140   0.5125  22.7848   0.1198  77.0954  17.4145

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8131  78.2154  18.8766   2.3954   0.5126  22.7848   0.1198  77.0954  17.4118
```


PNC N 9410 90-036

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*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX083)                   ***
***          FT08F001:PA351.@JUYON.MICRO18                        ***
***          FT16F001:PA351.JOYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
領域番号 = 15
PLANE = 21

INITIAL DENSITY
 1.1115E-03  2.6300E-04  3.4357E-05  7.0869E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.4991  18.5740   2.4264   0.5005  23.2169   0.0000  76.7831  17.4580
     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

NUMBER  DENSITY
 1.1035E-03  2.6374E-04  3.4212E-05  7.1340E-06  2.1560E-07  1.5337E-03
 4.0515E-06  5.1309E-03  1.6503E-05  2.5200E-06  1.3604E-05  5.0160E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4085  78.3409  18.7238   2.4289   0.5065  22.9990   0.0608  76.9402  17.4386

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4085  78.3559  18.7274   2.4101   0.5066  22.9990   0.0608  76.9402  17.4358
     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

NUMBER  DENSITY
 1.0964E-03  2.6438E-04  3.3822E-05  7.1750E-06  6.7746E-07  1.5157E-03
 7.5981E-06  5.1225E-03  3.0968E-05  4.7349E-06  2.5581E-05  9.4292E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7672  78.2158  18.8596   2.4127   0.5118  22.8070   0.1143  77.0787  17.4191

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7672  78.2307  18.8632   2.3941   0.5119  22.8070   0.1143  77.0787  17.4163
```

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**********************************************************************
***                      BURNUP CALCULATION                        ***
***                                                                ***
***          F105F001:PA351.BBURN.DATA(PPJX1301)                   ***
***          F108F001:PA351.BJOYOR.MICRO18                         ***
***          F116F001:PA351.JOYO.F1BX1A                            ***
**********************************************************************

NGRP = 18    NPIN = 36
集合体番号 =  1
PLANE =  19

INITIAL DENSITY
 1.1119E-03  2.6286E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01043  0.88479  2.42791  0.70058  1.76405  1.95709  0.52827  0.27221
SIGC     0.29247  0.34487  0.34038  0.29430  1.29049  0.37875  0.36424  0.19552
SIGF     1.71797  0.53992  2.08753  0.40678  0.47356  1.57834  0.16403  0.07669

NUMBER  DENSITY
 1.1020E-03  2.6360E-04  3.4013E-05  7.1736E-06  7.1413E-07  1.5298E-03
 4.7257E-06  5.1290E-03  1.9737E-05  3.1880E-06  1.6568E-05  5.9916E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4943  78.3369  18.7387   2.4180   0.5064  22.9580   0.0709  76.9711  17.4305

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4943  78.3519  18.7423   2.3993   0.5065  22.9580   0.0709  76.9711  17.4277

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01235  0.88428  2.42727  0.70013  1.76670  1.96111  0.52865  0.27253
SIGC     0.29403  0.34640  0.34148  0.29566  1.29541  0.38022  0.36550  0.19627
SIGF     1.71833  0.53787  2.08578  0.40448  0.47129  1.58089  0.16315  0.07625

NUMBER  DENSITY
 1.0933E-03  2.6423E-04  3.3622E-05  7.1705E-06  6.6717E-07  1.5083E-03
 8.8648E-06  5.1189E-03  1.7062E-05  6.0028E-06  3.1191E-05  1.1284E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.9295  78.1859  18.8968   2.4045   0.5178  22.7292   0.1336  77.1372  17.4058

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.9295  78.2008  18.9004   2.3859   0.5179  22.7292   0.1336  77.1372  17.4011

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01384  0.88408  2.43044  0.69995  1.76871  1.96404  0.52899  0.27278
SIGC     0.29517  0.34751  0.34278  0.29663  1.29889  0.38128  0.36641  0.19681
SIGF     1.71867  0.53656  2.08815  0.40331  0.46982  1.58277  0.16258  0.07597

NUMBER  DENSITY
 1.0846E-03  2.6487E-04  3.3744E-05  7.2172E-06  1.1121E-06  1.4867E-03
 1.3014E-05  5.1087E-03  5.4479E-05  8.8486E-06  4.5972E-05  1.6637E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3682  78.0319  19.0570   2.3918   0.5193  22.4978   0.1969  77.3053  17.3773

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3682  78.0430  19.0597   2.3780   0.5193  22.4978   0.1969  77.3053  17.3753

     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01572  0.88334  2.43493  0.69930  1.77134  1.96820  0.52930  0.27308
SIGC     0.29676  0.34911  0.34343  0.29804  1.30409  0.38281  0.36771  0.19761
SIGF     1.71896  0.53423  2.09151  0.40127  0.46724  1.58538  0.16159  0.07548

NUMBER  DENSITY
 1.0840E-03  2.6491E-04  3.3038E-05  7.2703E-06  1.3216E-06  1.4853E-03
 1.3300E-05  5.1079E-03  5.5677E-05  9.0386E-06  4.6991E-05  1.7005E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3983  78.0315  19.0703   2.3784   0.5198  22.4818   0.2013  77.3169  17.3736

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3983  78.0389  19.0721   2.3692   0.5198  22.4818   0.2013  77.3169  17.3722

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01583  0.88333  2.43517  0.69929  1.77149  1.96842  0.52933  0.27310
SIGC     0.29685  0.34919  0.34349  0.29811  1.30436  0.38289  0.36778  0.19765
SIGF     1.71898  0.53413  2.09169  0.40118  0.46714  1.58552  0.16155  0.07546

NUMBER  DENSITY
 1.0762E-03  2.6548E-04  3.2873E-05  7.2616E-06  1.5519E-06  1.4660E-03
 1.6994E-05  5.0986E-03  7.1211E-05  1.1586E-05  6.0243E-05  2.1806E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7906  77.8832  19.2123   2.3790   0.5255  22.2739   0.2582  77.4678  17.3520

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7906  77.9196  19.2213   2.3333   0.5258  22.2739   0.2582  77.4678  17.3453

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01744  0.88264  2.43909  0.69868  1.77375  1.97203  0.52959  0.27336
SIGC     0.29823  0.35059  0.34448  0.29933  1.30893  0.38474  0.36892  0.19834
SIGF     1.71920  0.53205  2.09460  0.39935  0.46483  1.58779  0.16066  0.07502

NUMBER  DENSITY
 1.0653E-03  2.6627E-04  3.2198E-05  7.3183E-06  2.3270E-06  1.4389E-03
 2.2166E-05  5.0855E-03  9.3011E-05  1.5192E-05  7.8952E-05  2.8546E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.3429  77.6980  19.4200   2.3483   0.5337  21.9801   0.3386  77.6814  17.3171

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.3429  77.7052  19.4218   2.3392   0.5338  21.9801   0.3386  77.6814  17.3158

     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01804  0.88253  2.44044  0.69859  1.77463  1.97328  0.52973  0.27348
SIGC     0.29871  0.35106  0.34482  0.29976  1.31044  0.38469  0.36931  0.19858
SIGF     1.71935  0.53146  2.09562  0.39883  0.46419  1.58859  0.16042  0.07490
```

NUMBER DENSITY
1.0543E-03 2.6706E-04 3.7046E-05 7.3760E-06 2.5845E-06 1.4115E-03
2.7386E-05 5.0719E-03 1.1513E-04 1.8898E-05 9.8099E-05 3.5494E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9061	77.4777	19.6253	2.3550	0.5420	21.6797	0.4206	77.8997	17.2874

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9061	77.4849	19.6272	2.3458	0.5421	21.6797	0.4206	77.8997	17.2860

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02028	0.88197	2.44548	0.69809	1.77769	1.97794	0.53018	0.27385
SIGC	0.30052	0.35284	0.34610	0.30132	1.31611	0.38639	0.37076	0.19945
SIGF	1.71977	0.52913	2.09938	0.39677	0.46159	1.59155	0.15942	0.07440

NUMBER DENSITY
1.0438E-03 2.6781E-04 3.1904E-05 7.4317E-06 2.8345E-06 1.3853E-03
3.2339E-05 5.0587E-03 1.3627E-04 2.2470E-05 1.1654E-04 4.2241E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4466	77.2644	19.8239	2.3616	0.5501	21.3901	0.4996	78.1103	17.2592

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4466	77.3073	19.8349	2.3073	0.5504	21.3901	0.4996	78.1103	17.2513

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02061	0.88198	2.44611	0.69810	1.77810	1.97852	0.53026	0.27390
SIGC	0.30075	0.35305	0.34626	0.30151	1.31676	0.38659	0.37094	0.19955
SIGF	1.71986	0.52892	2.09986	0.39659	0.46135	1.59192	0.15932	0.07435

NUMBER DENSITY
1.0312E-03 2.6467E-04 3.1165E-05 7.4959E-06 3.7114E-06 1.3541E-03
3.8245E-05 5.0427E-03 1.6146E-04 2.6791E-05 1.3873E-04 5.0309E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0941	77.0405	20.0713	2.3282	0.5600	21.0423	0.5943	78.3634	17.2195

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0941	77.0476	20.0732	2.3192	0.5600	21.0423	0.5943	78.3634	17.2182

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02271	0.88152	2.45076	0.69769	1.78098	1.98781	0.53070	0.27425
SIGC	0.30242	0.35469	0.34743	0.30295	1.32196	0.38815	0.37228	0.20035
SIGF	1.72029	0.52683	2.10333	0.39474	0.45902	1.59466	0.15842	0.07391

NUMBER DENSITY
1.0702E-03 2.6947E-04 3.1059E-05 7.5534E-06 3.9454E-06 1.3265E-03
4.3420E-05 5.0283E-03 1.8371E-04 3.0652E-05 1.5851E-04 5.7577E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6691	76.8084	20.2845	2.3584	0.5687	20.7323	0.6786	78.5891	17.1906

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6691	76.8297	20.2901	2.3114	0.5688	20.7323	0.6786	78.5891	17.1866

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02345	0.88137	2.45243	0.69756	1.78204	1.98435	0.53088	0.27439
SIGC	0.30301	0.35528	0.34785	0.30346	1.32382	0.38871	0.37276	0.20063
SIGF	1.72044	0.52609	2.10458	0.39410	0.45822	1.59564	0.15812	0.07376

NUMBER DENSITY
1.0101E-03 2.7009E-04 3.0720E-05 7.6053E-06 4.4070E-06 1.3014E-03
4.8109E-05 5.0150E-03 2.0398E-04 3.4215E-05 1.7670E-04 6.4282E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.1960	76.6087	20.4846	2.3299	0.5768	20.4474	0.7559	78.7967	17.1614

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.1960	76.6158	20.4865	2.3209	0.5769	20.4474	0.7559	78.7967	17.1601

PNC N 9410 90-036

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*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX11D1)                  ***
***          FT08F001:PA351.@JOYOR.MICR018                        ***
***          FT16F001:PA351.JOYO.FLUX1A                           ***
*********************************************************************

NGRP = 18    NPIN = 36
集合体番号 =  2
PLANE =  19

INITIAL DENSITY
 1.1119E-03  2.6286E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01435  0.88545  2.43077  0.70111  1.76940  1.96393  0.52950  0.27297
SIGC     0.29516  0.34743  0.34221  0.29656  1.29799  0.38113  0.36632  0.19670
SIGF     1.71920  0.53802  2.08807  0.40455  0.47142  1.58280  0.16318  0.07627

NUMBER  DENSITY
 1.1074E-03  2.6359E-04  3.4014E-05  7.1218E-06  2.1419E-07  1.5308E-03
 4.5556E-06  5.1295E-03  1.8959E-05  3.0339E-06  1.5875E-05  5.7514E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4740  78.3441  18.7325   2.4173   0.5061  22.9680   0.0684  76.9637  17.4321

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4740  78.3591  18.7361   2.3986   0.5062  22.9680   0.0684  76.9637  17.4293

     2 CYCLE

***** BURN UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01590  0.88489  2.43388  0.70061  1.77147  1.96725  0.52975  0.27320
SIGC     0.29644  0.34870  0.34313  0.29767  1.30212  0.38235  0.36736  0.19733
SIGF     1.71946  0.53619  2.09075  0.40294  0.46936  1.58490  0.16238  0.07587

NUMBER  DENSITY
 1.0940E-03  2.6427E-04  3.3627E-05  7.1673E-06  6.6743E-07  1.5100E-03
 8.5695E-06  5.1197E-03  3.5702E-05  5.7317E-06  2.9971E-05  1.0859E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8938  78.1986  18.8858   2.4032   0.5123  22.7467   0.1291  77.1242  17.4067

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8938  78.2135  18.8894   2.3847   0.5124  22.7467   0.1291  77.1242  17.4039

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01742  0.88470  2.43711  0.70044  1.77354  1.97074  0.53010  0.27346
SIGC     0.29761  0.34983  0.34395  0.29867  1.30565  0.38343  0.36829  0.19788
SIGF     1.71981  0.53486  2.09317  0.40177  0.46788  1.58681  0.16181  0.07558

NUMBER  DENSITY
 1.0856E-03  2.6485E-04  3.3244E-05  7.2126E-06  1.1178E-06  1.4891E-03
 1.2596E-05  5.1098E-03  5.2540E-05  8.4610E-06  4.4222E-05  1.6025E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3172  78.0502  19.0413   2.3900   0.5185  22.5229   0.1905  77.2866  17.3814

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3172  78.0612  19.0440   2.3762   0.5186  22.5229   0.1905  77.2866  17.3796

     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01862  0.88439  2.43997  0.70019  1.77542  1.97289  0.53041  0.27372
SIGC     0.29860  0.35085  0.34465  0.29957  1.30892  0.38440  0.36911  0.19839
SIGF     1.72001  0.53355  2.09531  0.40062  0.46649  1.58849  0.16130  0.07533

NUMBER  DENSITY
 1.0850E-03  2.6489E-04  3.3038E-05  7.2157E-06  1.3224E-06  1.4877E-03
 1.2872E-05  5.1091E-03  5.3695E-05  8.6437E-06  4.5203E-05  1.6379E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3462  78.0501  19.0544   2.3765   0.5190  22.5076   0.1947  77.2977  17.3778

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3462  78.0574  19.0561   2.3673   0.5191  22.5076   0.1947  77.2977  17.3764

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01872  0.88438  2.44020  0.70018  1.77556  1.97310  0.53044  0.27374
SIGC     0.29869  0.35093  0.34471  0.29964  1.30918  0.38448  0.36918  0.19843
SIGF     1.72004  0.53345  2.09549  0.40054  0.46639  1.58863  0.16126  0.07531

NUMBER  DENSITY
 1.0776E-03  2.6545E-04  3.2871E-05  7.2556E-06  1.5534E-06  1.4691E-03
 1.6442E-05  5.1002E-03  6.8663E-05  1.1090E-05  5.7944E-05  2.0995E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7237  77.9075  19.1914   2.3765   0.5246  22.3073   0.2497  77.4430  17.3571

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7237  77.9439  19.2003   2.3309   0.5248  22.3073   0.2497  77.4430  17.3504

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02041  0.88351  2.44436  0.69940  1.77783  1.97694  0.53063  0.27397
SIGC     0.30016  0.35241  0.34578  0.30094  1.31409  0.38591  0.37040  0.19917
SIGF     1.72025  0.53110  2.09858  0.39846  0.46375  1.59103  0.16024  0.07480

NUMBER  DENSITY
 1.0671E-03  2.6623E-04  3.2194E-05  7.3104E-06  2.3298E-06  1.4430E-03
 2.1451E-05  5.0875E-03  8.9716E-05  1.4544E-05  7.5964E-05  2.7485E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2561  77.7300  19.3925   2.3450   0.5325  22.0237   0.3274  77.6489  17.3238

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2561  77.7372  19.3943   2.3359   0.5325  22.0237   0.3274  77.6489  17.3224
```

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*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FIO5F001:PA351.@BURN.DATA(PPJX12B1)                  ***
***          FIOAF001:PA351.@JOYOR.MICRO18                        ***
***          FI16F001:PA351.JOYO.FLUX1A                           ***
*********************************************************************

NGRP = 18    NPLN = 36
ZONE = 4
PLANE = 16

INITIAL DENSITY
 1.1119E-03  2.6786E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.81 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01550  0.88487  2.43335  0.70063  1.77139  1.96679  0.52977  0.27323
SIGC     0.29618  0.34854  0.34297  0.29753  1.30170  0.38221  0.36722  0.19727
SIGF     1.71931  0.53632  2.09039  0.40310  0.46969  1.58458  0.16255  0.07596

NUMBER  DENSITY
 1.1035E-03  2.6351E-04  3.4007E-05  7.1157E-06  2.1433E-07  1.5336E-03
 4.0204E-06  5.1308E-03  1.6701E-05  7.6595E-06  1.3960E-05  5.0605E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4171  78.3668  18.7179   2.4150   0.5053  22.9978   0.0603  76.9420  17.4353

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4171  78.3818  18.7165   2.3963   0.5054  22.9978   0.0603  76.9420  17.4326

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01730  0.88450  2.43736  0.70030  1.77390  1.97050  0.53017  0.27355
SIGC     0.29762  0.34995  0.34397  0.29877  1.30618  0.38356  0.36838  0.19796
SIGF     1.71968  0.53455  2.09339  0.40153  0.46772  1.58694  0.16179  0.07559

NUMBER  DENSITY
 1.0962E-03  2.6407E-04  3.3608E-05  7.1556E-06  6.6835E-07  1.5154E-03
 7.5444E-06  5.1222E-03  3.1363E-05  5.0063E-06  2.6271E-05  9.5198E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7841  78.7426  18.8479   2.3987   0.5107  22.8042   0.1135  77.0823  17.4128

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7841  78.2574  18.8515   2.3802   0.5108  22.8042   0.1135  77.0823  17.4101

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01860  0.88438  2.44010  0.70019  1.77568  1.97303  0.53049  0.27377
SIGC     0.29861  0.35091  0.34466  0.29961  1.30916  0.38446  0.36916  0.19842
SIGF     1.71999  0.53346  2.09544  0.40058  0.46652  1.58857  0.16133  0.07535

NUMBER  DENSITY
 1.0889E-03  2.6464E-04  3.3221E-05  7.1953E-06  1.1151E-06  1.4970E-03
 1.1087E-05  5.1136E-03  4.6134E-05  7.3858E-06  3.8734E-05  1.4028E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1548  78.1158  18.9848   2.3832   0.5162  22.6080   0.1674  77.2245  17.3903

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1548  78.1268  18.9875   2.3694   0.5163  22.6080   0.1674  77.2245  17.3882

     4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02023  0.88353  2.44415  0.69944  1.77790  1.97677  0.53068  0.27400
SIGC     0.30004  0.35236  0.34570  0.30088  1.31394  0.38586  0.37034  0.19914
SIGF     1.72019  0.53117  2.09845  0.39856  0.46396  1.59090  0.16034  0.07486

NUMBER  DENSITY
 1.0884E-03  2.6468E-04  3.3014E-05  7.1980E-06  1.3247E-06  1.4958E-03
 1.1331E-05  5.1129E-03  4.7156E-05  7.5467E-06  3.9598E-05  1.4340E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1804  78.1169  18.9969   2.3696   0.5166  22.5945   0.1712  77.2344  17.3869

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1804  78.1242  18.9986   2.3604   0.5167  22.5945   0.1712  77.2344  17.3855

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02032  0.88352  2.44436  0.69943  1.77803  1.97695  0.53071  0.27402
SIGC     0.30011  0.35243  0.34575  0.30094  1.31417  0.38593  0.37040  0.19918
SIGF     1.72021  0.53109  2.09860  0.39849  0.46387  1.59102  0.16030  0.07485

NUMBER  DENSITY
 1.0818E-03  2.6518E-04  3.2839E-05  7.2334E-06  1.5575E-06  1.4793E-03
 1.4507E-05  5.1051E-03  6.0419E-05  9.6808E-06  5.0836E-05  1.8400E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5138  77.9924  19.1186   2.3676   0.5215  22.4173   0.2198  77.3628  17.3686

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5138  78.0287  19.1275   2.3721   0.5217  22.4173   0.2198  77.3628  17.3619

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02184  0.88291  2.44801  0.69889  1.78017  1.98033  0.53096  0.27427
SIGC     0.30140  0.35373  0.34668  0.30208  1.31841  0.38718  0.37146  0.19982
SIGF     1.72044  0.52918  2.10132  0.39681  0.46176  1.59315  0.15949  0.07445

NUMBER  DENSITY
 1.0725E-03  2.6590E-04  3.2147E-05  7.2818E-06  2.3373E-06  1.4561E-03
 1.8964E-05  5.0939E-03  7.9070E-05  1.2701E-05  6.6717E-05  2.4057E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.9839  77.8408  19.2976   2.3331   0.5285  22.1667   0.2887  77.5446  17.3385

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.9839  77.8480  19.2994   2.3241   0.5285  22.1667   0.2887  77.5446  17.3372

     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02258  0.88252  2.44980  0.69854  1.78111  1.98197  0.53103  0.27436
SIGC     0.30204  0.35436  0.34715  0.30253  1.32052  0.38779  0.37199  0.20014
SIGF     1.72054  0.52816  2.10265  0.39591  0.46060  1.59418  0.15904  0.07422
```

NUMBER DENSITY
1.0631E-03 2.6661E-04 3.1978E-05 7.3514E-06 2.6006E-06 1.4324E-03
2.3504E-05 5.0823E-03 9.8145E-05 1.5874E-05 8.3077E-05 2.9996E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.4667	77.6538	19.4748	2.3358	0.5355	21.9088	0.3595	77.7317	17.3135

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.4667	77.6610	19.4766	2.3268	0.5356	21.9088	0.3595	77.7317	17.3122

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02487	0.88207	2.45488	0.69814	1.78429	1.98667	0.53154	0.27476
SIGC	0.30386	0.35615	0.34843	0.30421	1.32618	0.38950	0.37345	0.20101
SIGF	1.72101	0.52592	2.10645	0.39393	0.45812	1.59718	0.15809	0.07375

NUMBER DENSITY
1.0541E-03 2.6730E-04 3.1817E-05 7.3790E-06 2.8568E-06 1.4098E-03
2.7876E-05 5.0711E-03 1.1635E-04 1.8816E-05 9.8785E-05 3.5697E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9788	77.4734	19.6458	2.3385	0.5423	21.6606	0.4275	77.9118	17.2897

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9788	77.5160	19.6566	2.2847	0.5426	21.6606	0.4275	77.9118	17.2819

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.07506	0.88214	2.45518	0.69820	1.78453	1.98695	0.53160	0.27479
SIGC	0.30398	0.35625	0.34850	0.30479	1.32645	0.38959	0.37353	0.20105
SIGF	1.72109	0.52589	2.10668	0.39391	0.45808	1.59736	0.15807	0.07374

NUMBER DENSITY
1.0433E-03 2.6810E-04 3.1053E-05 7.4340E-06 3.7419E-06 1.3828E-03
3.2966E-05 5.0575E-03 1.3811E-04 2.2445E-05 1.1773E-04 4.2512E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4840	77.2885	19.8604	2.3004	0.5507	21.3620	0.5093	78.1288	17.2552

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4840	77.2955	19.8622	2.2915	0.5508	21.3620	0.5093	78.1288	17.2540

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02733	0.88155	2.46078	0.69767	1.78760	1.99165	0.53204	0.27515
SIGC	0.30580	0.35805	0.34979	0.30587	1.33219	0.39131	0.37500	0.20193
SIGF	1.72153	0.52350	2.11048	0.39180	0.45541	1.60035	0.15704	0.07322

NUMBER DENSITY
1.0338E-03 2.6881E-04 3.0924E-05 7.4834E-06 3.9849E-06 1.3588E-03
3.7521E-05 5.0453E-03 1.5746E-04 2.5697E-05 1.3469E-04 4.8666E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.9795	77.0905	20.0453	2.3061	0.5581	21.0942	0.5825	78.3233	17.2306

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.9795	77.1116	20.0508	2.2794	0.5582	21.0942	0.5825	78.3233	17.2267

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02870	0.88127	2.46332	0.69742	1.78951	1.99447	0.53234	0.27539
SIGC	0.30689	0.35912	0.35056	0.30681	1.33559	0.39233	0.37587	0.20245
SIGF	1.72182	0.52215	2.11276	0.39060	0.45392	1.60214	0.15647	0.07294

NUMBER DENSITY
1.0251E-03 2.6944E-04 3.0563E-05 7.5280E-06 4.4549E-06 1.3369E-03
4.1651E-05 5.0339E-03 1.7508E-04 2.8682E-05 1.5024E-04 5.4316E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.4325	76.9227	20.2189	2.2935	0.5649	20.8489	0.6495	78.5016	17.2059

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.4325	76.9297	20.2207	2.2846	0.5650	20.8489	0.6495	78.5016	17.2046

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.BBURN.DATA(PPJX1202)                  ***
***          FT08F001:PA351.BJUYOR.MICRO18                        ***
***          FT16F001:PA351.JUYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体数 =  4
PLANE =  19

INITIAL DENSITY
 1.1119E-03  2.6286E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000   18.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.01491  0.88564  2.43125  0.70128  1.77020  1.96484  0.52973  0.27310
SIGC      0.29551  0.34776  0.34244  0.29685  1.29892  0.38143  0.36659  0.19685
SIGF      1.71940  0.53788  2.08881  0.40442  0.47128  1.58341  0.16314  0.07625

NUMBER  DENSITY
 1.1024E-03  2.6359E-04  3.4014E-05  7.1719E-06  2.1418E-07  1.5307E-03
 4.5644E-06  5.1295E-03  1.8987E-05  3.0412E-06  1.5895E-05  5.7599E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4747  78.3437  18.7328   2.4173   0.5061  22.9675   0.0685  76.9640  17.4321

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4747  78.3586  18.7364   2.3987   0.5062  22.9675   0.0685  76.9640  17.4293

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.01688  0.88521  2.43564  0.70090  1.77293  1.96890  0.53015  0.27344
SIGC      0.29708  0.34931  0.34355  0.29872  1.30384  0.38291  0.36785  0.19761
SIGF      1.71980  0.53590  2.09710  0.40268  0.46909  1.58599  0.16229  0.07583

NUMBER  DENSITY
 1.0941E-03  2.6422E-04  3.3623E-05  7.1672E-06  6.6748E-07  1.5101E-03
 8.5567E-06  5.1198E-03  3.5676E-05  5.7171E-06  2.9895E-05  1.0836E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8917  78.1991  18.8854   2.4032   0.5123  22.7478   0.1789  77.1234  17.4070

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU 241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8917  78.2140  18.8890   2.3847   0.5124  22.7478   0.1789  77.1234  17.4043

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.01836  0.88504  2.43878  0.70074  1.77494  1.97180  0.53050  0.27369
SIGC      0.29822  0.35041  0.34434  0.29918  1.30727  0.38595  0.36875  0.19814
SIGF      1.72014  0.53463  2.09444  0.40156  0.46767  1.58785  0.16175  0.07555

NUMBER  DENSITY
 1.0857E-03  2.6486E-04  3.3745E-05  7.2173E-06  1.1130E-06  1.4893E-03
 1.2563E-05  5.1099E-03  5.2363E-05  8.4244E-06  4.4054E-05  1.5969E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3174  78.0515  19.0401   2.3899   0.5185  22.5251   0.1900  77.2848  17.3819

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3124  78.0626  19.0428   2.3761   0.5186  22.5251   0.1900  77.2848  17.3798

     4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.02019  0.88415  2.44325  0.69995  1.77741  1.97592  0.53073  0.27395
SIGC      0.29980  0.35200  0.34549  0.30057  1.31251  0.38549  0.37005  0.19893
SIGF      1.72039  0.53215  2.09777  0.39938  0.46490  1.59043  0.16067  0.07502

NUMBER  DENSITY
 1.0851E-03  2.6490E-04  3.3040E-05  7.2153E-06  1.3225E-06  1.4879E-03
 1.2838E-05  5.1092E-03  5.3518E-05  8.6071E-06  4.5033E-05  1.6324E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3414  78.0514  19.0532   2.3765   0.5190  22.5098   0.1942  77.2960  17.3782

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3414  78.0587  19.0549   2.3673   0.5190  22.5098   0.1942  77.2960  17.3768

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.02029  0.88414  2.44349  0.69994  1.77756  1.97613  0.53076  0.27397
SIGC      0.29989  0.35208  0.34555  0.30065  1.31277  0.38557  0.37012  0.19897
SIGF      1.72041  0.53206  2.09794  0.39930  0.46480  1.59057  0.16063  0.07500

NUMBER  DENSITY
 1.0777E-03  2.6546E-04  3.2874E-05  7.2554E-06  1.5535E-06  1.4693E-03
 1.6419E-05  5.1003E-03  6.8511E-05  1.1039E-05  5.7780E-05  2.0947E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7191  77.9082  19.1907   2.3765   0.5245  22.3091   0.2493  77.4415  17.3577

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7191  77.9446  19.1997   2.3309   0.5248  22.3091   0.2493  77.4415  17.3510

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.02190  0.88349  2.44735  0.69937  1.77982  1.97970  0.53102  0.27424
SIGC      0.30125  0.35345  0.34653  0.30185  1.31725  0.38689  0.37124  0.19966
SIGF      1.72065  0.53004  2.10082  0.39752  0.46257  1.59282  0.15978  0.07458

NUMBER  DENSITY
 1.0672E-03  2.6625E-04  3.2198E-05  7.3104E-06  2.3300E-06  1.4431E-03
 2.1436E-05  5.0876E-03  8.9564E-05  1.4478E-05  7.5780E-05  2.7435E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2511  77.7305  19.3920   2.3450   0.5324  22.0254   0.3272  77.6474  17.3247

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2511  77.7377  19.3938   2.3359   0.5325  22.0254   0.3272  77.6474  17.3234

     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.02272  0.88308  2.44932  0.69900  1.78085  1.98151  0.53111  0.27433
SIGC      0.30195  0.35415  0.34704  0.30246  1.31955  0.38756  0.37182  0.20000
SIGF      1.72076  0.52893  2.10228  0.39654  0.46131  1.59395  0.15929  0.07433
```

NUMBER DENSITY
1.0566E-03 2.6705E-04 3.7045E-05 7.3668E-06 2.5888E-06 1.4165E-03
2.6532E-05 5.0744E-03 1.1105E-04 1.8035E-05 9.4302E-05 3.4158E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.7966	77.5164	19.5921	2.3510	0.5405	21.7336	0.4071	77.8593	17.2966

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.7966	77.5236	19.5939	2.3419	0.5405	21.7336	0.4071	77.8593	17.2952

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02525	0.88257	2.45492	0.69854	1.78435	1.98668	0.53165	0.27477
SIGC	0.30396	0.35612	0.34845	0.30419	1.32580	0.38944	0.37343	0.20096
SIGF	1.72129	0.52645	2.10647	0.39435	0.45855	1.59724	0.15823	0.07381

NUMBER DENSITY
1.0465E-03 2.6781E-04 3.1907E-05 7.4210E-06 2.8404E-06 1.3911E-03
3.1376E-05 5.0617E-03 1.3151E-04 2.1433E-05 1.1206E-04 4.0657E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.3178	77.3102	19.7848	2.3568	0.5482	21.4534	0.4838	78.0628	17.2702

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.3178	77.3531	19.7957	2.3026	0.5485	21.4534	0.4838	78.0628	17.2623

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02550	0.88264	2.45534	0.69860	1.78466	1.98708	0.53174	0.27481
SIGC	0.30412	0.35627	0.34856	0.30432	1.32670	0.38957	0.37354	0.20102
SIGF	1.72138	0.52637	2.10679	0.39428	0.45846	1.59751	0.15819	0.07379

NUMBER DENSITY
1.0344E-03 7.6868E-04 3.1161E-05 7.4836E-06 3.7197E-06 1.3608E-03
3.7103E-05 5.0463E-03 1.5590E-04 2.5554E-05 1.3344E-04 4.8429E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.9428	77.0944	20.0254	2.3225	0.5578	21.1167	0.5758	78.3075	17.2325

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.9428	77.1015	20.0272	2.3135	0.5578	21.1167	0.5758	78.3075	17.2312

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02804	0.88199	2.46101	0.69801	1.78807	1.99231	0.53222	0.27521
SIGC	0.30616	0.35826	0.35000	0.30607	1.33258	0.39148	0.37518	0.20200
SIGF	1.72188	0.52372	2.11102	0.39194	0.45550	1.60083	0.15705	0.07321

NUMBER DENSITY
1.0237E-03 7.6946E-04 3.1055E-05 7.5397E-06 3.9558E-06 1.3340E-03
4.2166E-05 5.0324E-03 1.7752E-04 2.9238E-05 1.5256E-04 5.5448E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.4994	76.8687	20.2353	2.3519	0.5662	20.8155	0.6580	78.5265	17.2054

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.4994	76.8899	20.2389	2.3049	0.5663	20.8155	0.6580	78.5265	17.2014

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02956	0.88169	2.46437	0.69774	1.79018	1.99541	0.53256	0.27548
SIGC	0.30736	0.35944	0.35084	0.30710	1.33632	0.39260	0.37614	0.20257
SIGF	1.72220	0.52224	2.11353	0.39064	0.45386	1.60281	0.15642	0.07290

NUMBER DENSITY
1.0140E-03 2.7015E-04 3.0715E-05 7.5904E-06 4.4200E-06 1.3096E-03
4.6743E-05 5.0196E-03 1.9716E-04 3.2617E-05 1.7007E-04 6.1896E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.0073	76.6758	20.4277	2.3226	0.5740	20.5399	0.7331	78.7270	17.1783

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.0073	76.6828	20.4296	2.3136	0.5740	20.5399	0.7331	78.7270	17.1770

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX12B3)                  ***
***          FT08F001:PA351.@JOYOR.MICRO18                        ***
***          FT16F001:PA351.JOYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NPIN = 36
集合体番号 =  4
PLANE =  22

INITIAL DENSITY
 1.8119E-03  2.6786E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     7.03496  0.89030  2.46883  0.70532  1.79949  1.99975  0.53716  0.27770
SIGC     0.30912  0.36084  0.35150  0.30839  1.33668  0.39344  0.37710  0.20287
SIGF     1.72584  0.52946  2.11733  0.39692  0.46280  1.60631  0.16006  0.07484

NUMBER  DENSITY
 1.1038E-03  2.6358E-04  3.4918E-05  7.1161E-06  2.1439E-07  1.5338E-03
 4.0186E-06  5.1309E-03  1.6435E-05  2.5420E-06  1.3589E-05  4.9711E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4077  78.3669  18.7127   2.4152   0.5052  23.0003   0.0603  76.9394  17.4381

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4077  78.3818  18.7163   2.3965   0.5053  23.0003   0.0603  76.9394  17.4354

     2 CYCLE

***** BURN UP TIME *****   43.00 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03692  0.89001  2.47308  0.70506  1.80221  2.00368  0.53762  0.27805
SIGC     0.31065  0.36253  0.35257  0.30971  1.34137  0.39486  0.37832  0.20359
SIGF     1.72627  0.52767  2.12051  0.39535  0.46084  1.60882  0.15930  0.07446

NUMBER  DENSITY
 1.0968E-03  2.6420E-04  3.3630E-05  7.1564E-06  6.6867E-07  1.5159E-03
 7.5438E-06  5.1225E-03  3.0873E-05  4.7862E-06  2.5581E-05  9.3548E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7666  78.2478  18.8476   2.3991   0.5105  22.8089   0.1135  77.0776  17.4181

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7666  78.2576  18.8512   2.3806   0.5106  22.8089   0.1135  77.0776  17.4154

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03834  0.88994  2.47599  0.70499  1.80413  2.00638  0.53798  0.27830
SIGC     0.31170  0.36335  0.35539  0.31060  1.34450  0.39587  0.37915  0.20407
SIGF     1.72663  0.52659  2.12270  0.39439  0.45963  1.61056  0.15884  0.07423

NUMBER  DENSITY
 1.0897E-03  2.6482E-04  3.3752E-05  7.1965E-06  1.1159E-06  1.4977E-03
 1.1089E-05  5.1139E-03  4.5430E-05  7.0634E-06  3.7730E-05  1.3790E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1294  78.1158  18.9845   2.3838   0.5159  22.6150   0.1674  77.2176  17.3983

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1294  78.1268  18.9872   2.3700   0.5160  22.6150   0.1674  77.2176  17.3962

     4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04019  0.88919  2.48040  0.70432  1.80665  2.01044  0.53827  0.27858
SIGC     0.31327  0.36491  0.35442  0.31197  1.34960  0.39732  0.38043  0.20485
SIGF     1.72692  0.52428  2.12598  0.39235  0.45705  1.61312  0.15784  0.07374

NUMBER  DENSITY
 1.0892E-03  2.6486E-04  3.3047E-05  7.1993E-06  1.3757E-06  1.4965E-03
 1.1332E-05  5.1133E-03  4.6438E-05  7.2170E-06  3.8571E-05  1.4096E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1545  78.1171  18.9963   2.3762   0.5163  22.6016   0.1712  77.2272  17.3950

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1545  78.1245  18.9981   2.3610   0.5164  22.6016   0.1712  77.2272  17.3937

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04030  0.88919  2.48061  0.70432  1.80679  2.01064  0.53830  0.27860
SIGC     0.31335  0.36499  0.35448  0.31204  1.34983  0.39740  0.38049  0.20488
SIGF     1.72694  0.52420  2.12614  0.39228  0.45696  1.61325  0.15781  0.07372

NUMBER  DENSITY
 1.0828E-03  2.6542E-04  3.2881E-05  7.2350E-06  1.5589E-06  1.4807E-03
 1.4512E-05  5.1055E-03  5.9509E-05  9.2636E-06  4.9527E-05  1.8091E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.4809  77.9925  19.1180   2.3683   0.5211  22.4264   0.2199  77.3537  17.3791

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.4809  78.0288  19.1269   2.3229   0.5214  22.4264   0.2199  77.3537  17.3725

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04198  0.88865  2.48454  0.70385  1.80916  2.01427  0.53862  0.27889
SIGC     0.31474  0.36638  0.35547  0.31326  1.35433  0.39873  0.38163  0.20557
SIGF     1.72724  0.52227  2.12908  0.39058  0.45484  1.61554  0.15699  0.07332

NUMBER  DENSITY
 1.0739E-03  2.6622E-04  3.2701E-05  7.2841E-06  2.3407E-06  1.4573E-03
 1.8980E-05  5.0944E-03  7.7914E-05  1.2160E-05  6.5032E-05  2.3704E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.9417  77.8406  19.2972   2.3341   0.5280  22.1783   0.2889  77.5328  17.3525

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.9417  77.8478  19.2990   2.3251   0.5280  22.1783   0.2889  77.5328  17.3512

     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04279  0.88831  2.48644  0.70353  1.81020  2.01602  0.53875  0.27899
SIGC     0.31542  0.36705  0.35596  0.31384  1.35657  0.39938  0.38218  0.20590
SIGF     1.72737  0.52126  2.13048  0.38969  0.45368  1.61664  0.15655  0.07309
```

1.0647E-03 2.6702E-04 3.2046E-05 7.3346E-06 2.6044E-06 1.4338E-03
2.3534E-05 5.0830E-03 9.6750E-05 1.5152E-05 8.1014E-05 2.9520E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.4152	77.6531	19.4748	2.3372	0.5349	21.9226	0.3598	77.7176	17.3307

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.4152	77.6603	19.4766	2.3281	0.5350	21.9226	0.3598	77.7176	17.3294

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04530	0.88796	2.49185	0.70371	1.81366	2.02101	0.53939	0.27944
SIGC	0.31736	0.36895	0.35732	0.31551	1.36247	0.40118	0.38372	0.20682
SIGF	1.72794	0.51901	2.13453	0.38770	0.45120	1.61984	0.15559	0.07262

NUMBER DENSITY
1.0560E-03 2.6779E-04 3.1897E-05 7.3830E-06 2.8615E-06 1.4114E-03
2.7874E-05 5.0719E-03 1.1474E-04 1.8021E-05 9.6371E-05 3.5146E-06

BURNUP	PU 239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.8687	77.4721	19.6461	2.3401	0.5417	21.6766	0.4281	77.8953	17.3103

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.8687	77.5148	19.6569	2.2863	0.5420	21.6766	0.4281	77.8953	17.3024

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04557	0.88805	2.49229	0.70378	1.81400	2.02142	0.53941	0.27949
SIGC	0.31753	0.36910	0.35742	0.31564	1.36287	0.40131	0.38385	0.20688
SIGF	1.72804	0.51895	2.13486	0.38764	0.45112	1.62011	0.15556	0.07261

NUMBER DENSITY
1.0456E-03 2.6869E-04 3.1148E-05 7.4591E-06 3.7497E-06 1.3846E-03
3.3034E-05 5.0585E-03 1.3624E-04 2.1499E-05 1.1489E-04 4.1872E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4135	77.2866	19.8611	2.3025	0.5459	21.3805	0.5101	78.1094	17.2797

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU 240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4135	77.2936	19.8629	2.2935	0.5499	21.3805	0.5101	78.1094	17.2784

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04806	0.88756	2.49771	0.70284	1.81754	2.02642	0.53993	0.27989
SIGC	0.31948	0.37101	0.35879	0.31731	1.36889	0.40313	0.38540	0.20780
SIGF	1.72857	0.51656	2.13891	0.38553	0.44846	1.62330	0.15453	0.07209

NUMBER DENSITY
1.0363E-03 2.6948E-04 3.1033E-05 7.4895E-06 3.9941E-06 1.3608E-03
3.7609E-05 5.0463E-03 1.5537E-04 2.4614E-05 1.3148E-04 4.7949E-06

BURNUP	PU 239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.8999	77.0879	20.0464	2.3085	0.5571	21.1151	0.5836	78.3013	17.2587

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.8999	77.1089	20.0519	2.2818	0.5573	21.1151	0.5836	78.3013	17.2548

11 CYCLE

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04961	0.88736	2.50105	0.70265	1.81951	2.02952	0.54030	0.28017
SIGC	0.32068	0.37218	0.35963	0.31834	1.37257	0.40424	0.38636	0.20837
SIGF	1.72893	0.51517	2.14142	0.38431	0.44693	1.62529	0.15395	0.07180

NUMBER DENSITY
1.0278E-03 2.7020E-04 3.0684E-05 7.5350E-06 4.4666E-06 1.3391E-03
4.1759E-05 5.0351E-03 1.7278E-04 2.7477E-05 1.4671E-04 5.3531E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.3448	76.9193	20.2205	2.2963	0.5639	20.8717	0.6509	78.4774	17.2372

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.3448	76.9263	20.2224	2.2874	0.5639	20.8717	0.6509	78.4774	17.2359

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*********************************************************************
***                        BURNUP CALCULATION                     ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX0681)                  ***
***          FT08F001:PA351.@JOYOR.MICRO18                        ***
***          FT16F001:PA351.JOYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NPIN = 36
集合体番号 =  5
PLANE =  16

INITIAL DENSITY
 1.1119E-03  2.6786E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01310  0.88471  2.42896  0.70005  1.76794  1.96271  0.52887  0.27268
SIGC     0.29458  0.34703  0.34191  0.29617  1.29737  0.38082  0.36601  0.19657
SIGF     1.71852  0.53718  2.08706  0.40388  0.47056  1.58189  0.16286  0.07611

NUMBER  DENSITY
 1.1036E-03  2.6350E-04  3.4005E-05  7.1153E-06  2.1434E-07  1.5337E-03
 3.9853E-06  5.1308E-03  1.6583E-05  2.6522E-06  1.3881E-05  5.0260E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4145  78.3682  18.7118   2.4148   0.5053  22.9994   0.0598  76.9409  17.4351

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4145  78.3831  18.7153   2.3961   0.5054  22.9994   0.0598  76.9409  17.4323

     2 CYCLE

***** BURN UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01498  0.88380  2.43316  0.69969  1.77056  1.96660  0.52928  0.27300
SIGC     0.29608  0.34851  0.34297  0.29748  1.30208  0.38223  0.36722  0.19730
SIGF     1.71890  0.53529  2.09020  0.40221  0.46847  1.58436  0.16206  0.07571

NUMBER  DENSITY
 1.0963E-03  2.6405E-04  3.3604E-05  7.1547E-06  6.6837E-07  1.5157E-03
 7.4731E-06  5.1223E-03  3.1124E-05  4.9844E-06  2.6106E-05  9.4492E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7787  78.2454  18.8455   2.3984   0.5104  22.8076   0.1125  77.0800  17.4125

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7787  78.2603  18.8491   2.3799   0.5107  22.8076   0.1125  77.0800  17.4097

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01608  0.88374  2.43546  0.69963  1.77208  1.96872  0.52957  0.27320
SIGC     0.29691  0.34932  0.34354  0.29819  1.30456  0.38299  0.36787  0.19768
SIGF     1.71917  0.53443  2.09192  0.40145  0.46752  1.58572  0.16169  0.07552

NUMBER  DENSITY
 1.0890E-03  2.6460E-04  3.3215E-05  7.1940E-06  1.1152E-06  1.4975E-03
 1.0981E-05  5.1138E-03  4.5781E-05  7.3493E-06  3.8488E-05  1.3922E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1468  78.1202  18.9811   2.3827   0.5161  22.6131   0.1658  77.2711  17.3898

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1468  78.1312  18.9837   2.3689   0.5161  22.6131   0.1658  77.2211  17.3877

     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01782  0.88288  2.43974  0.69887  1.77445  1.97266  0.52979  0.27345
SIGC     0.29842  0.35084  0.34464  0.29952  1.30959  0.38446  0.36912  0.19844
SIGF     1.71939  0.53204  2.09510  0.39935  0.46486  1.58820  0.16067  0.07501

NUMBER  DENSITY
 1.0885E-03  2.6463E-04  3.3009E-05  7.1966E-06  1.3747E-06  1.4962E-03
 1.1222E-05  5.1131E-03  4.6794E-05  7.5102E-06  3.9346E-05  1.4232E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1723  78.1217  18.9927   2.3690   0.5165  22.5996   0.1695  77.2309  17.3863

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1723  78.1291  18.9945   2.3599   0.5166  22.5996   0.1695  77.2309  17.3850

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01791  0.88287  2.43994  0.69886  1.77458  1.97284  0.52981  0.27347
SIGC     0.29850  0.35091  0.34469  0.29958  1.30981  0.38453  0.36918  0.19848
SIGF     1.71941  0.53196  2.09525  0.39928  0.46477  1.58832  0.16053  0.07500

NUMBER  DENSITY
 1.0819E-03  2.6513E-04  3.2831E-05  7.2315E-06  1.5576E-06  1.4799E-03
 1.4370E-05  5.1053E-03  5.9961E-05  9.6371E-06  5.0516E-05  1.8261E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5035  77.9985  19.1134   2.3668   0.5213  22.4239   0.2177  77.3584  17.3680

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5035  78.0347  19.1223   2.3214   0.5216  22.4239   0.2177  77.3584  17.3613
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*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX06B2)                  ***
***          FT08F001:PA351.@JOYOR.MICRO18                        ***
***          FT16F001:PA351.JOY9.FLUX18                           ***
*********************************************************************

NGRP = 18    NPIN = 36
集合体番号 =  5
PLANE =  19

INITIAL DENSITY
 1.1119E-03  2.6286E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01427  0.88544  2.43010  0.70111  1.76927  1.96377  0.52948  0.27295
SIGC     0.29509  0.34737  0.34217  0.29650  1.29780  0.38107  0.36627  0.19667
SIGF     1.71918  0.53807  2.08794  0.40460  0.47147  1.58270  0.16320  0.07628

NUMBER  DENSITY
 1.1024E-03  2.6359E-04  3.4014E-05  7.1218E-06  2.1419E-07  1.5308E-03
 4.5556E-06  5.1795E-03  1.8957E-05  3.0339E-06  1.5874E-05  5.7509E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4739  78.3441  18.7325   2.4173   0.5061  22.9680   0.0684  76.9636  17.4321

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4739  78.3591  18.7361   2.3986   0.5062  22.9680   0.0684  76.9636  17.4293

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01634  0.88497  2.43474  0.70069  1.77214  1.96805  0.52991  0.27330
SIGC     0.29675  0.34900  0.34334  0.29794  1.30300  0.38263  0.36761  0.19747
SIGF     1.71959  0.53597  2.09140  0.40375  0.46914  1.58542  0.16231  0.07583

NUMBER  DENSITY
 1.0941E-03  2.6422E-04  3.3677E-05  7.1669E-06  6.6749E-07  1.5102E-03
 8.5352E-06  5.1198E-03  3.5548E-05  5.7024E-06  2.9837E-05  1.0812E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8898  78.2000  18.8846   2.4031   0.5122  22.7488   0.1286  77.1227  17.4069

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8898  78.2149  18.8882   2.3846   0.5123  22.7488   0.1286  77.1227  17.4042

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01761  0.88467  2.43741  0.70060  1.77388  1.97052  0.53023  0.27353
SIGC     0.29772  0.34993  0.34401  0.29876  1.30589  0.38351  0.36837  0.19792
SIGF     1.71990  0.53494  2.09340  0.40184  0.46799  1.58701  0.16186  0.07561

NUMBER  DENSITY
 1.0858E-03  2.6484E-04  3.3743E-05  7.2118E-06  1.1130E-06  1.4895E-03
 1.2527E-05  5.1100E-03  5.2242E-05  8.4098E-06  4.5965E-05  1.5932E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3095  78.0530  19.0388   2.3897   0.5184  22.5268   0.1895  77.2837  17.3818

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3095  78.0641  19.0415   2.3759   0.5185  22.5268   0.1895  77.2837  17.3797

     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01958  0.88398  2.44216  0.69980  1.77655  1.97490  0.53050  0.27382
SIGC     0.29940  0.35162  0.34572  0.30024  1.31144  0.38514  0.36975  0.19876
SIGF     1.72018  0.53236  2.09694  0.39956  0.46511  1.58976  0.16075  0.07505

NUMBER  DENSITY
 1.0852E-03  2.6488E-04  3.3038E-05  7.2149E-06  1.3276E-06  1.4880E-03
 1.2802E-05  5.1093E-03  5.3394E-05  8.5925E-06  4.4943E-05  1.6286E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3385  78.0529  19.0519   2.3763   0.5189  22.5115   0.1937  77.2948  17.3781

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3385  78.0603  19.0536   2.3671   0.5190  22.5115   0.1937  77.2948  17.3768

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01968  0.88397  2.44240  0.69979  1.77670  1.97511  0.53053  0.27384
SIGC     0.29949  0.35170  0.34528  0.30031  1.31170  0.38522  0.36982  0.19880
SIGF     1.72020  0.53226  2.09711  0.39948  0.46500  1.58990  0.16071  0.07503

NUMBER  DENSITY
 1.0777E-03  2.6545E-04  3.2871E-05  7.2549E-06  1.5536E-06  1.4695E-03
 1.6376E-05  5.1003E-03  6.8360E-05  1.1024E-05  5.7669E-05  2.0899E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7157  77.9101  19.1892   2.3763   0.5245  22.3113   0.2486  77.4400  17.3577

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7157  77.9465  19.1982   2.3307   0.5247  22.3113   0.2486  77.4400  17.3510
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*****************************************************************
***                    BURNUP CALCULATION                     ***
***                                                           ***
***          FT05F001:PA351.BURN.DATA(PPJX06B3)               ***
***          FT08F001:PA351.BJOYOR.MICRO18                    ***
***          FT16F001:PA351.JOYO.FLUX18                       ***
*****************************************************************

NGRP = 18    NPIN = 36
集合体数 =  5
PLANE =  72

INITIAL DENSITY
 1.1119E-03  2.6286E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA    2.03461  0.89017  2.46822  0.70521  1.79897  1.99919  0.53701  0.27761
SIGC    0.30890  0.36063  0.35136  0.30821  1.33610  0.39325  0.37693  0.20277
SIGF    1.72571  0.52954  2.11687  0.39700  0.46287  1.60593  0.16008  0.07484

NUMBER  DENSITY
 1.1038E-03  2.6357E-04  3.4018E-05  7.1161E-06  2.1439E-07  1.5338E-03
 4.0164E-06  5.1309E-03  1.6433E-05  7.5420E-06  1.3589E-05  4.9701E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4076  78.3670  18.7127   2.4151   0.5052  23.0004   0.0602  76.9394  17.4381

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4076  78.3819  18.7162   2.3965   0.5053  23.0004   0.0602  76.9394  17.4354

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA    2.03668  0.88985  2.47271  0.70492  1.80183  2.00333  0.53749  0.27798
SIGC    0.31051  0.36271  0.35249  0.30960  1.34106  0.39475  0.37822  0.20354
SIGF    1.72617  0.52764  2.12023  0.39532  0.46077  1.60858  0.15927  0.07444

NUMBER  DENSITY
 1.0968E-03  2.6420E-04  3.3629E-05  7.1563E-06  6.6867E-07  1.5159E-03
 7.5352E-06  5.1225E-03  3.0854E-05  4.7789E-06  2.3566E-05  9.3481E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7661  78.2430  18.8474   2.3991   0.5105  22.8092   0.1134  77.0774  17.4182

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7661  78.2578  18.8510   2.3805   0.5106  22.8092   0.1134  77.0774  17.4155

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA    2.03790  0.88984  2.47519  0.70491  1.80350  2.00563  0.53782  0.27820
SIGC    0.31141  0.36307  0.35310  0.31036  1.34369  0.39556  0.37892  0.20395
SIGF    1.72649  0.52677  2.12209  0.39455  0.45981  1.61006  0.15890  0.07426

NUMBER  DENSITY
 1.0897E-03  2.6487E-04  3.3252E-05  7.1964E-06  1.1159E-06  1.4978E-03
 1.1076E-05  5.1139E-03  4.5394E-05  7.0487E-06  3.7705E-05  1.3778E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1285  78.1163  18.9841   2.3837   0.5159  22.6156   0.1672  77.2172  17.3983

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1285  78.1274  18.9867   2.3699   0.5160  22.6156   0.1672  77.2172  17.3963

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA    2.03990  0.88909  2.47989  0.70424  1.80623  2.00997  0.53815  0.27851
SIGC    0.31308  0.36474  0.35430  0.31182  1.34912  0.39717  0.38029  0.20477
SIGF    1.72682  0.52435  2.12560  0.39242  0.45711  1.61280  0.15786  0.07374

NUMBER  DENSITY
 1.0892E-03  2.6486E-04  3.3046E-05  7.1992E-06  1.3257E-06  1.4965E-03
 1.1320E-05  5.1133E-03  4.6401E-05  7.2023E-06  3.8546E-05  1.4085E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1536  78.1177  18.9958   2.3701   0.5163  22.6022   0.1710  77.2269  17.3950

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1536  78.1250  18.9976   2.3609   0.5164  22.6022   0.1710  77.2269  17.3937

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA    2.04000  0.88909  2.48011  0.70423  1.80637  2.01017  0.53818  0.27853
SIGC    0.31316  0.36482  0.35436  0.31189  1.34935  0.39724  0.38035  0.20481
SIGF    1.72684  0.52427  2.12575  0.39235  0.45705  1.61293  0.15783  0.07372

NUMBER  DENSITY
 1.0878E-03  2.6542E-04  3.2879E-05  7.2349E-06  1.5589E-06  1.4803E-03
 1.4498E-05  5.1055E-03  5.9466E-05  9.2489E-06  4.9499E-05  1.8078E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.4799  77.9932  19.1175   2.3682   0.5211  22.4271   0.2197  77.3532  17.3791

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.4799  78.0295  19.1264   2.3228   0.5214  22.4271   0.2197  77.3532  17.3725
```

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*****************************************************************
***                      BURNUP CALCULATION                   ***
***                                                           ***
***          FT05F001:PA351.BBURN.DATA(PJX09B1)               ***
***          FT08F001:PA351.BJUYUN.MICRO1B                    ***
***          FT16F001:PA351.JUYU.FLUX1B                       ***
*****************************************************************

NGRP = 18    MPIN = 36
集合体数 =  8
PLANE =  19

INITIAL DENSITY
 1.1119E-03  2.6786E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 0.0000   78.5236   18.5644    2.4127    0.4993   73.2169    0.0000   76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239    PU-240    PU-241    PU-242    AM-241     U-235     U-236     U-238
SIGA     2.03133   0.88857   2.46174   0.70338   1.79702   1.99308   0.53469   0.27608
SIGC     0.30665   0.35829   0.35003   0.30607   1.32967   0.39121   0.37507   0.20163
SIGF     1.72468   0.53008   2.11172   0.39732   0.46234   1.60186   0.15961   0.07446

NUMBER  DENSITY
 1.1036E-03  2.6358E-04  3.4017E-05  7.1173E-06  2.1435E-07  1.5333E-03
 4.1170E-06  5.1307E-03  1.6886E-05  7.6081E-06  1.3994E-05  5.1092E-07

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 0.4192   78.3625   18.7166    2.4155    0.5054   22.9945    0.0617   76.9437  17.4371

***** COOLING TIME *****   60.0 DAYS

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 0.4192   78.3775   18.7201    2.3969    0.5055   22.9945    0.0617   76.9437  17.4344

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239    PU-240    PU-241    PU-242    AM-241     U-235     U-236     U-238
SIGA     2.03149   0.88768   2.46757   0.70277   1.79704   1.99382   0.53446   0.27600
SIGC     0.30694   0.35859   0.35028   0.30632   1.33089   0.39153   0.37533   0.20180
SIGF     1.72455   0.52908   2.11730   0.39644   0.46114   1.60229   0.15913   0.07420

NUMBER  DENSITY
 1.0962E-03  2.6421E-04  3.3678E-05  7.1590E-06  6.6837E-07  1.5146E-03
 7.7740E-06  5.1219E-03  1.1937E-05  4.9474E-06  2.6539E-05  9.6830E-07

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 0.7939   78.2324   18.8566    2.4000    0.5109   22.7952    0.1170   77.0878  17.4157

***** COOLING TIME *****   60.0 DAYS

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 0.7939   78.2473   18.8602    2.3815    0.5110   22.7952    0.1170   77.0878  17.4130

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239    PU-240    PU-241    PU-242    AM-241     U-235     U-236     U-238
SIGA     2.03296   0.88758   2.46561   0.70268   1.79403   1.99664   0.53483   0.27626
SIGC     0.30805   0.35955   0.35104   0.30726   1.33417   0.39254   0.37670   0.20231
SIGF     1.72492   0.52793   2.11458   0.39542   0.45986   1.60410   0.15863   0.07395

NUMBER  DENSITY
 1.0887E-03  2.6485E-04  3.3751E-05  7.2007E-06  1.1151E-06  1.4957E-03
 1.1451E-05  5.1130E-03  4.7099E-05  7.3194E-06  3.9239E-05  1.4309E-06

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 1.1724   78.0994   18.9988    2.3853    0.5165   22.5934    0.1730   77.2337  17.3945

***** COOLING TIME *****   45.0 DAYS

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 1.1724   78.1105   19.0015    2.3714    0.5166   22.5934    0.1730   77.2337  17.3925

     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239    PU-240    PU-241    PU-242    AM-241     U-235     U-236     U-238
SIGA     2.03482   0.88715   2.46980   0.70230   1.79666   2.00051   0.53524   0.27659
SIGC     0.30954   0.36113   0.35209   0.30856   1.33889   0.39395   0.37740   0.20303
SIGF     1.72528   0.52602   2.11772   0.39374   0.45777   1.60656   0.15784   0.07356

NUMBER  DENSITY
 1.0882E-03  2.6488E-04  3.3046E-05  7.2035E-06  1.3249E-06  1.4944E-03
 1.1700E-05  5.1123E-03  4.8137E-05  7.4803E-06  4.0108E-05  1.4626E-06

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 1.1983   78.1007   19.0106    2.3717    0.5170   22.5795    0.1768   77.2437  17.3910

***** COOLING TIME *****   30.0 DAYS

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 1.1983   78.1080   19.0124    2.3625    0.5170   22.5795    0.1768   77.2437  17.3897

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239    PU-240    PU-241    PU-242    AM-241     U-235     U-236     U-238
SIGA     2.03492   0.88715   2.47002   0.70229   1.79680   2.00071   0.53527   0.27661
SIGC     0.30962   0.36121   0.35215   0.30863   1.33913   0.39402   0.37747   0.20307
SIGF     1.72530   0.52594   2.11787   0.39367   0.45768   1.60669   0.15780   0.07355

NUMBER  DENSITY
 1.0816E-03  2.6544E-04  3.2879E-05  7.2402E-06  1.5577E-06  1.4777E-03
 1.4958E-05  5.1043E-03  6.1597E-05  9.5922E-06  5.1435E-05  1.8748E-06

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 1.5351   77.9722   19.1356    2.3702    0.5219   22.3992    0.2267   77.3740  17.3740

***** COOLING TIME *****  150.0 DAYS

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 1.5351   78.0086   19.1445    2.3247    0.5222   22.3992    0.2267   77.3740  17.3673

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239    PU-240    PU-241    PU-242    AM-241     U-235     U-236     U-238
SIGA     2.03537   0.88623   2.47153   0.70147   1.79716   2.00208   0.53506   0.27656
SIGC     0.31014   0.36176   0.35257   0.30910   1.34120   0.39458   0.37793   0.20336
SIGF     1.72517   0.52447   2.11896   0.39237   0.45596   1.60750   0.15712   0.07320

NUMBER  DENSITY
 1.0723E-03  2.6623E-04  3.2199E-05  7.2907E-06  2.3378E-06  1.4540E-03
 1.9557E-05  5.0929E-03  8.0655E-05  1.2605E-05  6.7569E-05  2.4574E-06

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 2.0134   77.8140   19.3203    2.3367    0.5291   22.1424    0.2978   77.5598  17.3454

***** COOLING TIME *****   30.0 DAYS

 BURNUP    PU-239    PU-240    PU-241    PU-242     U-235     U-236     U-238  PU/PU+U
 2.0134   77.8212   19.3221    2.3276    0.5291   22.1424    0.2978   77.5598  17.3441

     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239    PU-240    PU-241    PU-242    AM-241     U-235     U-236     U-238
SIGA     2.03741   0.88581   2.47612   0.70108   1.80000   2.00632   0.53550   0.27691
SIGC     0.31179   0.36338   0.35373   0.31051   1.34631   0.39612   0.37925   0.20414
SIGF     1.72562   0.52243   2.12239   0.39057   0.45370   1.61020   0.15625   0.07277
```

NUMBER DENSITY
1.0628E-03 2.6703E-04 3.2047E-05 7.3421E-06 7.6012E-06 1.4300E-03
2.4191E-05 5.0812E-03 9.9912E-05 1.5668E-05 8.3976E-05 3.0538E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.4983	77.6221	19.5016	2.3401	0.5362	21.8809	0.3702	77.7489	17.3222

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.4983	77.6293	19.5034	2.3310	0.5363	21.8809	0.3702	77.7489	17.3209

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.03971	0.88573	2.48019	0.70056	1.80235	2.01007	0.53579	0.27716
SIGC	0.31375	0.36481	0.35477	0.31176	1.35093	0.39750	0.38042	0.20484
SIGF	1.72596	0.52042	2.12542	0.38880	0.45143	1.61258	0.15537	0.07232

NUMBER DENSITY
1.0538E-03 2.6779E-04 3.1894E-05 7.3971E-06 2.8570E-06 1.4068E-03
2.8653E-05 5.0597E-03 1.1851E-04 1.8645E-05 9.9928E-05 3.6374E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9683	77.4347	19.6784	2.3437	0.5432	21.6265	0.4405	77.9331	17.3001

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9683	77.4774	19.6892	2.2898	0.5435	21.6265	0.4405	77.9331	17.2922

```
*************************************************************************
***                        BURNUP CALCULATION                         ***
***                                                                   ***
***          F105F001:PA351.@BURN.DATA(PPJDOMD1)                      ***
***          F108F001:PA351.@JOYOR.MICRO18                            ***
***          F116F001:PA351.JOYO.FLUX18                               ***
*************************************************************************

NGRP = 18    NFIM = 36
集合体数 =  16
PLANE =  19

INITIAL DENSITY
 1.1119E-03  2.6286E-04  3.4163E-05  7.0699E-06  0.0000E+00  1.5543E-03
 0.0000E+00  5.1404E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  78.5236  18.5644   2.4127   0.4993  23.2169   0.0000  76.7831  17.4580

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03746  0.89043  2.47723  0.70505  1.80042  2.00284  0.53698  0.27741
SIGC     0.31051  0.36191  0.35255  0.30920  1.33965  0.39449  0.37792  0.20317
SIGF     1.72695  0.52852  2.11969  0.39585  0.46077  1.60835  0.15906  0.07424

NUMBER  DENSITY
 1.1035E-03  7.6362E-04  3.4023E-05  7.1184E-06  2.1435E-07  1.5329E-03
 4.2046E-06  5.1305E-03  1.7177E-05  2.6374E-06  1.4193E-05  5.1958E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4257  78.3586  18.7198   2.4160   0.5055  22.9904   0.0631  76.9465  17.4375

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4257  78.3736  18.7234   2.3974   0.5056  22.9904   0.0631  76.9465  17.4348

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03960  0.89011  2.47686  0.70476  1.80337  2.00712  0.53748  0.27778
SIGC     0.31217  0.36354  0.35371  0.31063  1.34475  0.39603  0.37924  0.20396
SIGF     1.72743  0.52657  2.12315  0.39413  0.45862  1.61109  0.15824  0.07383

NUMBER  DENSITY
 1.0961E-03  2.6426E-04  3.3618E-05  7.1606E-06  6.6843E-07  1.5141E-03
 7.8886E-06  5.1217E-03  1.7248E-05  4.9547E-06  2.6705E-05  9.7746E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8000  78.2273  18.8610   2.4007   0.5110  22.7904   0.1187  77.0909  17.4170

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8000  78.2421  18.8645   2.3822   0.5111  22.7904   0.1187  77.0909  17.4142

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04081  0.89014  2.47976  0.70478  1.80501  2.00934  0.53782  0.27800
SIGC     0.31304  0.36457  0.35431  0.31136  1.34728  0.39681  0.37992  0.20435
SIGF     1.72776  0.52576  2.12496  0.39341  0.45773  1.61252  0.15789  0.07365

NUMBER  DENSITY
 1.0887E-03  2.6494E-04  3.3765E-05  7.2027E-06  1.1153E-06  1.4952E-03
 1.1591E-05  5.1128E-03  1.7441E-05  7.3119E-06  3.9383E-05  1.4409E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1784  78.0929  19.0043   2.3842   0.5167  22.5878   0.1751  77.2371  17.3965

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1784  78.1040  19.0069   2.3723   0.5167  22.5878   0.1751  77.2371  17.3944

     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04134  0.88915  2.48115  0.70390  1.80561  2.01106  0.53763  0.27798
SIGC     0.31370  0.36506  0.35483  0.31195  1.34981  0.39751  0.38050  0.20472
SIGF     1.72764  0.52409  2.12632  0.39195  0.45579  1.61356  0.15713  0.07327

NUMBER  DENSITY
 1.0882E-03  2.6498E-04  3.3060E-05  7.2057E-06  1.3251E-06  1.4939E-03
 1.1847E-05  5.1121E-03  4.8495E-05  7.4728E-06  4.0265E-05  1.4731E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.2047  78.0939  19.0164   2.3726   0.5171  22.5737   0.1790  77.2473  17.3931

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.2047  78.1012  19.0182   2.3634   0.5172  22.5737   0.1790  77.2473  17.3917

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04145  0.88915  2.48137  0.70390  1.80575  2.01127  0.53766  0.27800
SIGC     0.31378  0.36514  0.35488  0.31202  1.35005  0.39758  0.38056  0.20475
SIGF     1.72766  0.52401  2.12649  0.39187  0.45570  1.61369  0.15710  0.07325

NUMBER  DENSITY
 1.0815E-03  2.6557E-04  3.2898E-05  7.2433E-06  1.5578E-06  1.4769E-03
 1.5175E-05  5.1040E-03  6.2181E-05  9.6065E-06  5.1748E-05  1.8923E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5465  77.9622  19.1442   2.3715   0.5221  22.3900   0.2301  77.3799  17.3764

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5465  77.9985  19.1531   2.3260   0.5224  22.3900   0.2301  77.3799  17.3698

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04304  0.88840  2.48522  0.70323  1.80787  2.01481  0.53786  0.27822
SIGC     0.31515  0.36650  0.35587  0.31321  1.35454  0.39890  0.38168  0.20543
SIGF     1.72789  0.52190  2.12935  0.39001  0.45334  1.61592  0.15618  0.07279

NUMBER  DENSITY
 1.0721E-03  2.6640E-04  3.2225E-05  7.2950E-06  2.3379E-06  1.4528E-03
 1.9856E-05  5.0924E-03  8.1479E-05  1.2626E-05  6.8027E-05  2.4826E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0298  77.8000  19.3321   2.3385   0.5294  22.1296   0.3025  77.5680  17.3487

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0298  77.8072  19.3339   2.3295   0.5294  22.1296   0.3025  77.5680  17.3474

     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.04427  0.88878  2.48769  0.70311  1.80947  2.01710  0.53814  0.27843
SIGC     0.31604  0.36737  0.35649  0.31397  1.35723  0.39972  0.38238  0.20584
SIGF     1.72818  0.52092  2.13120  0.38914  0.45225  1.61738  0.15576  0.07259
```

NUMBER DENSITY
1.0676E-03 2.6774E-04 5.7076E-05 7.3478E-06 2.6008E-06 1.4284E-03
2.4588E-05 5.0805E-03 1.0106E-04 1.5718E-05 8.4670E-05 3.0897E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.5221	77.6035	19.5173	2.3426	0.5366	21.8632	0.3763	77.7605	17.3261

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU 241	PU-242	U-235	U-236	U-238	PU/PU+U
2.5221	77.6107	19.5191	2.3336	0.5367	21.8632	0.3763	77.7605	17.3248

8 CYCLE

***** BURN UP TIME ***** 40.75 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04560	0.88814	2.49061	0.70298	1.81138	2.01980	0.53848	0.27868
SIGC	0.31709	0.36839	0.35722	0.31487	1.36042	0.40069	0.38371	0.20633
SIGF	1.72851	0.51975	2.13339	0.38811	0.45096	1.61911	0.15527	0.07234

NUMBER DENSITY
1.0534E-03 2.6803E-04 3.1935E-05 7.3988E-06 2.8563E-06 1.4050E-03
2.9128E-05 5.0689E-03 1.1992E-04 1.8724E-05 1.0081E-04 3.6823E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9981	77.4123	19.6972	2.3468	0.5437	21.6049	0.4479	77.9471	17.3044

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9981	77.4550	19.7081	2.2929	0.5440	21.6049	0.4479	77.9471	17.2965

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04714	0.88791	2.49387	0.70276	1.81341	2.02781	0.53882	0.27892
SIGC	0.31827	0.36953	0.35805	0.31587	1.36399	0.40177	0.38414	0.20688
SIGF	1.72886	0.51837	2.13582	0.38689	0.44942	1.62104	0.15467	0.07204

NUMBER DENSITY
1.0425E-03 2.6397E-04 3.1195E-05 7.4579E-06 3.7427E-06 1.3770E-03
3.4512E-05 5.0548E-03 1.4235E-04 2.2344E-05 1.2019E-04 4.3887E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.5673	77.2148	19.9223	2.3105	0.5524	21.2950	0.5337	78.1713	17.2728

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU 240	PU 241	PU-242	U-235	U-236	U-238	PU/PU+U
3.5673	77.2219	19.9241	2.3016	0.5524	21.2950	0.5337	78.1713	17.2715

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX13C2)                  ***
***          FT10F001:PA351.@JOYOR.MICRO18                        ***
***          FT16F001:PA351.JOYO.FLUX18                           ***
*********************************************************************

NGRP = 18    MPLN = 36
燃焼領域 =  1
PLANE =  19

INITIAL DENSITY
 1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0000E+00  1.5458E-03
 1.3483E-05  5.1270E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  23.0900   0.2014  76.5824  17.4762

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU 240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01044  0.88879  2.47291  0.70058  1.76405  1.95709  0.52877  0.27221
SIGC     0.29247  0.34487  0.34038  0.29430  1.29049  0.37875  0.36424  0.19552
SIGF     1.71797  0.53992  2.08253  0.40628  0.47356  1.57834  0.16403  0.07669
FLUX     1.96154E+15

NUMBER  DENSITY
 1.0855E-03  2.7670E-04  3.6649E-05  7.8880E-06  2.3079E-07  1.5215E-03
 1.8125E-05  5.1156E-03  1.9647E-05  3.1796E-06  1.6395E-05  6.4648E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4921  77.1652  19.6689   2.6052   0.5607  22.8325   0.2720  76.7693  17.4495

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4921  77.1811  19.6729   2.5851   0.5608  22.8325   0.2720  76.7693  17.4466

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01236  0.88428  2.42727  0.70013  1.76670  1.96112  0.52865  0.27253
SIGC     0.29403  0.34640  0.34148  0.29566  1.29541  0.38022  0.36550  0.19627
SIGF     1.71835  0.53787  2.08578  0.40448  0.47129  1.58089  0.16315  0.07625
FLUX     1.94105E+15

NUMBER  DENSITY
 1.0771E-03  2.7722E-04  3.6210E-05  7.9374E-06  7.1884E-07  1.5001E-03
 2.7190E-05  5.1055E-03  3.6893E-05  5.9871E-06  3.0866E-05  1.2172E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.9753  77.0198  19.8234   2.5893   0.5676  22.6049   0.3344  76.9345  17.4234

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.9753  77.0355  19.8274   2.5693   0.5677  22.6049   0.3344  76.9345  17.4205

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01384  0.88408  2.43044  0.69995  1.76871  1.96405  0.52899  0.27278
SIGC     0.29517  0.34751  0.34278  0.29663  1.29889  0.38178  0.36641  0.19681
SIGF     1.71867  0.53656  2.08815  0.40331  0.46982  1.58277  0.16258  0.07597
FLUX     1.94389E+15

NUMBER  DENSITY
 1.0686E-03  2.7774E-04  3.5784E-05  7.9866E-06  1.1980E-06  1.4786E-03
 2.6265E-05  5.0952E-03  5.4231E-05  8.8254E-06  4.5495E-05  1.7942E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3620  76.8715  19.9798   2.5742   0.5745  22.3747   0.3974  77.1017  17.3974

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3620  76.8832  19.9828   2.5593   0.5746  22.3747   0.3974  77.1017  17.3952

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01572  0.88334  2.43493  0.69930  1.77134  1.96820  0.52930  0.27308
SIGC     0.29676  0.34911  0.34343  0.29804  1.30409  0.38281  0.36771  0.19761
SIGF     1.71896  0.53423  2.09151  0.40127  0.46724  1.58538  0.16159  0.07548
FLUX     1.89887E+15

NUMBER  DENSITY
 1.0680E-03  2.7776E-04  3.5561E-05  7.9899E-06  1.4235E-06  1.4771E-03
 2.6545E-05  5.0945E-03  5.5423E-05  9.0148E-06  4.6504E-05  1.8339E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3920  76.8723  19.9930   2.5596   0.5751  22.3588   0.4018  77.1132  17.3936

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3920  76.8801  19.9950   2.5498   0.5752  22.3588   0.4018  77.1132  17.3921

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01583  0.88333  2.43518  0.69929  1.77149  1.96842  0.52933  0.27310
SIGC     0.29685  0.34919  0.34349  0.29811  1.30436  0.38289  0.36778  0.19765
SIGF     1.71898  0.53413  2.09169  0.40118  0.46714  1.58552  0.16155  0.07546
FLUX     2.84875E+15

NUMBER  DENSITY
 1.0604E-03  2.7823E-04  3.5366E-05  8.0333E-06  1.6714E-06  1.4580E-03
 3.0172E-05  5.0852E-03  7.0887E-05  1.1556E-05  5.9620E-05  2.3511E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7826  76.7286  20.1312   2.5589   0.5813  22.1521   0.4584  77.2633  17.3725

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7826  76.7672  20.1413   2.5099   0.5816  22.1521   0.4584  77.2633  17.3653

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01744  0.88254  2.43909  0.69868  1.77375  1.97203  0.52959  0.27336
SIGC     0.29823  0.35059  0.34448  0.29933  1.30893  0.38474  0.36892  0.19834
SIGF     1.71920  0.53205  2.09460  0.39935  0.46483  1.58779  0.16066  0.07502
FLUX     2.78158E+15

NUMBER  DENSITY
 1.0498E-03  2.7887E-04  3.4615E-05  8.0978E-06  2.5052E-06  1.4311E-03
 3.5249E-05  5.0721E-03  9.2588E-05  1.5152E-05  7.8140E-05  3.0768E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.3324  76.5515  20.3343   2.5240   0.5901  21.8597   0.5384  77.4756  17.3382

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.3324  76.5592  20.3363   2.5143   0.5902  21.8597   0.5384  77.4756  17.3367
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.01804	0.88757	2.44044	0.69859	1.77463	1.97328	0.52973	0.27348
SIGC	0.29871	0.35106	0.34482	0.29976	1.31044	0.38469	0.36931	0.19858
SIGF	1.71953	0.53146	2.09562	0.39883	0.46419	1.58859	0.16042	0.07490
FLUX	2.75558E+15							

NUMBER DENSITY

1.0391E-03	7.7950E-04	3.4477E-05	8.1533E-06	2.7819E-06	1.4038E-03
4.0373E-05	5.0585E-03	1.1461E-04	1.8848E-05	9.7095E-05	3.8244E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.8931	76.3378	20.5340	2.5292	0.5990	21.5609	0.6201	77.6929	17.3092

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.8931	76.3454	20.5360	2.5194	0.5990	21.5609	0.6201	77.6929	17.3078

8 CYCLE

***** BURN-UP TIME ***** 40.75 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02028	0.88196	2.44548	0.69809	1.77769	1.97794	0.53018	0.27385
SIGC	0.30052	0.35284	0.34610	0.30132	1.31611	0.38639	0.37076	0.19945
SIGF	1.71977	0.52913	2.09938	0.39677	0.46159	1.59155	0.15942	0.07440
FLUX	2.72599E+15							

NUMBER DENSITY

1.0288E-03	2.8010E-04	3.4249E-05	8.2116E-06	3.0503E-06	1.3777E-03
4.5253E-05	5.0454E-03	1.3565E-04	2.2411E-05	1.1535E-04	4.5499E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4313	76.1310	20.7270	2.5344	0.6076	21.2727	0.6987	77.9024	17.2819

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4313	76.1764	20.7393	2.4767	0.6080	21.2727	0.6987	77.9024	17.2734

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02061	0.88198	2.44611	0.69810	1.77811	1.97852	0.53076	0.27390
SIGC	0.30075	0.35305	0.34626	0.30151	1.31676	0.38659	0.37094	0.19955
SIGF	1.71986	0.52892	2.09986	0.39659	0.46135	1.59192	0.15932	0.07435
FLUX	2.73078E+15							

NUMBER DENSITY

1.0164E-03	2.8079E-04	3.3426E-05	8.2786E-06	3.9915E-06	1.3467E-03
5.1028E-05	5.0294E-03	1.6077E-04	2.6720E-05	1.3752E-04	5.4168E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0761	75.9169	20.9687	2.4962	0.6182	20.9265	0.7929	78.1544	17.2426

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0761	75.9245	20.9707	2.4865	0.6183	20.9265	0.7929	78.1544	17.2412

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02220	0.88157	2.45076	0.69769	1.78098	1.98281	0.53070	0.27425
SIGC	0.30242	0.35469	0.34743	0.30295	1.32196	0.38815	0.37228	0.20035
SIGF	1.72029	0.52683	2.10353	0.39474	0.45902	1.59466	0.15842	0.07391
FLUX	2.70291E+15							

NUMBER DENSITY

1.0058E-03	2.8139E-04	3.3286E-05	8.3384E-06	4.2421E-06	1.3192E-03
5.6103E-05	5.0151E-03	1.8287E-04	3.0571E-05	1.5690E-04	6.1970E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6486	75.6920	21.1756	2.5049	0.6275	20.6175	0.8768	78.3791	17.2144

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6486	75.7144	21.1819	2.4760	0.6277	20.6179	0.8768	78.3791	17.2102

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02345	0.88137	2.45243	0.69756	1.78204	1.98435	0.53088	0.27439
SIGC	0.30301	0.35528	0.34785	0.30346	1.32382	0.38871	0.37276	0.20063
SIGF	1.72044	0.52609	2.10458	0.39410	0.45822	1.59564	0.15812	0.07376
FLUX	2.67835E+15							

NUMBER DENSITY

9.9598E-04	2.8191E-04	3.2897E-05	8.3924E-06	4.7366E-06	1.2943E-03
6.0700E-05	5.0018E-03	2.0306E-04	3.4125E-05	1.7493E-04	6.9164E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.1733	75.4997	21.3703	2.4938	0.6362	20.3345	0.9537	78.5856	17.1859

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.1733	75.5072	21.3724	2.4841	0.6362	20.3345	0.9537	78.5856	17.1845

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(PPJX09C1)                  ***
***          FT08F001:PA351.@JOYOR.MICRO18                        ***
***          FT16F001:PA351.JOYO.FLUX18                           ***
*********************************************************************

NGRP = 18    MPLN = 36
集合体番号 =  8
PLANE =  19

INITIAL DENSITY
 1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0000E+00  1.5458E-03
 1.3483E-05  5.1770E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  23.0900   0.2014  76.5824  17.4762

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03133  0.88837  2.46175  0.70358  1.79202  1.99308  0.53469  0.27608
SIGC     0.30665  0.35829  0.35003  0.30607  1.32967  0.39171  0.37507  0.20163
SIGF     1.72468  0.53008  2.11172  0.39732  0.46234  1.60186  0.15961  0.07446
FLUX     1.65184E+15

NUMBER  DENSITY
 1.0871E-03  2.7670E-04  3.6656E-05  7.8814E-06  2.3104E-07  1.5249E-03
 1.7528E-05  5.1173E-03  1.6808E-05  2.6013E-06  1.3847E-05  5.5127E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4173  77.1904  19.6472   2.6028   0.5596  22.8686   0.2629  76.7423  17.4559

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4173  77.2063  19.6513   2.5827   0.5597  22.8686   0.2629  76.7423  17.4529

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03149  0.88767  2.46257  0.70276  1.79204  1.99382  0.53446  0.27600
SIGC     0.30694  0.35859  0.34078  0.30632  1.33089  0.39153  0.37533  0.20180
SIGF     1.72455  0.52908  2.11230  0.39644  0.46114  1.60229  0.15913  0.07420
FLUX     1.65851E+15

NUMBER  DENSITY
 1.0799E-03  2.7723E-04  3.6221E-05  7.9254E-06  7.2023E-07  1.5063E-03
 7.1171E-05  5.1085E-03  1.1790E-05  4.9345E-06  2.6260E-05  1.0445E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7903  77.0655  19.7841   2.5848   0.5656  22.6703   0.3179  76.8856  17.4349

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7903  77.0812  19.7881   2.5649   0.5657  22.6703   0.3179  76.8856  17.4319

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03796  0.88758  2.46562  0.70768  1.79403  1.99663  0.53483  0.27626
SIGC     0.30805  0.35965  0.35104  0.30726  1.33417  0.39254  0.37670  0.20231
SIGF     1.72497  0.52793  2.11458  0.39542  0.45986  1.60410  0.15863  0.07395
FLUX     1.66146E+15

NUMBER  DENSITY
 1.0726E-03  2.7776E-04  3.5798E-05  7.9694E-06  1.7014E-06  1.4875E-03
 2.4732E-05  5.0997E-03  4.6882E-05  7.3003E-06  3.8828E-05  1.5432E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1671  76.9377  19.9230   2.5677   0.5716  22.4693   0.3736  77.0309  17.4138

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1671  76.9494  19.9260   2.5528   0.5717  22.4693   0.3736  77.0309  17.4117

    4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03482  0.88715  2.46981  0.70230  1.79666  2.00051  0.53524  0.27659
SIGC     0.30954  0.36113  0.35209  0.30856  1.33889  0.39395  0.37740  0.20303
SIGF     1.72528  0.52602  2.11772  0.39374  0.45777  1.60656  0.15784  0.07356
FLUX     1.61256E+15

NUMBER  DENSITY
 1.0721E-03  2.7779E-04  3.5576E-05  7.9724E-06  1.4272E-06  1.4862E-03
 2.4977E-05  5.0990E-03  4.7915E-05  7.4608E-06  3.9688E-05  1.5774E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1928  76.9396  19.9352   2.5530   0.5721  22.4555   0.3774  77.0409  17.4104

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1928  76.9474  19.9372   2.5432   0.5722  22.4555   0.3774  77.0409  17.4089

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03492  0.88715  2.47002  0.70229  1.79680  2.00071  0.53527  0.27661
SIGC     0.30962  0.36121  0.35215  0.30863  1.33913  0.39402  0.37747  0.20307
SIGF     1.72530  0.52594  2.11787  0.39367  0.45768  1.60669  0.15780  0.07355
FLUX     2.41933E+15

NUMBER  DENSITY
 1.0657E-03  2.7826E-04  3.5381E-05  8.0109E-06  1.6778E-06  1.4696E-03
 2.8176E-05  5.0911E-03  6.1314E-05  9.5672E-06  5.0898E-05  2.0216E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5281  76.8153  20.0570   2.5502   0.5774  22.2760   0.4271  77.1707  17.3938

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5281  76.8538  20.0671   2.5014   0.5777  22.2760   0.4271  77.1707  17.3866

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
         PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03532  0.88623  2.47153  0.70147  1.79716  2.00208  0.53505  0.27656
SIGC     0.31014  0.36176  0.35257  0.30910  1.34170  0.39458  0.37793  0.20336
SIGF     1.72517  0.52447  2.11896  0.39237  0.45596  1.60750  0.15712  0.07320
FLUX     2.38053E+15

NUMBER  DENSITY
 1.0566E-03  2.7892E-04  3.4678E-05  8.0641E-06  2.5172E-06  1.4460E-03
 3.2693E-05  5.0797E-03  8.0285E-05  1.2572E-05  6.6856E-05  2.6490E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0042  76.6646  20.2378   2.5125   0.5851  22.0204   0.4979  77.3555  17.3654

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0042  76.6722  20.2399   2.5028   0.5852  22.0204   0.4979  77.3555  17.3640
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU 242	AM-241	U-235	U-236	U-238
SIGA	2.03741	0.88581	2.47612	0.70108	1.80001	2.00632	0.53550	0.27691
SIGC	0.31179	0.36338	0.35373	0.31051	1.34631	0.39612	0.37925	0.20414
SIGF	1.72562	0.52243	2.12239	0.39057	0.45370	1.61020	0.15625	0.07277
FLUX	2.34023E+15							

NUMBER DENSITY

1.0474E-03 2.7959E-04 3.4437E-05 8.1180E-06 2.8003E-06 1.4222E-03
3.7243E-05 5.0680E-03 9.9454E-05 1.5678E-05 8.3106E-05 3.2910E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.4870	76.4787	20.4142	2.5144	0.5927	21.7603	0.5698	77.5437	17.3430

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.4870	76.4863	20.4162	2.5047	0.5928	21.7603	0.5698	77.5437	17.3416

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.03921	0.88523	2.48019	0.70056	1.80236	2.01007	0.53579	0.27716
SIGC	0.31375	0.36481	0.35477	0.31176	1.35093	0.39750	0.38042	0.20484
SIGF	1.72596	0.52042	2.12542	0.38880	0.45143	1.61258	0.15537	0.07232
FLUX	2.33403E+15							

NUMBER DENSITY

1.0386E-03 2.8022E-04 3.4256E-05 8.1704E-06 3.0751E-06 1.3992E-03
4.1629E-05 5.0565E-03 1.1797E-04 1.8597E-05 9.8897E-05 3.9188E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9549	76.2973	20.5860	2.5166	0.6002	21.5072	0.6398	77.7267	17.3216

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU 242	U-235	U-236	U-238	PU/PU+U
2.9549	76.3425	20.5982	2.4588	0.6006	21.5072	0.6398	77.7267	17.3131

```
*************************************************************************
***                        BURNUP CALCULATION                         ***
***                                                                   ***
***          FT05F001:PA351.@BURN.DATA(PPJX08C2)                      ***
***          FT08F001:PA351.@JOYOR.MICRO18                            ***
***          FT16F001:PA351.JOYO.FLUX18                               ***
*************************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  15
PLANE =  18

INITIAL DENSITY
 1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0000E+00  1.5458E-03
 1.3483E-05  5.1270E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  23.0900   0.2014  76.5824  17.4762

CROSS SECTION FACTOR
  SIGF      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03069  0.88859  2.45983  0.70345  1.79065  1.99130  0.53445  0.27586
SIGC     0.30599  0.35762  0.34956  0.30539  1.32738  0.39055  0.37447  0.20120
SIGF     1.72469  0.53097  2.11028  0.39806  0.46327  1.60075  0.15998  0.07466
FLUX     1.70703E+15

NUMBER  DENSITY
 1.0868E-03  2.7672E-04  3.6658E-05  7.8879E-06  2.3100E-07  1.5742E-03
 1.7655E-05  5.1169E-03  1.7354E-05  2.6964E-06  1.4309E-05  5.6939E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4311  77.1849  19.6519   2.6034   0.5598  22.8615   0.7648  76.7475  17.4551

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4311  77.2008  19.6560   2.5833   0.5599  22.8615   0.7648  76.7475  17.4521

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03282  0.88874  2.46448  0.70315  1.79359  1.99559  0.53493  0.27624
SIGC     0.30766  0.35975  0.35077  0.30682  1.33252  0.39210  0.37580  0.20199
SIGF     1.72516  0.57898  2.11375  0.39651  0.46107  1.60350  0.15914  0.07424
FLUX     1.68168E+15

NUMBER  DENSITY
 1.0795E-03  2.7776E-04  3.6224E-05  7.9277E-06  2.2011E-07  1.5053E-03
 2.1300E-05  5.1081E-03  3.2548E-05  5.0661E-06  2.6897E-05  1.0699E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8094  77.0576  19.7908   2.5857   0.5659  22.6602   0.3206  76.8929  17.4339

 *** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8094  77.0734  19.7949   2.5658   0.5660  22.6602   0.3206  76.8929  17.4310
```

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.BBURN.DATA(PPJX13D1)                  ***
***          FT08F001:PA351.BJUYOR.MICRO18                        ***
***          FT16F001:PA351.JUYO.FLUX1A                           ***
*********************************************************************

NGRP = 18    NFLX = 36
集合体番号 =  1
PLANE =  19

INITIAL DENSITY
 1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0000E+00  1.5558E-03
 1.3008E-05  5.1172E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  23.2398   0.1943  76.4362  17.4767

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01044  0.88479  2.47291  0.70058  1.76405  1.95709  0.52827  0.27221
SIGC     0.29247  0.34487  0.34038  0.29430  1.79049  0.37875  0.36424  0.19552
SIGI     1.71797  0.53992  2.08253  0.40628  0.47356  1.57834  0.16403  0.07669
FLUX     1.96154E+15

NUMBER  DENSITY
 1.0855E-03  2.7670E-04  3.6649E-05  7.8880E-06  2.3079E-07  1.5313E-03
 1.7682E-05  5.1058E-03  1.9774L-05  3.1736E-06  1.6395E-05  6.4648E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4936  77.1649  19.6691   2.6052   0.5607  22.9810   0.2654  76.6239  17.4501

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4936  77.1808  19.6732   2.5852   0.5608  22.9810   0.2654  76.6239  17.4472

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01736  0.88478  2.47727  0.70013  1.76670  1.96112  0.52865  0.27253
SIGC     0.29403  0.34640  0.34148  0.29566  1.79541  0.38022  0.36550  0.19627
SIGF     1.71833  0.53787  2.08578  0.40448  0.47179  1.58089  0.16315  0.07625
FLUX     1.94105E+15

NUMBER  DENSITY
 1.0771E-03  2.7722E-04  3.6710E-05  7.9374L-06  7.1884E-07  1.5098E-03
 2.1776E-05  5.0957E-03  3.7131L-05  5.9756E-06  3.0866E-05  1.2172E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.9281  77.0193  19.8238   2.5893   0.5676  22.7523   0.3282  76.7899  17.4241

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.9281  77.0351  19.8278   2.5694   0.5677  22.7523   0.3282  76.7899  17.4211

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01384  0.88408  2.43044  0.69995  1.76471  1.96405  0.52899  0.27278
SIGC     0.29517  0.34751  0.34278  0.29663  1.79889  0.38128  0.36641  0.19681
SIGF     1.71867  0.53656  2.08815  0.40351  0.46982  1.58277  0.16258  0.07597
FLUX     1.94389E+15

NUMBER  DENSITY
 1.0685E-03  2.7774E-04  3.5784E-05  7.9866E-06  1.1980E-06  1.4882E-03
 2.5879E-05  5.0855E-03  5.4581E-05  8.8085E-06  4.5494E-05  1.7942E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3661  76.8708  19.9804   2.5743   0.5746  22.5209   0.3916  76.9578  17.3981

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3661  76.8526  19.9834   2.5594   0.5746  22.5209   0.3916  76.9578  17.3959

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01572  0.88334  2.43493  0.69930  1.77134  1.96820  0.52930  0.27308
SIGC     0.29676  0.34911  0.34343  0.29804  1.30409  0.38281  0.36771  0.19761
SIGF     1.71896  0.53423  2.09151  0.40127  0.46724  1.58538  0.16159  0.07548
FLUX     1.89887E+15

NUMBER  DENSITY
 1.0680E-03  2.7776E-04  3.5561E-05  7.9899E-06  1.4235E-06  1.4867E-03
 2.6161E-05  5.0848E-03  5.5780E-05  8.9976E-06  4.6503E-05  1.8339E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3962  76.8716  19.9936   2.5597   0.5751  22.5049   0.3960  76.9695  17.3943

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3962  76.8794  19.9956   2.5498   0.5752  22.5049   0.3960  76.9695  17.3928

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01583  0.88333  2.43518  0.69929  1.77149  1.96842  0.52933  0.27310
SIGC     0.29685  0.34919  0.34349  0.29811  1.30436  0.38289  0.36778  0.19765
SIGF     1.71898  0.53413  2.09169  0.40118  0.46714  1.58552  0.16155  0.07546
FLUX     2.84875E+15

NUMBER  DENSITY
 1.0604E-03  2.7823E-04  3.5366E-05  8.0333E-06  1.6714E-06  1.4674E-03
 2.9814E-05  5.0756E-03  7.1344E-05  1.1534E-05  5.9619E-05  2.3511E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7880  76.7277  20.1320   2.5590   0.5813  22.2968   0.4530  77.1205  17.3731

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7880  76.7663  20.1421   2.5100   0.5816  22.2968   0.4530  77.1205  17.3659

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01744  0.88264  2.43909  0.69868  1.77375  1.97203  0.52959  0.27336
SIGC     0.29823  0.35059  0.34448  0.29933  1.30893  0.38424  0.36892  0.19834
SIGF     1.71920  0.53295  2.09460  0.39935  0.46483  1.58779  0.16066  0.07502
FLUX     2.78158E+15

NUMBER  DENSITY
 1.0498E-03  2.7887E-04  3.4615E-05  8.0928E-06  2.5052E-06  1.4404E-03
 3.4927E-05  5.0624E-03  9.3185E-05  1.5124E-05  7.8137E-05  3.0768E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.3395  76.5503  20.3354   2.5242   0.5901  22.0031   0.5335  77.3337  17.3389

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.3395  76.5579  20.3374   2.5144   0.5902  22.0031   0.5335  77.3337  17.3375
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.01804	0.88752	2.44044	0.69859	1.77463	1.97328	0.52973	0.27348
SIGC	0.29871	0.35106	0.34482	0.29976	1.31044	0.38469	0.36931	0.19858
SIGF	1.71933	0.53146	2.09562	0.39883	0.46419	1.58859	0.16042	0.07490
FLUX	2.75558E+15							

NUMBER DENSITY

1.0390E-03	2.7950E-04	3.4427E-05	8.1533E-06	2.7819E-05	1.4179E-03
4.0086E-05	5.0489E-03	1.1535E-04	1.8812E-05	9.7091E-05	3.8244E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9018	76.3362	20.5353	2.5294	0.5990	21.7025	0.6157	77.5521	17.3100

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9018	76.3439	20.5374	2.5196	0.5991	21.7025	0.6157	77.5521	17.3085

8 CYCLE

***** BURN-UP TIME ***** 40.75 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02078	0.88196	2.44548	0.69809	1.77769	1.97794	0.53018	0.27385
SIGC	0.30052	0.35284	0.34610	0.30132	1.31611	0.38639	0.37076	0.19945
SIGF	1.71977	0.52913	2.09938	0.39677	0.46159	1.59155	0.15942	0.07440
FLUX	2.72599E+15							

NUMBER DENSITY

1.0287E-03	2.8010E-04	3.4249E-05	8.2116E-06	3.0503E-06	1.3867E-03
4.5001E-05	5.0358E-03	1.1653E-04	2.2368E-05	1.1535E-04	4.5499E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4416	76.1292	20.7286	2.5346	0.6077	21.4129	0.6949	77.7626	17.2828

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.4416	76.1746	20.7410	2.4764	0.6080	21.4129	0.6949	77.7626	17.2742

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02061	0.88198	2.44611	0.69810	1.77811	1.97852	0.53026	0.27390
SIGC	0.30075	0.35305	0.34676	0.30151	1.31676	0.38659	0.37094	0.19955
SIGF	1.71986	0.52892	2.09986	0.39659	0.46135	1.59192	0.15932	0.07435
FLUX	2.73078E+15							

NUMBER DENSITY

1.0165E-03	2.8079E-04	3.3426E-05	8.2786E-06	3.9915E-06	1.3554E-03
5.0816E-05	5.0199E-03	1.6176E-04	2.6669E-05	1.3731E-04	5.4168E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0882	75.9147	20.9706	2.4964	0.6183	21.0650	0.7898	78.0156	17.2436

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.0882	75.9223	20.9727	2.4867	0.6183	21.0650	0.7898	78.0156	17.2422

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02770	0.88157	2.45076	0.69769	1.78098	1.98281	0.53070	0.27425
SIGC	0.30247	0.35469	0.34743	0.30295	1.32196	0.38815	0.37228	0.20035
SIGF	1.72079	0.52683	2.10353	0.39474	0.45902	1.59466	0.15842	0.07391
FLUX	2.70291E+15							

NUMBER DENSITY

1.0057E-03	2.8139E-04	3.3286E-05	8.3384E-06	4.2421E-06	1.3278E-03
5.5927E-05	5.0056E-03	1.8405E-04	3.0513E-05	1.5689E-04	6.1970E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6625	75.6894	21.1778	2.5052	0.6276	20.7548	0.8742	78.2414	17.2155

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.6625	75.7119	21.1841	2.4763	0.6278	20.7548	0.8742	78.2414	17.2113

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02345	0.88137	2.45243	0.69756	1.78204	1.98435	0.53088	0.27439
SIGC	0.30301	0.35528	0.34785	0.30346	1.32382	0.38871	0.37276	0.20063
SIGF	1.72044	0.52609	2.10458	0.39410	0.45822	1.59564	0.15812	0.07376
FLUX	2.67835E+15							

NUMBER DENSITY

9.9582E-04	2.8191E-04	3.2897E-05	8.3924E-06	4.7366E-06	1.3026E-03
6.0557E-05	4.9923E-03	2.0437E-04	3.4060E-05	1.7491E-04	6.9164E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.1886	75.4969	21.3728	2.4941	0.6363	20.4697	0.9516	78.4490	17.1870

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.1886	75.5043	21.3749	2.4844	0.6363	20.4697	0.9516	78.4490	17.1856

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***                        BURNUP CALCULATION                             ***
***                                                                       ***
***          FT05F001:PA351.@BURN.DATA(PPJX11D1)                          ***
***          FT08F001:PA351.@JOYOR.MICRO18                                ***
***          FT16F001:PA351.JOYO.FLUX1A                                   ***
*****************************************************************************

NGRP = 18    NPLN = 36
ZONES =  2
PLANE =  19

INITIAL DENSITY
 1.0957E-03  2.7610E-04  3.6851E-05  7.8513E-06  0.0000E+00  1.555RE-03
 1.3008E-05  5.1172E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU 242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  25.2398   0.1943  76.4362  17.4767

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01435  0.88545  2.43028  0.70111  1.76940  1.96393  0.52950  0.27297
SIGC     0.29516  0.34743  0.34221  0.29656  1.29799  0.38113  0.36632  0.19670
SIGF     1.71920  0.53802  2.08807  0.40455  0.47142  1.58280  0.16318  0.07627
FLUX     1.87845E+15

NUMBER  DENSITY
 1.0859E-03  7.7669E-04  3.6650E-05  7.8861E-06  2.3085E-07  1.5323E-03
 1.7514E-05  5.1063E-03  1.8994E-05  3.0701E-06  1.5709E-05  6.2056E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4733  77.1720  19.6630   2.6045   0.5604  22.9911   0.2628  76.6165  17.4517

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4733  77.1879  19.6671   2.5845   0.5605  22.9911   0.2628  76.6165  17.4487

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01590  0.88489  2.43388  0.70061  1.77147  1.96725  0.52975  0.27320
SIGC     0.29644  0.34870  0.34313  0.29767  1.30712  0.38235  0.36736  0.19733
SIGF     1.71946  0.53619  2.09075  0.40294  0.46936  1.58490  0.16238  0.07587
FLUX     1.86943E+15

NUMBER  DENSITY
 1.0778E-03  2.7721E-04  3.6211E-05  7.9341E-06  7.1919E-07  1.5115E-03
 2.1484E-05  5.0965E-03  3.5768E-05  5.7057E-06  2.9658E-05  1.1714E-06

 BURNUP   PU-239   PU-240   PU-241   PU 242    U-235    U-236    U-238  PU/PU+U
 0.8925  77.0318  19.8130   2.5881   0.5671  22.7699   0.3237  76.7767  17.4269

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8925  77.0476  19.8171   2.5681   0.5672  22.7699   0.3237  76.7767  17.4240

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01242  0.88479  2.43711  0.70044  1.77354  1.97024  0.53019  0.27346
SIGC     0.29761  0.34983  0.34395  0.29867  1.30565  0.38343  0.36829  0.19788
SIGF     1.71981  0.53486  2.09317  0.40177  0.46788  1.58681  0.16181  0.07558
FLUX     1.87207E+15

NUMBER  DENSITY
 1.0696E-03  2.7773E-04  3.5785E-05  7.9818E-06  1.1988E-06  1.4906E-03
 2.5467E-05  5.0866E-03  5.2638E-05  8.4226E-06  4.3763E-05  1.7282E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3152  76.8887  19.9651   2.5725   0.5738  22.5451   0.3852  76.9390  17.4022

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3152  76.9004  19.9681   2.5576   0.5739  22.5461   0.3852  76.9390  17.4000

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01862  0.88439  2.43997  0.70019  1.77542  1.97289  0.53041  0.27372
SIGC     0.29860  0.35085  0.34465  0.29957  1.30892  0.38440  0.36911  0.19839
SIGF     1.72001  0.53355  2.09531  0.40062  0.46649  1.58849  0.16130  0.07533
FLUX     1.82281E+15

NUMBER  DENSITY
 1.0690E-03  2.7776E-04  3.5563E-05  7.9850E-06  1.4244E-06  1.4891E-03
 2.5739E-05  5.0859E-03  5.3795E-05  8.6045E-06  4.4733E-05  1.7664E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3442  76.8898  19.9780   2.5579   0.5743  22.5308   0.3894  76.9500  17.3984

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3442  76.8976  19.9800   2.5480   0.5744  22.5308   0.3894  76.9500  17.3970

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01872  0.88438  2.44020  0.70018  1.77557  1.97319  0.53044  0.27374
SIGC     0.29869  0.35093  0.34471  0.29964  1.30918  0.38448  0.36918  0.19843
SIGF     1.72004  0.53345  2.09549  0.40054  0.46639  1.58863  0.16126  0.07531
FLUX     2.73468E+15

NUMBER  DENSITY
 1.0617E-03  2.7821E-04  3.5367E-05  8.0770E-06  1.6730E-06  1.4705E-03
 2.9269E-05  5.0770E-03  6.8791E-05  1.1046E-05  5.7343E-05  2.2638E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7212  76.7515  20.1116   2.5566   0.5303  22.3306   0.4445  77.0952  17.3784

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7212  76.7901  20.1217   2.5076   0.5806  22.3306   0.4445  77.0952  17.3712

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02041  0.88351  2.44436  0.69940  1.77784  1.97694  0.53063  0.27397
SIGC     0.30016  0.35241  0.34578  0.30094  1.31409  0.38591  0.37040  0.19917
SIGF     1.72025  0.53110  2.09858  0.39846  0.46375  1.59103  0.16024  0.07480
FLUX     2.67421E+15

NUMBER  DENSITY
 1.0515E-03  2.7885E-04  3.4614E-05  8.0846E-06  2.5082E-06  1.4444E-03
 3.4222E-05  5.0643E-03  8.9883E-05  1.4478E-05  7.5179E-05  2.9626E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2528  76.5816  20.3087   2.5209   0.5888  22.0470   0.5224  77.3019  17.3455

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2528  76.5893  20.3107   2.5111   0.5888  22.0470   0.5224  77.3019  17.3441
```

```
*********************************************************************
***                        BURNUP CALCULATION                     ***
***                                                               ***
***          FILE5F001:PA351.@BURN.DATA(PPJX1207)                 ***
***          FILE1F001:PA351.@JOYOR.MICR018                       ***
***          FILE6F001:PA351.JOYO.FLUX18                          ***
*********************************************************************

NGRP = 18    NPLN = 36
組合せ番号 =  4
PLANE =  19

INITIAL DENSITY
 1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0000E+00  1.5558E-03
 1.3008E-05  5.1172E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  23.2398   0.1943  76.4362  17.4767

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01491  0.88564  2.43125  0.70178  1.77070  1.96484  0.52973  0.27310
SIGC     0.29551  0.34776  0.34244  0.29685  1.29892  0.38143  0.36659  0.19685
SIGF     1.71940  0.53788  2.08881  0.40442  0.47128  1.58341  0.16314  0.07625
FLUX     1.88062E+15

NUMBER  DENSITY
 1.0859E-03  2.7670E-04  3.6651E-05  7.8867E-06  7.3085E-07  1.5323E-03
 1.7523E-05  5.1063E-03  1.9072E-05  5.0775E-06  1.5729E-05  6.2148E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4740  77.1717  19.6633   2.6046   0.5604  22.9906   0.2629  76.6168  17.4517

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4740  77.1876  19.6674   2.5845   0.5605  22.9906   0.2629  76.6168  17.4487

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01688  0.88521  2.43565  0.70090  1.77793  1.96890  0.53015  0.27344
SIGC     0.29708  0.34931  0.34355  0.29822  1.30384  0.38291  0.36785  0.19761
SIGF     1.71980  0.53590  2.09210  0.40768  0.46909  1.58599  0.16229  0.07583
FLUX     1.85652E+15

NUMBER  DENSITY
 1.0778E-03  2.7722E-04  3.6712E-05  7.9339E-06  7.1924E-07  1.5114E-03
 2.1472E-05  5.0966E-03  3.5692E-05  5.6912E-06  2.9584E-05  1.1689E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8904  77.0325  19.8176   2.5881   0.5670  22.7707   0.3235  76.7762  17.4270

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU 240   PU-241   PU 242    U-235    U-236    U-238  PU/PU+U
 0.8904  77.0481  19.8166   2.5681   0.5672  22.7707   0.3235  76.7762  17.4241

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01836  0.88504  2.43878  0.70074  1.77494  1.97180  0.53050  0.27369
SIGC     0.29822  0.35041  0.34434  0.29918  1.30727  0.38395  0.36875  0.19814
SIGF     1.72014  0.53463  2.09444  0.40156  0.46767  1.58785  0.16175  0.07555
FLUX     1.85939E+15

NUMBER  DENSITY
 1.0697E-03  2.7774E-04  3.5787E-05  7.9814E-06  1.1990E-06  1.4908E-03
 2.5433E-05  5.0858E-03  5.2461E-05  8.3863E-06  4.3595E-05  1.7222E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3104  76.8900  19.9639   2.5724   0.5737  22.5482   0.3847  76.9374  17.4025

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3104  76.9017  19.9670   2.5575   0.5738  22.5482   0.3847  76.9374  17.4003

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02019  0.88415  2.44325  0.69995  1.77741  1.97592  0.53073  0.27395
SIGC     0.29980  0.35200  0.34549  0.30057  1.31251  0.38549  0.37005  0.19893
SIGF     1.72039  0.53215  2.09777  0.39938  0.46490  1.59043  0.16067  0.07502
FLUX     1.82341E+15

NUMBER  DENSITY
 1.0691E-03  2.7776E-04  3.5564E-05  7.9847E-06  1.4246E-06  1.4893E-03
 2.5706E-05  5.0861E-03  5.3617E-05  8.5682E-06  4.4565E-05  1.7605E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3394  76.8911  19.9769   2.5578   0.5743  22.5328   0.3889  76.9486  17.3987

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3394  76.8989  19.9789   2.5479   0.5743  22.5328   0.3889  76.9486  17.3973

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02029  0.88414  2.44349  0.69954  1.77756  1.97613  0.53076  0.27397
SIGC     0.29989  0.35208  0.34555  0.30065  1.31277  0.38557  0.37012  0.19897
SIGF     1.72041  0.53206  2.09794  0.39930  0.46480  1.59057  0.16063  0.07500
FLUX     2.73557E+15

NUMBER  DENSITY
 1.0618E-03  2.7823E-04  3.5369E-05  8.0768E-06  1.6732E-06  1.4707E-03
 2.9247E-05  5.0771E-03  6.8639E-05  1.0989E-05  5.7180E-05  2.2585E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7166  76.7522  20.1110   2.5566   0.5802  22.3323   0.4441  77.0940  17.3789

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7166  76.7908  20.1211   2.5076   0.5805  22.3323   0.4441  77.0940  17.3717

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.02190  0.88349  2.44735  0.69937  1.77982  1.97970  0.53102  0.27424
SIGC     0.30125  0.35345  0.34653  0.30185  1.31725  0.38689  0.37124  0.19966
SIGF     1.72065  0.53004  2.10082  0.39752  0.46257  1.59282  0.15978  0.07458
FLUX     2.67104E+15

NUMBER  DENSITY
 1.0516E-03  2.7888E-04  3.4618E-05  8.0845E-06  2.5085E-06  1.4446E-03
 3.4207E-05  5.0645E-03  8.9731E-05  1.4413E-05  7.4996E-05  2.9572E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2478  76.5821  20.3082   2.5209   0.5887  22.0484   0.5221  77.2998  17.3464

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.2478  76.5898  20.3102   2.5112   0.5888  22.0484   0.5221  77.2998  17.3449
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.07272	0.88308	2.44932	0.69900	1.78086	1.98151	0.53111	0.27433
SIGC	0.30195	0.35415	0.34704	0.30246	1.31955	0.38756	0.37182	0.20000
SIGF	1.77076	0.52893	2.10728	0.39654	0.46131	1.59395	0.15929	0.07433
FLUX	2.65949E+15							

NUMBER DENSITY

1.0412E-03	2.7957E-04	3.4430E-05	8.1417E-06	2.7866E-06	1.4179E-03
3.9744E-05	5.0514E-03	1.1126E-04	1.7951E-05	9.3330E-05	3.6807E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.7925	76.3742	20.5030	2.5254	0.5973	21.7566	0.6022	77.5115	17.3191

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.7925	76.3819	20.5051	2.5157	0.5974	21.7566	0.6022	77.5115	17.3177

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.07575	0.88257	2.45492	0.69854	1.78435	1.98668	0.53165	0.27477
SIGC	0.30396	0.35612	0.34845	0.30419	1.32580	0.38944	0.37343	0.20096
SIGF	1.72179	0.52645	2.10647	0.39435	0.45855	1.59724	0.15823	0.07381
FLUX	2.61815E+15							

NUMBER DENSITY

1.0314E-03	2.8014E-04	3.4252E-05	8.2004E-06	3.0568E-06	1.3974E-03
4.4025E-05	5.0387E-03	1.1175E-04	2.1536E-05	1.1091E-04	4.3795E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.3130	76.1740	20.6905	2.5298	0.6057	21.4765	0.6790	77.7148	17.2937

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU 242	U-235	U-236	U-238	PU/PU+U
3.3130	76.2194	20.7029	2.4717	0.6060	21.4765	0.6790	77.7148	17.2852

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02550	0.88264	2.45534	0.69860	1.78467	1.98708	0.53174	0.27481
SIGC	0.30412	0.35627	0.34856	0.30437	1.32620	0.38957	0.37354	0.20102
SIGF	1.72158	0.52637	2.10679	0.39428	0.45846	1.59751	0.15819	0.07379
FLUX	2.62388E+15							

NUMBER DENSITY

1.0196E-03	2.8085E-04	3.3427E-05	8.2657E-06	4.0007E-06	1.3622E-03
4.9691E-05	5.0232E-03	1.1619E-04	2.5438E-05	1.3208E-04	5.2147E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.9372	75.9675	20.9259	2.4907	0.6159	21.1398	0.7712	77.9594	17.2566

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.9372	75.9750	20.9280	2.4810	0.6159	21.1398	0.7712	77.9594	17.2552

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02804	0.88198	2.46101	0.69801	1.78808	1.99251	0.53222	0.27521
SIGC	0.30616	0.35826	0.35000	0.30607	1.33758	0.39148	0.37518	0.20200
SIGF	1.72188	0.52572	2.11102	0.39194	0.45550	1.60083	0.15705	0.07321
FLUX	2.60333E+15							

NUMBER DENSITY

1.0091E-03	2.8147E-04	3.3287E-05	8.3243E-06	4.2537E-06	1.3353E-03
5.4692E-05	5.0095E-03	1.1785E-04	2.9105E-05	1.5100E-04	5.9684E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.4931	75.7485	21.1280	2.4986	0.6249	20.8386	0.8535	78.1782	17.2304

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
4.4931	75.7709	21.1343	2.4698	0.6250	20.8386	0.8535	78.1782	17.2262

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.02956	0.88169	2.46437	0.69774	1.79018	1.99541	0.53256	0.27548
SIGC	0.30736	0.35944	0.35084	0.30710	1.33632	0.39260	0.37614	0.20257
SIGF	1.72220	0.52224	2.11353	0.39064	0.45386	1.60281	0.15642	0.07290
FLUX	2.56733E+15							

NUMBER DENSITY

9.9965E-04	2.8202E-04	3.2898E-05	8.3771E-06	4.7509E-06	1.3109E-03
5.9212E-05	4.9967E-03	1.1753E-04	3.2469E-05	1.6834E-04	6.6602E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.0003	75.5625	21.3176	2.4867	0.6332	20.5628	0.9288	78.3787	17.2039

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
5.0003	75.5699	21.3197	2.4771	0.6333	20.5628	0.9288	78.3787	17.2025

```
*********************************************************************
***                    BURNUP CALCULATION                         ***
***                                                               ***
***          FT05F001:PA351.#BURN.DATA(PPJX0602)                  ***
***          FT08F001:PA351.#JUYOR.MICRO18                        ***
***          FT16F001:PA351.JUYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NFIN = 36
集合体番号 =  5
PLANE =  19

INITIAL DENSITY
 1.0952E-03  7.7610E-04  3.6831E-05  7.8313E-06  0.0000E+00  1.5558E-03
 1.3008E-05  5.1172E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  23.2398   0.1943  76.4367  17.4767

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01427  0.88544  2.43010  0.70111  1.76927  1.96377  0.52948  0.27295
SIGC     0.29509  0.34737  0.34217  0.29650  1.29780  0.38107  0.36627  0.19667
SIGF     1.71918  0.53807  2.08794  0.40460  0.47147  1.58270  0.16320  0.07628
FLUX     1.87832E+15

NUMBER  DENSITY
 1.0879E-03  7.7669E-04  3.6650E-05  7.8861E-06  2.3085E-07  1.5323E-03
 1.7514E-05  5.1063E-03  1.8992E-05  3.0201E-06  1.5708E-05  6.2051E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4732  77.1720  19.6630   2.6045   0.5604  22.9911   0.2628  76.6164  17.4517

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4732  77.1879  19.6671   2.5845   0.5605  22.9911   0.2628  76.6164  17.4487

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01634  0.88497  2.43474  0.70069  1.77214  1.96805  0.52991  0.27330
SIGC     0.29475  0.34900  0.34334  0.29794  1.30300  0.38263  0.36761  0.19747
SIGF     1.71959  0.53597  2.09140  0.40275  0.46914  1.58542  0.16231  0.07583
FLUX     1.85187E+15

NUMBER  DENSITY
 1.0779E-03  7.7721E-04  3.6211E-05  7.9336E-06  7.1976E-07  1.5117E-03
 2.1450E-05  5.0966E-03  3.5614E-05  5.6766E-06  2.9526E-05  1.1664E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8885  77.0331  19.8119   2.5880   0.5670  22.7720   0.3231  76.7752  17.4271

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.8885  77.0489  19.8160   2.5680   0.5671  22.7720   0.3231  76.7752  17.4242

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01761  0.88487  2.43741  0.70060  1.77388  1.97052  0.53023  0.27353
SIGC     0.29472  0.34995  0.34401  0.29876  1.30589  0.38351  0.36837  0.19792
SIGF     1.71990  0.53494  2.09340  0.40184  0.46799  1.58701  0.16186  0.07561
FLUX     1.85548E+15

NUMBER  DENSITY
 1.0697E-03  7.7773E-04  3.5785E-05  7.9810E-06  1.1990E-06  1.4909E-03
 2.5398E-05  5.0868E-03  5.2339E-05  8.3717E-06  4.3508E-05  1.7182E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3076  76.8914  19.9628   2.5722   0.5737  22.5502   0.3841  76.9360  17.4026

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3076  76.9031  19.9658   2.5573   0.5738  22.5502   0.3841  76.9360  17.4004

    4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01958  0.88398  2.44216  0.69980  1.77655  1.97490  0.53050  0.27382
SIGC     0.29940  0.35162  0.34522  0.30024  1.31144  0.38514  0.36975  0.19876
SIGF     1.72018  0.53236  2.09694  0.39956  0.46511  1.58976  0.16075  0.07505
FLUX     1.82054E+15

NUMBER  DENSITY
 1.0692E-03  7.7775E-04  3.5562E-05  7.9842E-06  1.4246E-06  1.4895E-03
 2.5670E-05  5.0861E-03  5.3494E-05  8.5536E-06  4.4476E-05  1.7564E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3366  76.8925  19.9757   2.5576   0.5742  22.5349   0.3884  76.9471  17.3988

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.3366  76.9003  19.9777   2.5477   0.5743  22.5349   0.3884  76.9471  17.3974

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.01968  0.88397  2.44240  0.69979  1.77670  1.97512  0.53053  0.27384
SIGC     0.29949  0.35170  0.34528  0.30031  1.31170  0.38572  0.36982  0.19880
SIGF     1.72020  0.53226  2.09711  0.39948  0.46500  1.58990  0.16071  0.07503
FLUX     2.73128E+15

NUMBER  DENSITY
 1.0619E-03  7.7827E-04  3.5367E-05  8.0262E-06  1.6732E-06  1.4709E-03
 2.9204E-05  5.0772E-03  6.8487E-05  1.0974E-05  5.7071E-05  2.2534E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7131  76.7540  20.1096   2.5563   0.5801  22.3345   0.4434  77.0924  17.3789

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.7131  76.7925  20.1197   2.5074   0.5804  22.3345   0.4434  77.0924  17.3717
```

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*****************************************************************
***                    BURNUP CALCULATION                     ***
***                                                           ***
***          FI05F001:PA351.@BURN.DATA(PPJX0901)              ***
***          FI08F001:PA351.@JOYOR.MICRO18                    ***
***          FI16F001:PA351.JOYO.FLUX18                       ***
*****************************************************************

NGRP = 18    NPIN = 36
燃料体型 =  A
PLANE =  19

INITIAL DENSITY
 1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0000E+00  1.5558E-03
 1.3008E-05  5.1172E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  23.2398   0.1943  76.4362  17.4767

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03133  0.88837  2.46175  0.70338  1.79702  1.99308  0.53469  0.27608
SIGC     0.30665  0.35879  0.35003  0.30607  1.32967  0.39171  0.37507  0.20163
SIGF     1.72468  0.53008  2.11172  0.39732  0.46234  1.60186  0.15961  0.07446
FLUX     1.65184E+15

NUMBER  DENSITY
 1.0873E-03  2.7670E-04  3.6656E-05  7.8814E-06  2.3104E-07  1.5348E-03
 1.7081E-05  5.1075E-03  1.6916E-05  7.5963E-06  1.3846E-05  5.5177E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4185  77.1901  19.6474   2.6028   0.5596  23.0173   0.2562  76.5969  17.4564

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4185  77.2060  19.6515   2.5828   0.5597  23.0173   0.2562  76.5969  17.4535

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03349  0.88767  2.46257  0.70776  1.79704  1.99382  0.53446  0.27600
SIGC     0.30694  0.35859  0.35078  0.30632  1.33089  0.39153  0.37533  0.20180
SIGF     1.72455  0.52908  2.11230  0.39644  0.46114  1.60229  0.15913  0.07420
FLUX     1.65851E+15

NUMBER  DENSITY
 1.0799E-03  2.7723E-04  3.6721E-05  7.9254E-06  7.2023E-07  1.5161E-03
 2.0699E-05  5.0988E-03  3.1995E-05  4.9251E-06  2.6760E-05  1.0445E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7927  77.0650  19.7845   2.5849   0.5656  22.8179   0.3115  76.7409  17.4354

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7927  77.0808  19.7885   2.5650   0.5657  22.8179   0.3115  76.7409  17.4325

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03796  0.88758  2.46562  0.70768  1.79403  1.99663  0.53483  0.27626
SIGC     0.30805  0.35965  0.35104  0.30726  1.33417  0.39254  0.37620  0.20231
SIGF     1.72497  0.52793  2.11458  0.39542  0.45986  1.60410  0.15863  0.07395
FLUX     1.66146E+15

NUMBER  DENSITY
 1.0776E-03  2.7776E-04  3.5798E-05  7.9694E-06  1.2014E-06  1.4972E-03
 2.4336E-05  5.0899E-03  4.7185E-05  7.2864E-06  3.8828E-05  1.5432E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1707  76.9371  19.9235   2.5677   0.5716  22.6159   0.3676  76.2868  17.4145

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1707  76.9488  19.9265   2.5529   0.5717  22.6159   0.3676  76.8868  17.4123

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03482  0.88715  2.46981  0.70230  1.79666  2.00051  0.53524  0.27659
SIGC     0.30954  0.36113  0.35209  0.30856  1.33889  0.39395  0.37740  0.20303
SIGF     1.72528  0.52602  2.11772  0.39374  0.45777  1.60656  0.15784  0.07356
FLUX     1.61256E+15

NUMBER  DENSITY
 1.0721E-03  2.7779E-04  3.5576E-05  7.9724E-06  1.4272E-06  1.4959E-03
 2.4582E-05  5.0893E-03  4.8224E-05  7.4465E-06  3.9688E-05  1.5774E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1965  76.9390  19.9357   2.5531   0.5721  22.6021   0.3714  76.8969  17.4110

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.1965  76.9468  19.9378   2.5432   0.5722  22.6021   0.3714  76.8969  17.4096

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03492  0.88715  2.47002  0.70229  1.79680  2.00071  0.53527  0.27661
SIGC     0.30962  0.36121  0.35215  0.30863  1.33913  0.39402  0.37747  0.20307
SIGF     1.72530  0.52594  2.11787  0.39367  0.45768  1.60669  0.15780  0.07355
FLUX     2.41933E+15

NUMBER  DENSITY
 1.0657E-03  2.7826E-04  3.5381E-05  8.0109E-06  1.6778E-06  1.4791E-03
 2.7804E-05  5.0814E-03  6.1709E-05  9.5490E-06  5.0897E-05  2.0216E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5328  76.8145  20.0577   2.5503   0.5774  22.4216   0.4215  77.0272  17.3945

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 1.5328  76.8530  20.0678   2.5015   0.5777  22.4216   0.4215  77.0272  17.3873

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.03532  0.88623  2.47153  0.70147  1.79716  2.00208  0.53505  0.27656
SIGC     0.31014  0.36176  0.35257  0.30910  1.34170  0.39458  0.37793  0.20336
SIGF     1.72517  0.52447  2.11896  0.39237  0.45596  1.60750  0.15712  0.07320
FLUX     2.38053E+15

NUMBER  DENSITY
 1.0565E-03  2.7892E-04  3.4628E-05  8.0641E-06  2.5172E-06  1.4554E-03
 3.2352E-05  5.0700E-03  8.0803E-05  1.2548E-05  6.6864E-05  2.6490E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0103  76.6635  20.2388   2.5126   0.5851  22.1646   0.4927  77.2130  17.3661

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.0103  76.6711  20.2408   2.5029   0.5852  22.1646   0.4927  77.2130  17.3647
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     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.03741  0.88581  2.47612  0.70108  1.80001  2.00632  0.53550  0.27691
SIGC     0.31179  0.36338  0.35373  0.31051  1.34631  0.39612  0.37925  0.20414
SIGF     1.72562  0.52243  2.12239  0.39057  0.45370  1.61070  0.15625  0.07277
FLUX     2.34023E+15

NUMBER  DENSITY
 1.0474E-03  2.7959E-04  3.4437E-05  8.1180E-06  2.8003E-06  1.4314E-03
 3.6935E-05  5.0584E-03  1.0010E-04  1.5598E-05  8.3103E-05  3.2910E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.4946  76.4773  20.4153   2.5146   0.5928  21.9030   0.5652  77.4022  17.3437

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.4946  76.4849  20.4173   2.5049   0.5928  21.9030   0.5652  77.4022  17.3422

     8 CYCLE

***** BURN-UP TIME *****   40.25 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.03921  0.88571  2.48019  0.70056  1.80236  2.01007  0.53579  0.27716
SIGC     0.31325  0.36481  0.35477  0.31176  1.35093  0.39750  0.38042  0.20484
SIGF     1.72596  0.52042  2.12542  0.38880  0.45143  1.61258  0.15537  0.07232
FLUX     2.33403E+15

NUMBER  DENSITY
 1.0385E-03  2.8022E-04  3.4256E-05  8.1704E-06  3.0751E-06  1.4087E-03
 4.1346E-05  5.0469E-03  1.1873E-04  1.8561E-05  9.8893E-05  3.9188E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.9639  76.2957  20.5874   2.5167   0.6003  21.6486   0.6356  77.5861  17.3224

***** COOLING TIME *****  180.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 2.9639  76.3409  20.5995   2.4590   0.6006  21.6486   0.6356  77.5861  17.3139
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*****************************************************************************
***                           BURNUP CALCULATION                          ***
***                                                                       ***
***          F105F001:PA351.@BURN.DATA(PPJ00MD1)                          ***
***          F108F001:PA351.@JOYOR.MICRO18                                ***
***          F116F001:PA351.JOYO.FLUX18                                   ***
*****************************************************************************

NGRP = 18    NPLN = 36
集合体番号 =  16
PLANE =  19

INITIAL DENSITY
 1.0952E-03  2.7610E-04  3.6831E-05  7.8313E-06  0.0000E+00  1.5558E-03
 1.3008E-05  5.1172E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000  77.3467  19.4991   2.6011   0.5531  23.2398   0.1943  75.4362  17.4767

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.03746  0.89043  2.47223  0.70505  1.80042  2.00284  0.53698  0.27741
SIGC     0.31051  0.36191  0.35755  0.30920  1.33965  0.39449  0.37792  0.20317
SIGF     1.72695  0.52852  2.11969  0.39585  0.46077  1.60835  0.15906  0.07424
FLUX     1.67377E+15

NUMBER  DENSITY
 1.0870E-03  2.7674E-04  3.6662E-05  7.8825E-06  2.3103E-07  1.5344E-03
 1.7168E-05  5.1073E-03  1.7209E-05  2.6255E-06  1.4044E-05  5.6060E-07

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4251  77.1864  19.6506   2.6033   0.5597  23.0132   0.2575  76.5996  17.4568

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.4251  77.2022  19.6546   2.5832   0.5598  23.0132   0.2575  76.5996  17.4539

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.03960  0.89011  2.47686  0.70476  1.80337  2.00712  0.53748  0.27778
SIGC     0.31217  0.36354  0.35371  0.31063  1.34475  0.39603  0.37924  0.20396
SIGF     1.72743  0.52657  2.12315  0.39413  0.45862  1.61109  0.15824  0.07383
FLUX     1.65221E+15

NUMBER  DENSITY
 1.0798E-03  2.7729E-04  3.6231E-05  7.9771E-06  7.2029E-07  1.5156E-03
 2.0813E-05  5.0986E-03  3.2307E-05  4.9323E-06  2.6424E-05  1.0544E-06

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.7988  77.0600  19.7887   2.5856   0.5657  22.8133   0.3133  76.7438  17.4368

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-235    U-238  PU/PU+U
 0.7988  77.0758  19.7928   2.5657   0.5658  22.8133   0.3133  76.7438  17.4339

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.04080  0.89014  2.47927  0.70478  1.80501  2.00934  0.53781  0.27800
SIGC     0.31304  0.36437  0.35431  0.31136  1.34728  0.39681  0.37992  0.20435
SIGF     1.72776  0.52576  2.12496  0.39341  0.45773  1.61252  0.15789  0.07365
FLUX     1.65654E+15
```

NUMBER DENSITY
1.0726E-03 2.7785E-04 3.5813E-05 7.9716E-06 1.2016E-06 1.4967E-03
2.4476E-05 5.0896E-03 4.7527E-05 7.7789E-06 3.8969E-05 1.5540E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
1.1767	76.9307	19.9288	2.5687	0.5718	22.6107	0.3698	76.8898	17.4168

***** COOLING TIME ***** 45.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
1.1767	76.9425	19.9319	2.5538	0.5718	22.6107	0.3698	76.8898	17.4146

4 CYCLE

***** BURN-UP TIME ***** 3.10 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04134	0.88915	2.48115	0.70390	1.80561	2.01106	0.53763	0.27798
SIGC	0.31370	0.36506	0.35483	0.31195	1.34981	0.39751	0.38050	0.20472
SIGF	1.72764	0.52409	2.12637	0.39195	0.45579	1.61356	0.15713	0.07327
FLUX	1.63314E+15							

NUMBER DENSITY
1.0721E-03 2.7789E-04 3.5591E-05 7.9746E-06 1.4774E-06 1.4954E-03
2.4728E-05 5.0890E-03 4.8583E-05 7.4390E-06 3.9843E-05 1.5887E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
1.2029	76.9325	19.9412	2.5540	0.5723	22.5966	0.3737	76.9001	17.4133

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
1.2029	76.9403	19.9433	2.5442	0.5723	22.5966	0.3737	76.9001	17.4118

5 CYCLE

***** BURN-UP TIME ***** 26.95 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04145	0.88915	2.48137	0.70390	1.80576	2.01127	0.53766	0.27800
SIGC	0.31378	0.36514	0.35488	0.31202	1.35005	0.39758	0.38056	0.20475
SIGF	1.72766	0.52401	2.12649	0.39187	0.45570	1.61369	0.15710	0.07325
FLUX	2.45021E+15							

NUMBER DENSITY
1.0656E-03 2.7838E-04 3.5401E-05 8.0142E-06 1.6779E-06 1.4783E-03
2.8019E-05 5.0809E-03 6.2294E-05 9.5631E-06 5.1206E-05 2.0404E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
1.5442	76.8949	20.0657	2.5517	0.5777	22.4131	0.4248	77.0325	17.3972

***** COOLING TIME ***** 150.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
1.5442	76.8435	20.0758	2.5028	0.5780	22.4131	0.4248	77.0325	17.3900

6 CYCLE

***** BURN-UP TIME ***** 39.28 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04304	0.88840	2.48522	0.70373	1.80788	2.01482	0.53756	0.27872
SIGC	0.31515	0.36650	0.35587	0.31321	1.35454	0.39890	0.38168	0.20543
SIGF	1.72789	0.52190	2.12935	0.39001	0.45334	1.61592	0.15618	0.07279
FLUX	2.39948E+15							

NUMBER DENSITY
1.0564E-03 2.7908E-04 3.4655E-05 8.0686E-06 2.5173E-06 1.4543E-03
3.2650E-05 5.0693E-03 8.1628E-05 1.2569E-05 6.7316E-05 2.6761E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.0767	76.6502	20.2498	2.5145	0.5854	22.1524	0.4973	77.2206	17.3698

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.0767	76.6578	20.2518	2.5048	0.5855	22.1524	0.4973	77.2206	17.3683

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04472	0.88828	2.48769	0.70311	1.80947	2.01710	0.53814	0.27843
SIGC	0.31694	0.36737	0.35649	0.31397	1.35723	0.39972	0.38238	0.20584
SIGF	1.72818	0.52092	2.13120	0.38914	0.45225	1.61738	0.15576	0.07259
FLUX	2.37137E+15							

NUMBER DENSITY
1.0471E-03 2.7978E-04 3.4472E-05 8.1240E-06 2.7999E-06 1.4298E-03
3.7329E-05 5.0575E-03 1.0125E-04 1.5647E-05 8.3788E-05 3.3295E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.5184	76.4595	20.4300	2.5172	0.5932	21.8861	0.5714	77.4129	17.3480

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.5184	76.4672	20.4321	2.5075	0.5933	21.8861	0.5714	77.4129	17.3465

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04560	0.88814	2.49061	0.70298	1.81138	2.01980	0.53848	0.27868
SIGC	0.31709	0.36939	0.35722	0.31487	1.36042	0.40069	0.38321	0.20633
SIGF	1.72851	0.51975	2.13339	0.38811	0.45096	1.61911	0.15527	0.07234
FLUX	2.35934E+15							

NUMBER DENSITY
1.0381E-03 2.8045E-04 3.4297E-05 8.1775E-06 3.0744E-06 1.4063E-03
4.1817E-05 5.0458E-03 1.2013E-04 1.8639E-05 9.9766E-05 3.9670E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9937	76.2741	20.6051	2.5199	0.6008	21.6279	0.6431	77.5993	17.3272

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
2.9937	76.3194	20.6173	2.4621	0.6012	21.6279	0.6431	77.5993	17.3187

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.04713	0.88791	2.49387	0.70276	1.81341	2.02281	0.53882	0.27892
SIGC	0.31827	0.36953	0.35805	0.31587	1.36399	0.40177	0.38414	0.20688
SIGF	1.72886	0.51837	2.13582	0.38689	0.44942	1.62104	0.15467	0.07204
FLUX	2.35496E+15							

NUMBER DENSITY
1.0275E-03 2.8123E-04 3.3476E-05 8.2393E-06 4.0261E-06 1.3784E-03
4.7138E-05 5.0318E-03 1.4263E-04 2.2243E-05 1.1895E-04 4.7263E-06

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.5622	76.0856	20.8254	2.4789	0.6101	21.3180	0.7291	77.8233	17.2960

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
3.5622	76.0930	20.8274	2.4693	0.6102	21.3180	0.7291	77.8233	17.2946

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*****************************************************************************
***                        BURNUP CALCULATION                             ***
***                                      JOU                              ***
***             F105F001:PA351.@BURN.DATA(NFJ****)                        ***
***             F108F001:PA351.@JOYOR.MICRO18                             ***
***             F116F001:PA351.JOYO.FLUX18                                ***
*****************************************************************************
```

NGRP = 18   NPIN = 36
集合体番号 = 77
PLANE = 19

INITIAL DENSITY

0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.4332E-05
0.0000E+00	8.0863E-03	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0000	0.0000	0.0000	0.0000	0.0000	0.3000	0.0000	99.7000	0.0000

1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION   (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.50388	1.01349	3.16969	0.76901	2.30457	2.65410	0.67549	0.31906
SIGC	0.59539	0.64096	0.52238	0.51426	2.01496	0.61991	0.58089	0.27592
SIGF	1.90849	0.37257	2.64731	0.25475	0.28961	2.03418	0.09460	0.04314

NUMBER DENSITY

6.6819E-06	5.7374E-09	3.3697E-12	1.1590E-15	4.6631E-15	2.4138E-05
4.5136E-08	8.0785E-03	1.4831E-07	1.0406E-06	1.8409E-08	5.8784E-15

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0149	99.9142	0.0858	0.0001	0.0000	0.2979	0.0006	99.7016	0.0825

***** COOLING TIME *****   60.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0149	99.9142	0.0858	0.0000	0.0000	0.2979	0.0006	99.7016	0.0825

2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION   (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.50253	1.01229	3.16936	0.76861	2.30432	2.65380	0.67507	0.3191[illegible]
SIGC	0.59493	0.64009	0.52232	0.51413	2.01503	0.61979	0.58059	0.27606
SIGF	1.90760	0.37220	2.64705	0.25448	0.28930	2.03401	0.09448	0.04309

NUMBER DENSITY

1.2533E-05	2.0691E-08	2.3813E-11	1.6531E-14	9.4003E-14	2.3969E-05
8.4631E-08	8.0717E-03	2.7830E-07	1.9647E-06	6.6502E-08	8.3879E-14

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0285	99.8350	0.1648	0.0002	0.0000	0.2961	0.0010	99.7029	0.1548

***** COOLING TIME *****   60.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0285	99.8350	0.1648	0.0002	0.0000	0.2961	0.0010	99.7029	0.1548

3 CYCLE

***** BURN-UP TIME *****   43.77 DAYS

MICRO CROSS SECTION   (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.50049	1.01108	3.16761	0.76815	2.30303	2.65216	0.67443	0.31910
SIGC	0.59397	0.63879	0.52191	0.51357	2.01361	0.61920	0.57991	0.27598
SIGF	1.90652	0.37229	2.64570	0.25458	0.28942	2.03296	0.09453	0.04312

NUMBER DENSITY

1.8465E-05	4.5377E-08	7.7928E-11	8.1844E-14	5.4673E-13	2.3797E-05
1.7455E-07	8.0646E-03	4.1008E-07	2.8996E-06	1.4609E-07	4.1570E-13

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0426	99.7545	0.2451	0.0004	0.0000	0.2942	0.0015	99.7043	0.2283

***** COOLING TIME *****   45.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0426	99.7545	0.2451	0.0004	0.0000	0.2942	0.0015	99.7043	0.2283

4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION   (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.50101	1.01026	3.17016	0.76784	2.30474	2.65453	0.67452	0.31936
SIGC	0.59469	0.63917	0.52255	0.51431	2.01659	0.62003	0.58047	0.27646
SIGF	1.90632	0.37109	2.64760	0.25352	0.28815	2.03450	0.09405	0.04289

NUMBER DENSITY

1.8883E-05	4.7477E-08	8.3023E-11	8.9852E-14	1.0413E-12	2.3784E-05
1.2736E-07	8.0641E-03	4.1938E-07	2.9573E-06	1.5292E-07	4.5644E-13

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0435	99.7489	0.2508	0.0004	0.0000	0.2941	0.0016	99.7044	0.2335

***** COOLING TIME *****   30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0435	99.7489	0.2508	0.0004	0.0000	0.2941	0.0016	99.7044	0.2335

5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION   (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.50087	1.01018	3.17004	0.76781	2.30466	2.65443	0.67448	0.31935
SIGC	0.59462	0.63908	0.52252	0.51428	2.01650	0.61999	0.58043	0.27646
SIGF	1.90625	0.37109	2.64752	0.25353	0.28816	2.03443	0.09405	0.04289

NUMBER DENSITY

2.4329E-05	7.9360E-08	1.8072E-10	2.5404E-13	1.8084E-12	2.3626E-05
1.6398E-07	8.0575E-03	5.4038E-07	3.8221E-06	2.5578E-07	1.2912E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0569	99.6742	0.3251	0.0007	0.0000	0.2924	0.0020	99.7056	0.3011

***** COOLING TIME *****   150.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0569	99.6742	0.3251	0.0007	0.0000	0.2924	0.0020	99.7056	0.3011

6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION   (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.40708	0.98055	3.03572	0.75182	2.20574	2.52908	0.64575	0.31006
SIGC	0.53907	0.58404	0.48996	0.47509	1.88969	0.57692	0.54121	0.26209
SIGF	1.86801	0.39651	2.54576	0.27673	0.31604	1.95216	0.10454	0.04797

NUMBER DENSITY

3.2112E-05	1.3662E-07	4.0731E-10	7.7061E-13	6.7476E-12	2.3399E-05
2.1522E-07	8.0480E-03	7.1550E-07	5.2851E-06	4.5579E-07	3.9891E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0796	99.5751	0.4236	0.0013	0.0000	0.2899	0.0027	99.7075	0.3979

***** COOLING TIME *****   30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0796	99.5751	0.4236	0.0013	0.0000	0.2899	0.0027	99.7075	0.3979

7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION   (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.40632	0.97932	3.03624	0.75123	2.20587	2.52956	0.64540	0.31014
SIGC	0.53899	0.58366	0.49011	0.47523	1.89073	0.57710	0.54121	0.26233

```
SIGF      1.86732  0.39566  2.54613  0.27600  0.31514  1.95246  0.10419  0.04781

NUMBER  DENSITY
 4.0210E-05  2.1365E-07  7.9778E-10  1.9037E-12  1.1412E-11  2.3163E-05
 2.6843E-07  8.0380E-03  8.9771E-07  6.8154E-06  7.2529E-07  9.9096E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.1040  99.4696   0.5285   0.0020   0.0000   0.2873   0.0033  99.7094   0.4990

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.1040  99.4696   0.5285   0.0020   0.0000   0.2873   0.0033  99.7094   0.4990

     8 CYCLE

***** BURN-UP TIME *****   40.25 DAYS

MICRO CROSS SECTION      (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.40592  0.97846  3.03722  0.75097  2.20657  2.53048  0.64527  0.31031
SIGC      0.53910  0.58342  0.49017  0.47551  1.89206  0.57740  0.54132  0.76261
SIGF      1.86682  0.39504  2.54685  0.27546  0.31450  1.95307  0.10395  0.04769

NUMBER  DENSITY
 4.7960E-05  3.0430E-07  1.3541E-09  3.8807E-12  1.9995E-11  2.2937E-05
 3.1918E-07  8.0283E-03  1.0770E-06  8.2978E-06  1.0430E-06  2.0243E-11

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.1284  99.3667   0.6305   0.0028   0.0000   0.2849   0.0040  99.7112   0.5959

***** COOLING TIME *****  180.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.1284  99.3668   0.6305   0.0027   0.0000   0.2849   0.0040  99.7112   0.5959

     9 CYCLE

***** BURN-UP TIME *****   48.83 DAYS

MICRO CROSS SECTION      (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.40449  0.97737  3.03639  0.75052  2.20588  2.52970  0.64479  0.31031
SIGC      0.53852  0.58255  0.49019  0.47525  1.89160  0.57713  0.54093  0.76266
SIGF      1.86597  0.39481  2.54671  0.27527  0.31428  1.95257  0.10386  0.04765

NUMBER  DENSITY
 5.7749E-05  4.3506E-07  2.2839E-09  7.8980E-12  6.2591E-11  2.2667E-05
 3.7989E-07  8.0166E-03  1.2811E-06  1.0088E-05  1.5025E-06  4.1299E-11

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.1587  99.2419   0.7547   0.0040   0.0000   0.2819   0.0047  99.7133   0.7124

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.1587  99.2419   0.7542   0.0039   0.0000   0.2819   0.0047  99.7133   0.7124

    10 CYCLE

***** BURN-UP TIME *****   44.44 DAYS

MICRO CROSS SECTION      (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.40408  0.97643  3.03750  0.75023  2.20665  2.53073  0.64465  0.31050
SIGC      0.53865  0.58252  0.49047  0.47557  1.89310  0.57747  0.54107  0.76297
SIGF      1.86543  0.39411  2.54707  0.27466  0.31356  1.95326  0.10359  0.04753

NUMBER  DENSITY
 6.5590E-05  5.7188E-07  3.4461E-09  1.3669E-11  8.7411E-11  2.2426E-05
 4.3362E-07  8.0060E-03  1.4668E-06  1.1681E-05  1.9843E-06  7.1559E-11

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.1866  99.1793   0.8655   0.0052   0.0000   0.2793   0.0054  99.7153   0.8162

***** COOLING TIME *****   90.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.1866  99.1793   0.8655   0.0052   0.0000   0.2793   0.0054  99.7153   0.8162
```

```
    11 CYCLE

***** BURN-UP TIME *****   41.65 DAYS

MICRO CROSS SECTION      (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.40445  0.97577  3.03959  0.75006  2.20815  2.53269  0.64475  0.31074
SIGC      0.53921  0.58257  0.49100  0.47619  1.89553  0.57814  0.54152  0.76338
SIGF      1.86523  0.39320  2.54859  0.27387  0.31262  1.95454  0.10323  0.04736

NUMBER  DENSITY
 7.3111E-05  7.1574E-07  4.7966E-09  2.1411E-11  1.4927E-10  2.2204E-05
 4.8307E-07  7.9962E-03  1.6383E-06  1.3158E-05  2.4914E-06  1.1221E-10

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.2132  99.0241   0.9694   0.0065   0.0000   0.2769   0.0060  99.7171   0.9123

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.2132  99.0241   0.9694   0.0065   0.0000   0.2769   0.0060  99.7171   0.9123
```

```
**********************************************************************
***                     BURNUP CALCULATION                         ***
***                                III                             ***
***          FT05F001:PA351.@BURN.DATA(NFJ0072)                    ***
***          FT08F001:PA351.@JOYOR.MICRO18                         ***
***          FT16F001:PA351.JOYO.FLUX18                            ***
**********************************************************************

NGRP = 18     NPLN = 36
集合体番号 =  72
PLANE =  19

INITIAL DENSITY
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  2.4332E-05
 0.0000E+00  8.0863E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000   0.0000   0.0000   0.0000   0.0000   0.3000   0.0000  99.7000   0.0000

     2 CYCLE

***** BURN-UP TIME *****   43.06 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.61519  1.05078  3.32713  0.78905  2.42135  2.80105  0.70997  0.33006
SIGC     0.66080  0.70606  0.56048  0.56019  2.16270  0.67036  0.67699  0.79254
SIGF     1.95439  0.34422  2.76665  0.22886  0.25865  2.13070  0.08298  0.03752

NUMBER DENSITY
 6.1199E-06  5.0405E-09  7.8204E-12  8.9932E-16  3.5082E-15  2.4155E-05
 4.7210E-08  8.0794E-03  1.3434E-07  7.8627E-07  1.4921E-08  4.4447E-15

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0115  99.9176   0.0823   0.0000   0.0000   0.2981   0.0005  99.7014   0.0755

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0115  99.9176   0.0823   0.0000   0.0000   0.2981   0.0005  99.7014   0.0755

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.61430  1.04930  3.32733  0.78876  2.42151  2.80124  0.70969  0.33018
SIGC     0.66058  0.70544  0.56055  0.56071  2.16321  0.67040  0.67685  0.79271
SIGF     1.95371  0.34386  2.76679  0.22855  0.25830  2.13085  0.08284  0.03746

NUMBER DENSITY
 1.2204E-05  2.0552E-08  2.3962E-11  1.6392E-14  8.6937E-14  2.3979E-05
 8.4103E-08  8.0724E-03  2.6792E-07  1.5719E-06  6.0926E-08  8.1046E-14

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0234  99.8317   0.1681   0.0002   0.0000   0.2962   0.0010  99.7028   0.1508

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0234  99.8317   0.1681   0.0002   0.0000   0.2962   0.0010  99.7028   0.1508

     4 CYCLE

***** BURN-UP TIME *****    3.10 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.61121  1.04756  3.32447  0.78808  2.41939  2.79857  0.70873  0.33007
SIGC     0.65909  0.70349  0.55987  0.55932  2.16082  0.66945  0.62578  0.79255
SIGF     1.95213  0.34408  2.76460  0.22876  0.25856  2.12912  0.08294  0.03752

NUMBER DENSITY
 1.7626E-05  2.7056E-08  2.6562E-11  1.8977E-14  2.3976E-13  2.3967E-05
 8.7039E-08  8.0718E-03  2.7739E-07  1.6180E-06  6.5416E-08  9.3919E-14

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0242  99.8254   0.1744   0.0002   0.0000   0.2960   0.0011  99.7029   0.1560
```



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***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0242  99.8254   0.1744   0.0002   0.0000   0.2960   0.0011  99.7029   0.1560

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.50190  1.01106  3.17109  0.76845  2.30581  2.65542  0.67498  0.31953
SIGC     0.59511  0.63960  0.52275  0.51461  2.01720  0.62030  0.58075  0.27654
SIGF     1.90679  0.37146  2.64834  0.25384  0.28862  2.03512  0.09424  0.04299

NUMBER DENSITY
 1.6339E-05  3.6515E-08  5.7152E-11  5.4256E-14  4.8500E-13  2.3859E-05
 1.1204E-07  8.0675E-03  3.5985E-07  2.1952E-06  1.1197E-07  2.7309E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0329  99.7768   0.2230   0.0003   0.0000   0.2949   0.0014  99.7038   0.2020

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0329  99.7768   0.2230   0.0003   0.0000   0.2949   0.0014  99.7038   0.2020

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.50176  1.01097  3.17098  0.76842  2.30573  2.65532  0.67494  0.31953
SIGC     0.59504  0.63951  0.52272  0.51457  2.01711  0.62026  0.58070  0.27653
SIGF     1.90672  0.37146  2.64825  0.25384  0.28862  2.03506  0.09424  0.04299

NUMBER DENSITY
 2.4410E-05  8.2563E-08  1.8752E-10  2.6799E-13  2.1660E-12  2.3625E-05
 1.6625E-07  8.0579E-03  5.3892E-07  3.4755E-06  2.5483E-07  1.3597E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0526  99.6691   0.3302   0.0008   0.0000   0.2923   0.0021  99.7056   0.3021

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0526  99.6691   0.3302   0.0008   0.0000   0.2923   0.0021  99.7056   0.3021

     7 CYCLE

***** BURN-UP TIME *****   40.96 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.50311  1.01069  3.17445  0.76848  2.30830  2.65856  0.67537  0.31988
SIGC     0.59617  0.64031  0.52358  0.51559  2.02079  0.67136  0.58155  0.27708
SIGF     1.90694  0.37038  2.65087  0.25289  0.28750  2.03719  0.09382  0.04280

NUMBER DENSITY
 3.2557E-05  1.4413E-07  4.4640E-10  8.5662E-13  4.4964E-12  2.3389E-05
 2.2085E-07  8.0482E-03  7.1957E-07  4.7657E-06  4.5867E-07  4.3530E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0733  99.5579   0.4408   0.0014   0.0000   0.2898   0.0027  99.7075   0.4034

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0733  99.5579   0.4408   0.0014   0.0000   0.2898   0.0027  99.7075   0.4034

     8 CYCLE

***** BURN-UP TIME *****   40.25 DAYS

MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.40896  0.98087  3.03967  0.75238  2.20898  2.53278  0.64650  0.31055
SIGC     0.54042  0.58504  0.49091  0.47625  1.89358  0.57814  0.54218  0.26767
```

SIGF 1.86853 0.39583 2.54876 0.27617 0.31541 1.95464 0.10431 0.04788

NUMBER DENSITY
4.0547E-05 2.2110E-07 8.4877E-10 7.0623E-12 9.5184E-12 2.3156E-05
2.7336E-07 8.0382E-03 8.9945E-07 6.2846E-06 7.2751E-07 1.0646E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0975	99.4556	0.5423	0.0021	0.0000	0.2872	0.0034	99.7094	0.5032

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0975	99.4557	0.5423	0.0020	0.0000	0.2872	0.0034	99.7094	0.5032

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.40856	0.98000	3.04067	0.75212	2.20970	2.53371	0.64637	0.31072
SIGC	0.54053	0.58460	0.49117	0.47654	1.89493	0.57845	0.54230	0.26296
SIGF	1.86803	0.39520	2.54950	0.27558	0.31477	1.95526	0.10407	0.04776

NUMBER DENSITY
4.9743E-05 3.3417E-07 1.5548E-09 4.7064E-12 3.6584E-11 2.2882E-05
3.3492E-07 8.0265E-03 1.1108E-06 8.0771E-06 1.1229E-06 2.4481E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1271	99.3324	0.6645	0.0031	0.0000	0.2843	0.0042	99.7116	0.6207

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1271	99.3324	0.6645	0.0031	0.0000	0.2843	0.0042	99.7116	0.6207

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.40762	0.97901	3.04069	0.75174	2.20965	2.53373	0.64605	0.31080
SIGC	0.54027	0.58424	0.49119	0.47653	1.89537	0.57845	0.54215	0.26311
SIGF	1.86735	0.39477	2.54950	0.27521	0.31433	1.95528	0.10390	0.04769

NUMBER DENSITY
5.8406E-05 4.5718E-07 2.4887E-09 8.8303E-12 5.3893E-11 2.2636E-05
3.9020E-07 8.0158E-03 1.3011E-06 9.7065E-06 1.5545E-06 4.6067E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1549	99.2191	0.7766	0.0042	0.0000	0.2816	0.0049	99.7135	0.7269

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1549	99.2192	0.7766	0.0042	0.0000	0.2816	0.0049	99.7135	0.7269

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.40696	0.97782	3.04150	0.75123	2.21006	2.53449	0.64576	0.31092
SIGC	0.54028	0.58390	0.49141	0.47676	1.89664	0.57872	0.54221	0.26340
SIGF	1.86668	0.39391	2.55009	0.27447	0.31343	1.95577	0.10355	0.04752

NUMBER DENSITY
6.6305E-05 5.9063E-07 3.6298E-09 1.4731E-11 9.9023E-11 2.2405E-05
4.4167E-07 8.0057E-03 1.4789E-06 1.1242E-05 2.0236E-06 7.7002E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1818	99.1117	0.8829	0.0054	0.0000	0.2791	0.0055	99.7155	0.8264

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1818	99.1117	0.8829	0.0054	0.0000	0.2791	0.0055	99.7155	0.8264

PNC N 9410 90-036

```
**********************************************************************
***                      BURNUP CALCULATION                        ***
***                                                                ***
***          FT05F001:PA351.BBURN.DATA(NFJ44044)                   ***
***          FT08F001:PA351.BJOYOR.MICRO18                         ***
***          FT16F001:PA351.JOYO.FLUX18                            ***
**********************************************************************

NGRP = 18    NPLN = 36
集合体番号 = 104
PLANE = 19

INITIAL DENSITY
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  2.4332E-05
 0.0000E+00  8.0863E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000   0.0000   0.0000   0.0000   0.0000   0.3000   0.0000  99.7000   0.0000

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      3.14871  1.27628  4.02178  0.91555  2.95999  3.45047  0.88477  0.38027
SIGC      0.95929  1.01388  0.72662  0.76317  2.78857  0.89147  0.83392  0.35827
SIGF      2.18942  0.26240  3.29515  0.15238  0.17142  2.55899  0.05086  0.02200

NUMBER  DENSITY
 4.9021E-06  3.8253E-09  2.0071E-12  5.4186E-16  2.7775E-15  2.4190E-05
 3.6662E-08  8.0811E-03  1.0538E-07  3.0066E-07  8.7359E-09  2.4589E-15

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0051  99.9220   0.0780   0.0000   0.0000   0.2984   0.0005  99.7011   0.0605

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0051  99.9220   0.0780   0.0000   0.0000   0.2984   0.0005  99.7011   0.0605

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      3.14737  1.27749  4.01596  0.91406  2.95560  3.44504  0.88274  0.38004
SIGC      0.95621  1.00972  0.72526  0.76131  2.78373  0.88953  0.83173  0.35795
SIGF      2.18616  0.26277  3.29070  0.15275  0.17187  2.55550  0.05101  0.02209

NUMBER  DENSITY
 9.2145E-06  1.3831E-08  1.4216E-11  7.7465E-15  5.6095E-14  2.4065E-05
 6.8866E-08  8.0764E-03  1.9813E-07  5.6647E-07  3.1663E-08  3.5199E-14

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0098  99.8509   0.1499   0.0002   0.0000   0.2971   0.0009  99.7021   0.1138

***** COOLING TIME *****   60.0 DAYS
```

BURNUP	PU-239	PU 240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0098	99.8500	0.1499	0.0002	0.0000	0.2971	0.0009	99.7021	0.1138

3 CYCLE

***** BURN-UP TIME ***** 43.72 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU 241	PU 242	AM-241	U-235	U-236	U-238
SIGA	3.13441	1.26810	4.00780	0.91715	2.94936	3.43742	0.88016	0.37962
SIGC	0.95219	1.00468	0.72334	0.75877	2.77675	0.88686	0.82888	0.35738
SIGF	2.18223	0.26342	3.28446	0.15338	0.17260	2.55055	0.05128	0.02223

NUMBER DENSITY

1.3595E-05 3.0349E-08 4.6519E-11 3.8356E-14 3.2673E-13 2.3937E-05
1.0147E-07 8.0717E-03 7.9276E-07 8.3212E-07 6.9630E-08 1.7445E-13

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0147	99.7769	0.2227	0.0003	0.0000	0.2957	0.0013	99.7031	0.1680

***** COOLING TIME ***** 45.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0147	99.7769	0.2227	0.0003	0.0000	0.2957	0.0013	99.7031	0.1680

4 CYCLE

***** BURN-UP TIME ***** 3.10 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU 242	AM-241	U-235	U-236	U-238
SIGA	3.01439	1.21589	3.85361	0.88771	2.82908	3.29324	0.84051	0.36835
SIGC	0.88564	0.93599	0.68657	0.71382	2.63902	0.83786	0.78283	0.34300
SIGF	2.12875	0.27991	3.16709	0.16889	0.19006	2.45538	0.05768	0.02535

NUMBER DENSITY

1.3902E-05 3.1760E-08 4.9575E-11 4.2115E-14 6.2707E-13 2.3924E-05
1.0379E-07 8.0713E-03 7.9907E-07 8.5521E-07 7.3036E-08 1.9205E-13

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0151	99.7717	0.2279	0.0004	0.0000	0.2956	0.0013	99.7031	0.1718

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0151	99.7717	0.2279	0.0004	0.0000	0.2956	0.0013	99.7031	0.1718

5 CYCLE

***** BURN-UP TIME ***** 76.95 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU 242	AM-241	U-235	U-236	U-238
SIGA	3.01393	1.21564	3.85334	0.88760	2.82872	3.29279	0.84036	0.36833
SIGC	0.88540	0.93569	0.68641	0.71367	2.63861	0.83771	0.78266	0.34297
SIGF	2.12852	0.27995	3.16673	0.16893	0.19011	2.45509	0.05770	0.02536

NUMBER DENSITY

1.8031E-05 5.3040E-08 1.0762E-10 1.2005E-13 1.0810E-12 2.3808E-05
1.3599E-07 8.0667E-03 3.8810E-07 4.1553E-06 1.2442E-07 5.5232E-13

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0206	99.7062	0.2933	0.0006	0.0000	0.2943	0.0017	99.7041	0.2230

***** COOLING TIME ***** 150.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU 242	U 235	U-236	U-238	PU/PU+U
0.0206	99.7062	0.2933	0.0006	0.0000	0.2943	0.0017	99.7041	0.2230

6 CYCLE

***** BURN-UP TIME ***** 39.28 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.01778	1.21437	3.85355	0.88740	2.82970	3.29319	0.84007	0.36854
SIGC	0.88513	0.93467	0.68652	0.71369	2.63929	0.83777	0.78244	0.34321
SIGF	2.12765	0.27970	3.16792	0.16871	0.18990	2.45542	0.05762	0.02533

NUMBER DENSITY

2.3881E-05 9.2765E-08 2.4717E-10 3.6768E-13 4.0397E-12 2.3639E-05
1.7675E-07 8.0603E-03 5.1425E-07 1.5936E-06 2.2044E-07 1.6982E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0287	99.6121	0.3869	0.0010	0.0000	0.2924	0.0022	99.7054	0.2957

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0287	99.6121	0.3869	0.0010	0.0000	0.2924	0.0022	99.7054	0.2957

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.90854	1.16976	3.71818	0.85705	2.72372	3.16661	0.80565	0.35856
SIGC	0.82701	0.87501	0.65418	0.67422	2.51789	0.79475	0.74217	0.33039
SIGF	2.08154	0.29476	3.06400	0.18283	0.20583	2.37185	0.06348	0.02827

NUMBER DENSITY

3.0190E-05 1.4678E-07 4.9237E-10 9.3297E-13 6.9016E-12 2.3457E-05
2.2204E-07 8.0532E-03 6.5069E-07 2.1469E-06 3.5729E-07 4.3564E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0389	99.5146	0.4838	0.0016	0.0000	0.2904	0.0027	99.7068	0.3742

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0389	99.5146	0.4838	0.0016	0.0000	0.2904	0.0027	99.7068	0.3742

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.90294	1.16641	3.71316	0.85576	2.71998	3.16193	0.80388	0.35839
SIGC	0.82431	0.87136	0.65300	0.67263	2.51376	0.79308	0.74027	0.33015
SIGF	2.07862	0.29505	3.06016	0.18313	0.20621	2.36885	0.06361	0.02825

NUMBER DENSITY

3.6217E-05 2.1042E-07 8.4272E-10 1.9270E-12 1.2238E-11 2.3783E-05
2.6518E-07 8.0465E-03 7.8099E-07 2.6766E-06 5.1917E-07 9.0324E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0490	99.4201	0.5776	0.0023	0.0000	0.2885	0.0033	99.7082	0.4494

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0490	99.4202	0.5776	0.0023	0.0000	0.2885	0.0033	99.7082	0.4494

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.89687	1.16294	3.70733	0.85433	2.71556	3.15648	0.80194	0.35815
SIGC	0.82132	0.86750	0.65163	0.67081	2.50889	0.79116	0.73817	0.32981
SIGF	2.07554	0.29544	3.05570	0.18351	0.20668	2.36532	0.06378	0.02834

NUMBER DENSITY

4.3470E-05 3.0277E-07 1.4371E-09 3.9627E-12 3.8868E-11 2.3073E-05
3.1695E-07 8.0382E-03 9.3780E-07 3.3208E-06 7.5494E-07 1.8634E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0618	99.3051	0.6917	0.0033	0.0000	0.2862	0.0039	99.7099	0.5401

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0618	99.3051	0.6917	0.0033	0.0000	0.2862	0.0039	99.7099	0.5401

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.89017	1.15890	3.70174	0.85264	2.71090	3.15080	0.79979	0.35791
SIGC	0.81810	0.86329	0.65020	0.66897	2.50397	0.78916	0.73593	0.32951
SIGF	2.07206	0.29561	3.05103	0.18377	0.20693	2.36164	0.06386	0.02840

NUMBER DENSITY

5.0068L-05 4.0204L-07 2.1914E-09 6.9856E-12 5.4618E-11 2.2883E-05
3.6594E-07 8.0306E-03 1.0806E-06 3.9185E-06 1.0095E-06 3.2906E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0741	99.1991	0.7965	0.0043	0.0000	0.2841	0.0045	99.7113	0.6228

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0741	99.1992	0.7965	0.0043	0.0300	0.2841	0.0045	99.7113	0.6228

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.88506	1.15580	3.69683	0.85147	2.70762	3.14669	0.79820	0.35779
SIGC	0.81569	0.85999	0.64917	0.66754	2.50041	0.78769	0.73423	0.32933
SIGF	2.06937	0.29581	3.04766	0.18393	0.20721	2.35900	0.06396	0.02846

NUMBER DENSITY

5.6072E-05 5.0500E-07 3.0632E-09 1.1007E-11 9.4175E-11 2.2710E-05
4.0654E-07 8.0236E-03 1.2104E-06 4.4697E-06 1.2740E-06 5.1919E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0857	99.1021	0.8925	0.0054	0.0000	0.2822	0.0051	99.7127	0.6982

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0857	99.1021	0.8925	0.0054	0.0000	0.2822	0.0051	99.7127	0.6982

****
*** BURNUP CALCULATION ***
*** 664 ***
*** F10SF001:PASS1.@BURN.DATA(NIJ) ***
*** F10RF001:PASS1.@JUYUR.MIENU18 ***
*** F11GF001:PASS1.JUYU.F11DAT ***
****

NGRP = 18 NPIN = 36
燃料棒 = 142
PLANE = 19

INITIAL DENSITY

0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 2.4532E-05
0.0000E+00 8.0463E-03 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0000	0.0000	0.0000	0.0000	0.0000	0.3000	0.0000	99.7000	0.0000

1 CYCLE

***** BURN-UP TIME ***** 47.84 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.78218	1.61553	4.76095	1.09289	3.55176	4.14081	1.09667	0.43101
SIGC	1.29471	1.39568	0.90157	0.98297	3.47367	1.12584	1.06174	0.41679
SIGF	2.48746	0.21985	3.85943	0.10992	0.12759	3.01497	0.03543	0.01421

NUMBER DENSITY

5.1789E-06 1.8063E-09 7.1553E-13 1.3130E-16 9.9018E-16 2.4258E-05
2.5419E-08 8.0830E-03 6.8131E-08 1.0409E-07 3.4776E-09 5.6273E-16

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0022	99.9423	0.0577	0.0000	0.0000	0.2990	0.0003	99.7007	0.0386

***** COOLING TIME ***** 60.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0022	99.9423	0.0577	0.0000	0.0000	0.2990	0.0003	99.7007	0.0386

2 CYCLE

***** BURN-UP TIME ***** 43.00 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.77016	1.60805	4.74929	1.08980	3.54222	4.12995	1.09275	0.43042
SIGC	1.28876	1.38752	0.89879	0.97920	3.41386	1.12201	1.05705	0.41605
SIGF	2.48140	0.22053	3.85050	0.11060	0.12836	3.00794	0.03570	0.01436

NUMBER DENSITY

5.8896E-06 6.5400E-09 5.0764E-12 1.8795E-15 2.0029E-14 2.4155E-05
4.7783E-08 8.0801E-03 1.2822E-07 1.9657E-07 1.2594E-08 8.0691E-15

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0042	99.8890	0.1109	0.0001	0.0000	0.2981	0.0006	99.7013	0.0727

***** COOLING TIME ***** 60.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0042	99.8890	0.1109	0.0001	0.0000	0.2981	0.0006	99.7013	0.0727

3 CYCLE

***** BURN-UP TIME ***** 43.72 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.75714	1.60026	4.73604	1.08640	3.53189	4.11760	1.08847	0.47968
SIGC	1.28221	1.37893	0.89567	0.97502	3.40264	1.11770	1.05247	0.41515
SIGF	2.47494	0.22132	3.84037	0.11138	0.12924	2.99990	0.03600	0.01453

NUMBER DENSITY

8.6980E-06 1.4362E-08 1.4626E-11 9.3270E-15 1.1682E-13 2.4071E-05
7.0497E-08 8.0771E-03 1.8935E-07 2.8903E-07 2.7730E-08 4.0041E-14

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0062	99.8350	0.1648	0.0002	0.0000	0.2971	0.0009	99.7020	0.1074

***** COOLING TIME ***** 45.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0062	99.8350	0.1648	0.0002	0.0000	0.2971	0.0009	99.7020	0.1074

4 CYCLE

***** BURN-UP TIME ***** 3.10 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.62928	1.53482	4.58420	1.05087	3.41063	3.97566	1.04545	0.41886
SIGC	1.21410	1.30432	0.85970	0.93033	3.27183	1.06963	1.00604	0.40261
SIGF	2.41518	0.22050	3.72451	0.12053	0.13880	2.90603	0.03941	0.01625

NUMBER DENSITY

8.9039E-06 1.5040E-08 1.7733E-11 1.0256E-14 7.2240E-13 2.4065E-05
7.2143E-08 8.0769E-03 1.9386E-07 2.8903E-07 2.9192E-08 4.4153E-14

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0063	99.8312	0.1686	0.0002	0.0000	0.2971	0.0009	99.7020	0.1100

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0063	99.8312	0.1686	0.0002	0.0000	0.2971	0.0009	99.7020	0.1100

5 CYCLE

***** BURN-UP TIME ***** 26.95 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.62845	1.53433	4.58336	1.05065	3.40998	3.97487	1.04518	0.41881
SIGC	1.21368	1.30377	0.85950	0.93006	3.27112	1.06935	1.00575	0.40255
SIGF	2.41477	0.23055	3.72386	0.12059	0.13886	2.90552	0.03943	0.01626

NUMBER DENSITY

1.1611E-05 2.5449E-08 3.9213E-11 2.9824E-14 3.8807E-13 2.3984E-05

9.3723E-08 8.0740E-03 2.5271E-07 3.9299E-07 4.7872E-08 1.2911E-13

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0086	99.7809	0.2187	0.0003	0.0000	0.2962	0.0012	99.7027	0.1435

***** COOLING TIME ***** 150.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0086	99.7810	0.2187	0.0003	0.0000	0.2962	0.0012	99.7027	0.1435

6 CYCLE

***** BURN-UP TIME ***** 39.28 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.62439	1.53128	4.58052	1.04975	3.40794	3.97225	1.04392	0.41881
SIGC	1.21186	1.30055	0.84885	0.92899	3.26885	1.06834	1.00442	0.40250
SIGF	2.41253	0.23073	3.72167	0.12076	0.13910	2.90390	0.03951	0.01631

NUMBER DENSITY

1.5455E-05 4.4978E-08 9.1484E-11 9.3147E-14 1.4717E-12 2.3870E-05
1.2433E-07 8.0699E-03 3.3827E-07 5.4311E-07 8.8912E-08 4.0407E-13

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0119	99.7093	0.2902	0.0006	0.0000	0.2949	0.0015	99.7036	0.1911

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0119	99.7093	0.2902	0.0006	0.0000	0.2949	0.0015	99.7036	0.1911

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.51170	1.47364	4.44555	1.01837	3.30023	3.84608	1.00584	0.40915
SIGC	1.15145	1.23450	0.87686	0.88926	3.15237	1.02562	0.96321	0.39127
SIGF	2.35975	0.23914	3.61870	0.12911	0.14786	2.82046	0.04264	0.01789

NUMBER DENSITY

1.9687E-05 7.2400E-08 1.8676E-10 2.4347E-13 2.5457E-12 2.3745E-05
1.5754E-07 8.0653E-03 4.2814E-07 7.3930E-07 1.4538E-07 1.0640E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0167	99.6327	0.3664	0.0009	0.0000	0.2935	0.0019	99.7045	0.2437

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0162	99.6327	0.3664	0.0009	0.0000	0.2935	0.0019	99.7045	0.2437

8 CYCLE

***** BURN UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.49950	1.46644	4.43417	1.01543	3.29146	3.83547	1.00705	0.40860
SIGC	1.14564	1.27658	0.87418	0.88561	3.14277	1.02187	0.95913	0.39056
SIGF	2.35385	0.23986	3.60998	0.12982	0.14868	2.81360	0.04292	0.01804

NUMBER DENSITY

2.3739E-05 1.0493E-07 3.2479E-10 5.1292E-13 4.5896E-12 2.3624E-05
1.8923E-07 8.0609E-03 5.1607E-07 9.2385E-07 2.1258E-07 2.2475E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0204	99.5586	0.4401	0.0014	0.0000	0.2922	0.0023	99.7055	0.2941

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0204	99.5586	0.4401	0.0013	0.0000	0.2922	0.0023	99.7055	0.2941

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.48746	1.45918	4.42217	1.01236	3.28216	3.87479	0.99814	0.40798
SIGC	1.13962	1.21857	0.87136	0.8818.	3.13764	1.01794	0.95492	0.38977
SIGF	2.34783	0.24060	3.60080	0.13055	0.14952	2.80634	0.04322	0.01821

NUMBER DENSITY

2.8630E-05 1.5236E-07 5.5957E-10 1.0734E-12 1.4908E-11 2.3480E-05
2.2738E-07 8.0557E-03 6.2223E-07 1.1544E-06 3.1096E-07 4.7128E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0257	99.4687	0.5293	0.0019	0.0000	0.2906	0.0028	99.7066	0.3550

***** COOLING TIME ***** 10.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0257	99.4687	0.5293	0.0019	0.0000	0.2906	0.0028	99.7066	0.3550

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.47368	1.45074	4.40869	1.00880	3.27170	3.81172	0.99366	0.40732
SIGC	1.13279	1.20945	0.81820	0.87754	3.12138	1.01354	0.95017	0.38895
SIGF	2.34089	0.24129	3.59048	0.13125	0.15033	2.79818	0.04349	0.01837

NUMBER DENSITY

3.3114E-05 2.0363E-07 8.6472E-10 1.9161E-12 2.1178E-11 2.3347E-05
2.6219E-07 8.0507E-03 7.1935E-07 1.3733E-06 4.1780E-07 8.4281E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.031C	99.3863	0.6112	0.0026	0.0000	0.2892	0.0032	99.7076	0.4110

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0310	99.3863	0.6112	0.0026	0.0000	0.2892	0.0032	99.7076	0.4109

11 CYCLE

***** BURN-UP TIME ***** 41.65 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.46260	1.44393	4.39795	1.00603	3.26345	3.80172	0.99009	0.40681
SIGC	1.12731	1.20197	0.81568	0.87411	3.11234	1.01000	0.94633	0.38829
SIGF	2.33529	0.24197	3.58227	0.13192	0.15110	2.79171	0.04376	0.01852

NUMBER DENSITY

3.7197E-05 2.5701E-07 1.2170E-09 3.0465E-12 3.6830E-11 2.3727E-05
2.9383E-07 8.0463E-03 8.0789E-07 1.5690E-06 5.2940E-07 1.3417E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0358	99.3106	0.6862	0.0032	0.0000	0.2878	0.0036	99.7086	0.4620

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0358	99.3106	0.6862	0.0032	0.0000	0.2878	0.0036	99.7086	0.4620

****
*** BURNUP CALCULATION ***
*** ***
*** FT05F001:PA351.BBURN.DATA(NFJ[illegible]) ***
*** FT08F001:PA351.BJOYOR.MICRO18 ***
*** FT16F001:PA351.JOYO.FLUX18 ***
****

NGRP = 18 NPLN = 36
集合体番号 = 186
PLANE = 19

INITIAL DENSITY

0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 2.4332E-05
0.0000E+00 8.0863E-03 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0000	0.0000	0.0000	0.0000	0.0000	0.3000	0.0000	99.7000	0.0000

1 CYCLE

***** BURN-UP TIME ***** 47.84 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	4.80707	2.29719	5.81324	1.40392	4.39446	5.11786	1.43247	0.49055
SIGC	1.80881	2.09641	1.14875	1.31850	4.28782	1.46051	1.40312	0.48061
SIGF	2.99826	0.20078	4.66451	0.08542	0.10663	3.65236	0.02934	0.00994

NUMBER DENSITY

1.8837E-06	7.9523E-10	2.4777E-13	3.0332E-17	3.4288E-16	2.4271E-05
1.7273E-08	8.0844E-03	4.3248E-08	3.4699E-08	1.3185E-09	1.2328E-16

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0010	99.9578	0.0422	0.0000	0.0000	0.2993	0.0002	99.7005	0.0232

***** COOLING TIME ***** 60.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0010	99.9578	0.0422	0.0000	0.0000	0.2993	0.0002	99.7005	0.0232

2 CYCLE

***** BURN-UP TIME ***** 43.00 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	4.78860	2.28438	5.79549	1.39868	4.38053	5.09648	1.42643	0.48964
SIGC	1.79971	2.08287	1.14458	1.31251	4.27309	1.45473	1.39683	0.47954
SIGF	2.98890	0.20151	4.65091	0.08617	0.10744	3.64176	0.02960	0.01010

NUMBER DENSITY

3.5545E-06	2.8824E-09	1.7598E-12	4.3500E-16	6.9424E-15	2.4217E-05
3.2518E-08	8.0826E-03	8.1469E-08	6.9389E-08	4.7899E-09	1.7694E-15

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0019	99.9189	0.0810	0.0000	0.0000	0.2987	0.0004	99.7009	0.0439

***** COOLING TIME ***** 60.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0019	99.9189	0.0810	0.0000	0.0000	0.2987	0.0004	99.7009	0.0439

3 CYCLE

***** BURN-UP TIME ***** 43.72 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	4.76976	2.27134	5.77640	1.39316	4.36550	5.07885	1.42010	0.48860
SIGC	1.79009	2.06906	1.14010	1.30619	4.25722	1.44854	1.39022	0.47834
SIGF	2.97917	0.20728	4.63630	0.08697	0.10829	3.63030	0.02988	0.01026

NUMBER DENSITY

5.2561E-06	6.3412E-09	5.7774E-12	2.1607E-15	4.0555E-14	2.4163E-05
4.8031E-08	8.0808E-03	1.2040E-07	1.0407E-07	1.0560E-08	8.7983E-15

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0029	99.8794	0.1205	0.0001	0.0000	0.2981	0.0006	99.7013	0.0649

***** COOLING TIME ***** 45.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0029	99.8794	0.1205	0.0001	0.0000	0.2981	0.0006	99.7013	0.0649

4 CYCLE

***** BURN-UP TIME ***** 3.10 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	4.61936	2.18167	5.61301	1.34884	4.23429	4.97693	1.37009	0.47807
SIGC	1.71316	1.97458	1.10160	1.25624	4.12070	1.39675	1.33845	0.46680
SIGF	2.90620	0.20728	4.51141	0.09760	0.11360	3.53018	0.03164	0.01127

NUMBER DENSITY

5.3824E-06	6.6449E-09	6.1757E-12	2.3818E-15	7.7251E-14	2.4159E-05
4.9169E-08	8.0806E-03	1.2330E-07	1.0407E-07	1.1085E-08	9.7090E-15

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0029	99.8766	0.1233	0.0001	0.0000	0.2981	0.0006	99.7013	0.0664

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0029	99.8766	0.1233	0.0001	0.0000	0.2981	0.0006	99.7013	0.0664

5 CYCLE

***** BURN-UP TIME ***** 26.95 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	4.61808	2.18081	5.61175	1.34847	4.23330	4.92577	1.36967	0.47800
SIGC	1.71253	1.97347	1.10130	1.25582	4.11965	1.39634	1.33801	0.46672
SIGF	2.90556	0.20734	4.51045	0.09265	0.11365	3.52943	0.03166	0.01128

NUMBER DENSITY

7.0456E-06	1.1339E-08	1.3801E-11	7.0171E-15	1.3526E-13	2.4106E-05
6.4117E-08	8.0788E-03	1.6117E-07	1.3875E-07	1.9068E-08	2.8728E-14

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0039	99.8391	0.1607	0.0002	0.0000	0.2975	0.0008	99.7017	0.0870

***** COOLING TIME ***** 150.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0039	99.8391	0.1607	0.0002	0.0000	0.2975	0.0008	99.7017	0.0870

6 CYCLE

***** BURN-UP TIME ***** 39.28 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	4.61078	2.17513	5.60557	1.34650	4.22861	4.92012	1.36734	0.47778
SIGC	1.70906	1.96745	1.09987	1.25352	4.11456	1.39426	1.33556	0.46643
SIGF	2.90172	0.20768	4.50571	0.09299	0.11405	3.52586	0.03178	0.01136

NUMBER DENSITY

9.4135E-06	2.0200E-08	3.2537E-11	2.2179E-14	5.1799E-13	2.4030E-05
8.5365E-08	8.0763E-03	2.1509E-07	1.9652E-07	3.4143E-08	9.0978E-14

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0055	99.7855	0.2141	0.0003	0.0000	0.2967	0.0011	99.7023	0.1163

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0055	99.7855	0.2141	0.0003	0.0000	0.2967	0.0011	99.7023	0.1163

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	4.47576	2.09435	5.45836	1.30665	4.11047	4.78327	1.32231	0.46830
SIGC	1.63975	1.88199	1.06517	1.20846	3.99146	1.34759	1.28888	0.45600
SIGF	2.83602	0.21236	4.39319	0.09819	0.11901	3.43568	0.03343	0.01230

NUMBER DENSITY

1.2047E-05	3.2867E-08	6.7493E-11	5.9147E-14	9.0351E-13	2.3947E-05
1.0874E-07	8.0735E-03	2.7498E-07	2.6583E-07	5.6140E-08	2.4644E-13

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0074	99.7274	0.2721	0.0006	0.0000	0.2957	0.0013	99.7029	0.1490

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0074	99.7274	0.2721	0.0006	0.0000	0.2957	0.0013	99.7029	0.1490

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238

```
 SIGA     4.45657  2.08111  5.43988  1.36127  4.09602  4.76672  1.31607  0.46736
 SIGC     1.63028  1.86792  1.06084  1.20223  3.97609  1.34156  1.28733  0.45489
 SIGF     2.82629  0.21319  4.37904  0.09904  0.11993  3.42466  0.03373  0.01248

 NUMBER  DENSITY
  1.4581E-05  4.7967E-08  1.1864E-10  1.2621E-13  1.6471E-12  2.3867E-05
  1.3114E-07  8.0709E-03  3.3240E-07  3.3511E-07  8.2439E-08  5.2097E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0092  99.6713   0.3279   0.0008   0.0000   0.2948   0.0016  99.7036   0.1804

 ***** COOLING TIME *****  180.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0092  99.6713   0.3279   0.0008   0.0000   0.2948   0.0016  99.7036   0.1804

     9 CYCLE

 ***** BURN-UP TIME *****   48.83 DAYS

 MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
 SIGA     4.43711  2.06787  5.42092  1.29579  4.08117  4.74871  1.30972  0.46638
 SIGC     1.62064  1.85385  1.05640  1.19590  3.96031  1.33540  1.27569  0.45372
 SIGF     2.81647  0.21402  4.36452  0.09989  0.12085  3.41331  0.03404  0.01265

 NUMBER  DENSITY
  1.7648E-05  7.0091E-08  2.0630E-10  2.6714E-13  5.4301E-12  2.3770E-05
  1.5813E-07  8.0676E-03  4.0189E-07  4.1591E-07  1.2107E-07  1.1046E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0116  99.6033   0.3956   0.0012   0.0000   0.2938   0.0020  99.7043   0.2185

 ***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0116  99.6033   0.3956   0.0012   0.0000   0.2938   0.0020  99.7043   0.2185

    10 CYCLE

 ***** BURN-UP TIME *****   44.44 DAYS

 MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
 SIGA     4.41456  2.05246  5.39910  1.28942  4.06406  4.72857  1.30238  0.46576
 SIGC     1.60951  1.83759  1.05179  1.18864  3.94275  1.32831  1.26803  0.45242
 SIGF     2.80505  0.21487  4.34781  0.10078  0.12181  3.40026  0.03435  0.01284

 NUMBER  DENSITY
  2.0465E-05  9.4146E-08  3.2106E-10  4.8126E-13  7.7408E-12  2.3681E-05
  1.8287E-07  8.0646E-03  4.8570E-07  4.9668E-07  1.6324E-07  1.9931E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0139  99.5406   0.4579   0.0016   0.0000   0.2928   0.0023  99.7050   0.2535

 ***** COOLING TIME *****   90.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0139  99.5406   0.4579   0.0016   0.0000   0.2928   0.0023  99.7050   0.2535

    11 CYCLE

 ***** BURN-UP TIME *****   41.65 DAYS

 MICRO CROSS SECTION     (SIG*FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
 SIGA     4.39607  2.03973  5.38113  1.28477  4.05017  4.71717  1.29637  0.46437
 SIGC     1.60040  1.82405  1.04713  1.18266  3.92746  1.32751  1.26173  0.45135
 SIGF     2.79568  0.21568  4.33420  0.10161  0.12271  3.38965  0.03464  0.01302

 NUMBER  DENSITY
  2.3037E-05  1.1975E-07  4.5429E-10  7.7007E-13  1.3596E-11  2.3599E-05
  2.0541E-07  8.0618E-03  5.2401E-07  5.6589E-07  2.0739E-07  3.1937E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0160  99.4831   0.5150   0.0020   0.0000   0.2919   0.0025  99.7056   0.2856

 ***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
```

0.0160 99.4831 0.5150 0.0020 0.0000 0.2919 0.0025 99.7056 0.2856

```
**********************************************************************
***                        BURNUP CALCULATION                      ***
***                                                                ***
***          FT05F001:PA351.BBURN.DATA(NFJM18)                     ***
***          FT08F001:PA351.BJOYOR.MICRO18                         ***
***          FT16F001:PA351.JOYO.FLUX18                            ***
**********************************************************************

NGRP = 18    NPLN = 36
集合体番号 = 115
PLANE = 19

INITIAL DENSITY
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  2.4332E-05
 0.0000E+00  8.0863E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000   0.0000   0.0000   0.0000   0.0000   0.3000   0.0000  99.7000   0.0000

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.90907  1.16920  3.71714  0.85509  2.72104  3.16555  0.80498  0.35783
SIGC      0.82720  0.87668  0.65399  0.67417  2.51779  0.79469  0.74249  0.33017
SIGF      2.08188  0.29252  3.06315  0.18092  0.20325  2.37087  0.06249  0.02766
FLUX      5.29352E+14

NUMBER  DENSITY
 5.8101E-06  5.0402E-09  2.9453E-12  9.2253E-16  4.0757E-15  2.4164E-05
 4.2115E-08  8.0800E-03  1.2576E-07  4.8566E-07  1.2693E-08  4.3228E-15

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0077  99.9133   0.0867   0.0001   0.0000   0.2982   0.0005  99.7013   0.0717

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0077  99.9133   0.0867   0.0001   0.0000   0.2982   0.0005  99.7013   0.0717

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.90470  1.16677  3.71792  0.85598  2.71791  3.16167  0.80344  0.35771
SIGC      0.82488  0.87345  0.65300  0.67281  2.51434  0.79327  0.74084  0.32998
SIGF      2.07932  0.29277  3.05991  0.18117  0.20357  2.36835  0.06260  0.02773
FLUX      5.22345E+14

NUMBER  DENSITY
 1.0928E-05  1.8235E-08  2.0892E-11  1.3715E-14  8.2344E-14  2.4016E-05
 7.9105E-08  8.0743E-03  2.3647E-07  9.1318E-07  4.6042E-08  6.2023E-14

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0147  99.8332   0.1666   0.0002   0.0000   0.2965   0.0010  99.7025   0.1350

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0147  99.8332   0.1666   0.0002   0.0000   0.2965   0.0010  99.7025   0.1350

     3 CYCLE

***** BURN-UP TIME *****   45.77 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.89822  1.16296  3.70682  0.85259  2.71329  3.15597  0.80153  0.35741
SIGC      0.82186  0.86966  0.65156  0.67091  2.50911  0.79127  0.73871  0.32956
SIGF      2.07636  0.29330  3.05576  0.18168  0.20418  2.36466  0.06282  0.02785
FLUX      5.25211E+14

NUMBER  DENSITY
 1.6128E-05  4.3041E-08  6.8479E-11  6.5539E-14  4.8004E-13  2.3866E-05
 1.1652E-07  8.0686E-03  3.4879E-07  1.3519E-06  1.0134E-07  3.0789E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0222  99.7520   0.2477   0.0004   0.0000   0.2949   0.0014  99.7037   0.1994

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0222  99.7520   0.2477   0.0004   0.0000   0.2949   0.0014  99.7037   0.1994

     4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.72205  1.09909  3.46582  0.81799  2.53764  2.93089  0.74636  0.34077
SIGC      0.72025  0.76709  0.59342  0.60068  2.28612  0.71421  0.66767  0.30522
SIGF      2.00180  0.33200  2.87240  0.21731  0.24652  2.21668  0.07869  0.03554
FLUX      5.66361E+14

NUMBER  DENSITY
 1.6490E-05  4.1806E-08  7.2734E-11  7.1763E-14  9.1464E-13  2.3855E-05
 1.1907E-07  8.0682E-03  3.5681E-07  1.3866E-06  1.0628E-07  3.3849E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0228  99.7468   0.2529   0.0004   0.0000   0.2948   0.0015  99.7038   0.2039

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0228  99.7468   0.2529   0.0004   0.0000   0.2948   0.0015  99.7038   0.2039

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.72178  1.09893  3.46556  0.81793  2.53244  2.93065  0.74627  0.34076
SIGC      0.72011  0.76692  0.59336  0.60060  2.28590  0.71413  0.66757  0.30521
SIGF      2.00166  0.33202  2.87220  0.21733  0.24654  2.21652  0.07870  0.03555
FLUX      8.49887E+14

NUMBER  DENSITY
 2.1258E-05  6.8441E-08  1.5322E-10  1.9810E-13  1.5802E-12  2.3717E-05
 1.5246E-07  8.0627E-03  4.6117E-07  1.9519E-06  1.8067E-07  9.5215E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0320  99.6784   0.3209   0.0007   0.0000   0.2933   0.0019  99.7048   0.2630

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0320  99.6784   0.3209   0.0007   0.0000   0.2933   0.0019  99.7048   0.2630

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA      2.71640  1.09547  3.46049  0.81613  2.52818  2.92590  0.74438  0.34043
SIGC      0.71755  0.76383  0.59218  0.59908  2.28204  0.71253  0.66585  0.30495
SIGF      1.99886  0.33164  2.86830  0.21705  0.24613  2.21337  0.07853  0.03547
FLUX      8.46817E+14

NUMBER  DENSITY
 2.8121E-05  1.1876E-07  3.4718E-10  5.9815E-13  5.7766E-12  2.3518E-05
 2.0044E-07  8.0548E-03  6.1144E-07  2.7704E-06  3.2176E-07  2.8984E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0457  99.5783   0.4205   0.0012   0.0000   0.2911   0.0025  99.7064   0.3484

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0457  99.5783   0.4205   0.0012   0.0000   0.2911   0.0025  99.7064   0.3484
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.71299	1.09310	3.45806	0.81524	2.52632	2.92364	0.74329	0.34041
SIGC	0.71605	0.76161	0.59163	0.59879	2.28030	0.71171	0.66481	0.30495
SIGF	1.99694	0.33149	2.86643	0.21694	0.24602	2.21192	0.07848	0.03546
FLUX	8.36518E+14							

NUMBER DENSITY

3.5135E-05	1.8499E-07	6.7465E-10	1.4563E-12	9.7510E-12	2.3315E-05
2.4926E-07	8.0466E-03	7.6480E-07	3.6111E-06	5.0803E-07	7.0738E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0602	99.4744	0.5237	0.0019	0.0000	0.2889	0.0031	99.7080	0.4358

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0602	99.4744	0.5237	0.0019	0.0000	0.2889	0.0031	99.7080	0.4358

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.71330	1.09274	3.45959	0.81528	2.52754	2.92507	0.74343	0.34061
SIGC	0.71645	0.76166	0.59201	0.59871	2.28193	0.71217	0.66510	0.30522
SIGF	1.99685	0.33108	2.86759	0.21658	0.24561	2.21290	0.07833	0.03539
FLUX	8.33054E+14							

NUMBER DENSITY

4.1943E-05	2.6394E-07	1.1473E-09	2.9695E-12	1.7031E-11	2.3118E-05
2.9657E-07	8.0387E-03	9.1368E-07	4.4280E-06	7.3034E-07	1.4443E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0749	99.3720	0.6253	0.0027	0.0000	0.2868	0.0037	99.7096	0.5208

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0749	99.3721	0.6253	0.0027	0.0000	0.2868	0.0037	99.7096	0.5208

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-235
SIGA	2.70883	1.09008	3.45548	0.81419	2.52440	2.92123	0.74199	0.34045
SIGC	0.71429	0.75883	0.59104	0.59743	2.27857	0.71082	0.66359	0.30501
SIGF	1.99454	0.33125	2.86443	0.21676	0.24583	2.21041	0.07840	0.03544
FLUX	8.31889E+14							

NUMBER DENSITY

5.0104E-05	3.7766E-07	1.9360E-09	6.0423E-12	5.3194E-11	2.2882E-05
3.5309E-07	8.0290E-03	1.0922E-06	5.4164E-06	1.0516E-06	2.9436E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0932	99.2481	0.7481	0.0038	0.0000	0.2842	0.0044	99.7114	0.6230

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0932	99.2481	0.7481	0.0038	0.0000	0.2842	0.0044	99.7114	0.6230

10 CYCLE

***** BURN-UP TIME ***** 44.44 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.70379	1.08701	3.45097	0.81293	2.52095	2.91702	0.74037	0.34028
SIGC	0.71188	0.75565	0.58999	0.59603	2.27495	0.70933	0.66192	0.30480
SIGF	1.99191	0.33136	2.86098	0.21690	0.24600	2.20768	0.07846	0.03548
FLUX	8.19720E+14							

NUMBER DENSITY

5.7339E-05	4.9620E-07	2.9183E-09	1.0442E-11	7.4315E-11	2.2673E-05
4.0305E-07	8.0204E-03	1.2505E-06	6.3118E-06	1.3879E-06	5.0924E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1104	99.1371	0.8579	0.0050	0.0000	0.2819	0.0050	99.7131	0.7139

***** COOLING TIME ***** 90.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1104	99.1371	0.8579	0.0050	0.0000	0.2819	0.0050	99.7131	0.7139

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FI05F001:PA351.@BURN.DATA(NFJIOR)                    ***
***          FI08F001:PA351.@JUYOR.MICRO18                        ***
***          FI16F001:PA351.JUYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体番号 = 68
PLANE = 19

INITIAL DENSITY
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  2.4332E-05
 0.0000E+00  8.0863E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000   0.0000   0.0000   0.0000   0.0000   0.3000   0.0000  99.7000   0.0000

CROSS SECTION FACTOR
  SIGF     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC     1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37789  0.97006  2.99288  0.74501  2.17231  2.48902  0.63591  0.30648
SIGC     0.52177  0.56730  0.47966  0.46254  1.84972  0.56329  0.52895  0.25735
SIGF     1.85613  0.40275  2.51322  0.28247  0.32259  1.92573  0.10696  0.04913
FLUX     8.85552E+14

NUMBER  DENSITY
 7.5757E-06  6.9367E-09  4.3880E-17  1.6867E-15  6.0721E-15  2.4111E-05
 4.9883E-08  8.0772E-03  1.7077E-07  1.4452E-06  2.4701E-08  8.8432E-15

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0202  99.9085   0.0915   0.0001   0.0000   0.2976   0.0006  99.7018   0.0935

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0202  99.9085   0.0915   0.0001   0.0000   0.2976   0.0006  99.7018   0.0935

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37794  0.96943  2.99430  0.74486  2.17334  2.49034  0.63592  0.30666
SIGC     0.52209  0.56732  0.48002  0.46294  1.85141  0.56373  0.52970  0.25765
SIGF     1.85585  0.40211  2.51428  0.28191  0.32193  1.92661  0.10671  0.04901
FLUX     8.79548E+14

NUMBER  DENSITY
 1.4283E-05  2.5296E-08  3.1520E-11  7.4572E-14  1.2333E-13  2.3916E-05
 9.3952E-08  8.0691E-03  3.2192E-07  2.7271E-06  9.0160E-08  1.2894E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0387  99.8230   0.1768   0.0007   0.0000   0.2955   0.0012  99.7033   0.1765

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0387  99.8230   0.1768   0.0007   0.0000   0.2955   0.0012  99.7033   0.1765

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37704  0.96872  2.99396  0.74464  2.17311  2.49003  0.63565  0.30671
SIGC     0.52176  0.56673  0.47995  0.46282  1.85179  0.56361  0.52898  0.25772
SIGF     1.85579  0.40199  2.51401  0.28181  0.32182  1.92642  0.10667  0.04899
FLUX     8.87481E+14

NUMBER  DENSITY
 2.1066E-05  5.5652E-08  1.0370E-10  1.2252E-13  7.2331E-13  2.3718E-05
 1.3845E-07  8.0608E-03  4.7489E-07  4.0423E-06  1.9864E-07  6.4346E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0581  99.7360   0.2635   0.0005   0.0000   0.2934   0.0017  99.7050   0.2606

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0581  99.7360   0.2635   0.0005   0.0000   0.2934   0.0017  99.7050   0.2606

     4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37434  0.96671  2.99157  0.74343  2.17081  2.48777  0.63457  0.30648
SIGC     0.52053  0.56532  0.47942  0.46212  1.84969  0.56288  0.52818  0.25763
SIGF     1.85381  0.40138  2.51215  0.28131  0.32112  1.92488  0.10639  0.04886
FLUX     8.76686E+14

NUMBER  DENSITY
 2.1538E-05  5.8228E-08  1.1045E-10  1.3439E-13  1.3814E-12  2.3704E-05
 1.4155E-07  8.0601E-03  4.8557E-07  4.1345E-06  2.0790E-07  7.0639E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0595  99.7299   0.2696   0.0005   0.0000   0.2932   0.0018  99.7051   0.2664

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0595  99.7299   0.2696   0.0005   0.0000   0.2932   0.0018  99.7051   0.2664

     5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37428  0.96666  2.99154  0.74341  2.17080  2.48775  0.63456  0.30648
SIGC     0.52051  0.56528  0.47941  0.46211  1.84968  0.56288  0.52817  0.25763
SIGF     1.85377  0.40138  2.51213  0.28130  0.32111  1.92487  0.10639  0.04886
FLUX     1.31547E+15

NUMBER  DENSITY
 2.7709E-05  9.7044E-08  2.3948E-10  3.7840E-13  2.3987E-12  2.3524E-05
 1.8194E-07  8.0525E-03  6.2485E-07  5.3331E-06  3.4706E-07  1.9905E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0777  99.6502   0.3490   0.0009   0.0000   0.2913   0.0023  99.7065   0.3431

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0777  99.6502   0.3490   0.0008   0.0000   0.2913   0.0023  99.7065   0.3431

     6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37571  0.96631  2.99509  0.74332  2.17328  2.49106  0.63495  0.30680
SIGC     0.52170  0.56624  0.48029  0.46317  1.85355  0.56403  0.52908  0.25819
SIGF     1.85401  0.40007  2.51480  0.28015  0.31973  1.92702  0.10587  0.04861
FLUX     1.28810E+15

NUMBER  DENSITY
 3.6461E-05  1.6926E-07  5.4972E-10  1.1555E-12  8.9560E-12  2.3769E-05
 2.3904E-07  8.0417E-03  8.2202E-07  7.0369E-06  6.0585E-07  6.0839E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.1044  99.5365   0.4621   0.0015   0.0000   0.2885   0.0030  99.7085   0.4521

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.1044  99.5365   0.4621   0.0015   0.0000   0.2885   0.0030  99.7085   0.4521
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.37593	0.96555	2.99700	0.74306	2.17458	2.49283	0.63498	0.30701
SIGC	0.52219	0.56642	0.48077	0.46373	1.85583	0.56465	0.52948	0.25858
SIGF	1.85374	0.39913	2.51622	0.27933	0.31875	1.92818	0.10549	0.04843
FLUX	1.28465E+15							

NUMBER DENSITY

4.5458E-05	2.6510E-07	1.0822E-09	2.8620E-12	1.5252E-11	2.3006E-05
2.9766E-07	8.0304E-03	1.0249E-06	8.7958E-06	9.4984E-07	1.5072E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1328	99.4179	0.5798	0.0024	0.0000	0.2857	0.0037	99.7107	0.5645

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1328	99.4179	0.5798	0.0024	0.0000	0.2857	0.0037	99.7107	0.5645

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.37585	0.96482	2.99839	0.74286	2.17559	2.49413	0.63495	0.30722
SIGC	0.52247	0.56639	0.48113	0.46414	1.85755	0.56509	0.52973	0.25891
SIGF	1.85338	0.39843	2.51726	0.27872	0.31804	1.92904	0.10523	0.04831
FLUX	1.26297E+15							

NUMBER DENSITY

5.4056E-05	3.2753E-07	1.8407E-09	5.8516E-12	2.6883E-11	2.2756E-05
3.5352E-07	8.0195E-03	1.2189E-06	1.0495E-05	1.3539E-06	3.0818E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1611	99.3031	0.6935	0.0034	0.0000	0.2829	0.0044	99.7127	0.6723

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1611	99.3031	0.6936	0.0033	0.0000	0.2829	0.0044	99.7127	0.6723

9 CYCLE

***** BURN-UP TIME ***** 48.83 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.37429	0.96371	2.99775	0.74237	2.17464	2.49306	0.63442	0.30718
SIGC	0.52179	0.56545	0.48087	0.46379	1.85678	0.56472	0.52926	0.25891
SIGF	1.85249	0.39826	2.51638	0.27858	0.31787	1.92855	0.10515	0.04827
FLUX	1.26855E+15							

NUMBER DENSITY

6.4402E-05	5.4002E-07	3.1144E-09	1.1965E-11	8.4720E-11	2.2454E-05
4.2052E-07	8.0063E-03	1.4524E-06	1.2558E-05	1.9399E-06	6.3137E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1967	99.1637	0.8315	0.0048	0.0000	0.2797	0.0052	99.7151	0.8024

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1967	99.1637	0.8315	0.0048	0.0000	0.2797	0.0052	99.7151	0.8024

```
*********************************************************************
***                        BURNUP CALCULATION                     ***
***                                                               ***
***          FIO5F001:PA351.@BURN.DATA(MFJ109)                    ***
***          FIO8F001:PA351.@JOYOR.MICRO18                        ***
***          FI16F001:PA351.JOYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体番号 = 87
PLANE = 19

INITIAL DENSITY
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  2.4332E-05
 0.0000E+00  8.0863E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0000   0.0000   0.0000   0.0000   0.0000   9.3000   0.0000  99.7000   0.0000

CROSS SECTION FACTOR
  SIGF      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.50455  1.01396  3.17075  0.76949  2.30569  2.65511  0.67586  0.31926
SIGC     0.59578  0.64125  0.52762  0.51458  2.01582  0.62022  0.58115  0.27605
SIGF     1.90877  0.37271  2.64814  0.25491  0.28987  2.03489  0.09471  0.04321
FLUX     7.38134E+14

NUMBER  DENSITY
 6.7737E-06  5.8999E-09  3.5166E-12  1.2772E-15  4.8663E-15  2.4136E-05
 4.5791E-08  8.0785E-03  1.5045E-07  1.0637E-06  1.8928E-08  6.2228E-15

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0152  99.9129   0.0870   0.0001   0.0000   0.2979   0.0006  99.7016   0.0836

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0152  99.9129   0.0870   0.0001   0.0000   0.2979   0.0006  99.7016   0.0836

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.50325  1.01254  3.17068  0.76887  2.30546  2.65503  0.67537  0.31932
SIGC     0.59541  0.64048  0.52763  0.51452  2.01627  0.62019  0.58092  0.27624
SIGF     1.90784  0.37206  2.64805  0.25435  0.28919  2.03484  0.09445  0.04309
FLUX     7.44333E+14

NUMBER  DENSITY
 1.2864E-05  2.1815E-08  2.5803E-11  1.8393E-14  9.9906E-14  2.3959E-05
 8.6885E-08  8.0713E-03  2.8578E-07  2.0725E-06  7.0078E-08  9.3333E-14

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0293  99.8305   0.1693   0.0002   0.0000   0.2960   0.0011  99.7030   0.1589

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0293  99.8305   0.1693   0.0002   0.0000   0.2960   0.0011  99.7030   0.1589

    3 CYCLE

***** BURN-UP TIME *****   43.77 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.50118  1.01129  3.16894  0.76840  2.30417  2.65341  0.67473  0.31928
SIGC     0.59444  0.63916  0.52727  0.51397  2.01488  0.61961  0.58024  0.27617
SIGF     1.90674  0.37213  2.64672  0.25443  0.28929  2.03380  0.09449  0.04311
FLUX     7.47587E+14

NUMBER  DENSITY
 1.9041E-05  4.8277E-08  8.5533E-11  9.2624E-14  5.9272E-13  2.3780E-05
 1.2845E-07  8.0640E-03  4.2289E-07  3.0035E-06  1.5531E-07  4.7071E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0442  99.7467   0.2529   0.0004   0.0000   0.2940   0.0016  99.7044   0.2355

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0442  99.7467   0.2529   0.0004   0.0000   0.2940   0.0016  99.7044   0.2355

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.50275  1.01113  3.17264  0.76852  2.30692  2.65687  0.67523  0.31965
SIGC     0.59568  0.64009  0.52313  0.51506  2.01876  0.62079  0.58116  0.27674
SIGF     1.90707  0.37104  2.64951  0.25347  0.28816  2.03608  0.09406  0.04291
FLUX     7.27248E+14

NUMBER  DENSITY
 1.9459E-05  5.0497E-08  9.1075E-11  1.0154E-13  1.1356E-12  2.3767E-05
 1.3128E-07  8.0634E-03  4.3231E-07  3.0611E-06  1.6245E-07  5.1604E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0451  99.7407   0.2588   0.0005   0.0000   0.2939   0.0016  99.7045   0.2407

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0451  99.7407   0.2588   0.0005   0.0000   0.2939   0.0016  99.7045   0.2407

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241   U-235    U-236    U-238
SIGA     2.50261  1.01105  3.17253  0.76849  2.30684  2.65676  0.67518  0.31964
SIGC     0.59562  0.64001  0.52311  0.51502  2.01867  0.62075  0.58112  0.27673
SIGF     1.90699  0.37105  2.64942  0.25347  0.28817  2.03601  0.09407  0.04291
FLUX     1.09127E+15

NUMBER  DENSITY
 2.4979E-05  8.3755E-08  1.9596E-10  2.8296E-13  1.9736E-12  2.3607E-05
 1.6837E-07  8.0568E-03  5.5489E-07  3.9374E-06  2.6962E-07  1.4379E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0587  99.6651   0.3342   0.0008   0.0000   0.2921   0.0021  99.7058   0.3092

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242   U-235    U-236    U-238   PU/PU+U
 0.0587  99.6651   0.3342   0.0008   0.0000   0.2921   0.0021  99.7058   0.3092
```

```
**********************************************************************
***                        BURNUP CALCULATION                      ***
***                                                                ***
***          FT05F001:PA351.@BURN.DATA(MFJM1S)                     ***
***          FT08F001:PA351.@JUYOR.MICRO18                         ***
***          FT16F001:PA351.JOYO.FLUX18                            ***
**********************************************************************

NGRP = 18    NPLN = 36
集合体番号 = 119
PLANE = 19

INITIAL DENSITY
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  2.4332E-05
 0.0000E+00  8.0863E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000   0.0000   0.0000   0.0000   0.0000   0.3000   0.0000  99.7000   0.0000

CROSS SECTION FACTOR
  SIGF      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.56101  1.04167  3.24097  0.78531  2.36276  2.72089  0.69525  0.32449
SIGC     0.62654  0.67403  0.53919  0.53521  2.07762  0.64250  0.60212  0.28198
SIGF     1.93446  0.36764  2.70178  0.25011  0.28515  2.07839  0.09313  0.04251
FLUX     6.87143E+14

NUMBER  DENSITY
 6.4409E-06  5.4906E-07  3.2033E-12  1.0737E-15  4.4328E-15  2.4145E-05
 4.4173E-08  8.0788E-03  1.4309E-07  9.7124E-07  1.6979E-08  5.3841E-15

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0139  99.9148   0.0852   0.0000   0.0000   0.2980   0.0005  99.7015   0.0795

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0139  99.9148   0.0852   0.0000   0.0000   0.2980   0.0005  99.7015   0.0795

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.55985  1.04043  3.24107  0.78494  2.36284  2.72097  0.69489  0.32461
SIGC     0.62622  0.67320  0.53924  0.53518  2.07808  0.64250  0.60191  0.28217
SIGF     1.93362  0.36724  2.70183  0.24976  0.28475  2.07847  0.09298  0.04245
FLUX     6.83029E+14

NUMBER  DENSITY
 1.2157E-05  7.0042E-08  2.3032E-11  1.5657E-14  9.0120E-14  2.3978E-05
 8.3271E-08  8.0721E-03  2.6999E-07  1.8377E-06  6.2037E-08  7.8584E-14

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0268  99.8352   0.1646   0.0002   0.0000   0.2962   0.0010  99.7028   0.1502

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0268  99.8352   0.1646   0.0002   0.0000   0.2962   0.0010  99.7028   0.1502

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTIO      (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.55742  1.03897  3.23903  0.78437  2.36131  2.71907  0.69413  0.32456
SIGC     0.62509  0.67161  0.53876  0.53455  2.07645  0.64182  0.60111  0.28209
SIGF     1.93234  0.36731  2.70077  0.24984  0.28486  2.07725  0.09301  0.04247
FLUX     6.86150E+14

NUMBER  DENSITY
 1.7956E-05  4.4151E-08  7.5823E-11  7.8171E-14  5.2902E-13  2.3810E-05
 1.2281E-07  8.0653E-03  3.9865E-07  2.7149E-06  1.3687E-07  3.9256E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0401  99.7543   0.2453   0.0004   0.0000   0.2943   0.0015  99.7041   0.2220

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0401  99.7543   0.2453   0.0004   0.0000   0.2943   0.0015  99.7041   0.2220

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.55445  1.03631  3.23732  0.78302  2.35956  2.71746  0.69300  0.32447
SIGC     0.62393  0.66998  0.53840  0.53401  2.07576  0.64130  0.60040  0.28219
SIGF     1.93052  0.36633  2.69893  0.24901  0.28380  2.07616  0.09260  0.04228
FLUX     6.80776E+14

NUMBER  DENSITY
 1.8351E-05  4.6193E-08  8.0782E-11  8.5740E-14  1.0103E-12  2.3798E-05
 1.2555E-07  8.0648E-03  4.0764E-07  2.7725E-06  1.4325E-07  4.3097E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0410  99.7486   0.2511   0.0004   0.0000   0.2942   0.0016  99.7043   0.2269

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0410  99.7486   0.2511   0.0004   0.0000   0.2942   0.0016  99.7043   0.2269

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.55429  1.03621  3.23718  0.78298  2.35945  2.71733  0.69295  0.32447
SIGC     0.62385  0.66988  0.53837  0.53397  2.07565  0.64126  0.60034  0.28219
SIGF     1.93044  0.36633  2.69882  0.24901  0.28380  2.07608  0.09261  0.04228
FLUX     1.02155E+15

NUMBER  DENSITY
 2.3633E-05  7.7026E-08  1.7513E-10  2.4146E-13  1.7558E-12  2.3644E-05
 1.6149E-07  8.0585E-03  5.2479E-07  3.5798E-06  2.3918E-07  1.2140E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0536  99.6744   0.3249   0.0007   0.0000   0.2925   0.0020  99.7055   0.2925

***** COOLING TIME *****  150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0536  99.6745   0.3249   0.0007   0.0000   0.2925   0.0020  99.7055   0.2925

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.55548  1.03585  3.24046  0.78304  2.36190  2.72040  0.69333  0.32481
SIGC     0.62489  0.67052  0.53918  0.53491  2.07913  0.64230  0.60111  0.28272
SIGF     1.93058  0.36533  2.70129  0.24813  0.28277  2.07810  0.09222  0.04210
FLUX     9.96276E+14

NUMBER  DENSITY
 3.1094E-05  1.3412E-07  4.0091E-10  7.3441E-13  6.5575E-12  2.3428E-05
 2.1217E-07  8.0497E-03  6.9023E-07  4.7205E-06  4.1690E-07  3.6955E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0719  99.5693   0.4295   0.0013   0.0000   0.2902   0.0026  99.7072   0.3853

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0719  99.5693   0.4295   0.0013   0.0000   0.2902   0.0026  99.7072   0.3853
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.55369	1.03421	3.23995	0.78744	2.36144	2.71992	0.69275	0.32489
SIGC	0.62428	0.66938	0.53908	0.53472	2.07915	0.64211	0.60071	0.28288
SIGF	1.92942	0.36485	2.70087	0.24772	0.28229	2.07780	0.09203	0.04201
FLUX	9.78275E+14							

NUMBER DENSITY

3.8559E-05	2.0853E-07	7.7997E-10	1.7907E-12	1.1144E-11	2.3208E-05
2.6342E-07	8.0406E-03	8.5801E-07	5.8828E-06	6.4900E-07	9.0152E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0911	99.4615	0.5365	0.0020	0.0000	0.2878	0.0033	99.7090	0.4797

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0911	99.4615	0.5365	0.0020	0.0000	0.2878	0.0033	99.7090	0.4797

8 CYCLE

***** BURN-UP TIME ***** 40.25 DAYS

MICRO CROSS SECTION (SIG*FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	2.54506	1.03018	3.22936	0.78028	2.35320	2.71002	0.68989	0.32415
SIGC	0.61958	0.66429	0.53655	0.53158	2.06979	0.63873	0.59744	0.28193
SIGF	1.92548	0.36589	2.69281	0.24871	0.28341	2.07129	0.09245	0.04222
FLUX	1.00159E+15							

NUMBER DENSITY

4.6170E-05	2.9880E-07	1.3397E-09	3.7074E-12	1.9576E-11	2.2990E-05
3.1412E-07	8.0314E-03	1.0747E-06	7.0554E-06	9.3269E-07	1.8690E-11

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1111	99.3541	0.6430	0.0029	0.0000	0.2854	0.0039	99.7107	0.5736

***** COOLING TIME ***** 180.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.1111	99.3542	0.6430	0.0028	0.0000	0.2854	0.0039	99.7107	0.5736

```
**********************************************************************
***                        BURNUP CALCULATION                      ***
***                                                                ***
***          FT05F001:PA351.@BURN.DATA(NFJ04A)                     ***
***          FT08F001:PA351.@JOYOR.MICRO18                         ***
***          FT16F001:PA351.JOYO.FLUX18                            ***
**********************************************************************

NGRP = 18    NPLN = 36
炉合体番号 = 116
PLANE = 19

INITIAL DENSITY
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  2.4332E-05
 0.0000E+00  8.0863E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000   0.0000   0.0000   0.0000   0.0000   0.3000   0.0000  99.7000   0.0000

CROSS SECTION FACTOR
  SIGF      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

    1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     3.15085  1.27740  4.02431  0.91625  2.96209  3.45285  0.88552  0.38047
SIGC     0.96041  1.01500  0.72723  0.76389  2.79067  0.89226  0.83466  0.35847
SIGF     2.19044  0.26239  3.29709  0.15235  0.17142  2.56059  0.05086  0.02200
FLUX     4.16536E+14

NUMBER  DENSITY
 4.9711E-06  3.9371E-09  2.0967E-12  5.7458E-16  2.9014E-15  2.4188E-05
 3.7215E-08  8.0810E-03  1.0694E-07  3.0066E-07  8.9921E-09  2.6058E-15

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0051  99.9208   0.0791   0.0000   0.0000   0.2984   0.0005  99.7011   0.0613

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0051  99.9208   0.0791   0.0000   0.0000   0.2984   0.0005  99.7011   0.0613

    2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     3.14380  1.27374  4.01775  0.91460  2.95714  3.44672  0.88326  0.38021
SIGC     0.95697  1.01039  0.72568  0.76180  2.78518  0.89007  0.83221  0.35810
SIGF     2.18683  0.26285  3.29206  0.15280  0.17196  2.55664  0.05105  0.02211
FLUX     4.11766E+14

NUMBER  DENSITY
 9.3517E-06  1.4270E-08  1.4909E-11  8.7611E-15  5.8709E-14  2.4060E-05
 6.9965E-08  8.0762E-03  2.0126E-07  5.6646E-07  3.2648E-08  3.7502E-14

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0099  99.8475   0.1524   0.0002   0.0000   0.2970   0.0009  99.7021   0.1155

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0099  99.8475   0.1524   0.0007   0.0000   0.2970   0.0009  99.7021   0.1155

    3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     3.13554  1.26870  4.00924  0.91761  2.95042  3.43877  0.88058  0.37976
SIGC     0.95279  1.00517  0.72388  0.75916  2.77789  0.88729  0.82926  0.35750
SIGF     2.18275  0.26352  3.28556  0.15345  0.17272  2.55148  0.05132  0.02226
FLUX     4.14210E+14

NUMBER  DENSITY
 1.3811E-05  3.1355E-08  4.8881E-11  4.0981E-14  3.4272E-13  2.3931E-05
 1.0314E-07  8.0714E-03  2.9705E-07  8.4366E-07  7.1893E-08  1.8633E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0150  99.7731   0.2265   0.0004   0.0000   0.2956   0.0013  99.7031   0.1707

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0150  99.7731   0.2265   0.0004   0.0000   0.2956   0.0013  99.7031   0.1707

    4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     3.01605  1.21669  3.85577  0.88328  2.83089  3.29527  0.84111  0.36855
SIGC     0.88654  0.93679  0.68703  0.71442  2.64083  0.83852  0.78342  0.34319
SIGF     2.12951  0.27990  3.16874  0.16886  0.19007  2.45675  0.05769  0.02535
FLUX     4.40816E+14

NUMBER  DENSITY
 1.4130E-05  3.2808E-08  5.2077E-11  4.5002E-14  6.5305E-13  2.3922E-05
 1.0550E-07  8.0710E-03  3.0396E-07  8.6675E-07  7.5388E-08  2.0510E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0154  99.7680   0.2317   0.0004   0.0000   0.2955   0.0013  99.7032   0.1746

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0154  99.7680   0.2317   0.0004   0.0000   0.2955   0.0013  99.7032   0.1746

    5 CYCLE

***** BURN-UP TIME *****   26.95 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     3.01558  1.21644  3.85529  0.88317  2.83053  3.29482  0.84095  0.36852
SIGC     0.88631  0.93649  0.68692  0.71427  2.64041  0.83836  0.78325  0.34316
SIGF     2.12927  0.27994  3.16837  0.16890  0.19011  2.45646  0.05771  0.02536
FLUX     6.61517E+14

NUMBER  DENSITY
 1.8314E-05  5.4749E-08  1.1291E-10  1.2793E-13  1.1349E-12  2.3800E-05
 1.3613E-07  8.0664E-03  3.9423E-07  1.1784E-06  1.2831E-07  5.8868E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0210  99.7014   0.2981   0.0006   0.0000   0.2942   0.0017  99.7041   0.2265

***** COOLING TIME *****   150.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0210  99.7014   0.2981   0.0006   0.0000   0.2942   0.0017  99.7041   0.2265

    6 CYCLE

***** BURN-UP TIME *****   39.28 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     3.01126  1.21356  3.85187  0.88201  2.82788  3.29161  0.83956  0.36843
SIGC     0.88434  0.93374  0.68613  0.71318  2.63784  0.83723  0.78189  0.34307
SIGF     2.12693  0.27982  3.16574  0.16883  0.19003  2.45439  0.05767  0.02535
FLUX     6.54777E+14

NUMBER  DENSITY
 2.4308E-05  9.6168E-08  2.6099E-10  3.9526E-13  4.2420E-12  2.3627E-05
 1.7994E-07  8.0598E-03  5.2358E-07  1.6282E-06  2.2848E-07  1.8264E-12

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0293  99.6049   0.3941   0.0011   0.0000   0.2923   0.0022  99.7055   0.3010

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0293  99.6049   0.3941   0.0011   0.0000   0.2923   0.0022  99.7055   0.3010
```

7 CYCLE

***** BURN-UP TIME ***** 40.96 DAYS

MICRO CROSS SECTION (SIG=FLUX/FLUX)

	PU-239	PU-240	PU-241	PU-242	AM-241	U-235	U-236	U-238
SIGA	3.00440	1.20952	3.84551	0.88039	2.82307	3.28568	0.83737	0.36818
SIGC	0.88100	0.92933	0.68464	0.71118	2.63258	0.83512	0.77954	0.34273
SIGI	2.12340	0.28020	3.16087	0.16921	0.19049	2.45056	0.05783	0.02545

FLUX 6.46189E+14

NUMBER DENSITY

3.0425E-05 1.5070E-07 5.1232E-10 9.7548E-13 7.2483E-12 2.3450E-05
2.2448E-07 8.0530E-03 6.5557E-07 2.0892E-06 3.6082E-07 4.5147E-12

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0383	99.5054	0.4929	0.0017	0.0000	0.2903	0.0028	99.7069	0.3771

***** COOLING TIME ***** 30.0 DAYS

BURNUP	PU-239	PU-240	PU-241	PU-242	U-235	U-236	U-238	PU/PU+U
0.0383	99.5054	0.4929	0.0017	0.0000	0.2903	0.0028	99.7069	0.3771

```
*********************************************************************
***                      BURNUP CALCULATION                       ***
***                                                               ***
***          FT05F001:PA351.@BURN.DATA(MIJION)                    ***
***          FT08F001:PA351.@JOYOR.MICRO18                        ***
***          FT16F001:PA351.JOYO.FLUX18                           ***
*********************************************************************

NGRP = 18    NPLN = 36
集合体番号 = 88
PLANE = 19

INITIAL DENSITY
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  2.4332E-05
 0.0000E+00  8.0863E-03  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0000   0.0000   0.0000   0.0000   0.0000   0.3000   0.0000  99.7000   0.0000

CROSS SECTION FACTOR
  SIGF      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00
  SIGC      1.00     1.00     1.00     1.00     1.00     1.00     1.00     1.00

     1 CYCLE

***** BURN-UP TIME *****   47.84 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37484  0.96860  2.98853  0.74391  2.16860  2.48494  0.63473  0.30601
SIGC     0.52002  0.56569  0.47864  0.46176  1.84591  0.56195  0.52774  0.25688
SIGF     1.85482  0.40292  2.50989  0.28765  0.32269  1.92299  0.10699  0.04913
FLUX     8.68691E+14

NUMBER  DENSITY
 7.4152E-06  6.6371E-09  4.1059E-12  1.5448E-15  5.6819E-15  2.4116E-05
 4.8815E-08  8.0774E-03  1.6727E-07  1.4221E-06  2.3703E-08  8.1061E-15

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0199  99.9105   0.0894   0.0001   0.0000   0.2977   0.0006  99.7018   0.0915

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0199  99.9105   0.0894   0.0001   0.0000   0.2977   0.0006  99.7018   0.0915

     2 CYCLE

***** BURN-UP TIME *****   43.00 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37090  0.96640  2.98410  0.74264  2.16489  2.48078  0.63331  0.30564
SIGC     0.51799  0.56345  0.47760  0.45993  1.84221  0.56055  0.52634  0.25652
SIGF     1.85292  0.40295  2.50649  0.28771  0.32268  1.92023  0.10697  0.04912
FLUX     8.83049E+14

NUMBER  DENSITY
 1.4173E-05  2.4649E-08  3.0333E-11  2.3383E-14  1.1700E-13  2.3920E-05
 9.2826E-08  8.0693E-03  3.1860E-07  2.7156E-06  8.8345E-08  1.2291E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0385  99.8256   0.1742   0.0002   0.0000   0.2956   0.0011  99.7033   0.1745

***** COOLING TIME *****   60.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0385  99.8256   0.1742   0.0002   0.0000   0.2956   0.0011  99.7033   0.1745

     3 CYCLE

***** BURN-UP TIME *****   43.72 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.36986  0.96565  2.98351  0.74239  2.16448  2.48023  0.63299  0.30566
SIGC     0.51756  0.56277  0.47747  0.45974  1.84185  0.56034  0.52604  0.25655
SIGF     1.85230  0.40288  2.50604  0.28765  0.32263  1.91989  0.10695  0.04911
FLUX     8.86630E+14

NUMBER  DENSITY
 2.0908E-05  5.4633E-08  1.0083E-10  1.1818E-13  6.9665E-13  2.3722E-05
 1.3726E-07  8.0609E-03  4.7180E-07  4.0308E-06  1.9619E-07  6.2210E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0579  99.7390   0.2606   0.0005   0.0000   0.2934   0.0017  99.7049   0.2586

***** COOLING TIME *****   45.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0579  99.7390   0.2606   0.0005   0.0000   0.2934   0.0017  99.7049   0.2586

     4 CYCLE

***** BURN-UP TIME *****   3.10 DAYS

MICRO CROSS SECTION     (SIG=FLUX/FLUX)
          PU-239   PU-240   PU-241   PU-242   AM-241    U-235    U-236    U-238
SIGA     2.37365  0.96621  2.99005  0.74271  2.16911  2.48632  0.63409  0.30615
SIGC     0.52007  0.56516  0.47908  0.46169  1.84847  0.56247  0.52790  0.25741
SIGF     1.85357  0.40305  2.51097  0.28702  0.32064  1.92385  0.10619  0.04874
FLUX     8.59331E+14

NUMBER  DENSITY
 2.1369E-05  5.7129E-08  1.0731E-10  1.2957E-13  1.3366E-12  2.3708E 05
 1.4030E-07  8.0603E-03  4.8229E-07  4.1115E-06  2.0520E-07  6.8192E-13

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0592  99.7329   0.2666   0.0005   0.0000   0.2933   0.0017  99.7050   0.2643

***** COOLING TIME *****   30.0 DAYS

 BURNUP   PU-239   PU-240   PU-241   PU-242    U-235    U-236    U-238  PU/PU+U
 0.0592  99.7329   0.2666   0.0005   0.0000   0.2933   0.0017  99.7050   0.2643
```